

ORIGINAL ARTICLE

Servant Leadership and Nurses' Innovative Work Behavior: The Serial Mediation Role of Trust-In Leadership and Knowledge Sharing

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ABSTRACT

Aim/Objective: The research investigated the relationship between servant leadership (SL) and innovative work behavior (IWB) among nurses in Pakistan. It also formulates and hypothesizes a serial mediation model, integrating trust-in leadership (TL) and knowledge sharing (KS) as mediated variables.

Background: Nurses' IWBs are critical for improving patient healthcare quality. Despite their significance, scant research has examined how leadership styles, especially SL, can trigger such behavior in nursing. The paper seeks to fill this gap by examining how SL can enhance innovation among nurses, while accounting for the mediating variables of TL and KS within the Pakistani healthcare system.

Design/Methodology/Approach: A quantitative, cross-sectional study was conducted, involving 269 nurses from hospitals in Islamabad and Rawalpindi. A time-lagged approach to data collection was used to reduce common method bias. Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) were employed to test the proposed hypothesized relationships using SPSS (version 27) and AMOS (version 23).

Results: The hypotheses revealed a significant impact of the constructs. It was discovered that SL has both direct and indirect positive influences on IWB among nurses through TL and KS. Moreover, the findings support high serial mediation, implying that SL has a positive effect on IWB by first building trust, which then leads to knowledge sharing.

Conclusions: The paper contributes to the literature on servant leadership and innovative work behavior by examining mediating mechanisms within nursing teams in Pakistan. The paper also offers practical implications for nurse managers and hospital administrators on fostering a culture of innovation and trust among nurses.

Clinical Relevance: The findings offer actionable insights for nursing management by demonstrating that adopting a servant leadership style can directly and indirectly enhance nurses' innovative work behaviors. By prioritizing trust-building and fostering a culture of knowledge sharing, nurse managers can stimulate innovation, which is critical for improving patient care quality and overall healthcare outcomes.

1 | Introduction

Healthcare providers globally face pressure from various stakeholders to improve the quality of their services (Gwangwava and Mutingi 2018; Upadhyay and Opoku-Agyeman 2020). A potential avenue in this regard is the adoption of innovative work behaviors (IWB) at the nursing level (Wang et al. 2019). The nursing team is an integral part of the health care system, providing invaluable contributions to its value chain (AlThubaity and Mahdy Shalby 2023; Will and Lamb 2021). Wang et al. (2019) deem IWB crucial for nursing professionals, as only through such behaviors can they contribute to improving the quality, efficiency, and competitiveness of their organizations. Therefore, it is essential to identify the antecedents of nurses' innovative behaviors and provide a theoretical framework for enhancing the nursing team's innovative potential (Yan et al. 2020).

Nursing-specific IWB can include the creation, communication, and execution of ideas to develop novel solutions and contribute to the hospital's overall innovation environment (Abdelatti et al. 2022). The efforts to identify the antecedents of IWB in nursing have identified factors such as leadership styles, organizational environment, interpersonal communication, talent management, and personal factors (Emiralioglu and Sönmez 2021; Lv et al. 2022; Shahid et al. 2021). These findings, along with the continued efforts to develop new frameworks that explain the mechanisms that enhance innovative work behaviors among nursing teams, have significant practical implications, ensuring the delivery of high-quality healthcare services (Baker 2020; Liaw et al. 2025).

As noted above, the leadership style of the nursing team head (hereinafter, the nurse manager) significantly influences the nursing team's innovative work behavior. The leadership styles identified as influencing innovative work behavior include humble leadership (Yang et al. 2017), transformational leadership (Baker 2020; Masood and Afsar 2017), and empowering leadership (Jönsson et al. 2021). Additionally, inclusive leadership (Zhang et al. 2022) and Authentic leadership (Lv et al. 2022) have been recognized as important predictors of IWB. The lack in this discussion of the leadership styles embraced by nurse managers and their effects on the innovative work behavior of nursing teams is the role of servant leadership (SL), which has recently grown (Hughes et al. 2018; Shailja et al. 2023). The literature on SL and IWB highlights a range of factors, such as leader authenticity, humility, trust, knowledge sharing, and stewardship practices, that can foster innovation (Musenze et al. 2024). Moreover, participation in IWB goes beyond formal job requirements and is heavily influenced by leadership. In a recent systematic review, Demeke et al. (2024) suggested that SL significantly correlates with IWB and further suggested investigating SL and IWB in the context of knowledge sharing. This gap is confounding, considering that previous studies have shown a significant relationship between SL and IWB (Dayanti and Yulianti 2023; Khan, Mubarik, et al. 2022; Su et al. 2020; Yang et al. 2017). However, there is still need to investigate how positive leadership behaviors drive IWB. The key driver of IWB among nursing supervisors is SL (Ekmekcioglu and Öner 2024). Exchange of expertise, learning, dialogue, adaptability, and pressure allow nursing staff to identify, develop, and use ideas for

improvements. Consistent with the insights from previous literature, we contend that nursing supervisors adapt and develop different innovative ways for smooth workflow in processes.

The existing literature revealed limited investigations that have identified the underlying mechanism through which SL contributes to IWB. Trust-in leadership (TL), a leader-follower belief in which employees believe their leaders are competent, reliable, transparent, and benevolent (Burke et al. 2007; Yuan et al. 2022). SL and TL are antecedents to foster an environment where employees share knowledge (KS) (Kmieciak 2021; Le and Nguyen 2023; Noh et al. 2023). Drawing on Social Exchange Theory (SET), we propose that employees often engage in reciprocal exchanges of activities for their personal interests. This display of exchange of activities from SL to foster their trust among subordinates through knowledge sharing and practices will engage the subordinates in innovative behaviors (Cropanzano and Mitchell 2005). To fill the void of evidence regarding SL and IWB, the current study aims to examine the mediating roles of TL and KS in the SL-IWB relationship.

Leadership shapes nurses' willingness to share knowledge and innovate. Furthermore, trust-in leadership and knowledge sharing are essential for collaboration and innovative practice in healthcare teams. Additionally, SL has been linked to innovation in other industries (Eva et al. 2019; Kainde and Mandagi 2023), but its role in nursing remains largely unexplored.

Saavedra et al. (2025) and Lee and Seo (2024) postulated in their literature reviews that SL significantly enhances innovative work behavior among nurses. Moreover, trust-in leadership and knowledge sharing are key mechanisms through which servant leadership fosters innovation. A serial mediation model suggests that nurse managers who foster trust create knowledge-sharing cultures that drive innovation and enhance patient care outcomes.

The present study's research questions are:

RQ1: *What is the impact of SL on IWB?*

RQ2: *What is the mediation role of TL on the relationship between SL and IWB?*

RQ3: *What is the mediation role of KS on the relationship between SL and IWB?*

RQ4: *What is the serial mediation role of TL and KS on the relationship between SL and IWB?*

The present study aims to contribute to the above gap by examining the impact of servant leadership on the innovative work behavior of nursing teams. The study will investigate how servant leadership, characterized by leaders who prioritize their followers' needs and foster a supportive, nurturing environment, influences innovative work behavior among nursing teams. The remainder of this study is structured as follows: the next section will elaborate on the evidence supporting the theoretical model developed for this study. Then, based on theoretical and empirical evidence, hypotheses are proposed. After that, the research methodology is presented, followed by the results and analysis section. Lastly, the results, including both theoretical and

practical implications, are discussed, concluding the article with an overview of the study's limitations and potential avenues for future research.

2 | Literature Review

2.1 | Servant Leadership (SL)

During the 1970s, SL was introduced as a fresh approach to administration in the USA (Greenleaf 2002). It is defined as a style of leadership in which one serves first and does not lead (Wesevich 2022). Besides, SL helps transform their supporters to further develop, benefit, groom, and become more liberated, independent, and self-sufficient as servants before leading (Meuser and Smallfield 2023).

Barbuto Jr. and Wheeler (2006) identified five distinguishing characteristics associated with SL, including “altruistic calling, emotional healing, wisdom, persuasive mapping, and organizational stewardship,” which build innovativeness in employees and uplift their morale to complete the tasks successfully (Cai et al. 2018).

2.1.1 | Altruistic Calling

A Servant leader goes above and beyond to help and serve their followers, and does everything to satisfy them. Additionally, servant leaders prioritize their subordinates' needs over their own interests and accommodate followers' needs while executing tasks and supporting them in every aspect (Al-Asfour et al. 2026; Krumrei-Mancuso and Rowatt 2023).

2.1.2 | Emotional Healing

If followers experience emotional trauma, they seek help from the leader. Furthermore, subordinates always get strong emotional support from the leader. The servant leader possesses a God-given capability for emotional healing, providing support during emotional crises and helping subordinates find justice for their hurt emotions (Al-Asfour et al. 2026; Krumrei-Mancuso and Rowatt 2023).

2.1.3 | Wisdom

The servant leader appears to be aware of what is happening and has the strong ability to anticipate the effects of decisions and can sense what could happen as the outcome of such decisions (Al-Asfour et al. 2026; Krumrei-Mancuso and Rowatt 2023).

2.1.4 | Persuasive Mapping

The leader provides compelling arguments to persuade the followers to take specific actions. Besides this, the leader exhorts subordinates to have “big dreams” for the business. The leader possesses exceptional persuasion skills and can easily convince followers to perform specific tasks. Moreover, the servant leader

has excellent convincing abilities and is brilliant (Al-Asfour et al. 2026; Krumrei-Mancuso and Rowatt 2023).

2.1.5 | Organizational Stewardship

According to servant leaders, a company must have an ethical presence in the community and function as an extended family to succeed. Furthermore, the leader recognizes the organization's perspective as a means to benefit the community and encourages followers to foster a sense of camaraderie within the company, aiming to influence the world for future generations (Al-Asfour et al. 2026; Krumrei-Mancuso and Rowatt 2023; Ridzuan et al. 2018).

2.2 | Innovative Work Behaviors (IWB)

Innovative work behaviors have been defined as “an employee's intentional introduction or application of new ideas, products, processes, and procedures to his or her work role, work unit, or organization” (Yuan and Woodman 2010, 324). Attempting novel concepts, seeking improved methods to complete assignments, and generating new concepts and their implementations are significant characteristics of Innovative work behaviors (Yasir et al. 2023). Moreover, Innovative work behaviors consist of “idea generation, idea promotion, and idea realization.”

Idea generation is a technique that enables employees to develop novel concepts to address the unique challenges organizations face. It facilitates the gathering of diverse perspectives to develop solutions to organizational problems (Ayoub et al. 2023; Tsameti et al. 2023). Whereas, *Idea promotion* occurs when employees encourage others to support their innovative concepts through participation in social gatherings (Ayoub et al. 2023; Tsameti et al. 2023). Furthermore, *idea realization* involves implementing the generated concept by creating procedures that serve a purpose within a specific position, a group, or the organization as a whole (Ayoub et al. 2023; Tsameti et al. 2023).

2.3 | Trust-In Leadership (TL)

Trust is a state that involves faith in a particular individual or thing (Sapienza et al. 2013). The psychological condition of the staff member, which includes having optimistic expectations of their leader due to challenging circumstances, is known as trust-in a leader (Zhou et al. 2022). According to Winston (2023), SL provides a crucial foundation for trust, which ultimately leads to increased productivity. Trust-in a leader comprises two dimensions: “faith-in and loyalty-to”.

2.3.1 | Faith-In

Generally, having faith is a belief or trust, not always supported by facts or evidence. It frequently relates to leadership. Expressing an individual's trust and confidence in a specific person or thing is called “faith in.” It can relate to faith in a divine source, a specific person, an idea, or an organization (Roberts 2015).

2.3.2 | Loyalty-To

Loyalty is a devotion to an individual, organization, or group. It entails remaining devoted and steadfast to something, even in difficult or tempting circumstances. The willingness to stand with and safeguard the objectives of an individual or organization to which someone is loyal is an additional component of loyalty (Reichheld 2001).

2.4 | Knowledge Sharing (KS)

According to Santhos and Lawrence (2023), KS entails transferring experiences, information, and expert insights into organizational practices. Olan et al. (2022) defined KS as the process of exchanging knowledge within the organization through communication to enhance its practices. Employees should be able to share both implicit and explicit knowledge to gain insight and generate innovative ideas (Ellis and Roever 2021). Organizational members exchange information only when they feel at ease (Fait et al. 2023). The amount they are willing to share is determined by their personality traits (Hamza et al. 2023; Santhos and Lawrence 2023). KS comprises two dimensions: (1) knowledge donating and (2) knowledge collecting.

2.4.1 | Knowledge Donating and Knowledge Collecting

The notion of knowledge donating is described as communicating knowledge to other individuals, whether organizational members request it or not, and knowledge collecting is referred to as consistently seeking intellectual capital from other individuals or departments of the organization, prompting them to disseminate their knowledge (Garcia et al. 2022; Than et al. 2023). The successful transfer of knowledge between donors and collectors is the primary means by which employees can contribute to knowledge dissemination, and, as a result, efficiency and effectiveness prevail at the organizational level.

2.5 | Servant Leadership (SL) and Innovative Work Behavior (IWB)

SL is an emerging leadership trait that has been cited as a revolutionary leadership style, focusing on developing followers, their welfare, and empowering them. Previous literature highlights its impact on other work-related outcomes. For example, Chughtai (2021) and Ahmed et al. (2025) found that SL has a significant impact on employee attitudes and behaviors, with organizational identification and psychological safety serving as mediators. In nursing practice, servant leadership has been shown to impact team performance. Collectively, these studies have demonstrated that SL encourages innovative and proactive behaviors among nurses, which are essential for delivering high-quality healthcare. Yasir and Jan (2023) further suggested that SL serves as agents to reduce adverse work outcomes and enhance nurse performance.

The potential of SL to stimulate IWB in modern organizations has attracted the attention of many leadership scholars (Khan, Mubarik, et al. 2022; Su et al. 2020). While findings support

the positive influence of servant leadership on innovative work behavior, the evidence remains equivocal. For example, Su et al. (2020) and Khan, Mubarik, et al. (2022) found that SL bolsters IWB, with both studies identifying mediating roles for intrinsic motivation and identification with the leader, psychological empowerment, and job crafting, respectively. However, Newman et al. (2018) and Rafiki et al. (2026) reported that the impact of SL on innovative work behavior was insignificant compared to that of entrepreneurial leadership. Based on the above body of literature, it is hypothesized that:

H1. *SL positively influence IWB among nurses.*

2.6 | The Mediating Role of Trust-In Leadership (TL)

Studies have examined the mediating role of trust-in leadership between SL and work outcomes. Goh and Zhen-Jie (2014) found that trust-in leadership partially mediated the relationship between servant leadership and organizational commitment. Sevy et al. (2022) also examined the mediating role of emotional and rational trust-in leaders on the relationship between SL and employee productivity. They confirmed that SL has a significant impact on emotional trust and task performance. They also validated the mediating effect of trust-in leadership on this relationship.

Various studies have explored how trust-in leadership fosters IWB. For instance, Masood and Afsar (2017) tested a serial mediation model to evaluate the impact of transformational leadership on innovative work behavior. Their model viewed psychological empowerment as a vital outcome of transformational leadership, which, in turn, stimulates intrinsic motivation and knowledge-sharing behavior—adopting a dual-faceted operationalization of trust-in leadership that covers both reliance-based and disclosure-based trust. The evidence underscores the significance of trust-in leadership on innovative work behavior, suggesting that trust-in leadership. Therefore, Hypothesis 2 and 3 posit that.

H2. *SL will positively influence TL.*

H3. *TL mediates the relationship between SL and IWB among nurses.*

2.7 | The Mediating Role of Knowledge Sharing (KS)

KS is a primary motivator of IWB, especially in knowledge-intensive professions such as nursing. Its mediating effect on leadership behaviors and innovation has been proven empirically. Building on this assumption, Rai and Prakash (2012) posit that SL develops a KS culture by demonstrating genuine interest in their followers' growth and welfare. This relational orientation would encourage employees to share information freely, seek feedback, and collaborate on solving problems. Nauman et al. (2022) similarly note that SL encourages interpersonal collaboration and trust, which are critical antecedents of successful KS. In line with this, Hypothesis 4 and 5 posit that.

H4. *SL positively influences KS behavior among nursing teams.*

H5. *KS mediates the relationship between SL and IWB among nurses.*

2.8 | Trust-In Leadership (TL) and Knowledge Sharing (KS)

The existing literature substantiates a positive relationship between trust-in leadership and employee knowledge sharing. Research has shown that trust-in leadership mediates the relationship between different leadership styles (e.g., transformational, authentic, servant) and knowledge-sharing behavior (Li et al. 2018; Tian and Sanchez 2017). Hence, it is plausible to propose that trust-in leadership mediates the relationship between SL and KS in the context of nursing teams, contributing to the support of IWB.

The role of trust-in leadership in overcoming obstacles to KS has been extensively discussed in the literature (Park and Kim 2018). Further, TL mediates the impact of other constructs, such as cooperative norms, on KS behavior (Raza and Tariq 2016). Moreover, mediating the association between AL and KS was attributed to factors in the team environment, such as psychological safety and trust (Zeb et al. 2020). Hence, the correlation between SL and IWB is the same in nursing settings, as these studies suggest that TL plays a similar mediating role.

Many researchers have examined the mediating role of TL in relation to different leadership styles and KS. The leadership styles analyzed in the studies presented include ethical leadership (Le and Nguyen 2023), humble leadership (Al Hawamdeh 2023), and transformational leadership (Hananta and Suratman 2023). All these studies supported the mediating role of TL in the interaction between SL and KS behavior. Hence, a potentially similar interaction may be replicated in the nursing team SL scenario. Given the evidence provided above supporting the role of TL in facilitating KS, it is hypothesized that:

H6. *TL has a positive influence on KS among nurses.*

2.9 | Knowledge Sharing (KS) and Innovative Work Behavior (IWB)

Studies always indicate the association between IWB and KS. A study conducted by Munir and Beh (2019) investigated creative climate and KS within an organization and found that they had a significant impact on the IWB. When applied to the health-care domain, it implies that the development of KS may lead to greater adoption of IWBs by nursing staff, thereby improving patient care and outcomes.

According to Radaelli et al. (2014), KS can benefit the IWB in three ways. KS enables individuals to share and interpret the knowledge, increasing their innovation capacity. Second, it fosters social conditions for reciprocal knowledge exchange, increasing contributors' chances of gaining more knowledge. Lastly, Radaelli et al. (2014) conceptualize the distant impact of KS as a direct effect of its antecedents in promoting innovation.

In light of the above discussion supporting the effect of KS on IWB, it is hypothesized that:

H7. *KS has a positive influence on IWB among nurses.*

2.10 | Serial Mediation

Serial mediation involves a process in which multiple mediators support the relationship between an independent and a dependent variable. This technique has been employed in studies from diverse fields of science. In the study of leadership styles, researchers have employed serial mediation models to gain insights into the relationships between different leadership behaviors and their corresponding outcomes (Carnevale et al. 2022; Nguyen et al. 2021; Pazetto et al. 2023; Tan et al. 2020).

Gürlek and Cemberci (2020) argued that serial mediation models are better suited to understanding the mechanisms by which leadership influences indirect organizational outcomes, including organizational performance. In their research, they sought to describe the relationship between knowledge-oriented leadership and organizational performance. They used knowledge management capacity and innovation performance as serial moderators. Explaining the serial moderator effect, Gürlek and Cemberci (2020) hypothesized that the independent variable (knowledge-oriented leadership) would have a direct impact on the first mediator (knowledge management capacity), which in turn would enhance the second mediator (innovation performance). Finally, the second mediator has a direct effect on the dependent variable (organizational performance). Table 1: "Leadership studies employing serial mediation", summarizes the theoretical models from similar studies within the leadership literature.

The hypothesis (H8) that

H8. *Nurse managers' adoption of the SL style will have a positive indirect effect on nursing teams' IWB through the mediating variables of TL and KS.*

To investigate this hypothesis, the study will estimate additional paths to test for these serial mediation effects. These other paths include: servant leadership →, trust-in leadership, servant leadership → knowledge sharing, and knowledge sharing → innovative work behavior.

3 | Research Methodology

The present study is grounded in servant leadership theory and social exchange theory (SET). Servant leadership theory postulates that leaders are obligated to serve their followers by prioritizing their needs, professional growth, and overall well-being (Fry et al. 2007). The extant literature has established that trust is essential to successful leadership (Ng 2022). Thus, SL, as an organizational intervention, can facilitate knowledge sharing among employees, and this leadership style can also enhance organizational performance (Ng 2022). It is also revealed that KS behavior is an important antecedent to innovation (Khan, Usman, et al. 2022). SLs help create inclusivity and trust,

TABLE 1 | Leadership studies employing serial mediation.

Study name	Independent variable	First mediator	Second mediator	Dependent variable
Tan et al. (2020)	Leader humor	Employee-perceived organizational support	Work engagement	Employee job crafting
Carnevale et al. (2022)	Leader humor style	Avoidance approach	Follower workplace status	Constructive voice and work engagement
Pazetto et al. (2023)	Empowering leadership	Perceived organizational support	Affective organizational commitment	Contextual performance
Nguyen et al. (2021)	Ethical leadership	Corporate social responsibility	Firm reputation	Firm performance

allowing employees to exchange ideas and information (Chen et al. 2022). The diversity of opinions enables organizations to develop new and creative solutions to challenges. Having consistent and reliable leaders who demonstrate an interest in the success and well-being of the team they lead fosters trust (Zhao and Detlor 2023).

Trust fosters a sense of togetherness among team members, who are more likely to share knowledge, which in turn helps them perform their tasks more effectively. KS is thus a crucial asset in ensuring that a business is innovative and competitive (Zhao and Detlor 2023). By combining these ideas, SL may improve the relationship between employees and leaders (LMX) and advance the KS and IWB (Arsawan et al. 2022; Sa'adah and Rijanti 2022).

3.1 | Data and Methods

A quantitative design was selected because a deductive research method was applied to test the hypothesized relationship among the theorized models deductively. The cross-sectional study design, based on survey research, was adopted due to its ability to yield results from large numbers of people and to extract valuable information (Tummers and Bakker 2021).

The study sample comprised healthcare practitioners working in hospitals in the Pakistani healthcare sector. Due to time and cost constraints, the researchers reduced the areas of study to two cities, namely Rawalpindi and Islamabad. The geographic area is quite significant in both cities, but scholars have attempted to encompass a considerable area beneath them. Healthcare facilities are prominent in Islamabad, the Pakistani capital. Namely, there are seven government-managed hospitals, three semi-government hospitals, and thirteen private-sector hospitals that offer region-wide health services. On the same note, Rawalpindi, the neighboring city to Islamabad, has eleven government-sector hospitals, eight semi-government hospitals, and fifteen private-sector hospitals that provide healthcare services. These hospitals were selected for their large-scale operations and ability to provide a wide range of medical services.

These institutions play a critical role in providing healthcare facilities. In addition, the teaching hospitals accredited by the Pakistan Medical and Dental Council (PMDC) are also affiliated with several government and private hospitals. Degrees offered

by these institutions include MBBS, underscoring their relevance in the healthcare system. On the other hand, smaller medical centers, such as clinics, dispensaries, and rural health centers in Islamabad and Rawalpindi, are not included because their impact on the community is minimal. Moreover, these facilities offer minimal care services under the oversight of general medical practitioners (doctors), which has not been considered in the present study, which focuses on the IWB of nurses. Therefore, in the future, large hospitals will play a critical role in addressing the healthcare needs of people living in the Twin Cities. Given their substantial role in improving population health outcomes in these areas, it can be concluded that the health domains linked to successful hospitals should be selected for this study.

3.2 | Sample and Procedure

In line with a large body of literature, if each variable in an investigation includes three or more items, then obtaining a representative sample consisting of one hundred participants provides sufficient evidence for convergence (Anderson and Gerbing 1984; Francis et al. 2010; Iacobucci and Churchill 2010; Serdar et al. 2021). Anderson and Gerbing (1984) emphasized that a sample size of at least 150 participants is necessary to yield satisfactory results and convergence.

In contrast to this viewpoint, researchers Iacobucci (2010) suggest that even with a smaller sample size of 50–100 participants, valid findings can still be obtained using Partial Least Squares Structural Equation Modeling. Thus, one can conclude that any sample size greater than the suggested threshold (approximately 150) will be sufficient to support a robust statistical analysis.

Purposive sampling was used to select participants in this study. To reduce the likelihood of common method bias, a time-lagged method was employed, where data collection occurred at three intervals at the end of each month. Those individuals who voluntarily consented to the research investigation were guaranteed that their information could be used exclusively for research purposes and kept confidential. T1 was the stage where demographic data and SL data were gathered. During the T2 stage, the information about the TL and KS was obtained. The third and final stage (T3) involved collecting data from nurses' IWBs. After carefully examining the collected data, 34 questionnaires were found to be incomplete

and were therefore removed from the analysis. After that, when data collection and analysis were complete, a final sample of 269 valid responses remained.

The overall response rate was 67.25% throughout the study. Table 2: “Study Demographics” presents a detailed report of demographic information.

3.3 | Measures

The measures of the constructs in this study were adopted from the literature, and assessed using a 5-point Likert scale. The following paragraph gives a short description of each measure used in this study:

3.3.1 | Servant Leadership

The scale by Barbuto Jr. and Wheeler (2006), with a total of 23 items and five dimensions, assessed the characteristics of the

TABLE 2 | Study demographics.

Measures	Items	Frequency	% Age
Gender	Male	78	29.00
	Female	191	71.00
Age (years)	Less than 25years	43	16.00
	25–30	78	29.00
	More than 30years	148	55.00
Education	BS Nursing (4-year degree)	118	43.90
	Diploma in nursing	151	56.10
Work experience	Less than 5years	92	34.20
	5–10years	87	32.30
	More than 10years	90	33.50
Job titles	Nurse manager	59	21.93
	Senior nurse	132	49.07
	Nurse/Junior nurse	78	29.00

TABLE 3 | Mean, SD, skewness, kurtosis, multicollinearity.

Constructs	Mean	SD	Data normality		Collinearity statistics	
			Skewness	Kurtosis	Tolerance	VIF
Innovative work behavior	2.444	0.557	0.306	0.411	—	—
Servant leadership	2.554	0.446	0.301	0.604	0.787	1.271
Trust-in leadership	2.460	0.552	−0.096	−0.028	0.592	1.688
Knowledge sharing	2.502	0.581	0.038	−0.404	0.584	1.712

Note: Dependent Variable: Innovative work behavior.

concept of SL. These dimensions are “altruistic calling, emotional healing, wisdom, persuasive mapping, and organizational stewardship”. The items of each dimension are: altruistic calling (5 items), emotional healing (4 items), wisdom (5 items), persuasive mapping (5 items), and organizational stewardship (5 items). This instrument is highly reliable, as shown by the Cronbach's Alpha value of 0.928.

3.3.2 | Innovative Work Behavior (IWB)

IWB is assessed using the scale of Janssen (2000), which includes three dimensions and nine items: *idea generation*, three items; *idea promotion*, three items; and *idea realization*, three items. The Cronbach's Alpha of the scale is 0.924, indicating excellent reliability.

3.3.3 | Trust-In Leadership (TL)

TL scale was adopted by Podsakoff et al. (1990). The scale consists of two dimensions and has six items. *Fairness* and *Loyalty* each have three items. This scale has high reliability, as indicated by a Cronbach's Alpha of 0.839. This shows that the measure is highly consistent.

3.3.4 | Knowledge Sharing (KS)

The scale used for KS in this study was developed by Hooff and Ridder (2004). It includes two dimensions, *knowledge donation* and *knowledge collection*, with six and four items, respectively. To establish the scale's reliability, Cronbach's Alpha was calculated, yielding a value of 0.936, indicating excellent internal consistency.

4 | Results

4.1 | Descriptive Statistics

Table 3 presents the means, SDs, skewness, kurtosis, and multicollinearity for the constructs under investigation. The mean and SD values indicate that respondents marked all construct responses on a 5-point Likert scale. In contrast, SD values show the spread of responses according to the mean.

Furthermore, data normality was assessed through skewness and kurtosis (Kline 2023). The skewness threshold is ± 2 , and the kurtosis value is between ± 7 (Hair Jr. et al. 2014; Kline 2023; Low and Aryadoust 2023). The values shown in Table 3 indicate that the data are normally distributed. Additionally, multicollinearity was assessed using variance inflation factors (VIFs) and tolerances. Multicollinearity shows intercorrelation between variables. VIF = 1 means no correlation, VIF > 1 and < 5 means moderate correlation, and VIF > 5 means highly correlated (Daoud 2017). Whereas a tolerance value < 0.1 indicates the presence of collinearity (Daoud 2017). The tolerance and VIF values in Table 3 indicate that there is no multicollinearity.

4.2 | Data Analysis

The data was analyzed using SPSS version 23 and AMOS version 23. The analysis process involved two steps: the first was a confirmatory factor analysis to determine the extent to which the proposed predictor included all the assessed items, as explained by Kline (2023). In the second step, a structural model evaluation was performed. SEM (structural equation modeling), developed by Jöreskog (1993), was used to examine hypothesized relationships between variables. Additionally, a serial mediation analysis was conducted using Model 6 of Preacher and Hayes (2008) Process Macro to investigate further relationships among variables.

4.3 | Confirmatory Factor Analysis (CFA)

CFA assessed the correlation between the hypothesized construct model and the data. The second-order CFA findings demonstrate exceptional model fitness, as indicated by $\chi^2 = 1127.418$, $df = 910$, $\chi^2/df = 1.239$, $p < 0.001$, CFI = 0.980, TLI = 0.979, SRMR = 0.069, and RMSEA = 0.030. The second-order fitness model is shown in Figure 1, with unstandardized weights.

The composite reliability, convergent validity, and discriminant validity of the latent variables were assessed in this study. The CR values for all the latent variables exceeded 0.90, indicating strong internal consistency (Bagozzi 1983; Fornell and Larcker 1981). To evaluate convergent validity, average variance extracted values were examined. Achieving a threshold value greater than 0.5 is necessary for successful convergence validation. In this investigation, all constructs' AVEs exceeded the required threshold of 0.5, confirming no issues with convergent validity. Furthermore, Fornell and Larcker (1981) criteria from their seminal work in 1981 were employed to verify discriminant validity: the square root of AVE values should exceed correlations between constructs themselves.

Table 4: "CR, AVE, Discriminant validity" presents detailed information on CR scores, which quantify internal consistency, and AVE results, which verify convergent validity and demonstrate discriminant validity. The bold and italic diagonal values shown in Table 4 indicate the square root of the Average Variance Extracted. These values demonstrate that the correlations between variables are lower than the AVE values.

Consequently, it can be inferred that the present study provides evidence of discriminant validity.

4.4 | Structural Model Testing

The measurement model was evaluated as a first step to ensure that the constructs were reliable and valid. Subsequently, in the second stage, the structural model was assessed. This step aimed to analyze the model's effectiveness in predicting outcomes and examine correlations between projected variables. A visual representation of this process can be observed in Figure 2: "Path diagram", where a path diagram is presented.

The outcomes of the structural model provided insight into the hypotheses investigated in this study. The results of the direct effect hypothesis are presented first, followed by the results of the mediation hypothesis. The initial hypothesis examined the direct impact of SL on IWB; the results indicated a statistically significant positive relationship ($\beta = 0.122$, $p < 0.05$), thus confirming the first hypothesis (H1). The second hypothesis examined the relationship between SL and trust-in leadership, revealing a statistically significant positive correlation ($\beta = 0.639$, $p < 0.001$). These findings support H2, indicating a substantial connection between servant leadership and trust-in leadership. As a result, the study's second hypothesis (H2) is supported.

The fourth hypothesis examines the correlation between servant leadership and knowledge sharing, revealing a statistically significant positive relationship ($\beta = 0.250$, $p < 0.01$). Therefore, H4 is confirmed. The sixth hypothesis, which proposes a connection between trust-in leadership and knowledge sharing, yields a statistically significant positive relationship ($\beta = 0.654$, $p < 0.001$), thereby supporting H6. The seventh hypothesis examines the relationship between knowledge sharing and Innovative work behavior, revealing a statistically significant positive association ($\beta = 0.448$, $p < 0.001$). Consequently, H7 can be accepted based on these findings.

The third (H3), fifth (H5), and eighth (H8) hypotheses of the study are related to indirect effects, with H8 specifically focusing on serial mediation. To examine these relationships, the researchers employed the process proposed by Preacher and Hayes (2008) and conducted a bootstrap analysis. As Wang et al. (2017) stated, bootstrapping provides an accurate confidence interval for evaluating indirect effects. To calculate the bootstrapped 95% confidence intervals, a sample size of 5000 data points was utilized following standard practice.

The outcomes of the mediation analysis are presented in Table 5. The results from the bootstrap analysis for hypothesis three (H3), as shown in Table 5, demonstrate a statistically significant mediation effect of trust-in leadership on the relationship between SL and IWB ($\beta = 0.262$, $SE = 0.056$, $p < 0.001$; CI: 95%). Consequently, H3 is accepted. The bootstrapping outcomes reported in Table 5 also establish that Hypothesis H5 holds true, with the expected positive mediation effect provided by knowledge sharing intervening between SL and IWB ($\beta = 0.347$, $SE = 0.060$, $p < 0.001$; CI: 95%). Therefore, H5

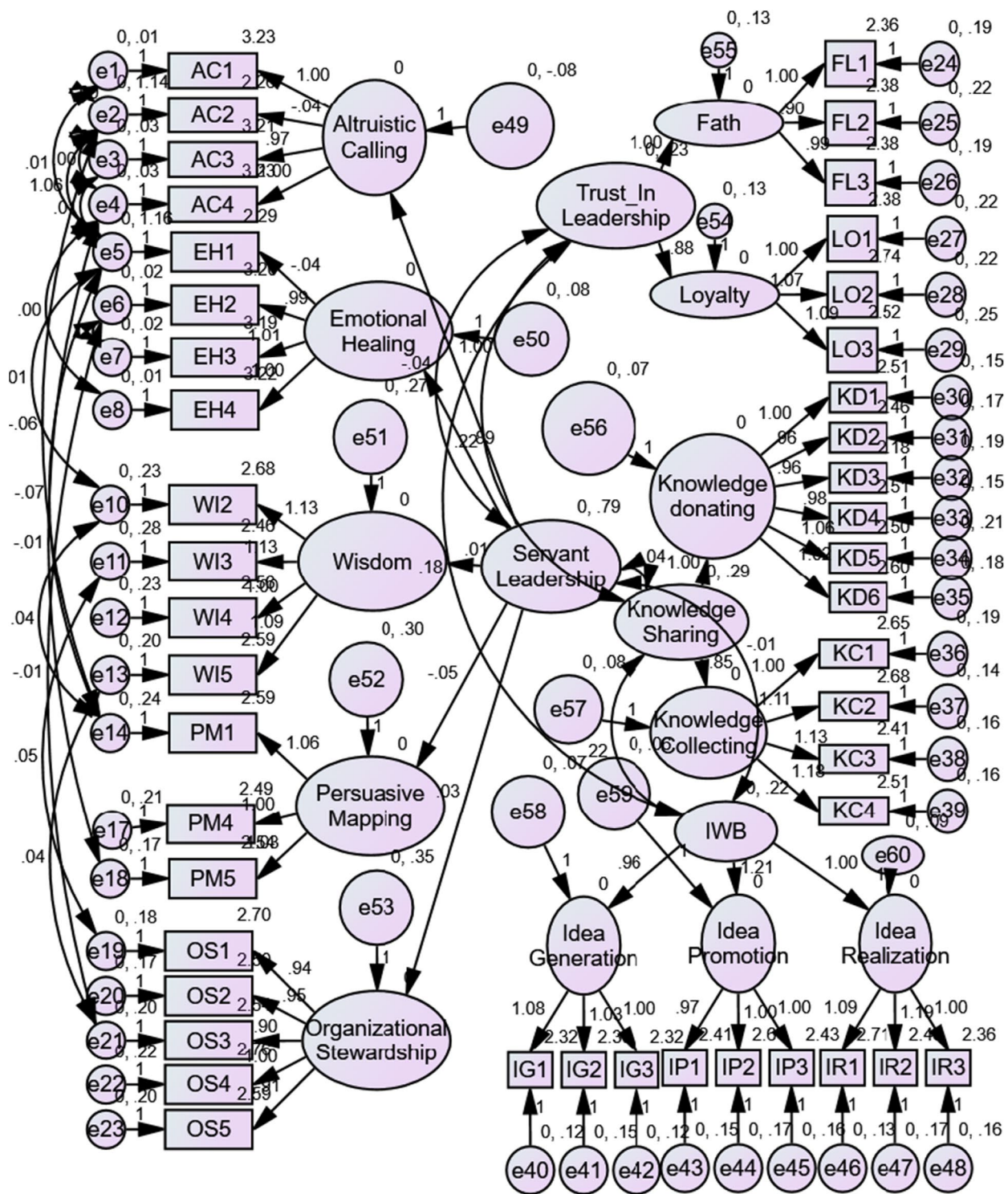


FIGURE 1 | Second-order model fitness.

is also accepted. Furthermore, the findings detailed in Table 5 reveal statistically significant positive relationships, both direct and indirect, between trust-in leadership and innovative work behavior, as well as the use of knowledge sharing to link servant leadership and innovative work behavior. These results indicate the partial mediation (Baron and Kenny 1986; Zhao et al. 2010).

The study's eighth hypothesis was to examine the serial mediation. To analyze this, the Process Macro Model 6, developed by Hayes,

was utilized. The findings are presented in Table 6, which shows that a significant positive indirect effect exists between trust-in leadership and nurses' Innovative work behaviors, as well as between knowledge sharing and nurses' Innovative work behaviors. Additionally, the results demonstrate a significant sequential mediation effect through trust-in leadership and knowledge sharing between servant leadership and Innovative work behavior ($\beta=0.145$, $SE=0.033$, 95% CI [0.087, 0.218]). Importantly, no negative sign was found within the confidence interval boundaries for LL or UL at the level of significance set at $\alpha<0.05$. As such,

TABLE 4 | CR, AVE, discriminant validity.

Construct	CR	AVE	Servant leadership	Trust-in leadership	Knowledge sharing	Innovative work behavior
Servant leadership	0.97	0.55	0.740			
Trust-in leadership	0.88	0.56	0.408*	0.750		
Knowledge sharing	0.92	0.53	0.422*	0.617*	0.730	
Innovative work behavior	0.90	0.50	0.433*	0.606*	0.723*	0.707

*Correlation is statistically significant at the 0.01 level (2-tailed).

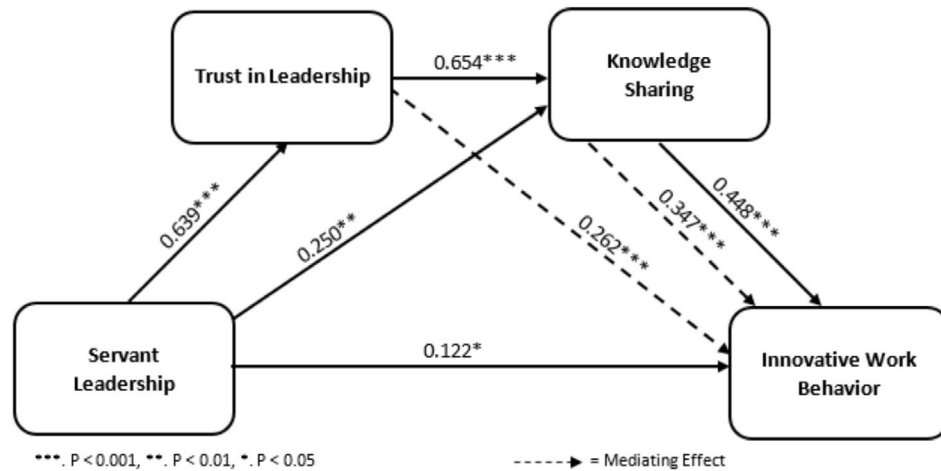


FIGURE 2 | Path diagram.

TABLE 5 | Mediation results.

Path	Total effect	T	Sig.	Direct effect	T	Sig.	Path	Indirect effect	Sig.
H3: SL → IWB	0.540	7.842	0.000	0.278	4.310	0.000	SL → TL → IWB	0.262	0.000
H5: SL → IWB	0.540	7.842	0.000	0.193	3.393	0.000	SL → KS → IWB	0.347	0.000

Abbreviations: IWB, innovative work behavior; KS, knowledge sharing; SL, servant leadership; TL, trust-in leadership.

TABLE 6 | Bootstrap results for the indirect effect.

Path	Indirect effect	SE	LL 95% CI	UL 95% CI
SL → TL → IWB	0.118	0.068	0.273	0.546
SL → KS → IWB	0.136	0.037	0.072	0.215
SL → TL → KS → IWB	0.145	0.033	0.087	0.218

Abbreviations: CI, confidence interval; IWB, innovative work behavior; KS, knowledge sharing; LL, lower limit; SE, standard error; SL, servant leadership; TL, trust-in leadership; UL, upper limit.

Hypothesis eight (H8), which posits that perceptions of trust-in leadership and knowledge sharing among nurses act sequentially to mediate the influence exerted by head nursing staff members on their Innovative work behaviors, is supported.

5 | Discussion

Practitioners and researchers deliberated on how nurse managers can inspire their team of nurses in the aftermath of a pandemic, especially when these nurses have seen their peers lose their jobs (Afsar et al. 2019). Some opinions suggest that it falls to the nurse manager to boost the morale of the nursing staff and foster a stronger commitment to the hospital (Abdelatti et al. 2022; Saleem et al. 2020). Nevertheless, hospitals face a prevalent issue of nurses lacking complete confidence in their nurse managers. The psychological trust between nurses and their leaders, as well as the establishment of clear expectations by nurse managers, is essential in difficult situations (Saleem et al. 2020). The built TL will require nurse managers to foster a culture in which nurses are eager to listen and exceed the requirements they are bound to fulfill to improve patient care (Ahmed et al. 2023). Nurturing this sense of teamwork among employees is crucial to eliciting superior cooperation from nurses. Also, the IWB of nurses is correlated with the actions of nurse managers and the work environment (Khan, Mubarik, et al. 2022).

This paper has examined the relationship between adherence to the SL style by nurse managers and adherence to the IWB by nurses, with TL and KS serving as serial mediators. The empirical studies conducted demonstrate the theoretical correlations postulated. In line with servant leadership and social exchange theories, it was found that nurse managers have a significant impact on nurses' IWB (Al-Ajarmeh et al. 2022; Galloway et al. 2023; Yasir and Jan 2023; Zhao and Detlor 2023). In particular, even a slight alteration in nurse managers' activities would result in a 12% increase in nurses' IWB. Furthermore, all sub-paths demonstrated a strong positive influence on nurses' IWB.

Additionally, the authors of the study by Afsar et al. (2019) discovered an excessive partial mediation impact on the transformational leadership and KS between head nurses and IWB among nurses. The findings align with prior research on the role of servant leadership and social exchange theory, as well as TL and KS, in the context of IWB. In addition, the study identified a substantial serial mediation effect. This observation is consistent with the idea proposed by social exchange theory, which suggests that TL enhances KS mechanisms that motivate nurses in the IWB, a prerequisite for success in the healthcare sector, as noted by Yasir and Jan (2023).

5.1 | Theoretical Implications

The results revealed several key implications for the theory. First, nurse managers should empower nurses by fostering an atmosphere that encourages creative thinking and streamlines patient care, in line with SL principles (Abdelmoteleb et al. 2022). Secondly, emotionally intelligent nurse managers can foster trust and rapport, promoting open communication and collaboration (Kumari et al. 2022). Thirdly, the connection between applying the Social Exchange Theory to servant leadership and how reciprocity and trust between the servant nurse manager and staff will promote the IWB (Ahmed et al. 2023). Fourthly, according to this theory, people also exchange resources, fostering a positive, innovative atmosphere in healthcare organizations, thanks to nurse managers who prioritize their employees' welfare (Zhao and Detlor 2023). Fifthly, SL encourages nurses to work innovatively, as it is accompanied by psychological contracts (Maglione 2022).

5.2 | Practical Implications

The research presents key approaches that servant leaders should adopt to enhance TL and IWB amid mass unemployment and post-pandemic worker concerns, particularly among nurses (Niinihuhta and Häggman-Laitila 2022).

In Pakistan, the post-pandemic era of Pakistani hospitals faced many challenges, including but not limited to burnout, shortage of staff, and emotional exhaustion. Furthermore, changing patient care demands are requiring leadership styles that extend beyond managerial control. In this context, SL is highly significant, as it focuses on empathy, support, empowerment, and nurses' personal development, helping the nursing team regain psychological well-being. By putting followers' needs first and building a culture of support, SLs can promote KS, creativity, and collaborative problem-solving, all of which are key

to advancing IWB. Therefore, the explicit connection between post-pandemic nursing pressures and SL provides a strong theoretical and practical justification for promoting innovation as a mechanism to enhance resilience, service quality, and sustainable performance in Pakistani healthcare settings.

Hong and Zainal (2022) have emphasized the importance of fostering a culture of trust, innovative thinking, knowledge sharing, and continuous learning. This culture may be triggered by encouraging inter-departmental interaction and cooperation, thereby enhancing creativity (Jeske and Calvard 2021). In addition, employee empowerment (by providing nurses with decision-making authority), coherence between their skills, objectives, and personal values, and competency acquisition may stimulate productivity and job satisfaction (Fowler et al. 2021; Yasin et al. 2025). These measures and enhanced nurse competency procedures can define an enabling environment where better patient services will be offered.

Essentially, SL can promote innovation among nurses. SL can foster a climate where IWB can thrive through transformational leadership and KS, which may also improve the quality of healthcare (Niinihuhta and Häggman-Laitila 2022). The relevance of the leadership training based on the SL is identified.

5.3 | Limitations and Future Research Directions

Although this research was interesting and yielded notable results, its limitations highlight areas that warrant further investigation. The study's cross-sectional design does not permit causal inference, and data were collected only in the healthcare sector of two specific regions. The study provides insights into innovative work behaviors in the health sector, while the findings may not be generalizable to other types of workers (e.g., other service employees). Multi-stage data collection across three phases minimized the prevalence of common method bias. However, longitudinal design-based research would minimize bias to a greater extent as IWB evolves. TL and KS were measured through self-reported surveys, which may lead to CMB and response consistency effects. Organizations operating in other industries, as well as similar organizations in different geographical regions, should also be explored in future studies to establish external validity. TL emerged as a key mediator; however, future studies can explore other variables, such as AI-enhanced leadership, organizational culture, and employee empowerment. Other psychological variables that can be explored include psychological empowerment and job satisfaction, as well as the interplay between organizational support and creative self-efficacy.

To address these limitations and further enhance the validity of the findings, future research can adopt complexity theory or mixed-methods approaches to investigate the model across different settings. Furthermore, the current study serves a specific perspective. Future studies can model the relationship in different ways. For example, SL could be framed as a mediator between the adoption of GenAI and IWB. By addressing these gaps, future studies can provide in-depth insights into modern organizations that are adopting AI-based practices to enhance IWBs and inform strategies for integrating technology with IWBs.

6 | Conclusion

This study highlights the vital role of servant leadership in promoting innovative behavior within organizations by fostering employee trust. Trustworthy leadership is crucial for fostering risk-taking and knowledge sharing, which, in turn, enhances innovative activities. Simultaneously, transformational leadership positively impacts knowledge sharing, driving employee engagement and innovation. While emphasizing the importance of cultivating cultures that value knowledge sharing and transparency, this research provides insights into how servant leadership, trust-in leadership, and knowledge sharing act as catalysts for a more innovative organizational environment.

7 | Clinical Resources

- American Organization for Nursing Leadership (AONL)—Provides resources, toolkits, and educational materials for developing nursing leadership competencies and fostering supportive work environments (<https://www.aonl.org>).
- Institute for Healthcare Improvement (IHI)—Offers actionable frameworks, tools, and insights on healthcare leadership, innovation, and improving patient safety and care quality (<https://www.ihl.org>).
- Sigma Theta Tau International Honor Society of Nursing (Sigma)—Features evidence-based practice resources, leadership academies, and global knowledge-sharing platforms for nursing professionals (<https://www.sigmanursing.org>).

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Ethics Statement

The authors have nothing to report.

Consent

Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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