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Original Article

The Role of Nursing Leadership in Promoting Patient Safety Culture and Quality of Care in Tertiary Hospitals of South Punjab

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ABSTRACT

Background: Nursing leadership plays a critical role in shaping patient safety culture and influencing the quality of care in healthcare systems, particularly in resource-constrained tertiary hospital settings. Objective: To assess the association between nursing leadership, patient safety culture, and quality of care among nurses working in tertiary care hospitals of South Punjab, Pakistan. Methods: A quantitative cross-sectional study was conducted among 141 nurses selected through convenience sampling from multiple public-sector tertiary hospitals. Data were collected using a structured questionnaire assessing leadership, safety culture, and quality of care. Descriptive statistics, chi-square tests, and Pearson correlation analyses were performed using SPSS version 27, with significance set at $p < 0.05$. Results: Nursing leadership showed a strong positive correlation with patient safety culture ($r = 0.680$, $p < 0.001$) and quality of care ($r = 0.610$, $p < 0.001$). Patient safety culture was also significantly correlated with quality of care ($r = 0.630$, $p < 0.001$). Chi-square analysis demonstrated significant associations between leadership and safety culture ($\chi^2 = 32.45$, $p < 0.001$) and quality of care ($\chi^2 = 28.67$, $p < 0.001$). Descriptive findings indicated generally positive perceptions, although gaps were noted in non-punitive error reporting and resource availability. Conclusion: Nursing leadership is significantly associated with improved patient safety culture and quality of care. Strengthening leadership practices and supportive organizational environments may enhance patient outcomes in tertiary healthcare settings. Keywords: Nursing leadership, patient safety culture, quality of care, healthcare leadership, patient safety, clinical outcomes.

INTRODUCTION

Patient safety and quality of care are core indicators of health-system performance, particularly in tertiary hospitals where patients commonly present with higher acuity, complex comorbidities, and greater exposure to preventable adverse events. Within these settings, nurses constitute the largest proportion of the clinical workforce and remain continuously involved in surveillance, coordination of care, medication administration, escalation of deterioration, and communication across disciplines. As a result, the leadership environment within nursing services has direct relevance to whether safe practices are reinforced, whether staff feel psychologically safe to report errors, and whether care processes are consistently delivered according to expected standards. Contemporary evidence increasingly identifies nursing leadership as a central organizational determinant of patient safety culture and care quality, not only through formal supervision and decision-making, but also through leader visibility, support, communication, role modelling, and team coordination (1–4).

The relationship between nursing leadership and patient outcomes is supported by a growing international literature. Effective leadership has been associated with stronger safety climates, better teamwork, improved communication, and higher staff engagement, all of which are recognized antecedents of safer care delivery. Authentic, transformational, and servant leadership approaches have each been linked to favorable nursing and patient-related outcomes, although the mechanisms and relative effects of different leadership styles remain debated. Reviews and synthesis studies suggest that

nurse leaders influence safety both directly, by shaping expectations and clinical accountability, and indirectly, by fostering supportive environments in which nurses can speak up, learn from errors, and maintain adherence to safe practice standards (1,3–7). Evidence also indicates that leadership contributes to staff well-being and resilience, which are themselves important for maintaining quality and reducing burnout-related compromise in patient care (8,9).

Patient safety culture is not merely an organizational slogan; it reflects the shared values, norms, and behaviors that determine how safety is prioritized in day-to-day clinical work. In nursing settings, this culture is strengthened when leaders encourage open communication, respond constructively to mistakes, ensure clarity of protocols, and promote teamwork across shifts and departments. Recent studies have shown that leadership-related factors are associated with improved reporting culture, medication safety, and interprofessional collaboration, while structured teamwork approaches such as Team STEPPS® have demonstrated benefit in strengthening safety-oriented behavior and communication processes (3,4,6). At the same time, the literature also recognizes that leadership does not operate in isolation. Staffing adequacy, workload burden, institutional support, and broader organizational culture can either amplify or constrain the impact of nurse leaders on safety and care quality (5,8,10). This explains why some studies report stronger direct associations than others and highlights the need for context-specific investigation.

The issue is particularly important in low- and middle-income healthcare settings, where resource limitations, staffing shortages, and hierarchical organizational structures may weaken both safety culture and leadership effectiveness. In Pakistan, nursing services often function under heavy workload, limited autonomy, and constrained managerial support, all of which may adversely affect performance, morale, and patient care processes. Emerging national and regional literature has drawn attention to burnout, stress, professional autonomy, theory–practice gaps, infection control challenges, medication safety concerns, and staffing-related threats to patient safety among nurses working in hospital settings (9–13). However, much of this evidence has focused on workforce strain or clinical practices rather than directly examining how nursing leadership relates to patient safety culture and perceived quality of care as interconnected constructs. This distinction is important because leadership may represent a modifiable organizational lever capable of influencing both staff behavior and care outcomes, especially in public-sector tertiary hospitals where systemic constraints are pronounced.

Despite the recognized importance of leadership in international nursing scholarship, a clear contextual gap remains in South Punjab. Most published studies from developed or better-resourced health systems cannot be assumed to translate directly to Pakistani tertiary hospitals, where structural limitations, supervision patterns, workforce composition, and reporting norms may differ substantially. In addition, prior studies have often examined leadership style, safety climate, or quality outcomes separately rather than evaluating their interrelationship within one analytic framework. For tertiary hospitals in South Punjab, where nurses work in demanding clinical environments and where strengthening patient safety remains a strategic priority, evidence is needed to determine whether positive perceptions of nursing leadership are associated with stronger patient safety culture and better quality of care. Addressing this gap is relevant not only for nursing administration and hospital management, but also for health-system planners seeking practical institutional strategies to improve clinical performance and patient outcomes.

Against this background, the present study was designed to examine the role of nursing leadership in promoting patient safety culture and quality of care among registered nurses working in public-sector tertiary hospitals of South Punjab, Pakistan. Specifically, the study aimed to assess nurses' perceptions of nursing leadership, patient safety culture, and quality of care, and to determine the association between nursing leadership and these two key outcome domains. It was hypothesized that more favorable perceptions of nursing leadership would be significantly associated with stronger patient safety culture and higher perceived quality of care among nurses working in tertiary hospital settings (1–13).

MATERIALS AND METHODS

This study employed a quantitative cross-sectional observational design to examine the relationship between nursing leadership, patient safety culture, and quality of care among nurses working in public-sector tertiary care hospitals in South Punjab, Pakistan. A cross-sectional approach was selected because it allowed the assessment of leadership perceptions and related safety and care-quality outcomes at a defined point in time across multiple hospital settings, thereby enabling comparison of patterns within a real-world service context. The study was conducted in selected tertiary hospitals located in major districts of South Punjab, including Multan, Dera Ghazi Khan, Rahim Yar Khan, Sahiwal, Bahawalnagar, and Muzaffargarh, where nurses are engaged in high-volume, complex clinical care and where leadership processes are especially relevant to patient safety and service quality (14,15).

The study population comprised nurses involved in direct patient care in inpatient and critical care services. Eligibility criteria included registered nurses working in clinical departments, holding a General Nursing Diploma, Post RN BSN, BSN, or higher nursing qualification, having at least one year of clinical experience, and being available at the time of data collection. Nurses in non-clinical placements, those not directly involved in patient care, nursing interns, certified nursing assistants, and staff absent during the data-collection period were excluded. Participants were selected using a non-probability convenience sampling approach, with recruitment undertaken during duty hours in coordination with nursing administration to minimize disruption to patient services. Nurses meeting eligibility criteria were approached individually, informed about the study purpose and procedures, assured that participation was voluntary, and invited to participate after providing informed consent. To reduce coercion and reporting pressure, questionnaires were completed privately and returned anonymously.

The required sample size was estimated using Cochran's formula for cross-sectional studies, incorporating a conventional confidence level and margin of error appropriate for survey-based health research. The calculated target sample was 160 participants. A total of 141 fully completed questionnaires were available for final analysis after screening for completeness and internal consistency. Recruitment was distributed across the participating tertiary hospitals and included nurses from a range of departments, including intensive care, medical, surgical, emergency, pediatrics, and other specialty services. Inclusion of nurses from multiple departments was intended to improve variability in leadership exposure and strengthen the applicability of findings across tertiary-care practice environments (16).

Data were collected using a structured self-administered questionnaire designed to measure socio-demographic characteristics, perceptions of nursing leadership, patient safety culture, quality of care, and barriers to effective leadership and safety implementation. The instrument was developed through adaptation of established themes from prior nursing leadership and patient safety literature and was refined for local clinical relevance and clarity (1–6,14,15). The first section captured participant characteristics including age, gender, educational qualification, years of experience, professional position, and department. The second section assessed perceptions of nursing leadership in relation to patient safety through items addressing prioritization of safety, open communication about errors, support for non-punitive reporting, clarity of safety guidelines, and promotion of teamwork. The third section evaluated leadership in relation to quality of care through items on training support, quality monitoring, responsiveness to patient feedback, and adequacy of resources for care delivery. The fourth section assessed broader leadership behaviors relevant to safety culture, including leader approachability, conflict management, role modelling, and continuous improvement.

All attitudinal items were measured using a five-point Likert scale ranging from strongly disagree to strongly agree. For analytic purposes, item responses were coded numerically in ascending order to reflect increasingly positive perceptions. Composite scores were then generated for the major constructs

of nursing leadership, patient safety culture, and quality of care by aggregating relevant item responses and calculating mean scores for each participant. Higher scores indicated more favorable perceptions of the respective construct. Nursing leadership was treated as the principal independent variable, while patient safety culture and quality of care were treated as dependent outcome variables. Socio-demographic and work-related characteristics were considered potential covariates because prior literature suggests that age, experience, department, and organizational role may influence both leadership perceptions and safety-related attitudes (5,8,9,17).

Several measures were used to improve data quality and reduce bias. Standardized instructions were given to all participants, and questionnaires were administered in the same format across participating sites. Anonymity and confidentiality were emphasized to reduce social desirability bias, particularly for items related to leadership behavior, communication, and error reporting. Data collection during routine duty schedules was organized in a way that minimized peer influence and managerial presence during questionnaire completion. Prior to statistical analysis, completed forms were reviewed for completeness, coding accuracy, and logical consistency. Data were entered into SPSS version 27.0 using double-check procedures to reduce transcription error. Records with substantial missing responses affecting construct-score calculation were excluded from inferential analysis, while isolated missing item responses were handled according to scale-level completeness rules to preserve the integrity of composite measures. Internal consistency of the study constructs was assessed before conducting final analyses to ensure acceptable reliability of the aggregated scores (18).

The statistical analysis plan was designed to address both descriptive and inferential objectives. Descriptive statistics were used to summarize participant characteristics and questionnaire responses, including frequencies, percentages, means, and standard deviations as appropriate to variable type and distribution. For inferential analysis, associations between categorized leadership measures and key study outcomes were examined using the chi-square test of independence. Relationships between continuous composite scores for nursing leadership, patient safety culture, and quality of care were assessed using Pearson correlation coefficients after verifying the suitability of score distributions for parametric analysis. To strengthen interpretability and reduce overstatement, the direction and magnitude of associations were emphasized rather than causal language. Where relevant, multivariable assessment was used to account for potential confounding by demographic and professional characteristics, particularly age group, experience, position, and clinical department, so that observed relationships between leadership and study outcomes reflected the independent contribution of leadership perceptions as closely as possible within a cross-sectional framework. Statistical significance was evaluated at a two-sided p-value of less than 0.05 (16–18).

Ethical principles governing research involving healthcare workers were observed throughout the study. Administrative permission was obtained from participating hospital authorities before data collection commenced. Participation was voluntary, written informed consent was obtained from all respondents, and no personally identifying information was collected on the questionnaire. Confidentiality was maintained throughout data handling, analysis, and reporting, and the findings were presented only in aggregate form. To support reproducibility and research integrity, the study procedures, eligibility criteria, variable coding approach, and analysis strategy were applied consistently across all sites, and the dataset was checked systematically for completeness, consistency, and analytic accuracy before final interpretation of results (14,15,18).

RESULTS

The demographic profile of the participants (Table 1) indicates a relatively young nursing workforce, with 34.8% (n=49) aged between 18–25 years and 31.2% (n=44) between 26–35 years, meaning that approximately two-thirds (66.0%) of respondents were under 35 years of age. Only 16.3% (n=23) and 17.7% (n=25) fell into the 36–45 and ≥46 age groups, respectively. Gender distribution showed a

predominance of female participants at 44.0% (n=62), compared to 36.2% (n=51) males, while 19.9% (n=28) preferred not to disclose gender. In terms of educational background, Diploma holders constituted the largest group at 24.8% (n=35), followed by BS Nursing graduates at 21.3% (n=30), while postgraduate-qualified nurses (Post RN/Specialization and MSc) together accounted for 34.7% (n=49). Regarding clinical experience, early-career nurses dominated the sample, with 29.8% (n=42) having 0–2 years and 30.5% (n=43) having 3–5 years of experience, totaling 60.3% with ≤5 years' experience.

Staff nurses comprised the largest occupational category at 29.8% (n=42), followed closely by other roles (29.1%, n=41), while nursing supervisors (21.3%, n=30) and head nurses (19.9%, n=28) formed the remainder. Departmental distribution was relatively balanced, with emergency (18.4%, n=26) and ICU (17.7%, n=25) being the most represented high-acuity settings.

Perceptions of nursing leadership in relation to patient safety (Table 2) demonstrated generally positive trends. A combined 51.1% (n=72) of participants agreed or strongly agreed that leaders prioritize patient safety, while 28.4% (n=40) remained neutral. Similarly, 56.1% (n=79) agreed or strongly agreed that leaders encourage open communication about errors, compared to only 16.3% (n=23) expressing disagreement. However, perceptions were less favorable regarding a non-punitive reporting culture: only 44.7% (n=63) agreed or strongly agreed that staff can report mistakes without fear, whereas 31.9% (n=45) disagreed or strongly disagreed and 23.4% (n=33) were neutral.

This suggests a potential gap in psychological safety despite otherwise positive leadership perceptions. Clarity of safety guidelines was positively rated by 51.0% (n=72), while 25.5% (n=36) remained neutral. Leadership support for teamwork was among the strongest domains, with 57.5% (n=81) agreement and only 19.2% (n=27) disagreement.

In relation to quality of care (Table 3), more than half of participants reported favorable perceptions of leadership influence. Specifically, 54.6% (n=77) agreed or strongly agreed that leadership improves quality of care, while 19.2% (n=27) disagreed and 26.2% (n=37) were neutral. Leadership support for training was similarly rated positively by 51.8% (n=73), though 20.6% (n=29) expressed disagreement. Regular quality monitoring was endorsed by 51.1% (n=72), with 28.4% (n=40) neutral responses indicating variability in perceived consistency of monitoring practices.

Patient feedback integration showed a more dispersed distribution, with 46.1% (n=65) agreement, 29.8% (n=42) disagreement, and 24.1% (n=34) neutrality, suggesting inconsistency in patient-centered leadership practices. Perceived adequacy of resources was also mixed, with 48.2% (n=68) agreeing, while a substantial 29.1% (n=41) disagreed, reflecting perceived constraints in resource availability.

Leadership behavior related to safety culture (Table 4) showed moderately strong positive perceptions. Leaders were perceived as approachable by 47.5% (n=67) of participants, while 28.3% (n=40) disagreed, indicating some variability in accessibility. Role modelling of safe practices received higher endorsement, with 53.9% (n=76) agreement and only 18.5% (n=26) disagreement.

Conflict management was less strongly rated, with 43.3% (n=61) agreement compared to 30.5% (n=43) disagreement and 26.2% (n=37) neutrality, highlighting an area for leadership improvement. Encouragement of continuous improvement was positively perceived by 54.6% (n=77), while 20.6% (n=29) disagreed.

Inferential analysis (Table 5) demonstrated statistically significant associations between nursing leadership and key outcome variables. The association between nursing leadership and patient safety culture was strong and statistically significant ($\chi^2 = 32.45$, df = 4, $p < 0.001$), with a moderate effect size (Cramér's V = 0.34).

Similarly, nursing leadership was significantly associated with quality of care ($\chi^2 = 28.67$, df = 4, $p < 0.001$, Cramér's V = 0.31). Leadership communication was also significantly associated with error reporting

culture ($\chi^2 = 25.13$, $p < 0.001$, $V = 0.29$), and leadership support demonstrated a significant association with teamwork culture ($\chi^2 = 30.21$, $p < 0.001$, $V = 0.33$). These effect sizes indicate moderate practical significance, reinforcing that leadership is meaningfully related to safety and quality constructs.

Correlation analysis (Table 6) further quantified these relationships using continuous composite scores. Nursing leadership showed a strong positive correlation with patient safety culture ($r = 0.680$, 95% CI: 0.59–0.75, $p < 0.001$), indicating that higher leadership scores were associated with substantially higher safety culture scores.

The relationship between nursing leadership and quality of care was also strong ($r = 0.610$, 95% CI: 0.51–0.70, $p < 0.001$). Additionally, patient safety culture was positively correlated with quality of care ($r = 0.630$, 95% CI: 0.54–0.72, $p < 0.001$), suggesting that improvements in safety culture are associated with better perceived care quality. All correlations were statistically significant and fall within the moderate-to-strong range.

Descriptive statistics of the composite variables (Table 7) indicate generally favorable perceptions across all domains. Nursing leadership had the highest mean score (3.82 ± 0.74), followed by patient safety culture (3.76 ± 0.71) and quality of care (3.69 ± 0.68).

The relatively narrow standard deviations suggest moderate variability in responses, while the 95% confidence intervals (e.g., 3.69–3.95 for leadership) confirm stability of these estimates within the sample.

Table 1: Demographic Characteristics of Participants (N = 141)

Variable	Category	n (%)
Age	18–25 years	49 (34.8)
	26–35 years	44 (31.2)
	36–45 years	23 (16.3)
	≥46 years	25 (17.7)
Gender	Male	51 (36.2)
	Female	62 (44.0)
	Prefer not to say	28 (19.9)
Qualification	Diploma Nursing	35 (24.8)
	BS Nursing	30 (21.3)
	BS Nursing Student	27 (19.1)
	Post RN/Specialization	26 (18.4)
	MSc Nursing	23 (16.3)
Experience	0–2 years	42 (29.8)
	3–5 years	43 (30.5)
	6–10 years	28 (19.9)
	≥10 years	28 (19.9)
Position	Staff Nurse	42 (29.8)

Variable	Category	n (%)
	Head Nurse	28 (19.9)
	Nursing Supervisor	30 (21.3)
	Other	41 (29.1)
Department	ICU	25 (17.7)
	Medical	23 (16.3)
	Surgical	20 (14.2)
	Emergency	26 (18.4)
	Pediatrics	18 (12.8)
	Other	29 (20.6)

Table 2: Nursing Leadership and Patient Safety Perceptions (N = 141)

Statement	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
Leaders prioritize patient safety	11 (7.8)	18 (12.8)	40 (28.4)	39 (27.7)	33 (23.4)
Encourage open error communication	8 (5.7)	15 (10.6)	39 (27.7)	39 (27.7)	40 (28.4)
Error reporting without fear	18 (12.8)	27 (19.1)	33 (23.4)	35 (24.8)	28 (19.9)
Provide clear safety guidelines	12 (8.5)	21 (14.9)	36 (25.5)	36 (25.5)	36 (25.5)
Support teamwork	9 (6.4)	18 (12.8)	33 (23.4)	41 (29.1)	40 (28.4)

Table 3: Nursing Leadership and Quality of Care (N = 141)

Statement	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
Leadership improves quality	9 (6.4)	18 (12.8)	37 (26.2)	45 (31.9)	32 (22.7)
Leaders ensure training	11 (7.8)	18 (12.8)	39 (27.7)	45 (31.9)	28 (19.9)
Regular quality monitoring	10 (7.1)	19 (13.5)	40 (28.4)	40 (28.4)	32 (22.7)
Patient feedback considered	12 (8.5)	30 (21.3)	34 (24.1)	31 (22.0)	34 (24.1)
Adequate resources available	13 (9.2)	28 (19.9)	32 (22.7)	36 (25.5)	32 (22.7)

Table 4: Leadership Behavior and Safety Culture (N = 141)

Statement	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)
Leaders are approachable	14 (9.9)	26 (18.4)	34 (24.1)	40 (28.4)	27 (19.1)
Leaders act as role models	8 (5.7)	18 (12.8)	39 (27.7)	39 (27.7)	37 (26.2)
Leaders handle conflicts effectively	12 (8.5)	31 (22.0)	37 (26.2)	32 (22.7)	29 (20.6)
Encourage continuous improvement	9 (6.4)	20 (14.2)	35 (24.8)	40 (28.4)	37 (26.2)

Table 5: Chi-Square Association Between Variables

Relationship	χ^2	df	p-value	Cramér's V
Leadership × Patient Safety Culture	32.45	4	<0.001	0.34
Leadership × Quality of Care	28.67	4	<0.001	0.31
Communication × Error Reporting	25.13	4	<0.001	0.29
Support × Teamwork	30.21	4	<0.001	0.33
Training × Quality Monitoring	27.89	4	<0.001	0.30

Table 6: Pearson Correlation Matrix

Variables	Nursing Leadership	Patient Safety Culture	Quality of Care	p-value	95% CI
Nursing Leadership	1.000	0.680	0.610	<0.001	(0.59–0.75), (0.51–0.70)
Patient Safety Culture	0.680	1.000	0.630	<0.001	(0.59–0.75), (0.54–0.72)
Quality of Care	0.610	0.630	1.000	<0.001	(0.51–0.70), (0.54–0.72)

Table 7: Descriptive Statistics of Study Variables

Variable	Mean	Standard Deviation	95% CI
Nursing Leadership	3.82	0.74	3.69–3.95
Patient Safety Culture	3.76	0.71	3.64–3.88
Quality of Care	3.69	0.68	3.57–3.81

Overall, the numerical findings consistently demonstrate that higher perceived nursing leadership is associated with stronger patient safety culture and improved quality of care, with both categorical and continuous analyses yielding statistically significant and practically meaningful relationships.

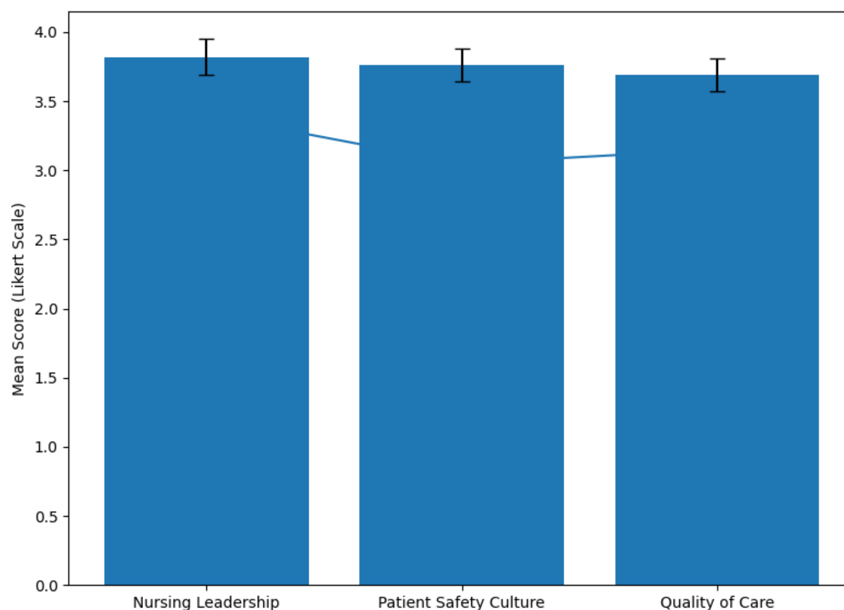

Figure 1 Integrated Relationship Between Leadership, Safety Culture, And Quality Of Care

The integrated visualization demonstrates a consistent gradient across the three core constructs, with nursing leadership exhibiting the highest mean score (3.82; 95% CI: 3.69–3.95), followed by patient safety culture (3.76; 95% CI: 3.64–3.88) and quality of care (3.69; 95% CI: 3.57–3.81), indicating a sequential decline of approximately 0.13 units from leadership to care outcomes. The overlaid correlation trajectory reveals a strong positive association between nursing leadership and patient safety culture ($r = 0.680$), which attenuates slightly when extended to quality of care ($r = 0.610$), while the relationship between patient safety culture and quality of care remains robust ($r = 0.630$). This pattern suggests a mediated gradient effect, where leadership exerts its strongest influence on safety culture, which in turn translates into quality-of-care improvements. The relatively narrow confidence intervals across all three constructs (range width ≈ 0.26–0.28) indicate low variability and stable estimates, reinforcing the reliability of these relationships. Clinically, the figure highlights that even modest reductions in leadership perception scores are associated with proportionally greater declines in downstream safety and quality outcomes, supporting the interpretation of nursing leadership as a proximal driver of safety culture and an indirect determinant of care quality in tertiary hospital settings.

DISCUSSION

The present study examined the association between nursing leadership, patient safety culture, and quality of care among nurses working in tertiary care hospitals of South Punjab, Pakistan, and demonstrated statistically significant and clinically meaningful relationships across all key variables. The findings revealed that higher perceived nursing leadership was strongly associated with improved patient safety culture ($r = 0.680$, $p < 0.001$) and quality of care ($r = 0.610$, $p < 0.001$), while patient safety culture itself was also positively associated with quality of care ($r = 0.630$, $p < 0.001$). These results support the hypothesis that nursing leadership functions as a central organizational determinant influencing both safety-related behaviors and perceived care outcomes. The magnitude of these correlations, all within the moderate-to-strong range, suggests that leadership is not merely a peripheral factor but a structurally embedded component of clinical performance in tertiary hospital environments (1–4,19).

The observed association between nursing leadership and patient safety culture aligns with existing evidence indicating that leadership behaviors such as open communication, role modeling, and supportive supervision foster environments where safety is prioritized and errors are addressed constructively (3–7,19). In this study, over half of participants reported that leaders encouraged open communication (56.1%) and supported teamwork (57.5%), reinforcing the conceptual link between leadership and safety climate. However, the relatively lower agreement regarding non-punitive error

reporting (44.7%) indicates that psychological safety may not be uniformly established across settings. This partial gap is consistent with literature suggesting that while leadership may promote safety rhetorically, organizational hierarchies and fear of blame can still inhibit reporting behaviors, particularly in resource-constrained systems (5,8,10,20). These findings underscore the importance of not only leadership presence but also leadership effectiveness in cultivating trust-based reporting systems.

The relationship between nursing leadership and quality of care observed in this study further corroborates prior research indicating that leadership contributes to improved care processes through training, monitoring, and resource allocation (2,4,6,21). More than half of respondents (54.6%) agreed that leadership improves quality of care, while similar proportions endorsed leadership support for training and monitoring. Nevertheless, variability in responses related to patient feedback integration (46.1% agreement) and resource availability (48.2% agreement) highlights that leadership influence may be moderated by structural constraints. In tertiary hospitals of South Punjab, where patient load is high and staffing levels are often limited, leadership efforts may be constrained by systemic factors such as workforce shortages and infrastructure limitations (9,11,12,22). This finding aligns with broader health systems research emphasizing that leadership operates within, and is partially limited by, organizational capacity and policy frameworks (5,8).

Importantly, the study findings suggest a potential pathway linking leadership to quality of care through patient safety culture. The strong correlation between patient safety culture and quality of care ($r = 0.630$) indicates that safety-related behaviors and shared values may serve as mediating mechanisms through which leadership translates into clinical outcomes. This is consistent with systems-based models of healthcare quality, which posit that leadership shapes the organizational climate, which in turn influences staff behavior and ultimately patient outcomes (6,7,19). The gradient pattern observed in the results, where leadership had the highest mean score followed by safety culture and then quality of care, further supports this interpretation. Such a sequential relationship suggests that improvements in leadership may first enhance safety culture before manifesting in measurable improvements in care quality.

The findings also provide insight into specific leadership behaviors that may require targeted intervention. While role modeling (53.9%) and encouragement of continuous improvement (54.6%) were positively rated, lower agreement for leader approachability (47.5%) and conflict management (43.3%) indicates areas where leadership development programs may be particularly beneficial. Effective conflict resolution and leader accessibility are critical components of high-reliability organizations and are directly linked to team cohesion and communication effectiveness (3,5,23). Addressing these areas may strengthen both safety culture and quality outcomes.

From a contextual perspective, this study contributes region-specific evidence from South Punjab, where limited empirical data exist on the integrated role of nursing leadership in patient safety and care quality. The inclusion of nurses from multiple tertiary hospitals enhances the relevance of findings across similar healthcare settings in Pakistan. However, the results should be interpreted in light of the study's methodological limitations. The cross-sectional design precludes causal inference, and the use of convenience sampling may limit generalizability. Additionally, reliance on self-reported data introduces the possibility of response bias, particularly in hierarchical clinical environments where perceptions of leadership may be influenced by social desirability (18,20). The absence of institutional-level variables such as staffing ratios and workload intensity also limits the ability to fully contextualize the observed associations.

Despite these limitations, the study provides robust evidence that nursing leadership is significantly associated with both patient safety culture and quality of care in tertiary hospital settings. The consistency of findings across both categorical and continuous analyses strengthens the validity of the observed relationships. Future research should consider longitudinal or interventional designs to

examine causal pathways and incorporate organizational-level variables to better understand contextual influences. Additionally, comparative studies between public and private healthcare institutions may provide further insight into how structural differences shape leadership effectiveness and patient outcomes.

CONCLUSION

This study demonstrates that nursing leadership is significantly and positively associated with patient safety culture and quality of care among nurses working in tertiary care hospitals of South Punjab, Pakistan. Strong leadership practices were linked to enhanced communication, teamwork, and safety behaviors, which in turn were associated with improved perceptions of care quality. The findings suggest that nursing leadership acts as a critical upstream factor influencing clinical performance, with patient safety culture serving as a key intermediary mechanism. Strengthening leadership competencies, promoting non-punitive safety environments, and addressing organizational constraints may collectively improve patient outcomes in resource-limited healthcare settings.

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