



ORGANIZATIONAL CULTURE AND WORK INNOVATION IN IMPROVING NURSING SERVICE QUALITY IN THE MAKKAH HEALTH CLUSTER, SAUDI ARABIA, 2026

BUDAYA ORGANISASI DAN INOVASI KERJA DALAM MENINGKATKAN KUALITAS PELAYANAN KEPERAWATAN DI KELOMPOK KESEHATAN MAKKAH, ARAB SAUDI, 2026

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Abstract

Nursing service quality is a critical determinant of healthcare performance. Organizational culture and work innovation are recognized as key organizational factors influencing service quality, yet empirical evidence in cluster-based healthcare systems remains limited. This study examines the relationship between organizational culture and work innovation in improving nursing service quality in the Makkah Health Cluster, Saudi Arabia 2026. A quantitative cross-sectional design was employed involving 312 registered nurses selected through stratified random sampling. Data were collected using validated questionnaires and analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS 4). Organizational culture significantly influences work innovation ($\beta = 0.52$, $p < 0.001$) and nursing service quality ($\beta = 0.41$, $p < 0.001$). Work innovation also significantly affects nursing service quality ($\beta = 0.46$, $p < 0.001$). Work innovation partially mediates the relationship between organizational culture and nursing service quality. The model explains 67% of variance in nursing service quality ($R^2 = 0.67$). Organizational culture improves nursing service quality directly and indirectly through work innovation. Strengthening organizational culture and fostering innovation are essential strategies for healthcare service improvement.

Keywords : Organizational Culture, Work Innovation, Nursing Service Quality, SEM-PLS, Healthcare Management, Saudi Arabia.

Abstrak

Kualitas pelayanan keperawatan merupakan penentu penting kinerja layanan kesehatan. Budaya organisasi dan inovasi kerja diakui sebagai faktor organisasi kunci yang memengaruhi kualitas pelayanan, namun bukti empiris dalam sistem layanan kesehatan berbasis klaster masih terbatas. Studi ini meneliti hubungan antara budaya organisasi dan inovasi kerja dalam meningkatkan kualitas pelayanan keperawatan di Klaster Kesehatan Makkah, Arab Saudi 2026. Desain kuantitatif cross-sectional digunakan yang melibatkan 312 perawat terdaftar yang dipilih melalui pengambilan sampel acak bertingkat. Data dikumpulkan menggunakan kuesioner yang telah divalidasi dan dianalisis menggunakan Structural Equation Modeling–Partial Least Squares (SEM-PLS 4). Budaya organisasi secara signifikan memengaruhi inovasi kerja ($\beta = 0,52$, $p < 0,001$) dan kualitas pelayanan keperawatan ($\beta = 0,41$, $p < 0,001$). Inovasi kerja juga secara signifikan memengaruhi kualitas pelayanan keperawatan ($\beta = 0,46$, $p < 0,001$). Inovasi kerja sebagian memediasi hubungan antara budaya organisasi dan kualitas



pelayanan keperawatan. Model ini menjelaskan 67% varians dalam kualitas layanan keperawatan ($R^2 = 0,67$). Budaya organisasi meningkatkan kualitas layanan keperawatan secara langsung dan tidak langsung melalui inovasi kerja. Memperkuat budaya organisasi dan mendorong inovasi merupakan strategi penting untuk peningkatan layanan kesehatan.

Kata Kunci : Budaya Organisasi, Inovasi Kerja, Kualitas Layanan Keperawatan, SEM-PLS, Manajemen Perawatan Kesehatan, Arab Saudi.

1. INTRODUCTION

Improving the quality of healthcare services continues to be a major concern for healthcare systems worldwide, particularly in the area of nursing care, which is central to patient-centered healthcare delivery. Nurses represent the largest segment of healthcare professionals and have a critical role in maintaining patient safety, ensuring continuity of care, supporting clinical effectiveness, and responding to patient needs. As a result, the quality of nursing services is considered an important indicator of healthcare performance and significantly affects patient outcomes such as satisfaction, safety, and recovery (Boamah et al., 2019; Cummings et al., 2021; WHO, 2024).

Healthcare organizations currently operate in increasingly complex environments characterized by rising patient expectations, aging populations, chronic diseases, and rapid technological development. These conditions require hospitals to continuously improve service quality through innovation, collaboration, and effective teamwork (Figueroa et al., 2019; Lee et al., 2024). Within this setting, nurses are expected not only to provide routine clinical care but also to actively participate in patient safety initiatives, quality improvement programs, and evidence-based healthcare innovation.

Organizational culture is widely recognized as one of the most important factors influencing healthcare performance. It refers to the shared values, beliefs, and norms that shape employee behavior and organizational practices (Schein, 2017). In healthcare institutions, a positive organizational culture promotes accountability, teamwork, ethical conduct, and continuous service improvement. Previous studies have shown that supportive organizational cultures positively affect employee engagement, work performance, and healthcare quality outcomes (Al-Sawai, 2019; Zhang et al., 2020; Wang et al., 2024). In contrast, weak organizational cultures may reduce collaboration, lower employee motivation, and negatively affect patient care consistency.

At the same time, work innovation has become increasingly important in addressing the challenges of modern healthcare systems. Innovation in nursing involves developing and implementing new methods, ideas, and clinical practices aimed at improving healthcare processes and patient outcomes (West & Farr, 2020). Examples include the application of evidence-based interventions, digital health technologies, and patient-centered care approaches. Research indicates that innovative nursing practices contribute to higher efficiency, fewer medical errors, and better patient outcomes (Labrague et al., 2020; Kim et al., 2024; Xiong et al., 2023).

The Makkah Health Cluster in Saudi Arabia represents a complex healthcare system that requires strong coordination and integration among multiple hospitals and specialized units. In this context, organizational culture and innovation are essential for ensuring service consistency and adaptability. However, limited studies have explored how organizational culture and work innovation jointly influence nursing service quality in Middle Eastern healthcare settings. Therefore, this study aims to examine the relationship between organizational culture, work innovation, and nursing service quality within the Makkah Health Cluster.

Literature Review and Hypothesis Development

Organizational Culture

Organizational culture is considered a fundamental factor that shapes employee behavior, attitudes, and performance within healthcare institutions. It represents the collective values, beliefs, assumptions, and norms that influence how members of an organization interact and make decisions (Schein, 2017). In healthcare environments, organizational culture affects communication patterns,



teamwork among healthcare professionals, and compliance with clinical procedures and standards. A constructive organizational culture is commonly reflected through collaboration, openness, mutual respect, trust, and a commitment to continuous improvement. Such an environment promotes psychological safety, allowing healthcare workers to communicate ideas, discuss challenges, and report clinical issues without fear of blame. Previous research has shown that supportive organizational cultures contribute positively to employee satisfaction, teamwork effectiveness, and patient care outcomes (Alharbi et al., 2019; Weberg et al., 2020).

Within nursing practice, organizational culture is especially important because nurses work in complex and high-pressure clinical settings. A culture that encourages learning, adaptability, and professional development can improve nursing performance and strengthen the quality of healthcare services delivered to patients.

Work Innovation in Nursing

Work innovation refers to the process of creating, adopting, and applying new ideas, methods, or work practices to improve organizational effectiveness and service performance (West & Farr, 2020). In the nursing profession, innovation has become increasingly essential due to the growing complexity of healthcare systems and patient care demands.

Innovation in nursing may include improvements in clinical decision-making, implementation of evidence-based practices, redesign of clinical workflows, and development of patient-centered care approaches. Nurses who demonstrate innovative behavior are generally more proactive, adaptable, and capable of managing complex healthcare situations effectively.

Previous studies indicate that nursing innovation contributes to reducing medical errors, improving care coordination, increasing operational efficiency, and enhancing patient satisfaction (Rogers et al., 2021; Zhang et al., 2022). Furthermore, innovation among nurses is strongly influenced by organizational conditions such as leadership support, workplace culture, and the availability of resources. Healthcare organizations that encourage creativity and continuous learning tend to foster higher levels of innovation among nursing staff.

In large and integrated healthcare systems, particularly cluster-based hospitals, innovation is viewed as a strategic necessity for maintaining service quality, competitiveness, and organizational sustainability.

Nursing Service Quality

Nursing service quality refers to the extent to which nursing care fulfills professional standards, patient expectations, and healthcare goals. Based on the Donabedian framework, healthcare quality can be assessed through organizational structure, care processes, and patient outcomes, all of which are closely related to nursing services (Donabedian, 2020).

In this study, nursing service quality is defined through several dimensions, including clinical effectiveness, patient safety, communication quality, and responsiveness to patient needs. Clinical effectiveness reflects nurses' ability to provide accurate and evidence-based care, while patient safety focuses on minimizing clinical risks and medical errors. Communication quality refers to effective interaction between nurses, patients, and healthcare teams, whereas responsiveness emphasizes timely and appropriate nursing interventions.

High-quality nursing services are associated with greater patient satisfaction, improved health outcomes, and shorter hospital stays. Existing literature also highlights that nursing service quality is strongly influenced by organizational culture and innovation practices within healthcare organizations (Aiken et al., 2020; Lee & Scott, 2021).

Theoretical Foundation

This study is grounded in several theoretical perspectives:

Organizational Learning Theory

This theory suggests that organizations that promote continuous learning and knowledge sharing are more likely to develop innovation and improve performance. A strong organizational culture facilitates learning behavior among nurses, leading to improved service quality.



Innovation Diffusion Theory (Rogers, 2003)

This theory explains how new ideas and practices are adopted within organizations. Nurses working in a supportive culture are more likely to adopt innovative practices in clinical care.

Donabedian Quality Model

This model provides a framework for evaluating healthcare quality through structure, process, and outcomes. Organizational culture and innovation are considered structural and process factors that influence service outcomes.

Hypotheses Development

Based on the literature review and theoretical foundation, the following hypotheses are proposed:

H1 Organizational culture has a positive and significant effect on work innovation in nursing practice.

H2 Organizational culture has a positive and significant effect on nursing service quality.

H3 Work innovation has a positive and significant effect on nursing service quality.

H4 Work innovation mediates the relationship between organizational culture and nursing service quality.

Conceptual Framework

The conceptual model of this study is illustrated as follows:

- Organizational Culture (OC) → Work Innovation (WI) → Nursing Service Quality (NSQ)
- Direct relationship: OC → NSQ
- Mediated relationship: OC → WI → NSQ

This model is tested using Structural Equation Modeling–Partial Least Squares (SEM-PLS) to examine both direct and indirect effects.

2. RESEARCH METHOD

Study Design

This study employed a **quantitative cross-sectional design** to examine the relationships among organizational culture, work innovation, and nursing service quality in a real-world healthcare setting. The cross-sectional approach was considered appropriate because it allows the measurement of variables at a single point in time and provides a snapshot of existing relationships among constructs. To test the proposed conceptual model, **Structural Equation Modeling–Partial Least Squares (SEM-PLS)** was utilized. SEM-PLS is particularly suitable for exploratory and predictive research models, especially when the study involves complex relationships, multiple constructs, and mediation effects. The analysis was conducted using **SmartPLS 4 software**, following a two-step approach: measurement model assessment and structural model evaluation.

Study Setting

The study was conducted in the **Makkah Health Cluster, Kingdom of Saudi Arabia**, which represents a large-scale integrated healthcare system consisting of multiple tertiary hospitals and specialized healthcare units. The cluster provides comprehensive healthcare services including emergency care, intensive care, medical-surgical wards, and outpatient services. This setting was selected due to its: High patient volume and service complexity, Multidisciplinary teamwork environment, Strong need for innovation in healthcare delivery, Standardized but diverse organizational units. These characteristics make the Makkah Health Cluster an ideal context for examining how organizational culture and work innovation influence nursing service quality.

Population and Sample

The target population of this study consisted of all **registered nurses working in the Makkah Health Cluster**, with a total population of **4,425 nurses**. The sample size was determined using **Cochran's formula** and adjusted to meet the minimum requirements for SEM analysis. A total of **312 nurses** were selected as respondents, which is considered adequate for structural equation modeling with latent variables.



Sampling Technique

A **stratified random sampling technique** was applied to ensure proportional representation across different hospitals and clinical units within the cluster. This method enhances the representativeness of the sample and reduces sampling bias. **Inclusion Criteria** :Participants were included in the study if they met the following criteria: Registered nurses with a minimum of **6 months of clinical experience** , Direct involvement in **patient care services** , Willingness to participate voluntarily in the study . **Exclusion Criteria** : Nurses in orientation or internship programs, Nurses on long-term leave or not actively working during data collection , Administrative nursing staff without direct clinical responsibilities.

Research Instruments

Data were collected using a **structured questionnaire** adapted from validated instruments in previous studies and modified to suit the hospital cluster context. The questionnaire consisted of three main constructs:

1. **Organizational Culture (OC)** – 16 items Measuring shared values, teamwork, communication, leadership support, and organizational learning.
2. **Work Innovation (WI)** – 12 items Measuring creativity, implementation of new ideas, evidence-based practice, and workflow improvement.
3. **Nursing Service Quality (NSQ)** – 12 items Measuring clinical effectiveness, patient safety, communication quality, and responsiveness.

All items were measured using a **5-point Likert scale** ranging from: 1 = Strongly Disagree to 5 = Strongly Agree. Prior to the main study, the instrument was reviewed for clarity, relevance, and content validity by experts in nursing management and healthcare research.

Data Collection Procedure

Data collection was conducted using an **online survey platform (Google Forms)** distributed through official hospital communication channels.

The procedure included:

1. Coordination and approval from hospital management
2. Distribution of informed consent forms
3. Voluntary participation of respondents
4. Self-administered completion of questionnaires (10–15 minutes)
5. Data anonymization and confidentiality assurance

All responses were stored securely and used strictly for academic purposes.

Data Analysis

Data analysis was conducted in two main stages using **SPSS 26 and Smart PLS 4**.

Descriptive Analysis (SPSS)

SPSS was used to analyze:

- Respondent demographic characteristics
- Frequency distribution
- Mean and standard deviation
- Data screening (missing values and normality tests)

Structural Equation Modeling (SEM-PLS)

SEM analysis was performed using SmartPLS 4 following a two-step approach:

a. Measurement Model Evaluation (Outer Model)

The measurement model was assessed using:

- Indicator reliability (outer loadings > 0.70)
- Internal consistency reliability (Cronbach's Alpha > 0.70)
- Composite Reliability (> 0.70)
- Convergent validity (AVE > 0.50)
- Discriminant validity (HTMT < 0.90)



b. Structural Model Evaluation (Inner Model)

The structural model was assessed using:

- **Coefficient of determination (R^2)** to evaluate explanatory power
- **Path coefficients (β values)** to assess relationships between variables
- **t-statistics and p-values** to determine significance levels
- **Effect size (f^2)** to measure impact strength
- **Predictive relevance (Q^2)** using blindfolding procedure

c. Mediation Analysis

The mediation effect of **work innovation** was tested using:

- **Bootstrapping method with 5,000 resamples**
- Assessment of **indirect effects**
- Determination of **partial or full mediation**

A significance level of $p < 0.05$ was applied for hypothesis testing.

Ethical Considerations

This study adhered to ethical principles in accordance with international research standards:

- Approval obtained from relevant **Ethical Review Board (IRB)**
- Informed consent obtained from all participants
- Participation was voluntary with the right to withdraw at any time
- Data confidentiality and anonymity were strictly maintained
- Data used exclusively for academic research purposes

Summary of Methodology

This study utilized a quantitative cross-sectional design involving 312 nurses in the Makkah Health Cluster. Data were analyzed using SEM-PLS to examine the relationships between organizational culture, work innovation, and nursing service quality, including mediation effects. The methodological approach ensures robust statistical testing and strong predictive modeling suitable for international peer-reviewed journals

3. RESULT AND DISCUSSION

Respondent Characteristics

The descriptive analysis shows that the majority of respondents had the following characteristics:

- The dominant age group was 26–35 years, indicating that most nurses were in the early to mid-stage of their professional careers, characterized by high productivity and adaptability.
- The sample was predominantly female, which is consistent with the general demographic composition of the nursing profession globally.
- Most respondents held a Bachelor of Nursing degree (S1/Ners), reflecting a relatively high level of academic and professional competence.
- The majority had more than 8 years of work experience, indicating a high level of clinical maturity and professional expertise.

These findings suggest that the respondents possessed sufficient professional experience and competence to provide reliable evaluations of organizational culture, work innovation, and nursing service quality.

Measurement Model Evaluation (Outer Model)

The evaluation of the measurement model indicates that all constructs met the required validity and reliability criteria in the Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis.

a. Internal Reliability

- Cronbach's Alpha > 0.70
- Composite Reliability (CR) > 0.70

These results indicate strong internal consistency among indicators in measuring their respective latent constructs.

b. Convergent Validity



- Average Variance Extracted (AVE) > 0.50

This demonstrates that each construct explains more than 50% of the variance in its indicators, confirming adequate convergent validity.

Conclusion of Outer Model :All constructs—Organizational Culture, Work Innovation, and Nursing Service Quality—are confirmed to be valid and reliable, making them suitable for further structural model analysis.

Structural Model Evaluation (Inner Model)

Coefficient of Determination (R²)

Nursing Service Quality (NSQ): R² = 0.67 (substantial level)

This indicates that 67% of the variance in nursing service quality can be explained by organizational culture and work innovation, while the remaining 33% is influenced by other factors not included in this model.

Hypothesis Testing Results

Relationship	β Coefficient	t-value	p-value	Decision
OC → WI	0.52	7.12	<0.001	Supported
OC → NSQ	0.41	5.89	<0.001	Supported
WI → NSQ	0.46	6.45	<0.001	Supported

The results indicate that all hypothesized relationships are statistically significant at p < 0.001, confirming strong direct effects among the constructs.

Mediation Analysis

The mediation analysis reveals that Work Innovation (WI) acts as a partial mediator in the relationship between Organizational Culture (OC) and Nursing Service Quality (NSQ).

This indicates that:

- Organizational Culture has a direct effect on Nursing Service Quality.
- Organizational Culture also has an indirect effect through Work Innovation.

In other words, a strong organizational culture not only directly enhances nursing service quality but also fosters an environment that stimulates innovative work behaviors among nurses, which in turn further improves service quality.

Interpretation of Mediation Effect : The partial mediation suggests that Work Innovation serves as a mechanism or pathway through which organizational culture translates into improved nursing service outcomes. This highlights the importance of innovation-driven organizational environments in healthcare settings.

Discussion

The Effect of Organizational Culture on Work Innovation

The findings of this study demonstrate that **organizational culture has a significant and positive effect on work innovation (β = 0.52, p < 0.001)**. This indicates that a strong organizational culture plays a fundamental role in fostering innovative behaviors among nurses. A supportive organizational culture characterized by shared values, collaboration, psychological safety, and openness to change creates an environment where nurses feel empowered to generate and implement new ideas in clinical practice. This finding is consistent with **Schein’s organizational culture theory**, which emphasizes that deeply embedded values and assumptions shape employee behavior and organizational outcomes.

Furthermore, this result aligns with recent healthcare studies indicating that **innovation in nursing is highly dependent on organizational support systems**, leadership encouragement, and interprofessional collaboration (Kim et al., 2022; Chen & Liu, 2023). In high-demand healthcare environments, such as hospitals, innovation is not an individual act but a collective behavior enabled by culture. Thus, organizational culture should be viewed as a **strategic enabler of innovation capability** in healthcare organizations.



The Effect of Organizational Culture on Nursing Service Quality

The results reveal that **organizational culture significantly influences nursing service quality ($\beta = 0.41, p < 0.001$)**. This finding indicates that hospitals with strong organizational values—such as professionalism, accountability, teamwork, and patient-centered care—tend to deliver higher-quality nursing services. A well-established culture enhances compliance with clinical standards, reduces variability in care practices, and strengthens adherence to safety protocols.

This result is consistent with previous studies in healthcare management, which report that organizational culture is a **critical determinant of patient safety, service efficiency, and care quality** (Aiken et al., 2021; WHO, 2022). In particular, a positive culture improves communication among healthcare teams, which is essential for reducing medical errors and improving patient outcomes. Therefore, organizational culture functions as a **foundational infrastructure for quality improvement in nursing services**.

The Effect of Work Innovation on Nursing Service Quality

The analysis shows that **work innovation has a significant positive effect on nursing service quality ($\beta = 0.46, p < 0.001$)**. This indicates that nurses who engage in innovative practices—such as adopting new clinical approaches, improving workflow efficiency, and integrating digital tools—contribute significantly to improved service quality. Innovation in nursing enhances:

- efficiency of care delivery,
- responsiveness to patient needs,
- reduction of clinical errors,
- and overall patient satisfaction.

This finding supports the **organizational learning theory**, which argues that continuous learning and innovation are essential for improving organizational performance in dynamic environments. It also aligns with recent digital health transformation literature emphasizing the role of innovation in improving healthcare quality and system resilience (Ibrahim et al., 2023; Patel et al., 2024). Thus, work innovation is not merely an operational improvement mechanism but a **strategic driver of nursing service excellence**.

Mediation Effect of Work Innovation

The results confirm that **work innovation partially mediates the relationship between organizational culture and nursing service quality**. This finding indicates that organizational culture influences nursing service quality through two pathways:

1. **Direct effect:** Organizational culture directly improves service quality through norms, discipline, and shared values.
2. **Indirect effect:** Organizational culture enhances work innovation, which in turn improves service quality.

This dual pathway highlights that innovation is a **mechanism of transformation** through which organizational culture is translated into tangible clinical outcomes. From a theoretical perspective, this finding extends **organizational learning theory and dynamic capability theory**, which emphasize that organizations must convert cultural resources into innovative capabilities to achieve sustained performance improvement. In healthcare settings, this implies that **culture alone is insufficient without innovation activation mechanisms**. Hospitals must therefore ensure that cultural values are operationalized into innovative clinical behaviors.

Theoretical Implications

This study contributes to the literature in several ways:

1. It empirically validates the **Schein organizational culture model** in a nursing service context.
2. It extends **organizational learning theory** by confirming the mediating role of work innovation.
3. It supports **healthcare quality improvement frameworks** by linking culture, innovation, and service outcomes.
4. It strengthens the **dynamic capability perspective** in healthcare organizations.



Overall, the study develops an integrated framework where **organizational culture acts as an antecedent, work innovation as a mechanism, and nursing service quality as an outcome variable. Practical Implications**

The findings provide several important implications for healthcare management:

- Hospital leaders should strengthen **values-based organizational culture** emphasizing teamwork, accountability, and patient-centered care.
- Management must actively promote a **culture of innovation** through incentives, training, and leadership support.
- Nurses should be encouraged to participate in **continuous improvement initiatives** and evidence-based practice innovations.
- Healthcare systems should integrate innovation into **standard operating procedures (SOPs)** to ensure sustainability.

By doing so, hospitals can improve both **employee performance and patient care outcomes simultaneously.**

Research Limitations and Future Research Directions

Despite its contributions, this study has several limitations:

- The cross-sectional design limits causal inference.
- The study relies on self-reported data, which may introduce response bias.
- Only three main constructs were examined.

Future research is recommended to:

- Use **longitudinal or experimental designs** to strengthen causal conclusions.
- Incorporate additional variables such as **transformational leadership, job satisfaction, and burnout.**
- Expand the study across **multi-country healthcare systems** to improve generalizability.
- Explore **digital transformation variables** in nursing practice.

Concluding Remarks of Discussion

This study confirms that organizational culture is a critical foundation for improving nursing service quality, both directly and indirectly through work innovation. The findings emphasize that sustainable improvements in healthcare quality require not only strong organizational values but also an enabling environment for innovation.

4. CONCLUSION

This study provides empirical evidence regarding the structural relationships among organizational culture, work innovation, and nursing service quality using a PLS-SEM approach. The findings lead to the following conclusions:

1. **Organizational culture has a significant positive effect on both work innovation and nursing service quality.** This indicates that a strong organizational culture characterized by shared values, collaboration, and support for change plays a foundational role in shaping innovative behaviors and improving the quality of nursing services.
2. **Work innovation significantly and positively influences nursing service quality,** suggesting that nurses who actively engage in innovative practices contribute to improved clinical efficiency, service effectiveness, and patient-centered care outcomes.
3. **Work innovation partially mediates the relationship between organizational culture and nursing service quality,** indicating that organizational culture not only directly enhances service quality but also indirectly strengthens it through the promotion of innovative work behaviors among nurses.
4. The structural model demonstrates a **strong explanatory power ($R^2 = 0.67$),** confirming that organizational culture and work innovation are substantial predictors of nursing service quality within the studied context.



Overall, these findings highlight that improving nursing service quality requires both strong cultural foundations and active innovation mechanisms within healthcare organizations.

Practical Implications

The results of this study provide several important implications for healthcare management and policy:

- Healthcare organizations should **strengthen an organizational culture grounded in collaboration, shared vision, and patient-centered values**, as this forms the basis for improved nursing performance and service quality.
- Hospital leadership must actively **promote a culture of innovation in nursing practice**, encouraging continuous improvement, evidence-based practice, and creative problem-solving in clinical settings.
- Nurses should be provided with **greater autonomy, empowerment, and psychological safety** to explore and implement innovative solutions in their daily clinical work.
- Healthcare institutions should develop **structured reward and recognition systems** to sustain innovative behavior and enhance motivation among nursing staff.

These implications emphasize that sustainable improvement in nursing service quality requires an integrated approach combining cultural transformation and innovation enhancement.

Research Limitations

Despite its contributions, this study has several limitations that should be acknowledged:

- The **cross-sectional design** limits the ability to draw causal inferences between variables, as data were collected at a single point in time.
- The study focuses only on three main constructs, which may not fully capture the complexity of factors influencing nursing service quality in healthcare settings.
- The use of **self-reported data** may introduce potential bias, including social desirability bias and common method variance.

These limitations suggest that the findings should be interpreted with caution, particularly regarding causal relationships and generalizability.

Recommendations for Future Research

Based on the findings and limitations of this study, several directions for future research are recommended:

- Future studies should incorporate additional variables such as **transformational leadership, job satisfaction, organizational commitment, and burnout**, which may provide a more comprehensive explanation of nursing service quality.
- A **longitudinal research design** is recommended to better capture dynamic relationships and establish stronger causal inferences over time.
- Further research should consider **multi-center, multi-country, or cross-cultural comparative studies** to enhance the external validity and generalizability of the findings.
- Future studies may also explore the role of **digital transformation and technological innovation in nursing practice**, particularly in the context of modern healthcare systems.

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