

Transformational Leadership and Organizational Innovation among Nurses in Tabuk, Saudi Arabia: The Moderating Role of Professional Experience

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Abstract

This study examines whether professional experience moderates the relationship between transformational leadership and organizational innovation among registered nurses in public hospitals in Tabuk, Saudi Arabia. A secondary quantitative moderation analysis was specified using baseline pre-intervention data from a larger pre-test/post-test parent study, with an analytical sample of 151 registered nurses. Transformational leadership was assessed using the Transformational Leadership Questionnaire, organizational innovation using the Organizational Innovativeness Construct Questionnaire, and professional experience as a continuous moderator. Hierarchical multiple regression using PROCESS Model 1 was applied after mean-centering professional experience. Transformational Leadership Theory provided the principal theoretical basis, complemented by Situational Leadership Theory. The simulated, non-empirical results indicated a significant positive interaction between transformational leadership and professional experience ($\beta_3 = 0.042$, $p < .001$, 95% CI [0.021, 0.063]). Simple slopes showed that the leadership–innovation relationship was not statistically reliable at low experience ($\beta = 0.153$, $p = .089$), but was positive at mean experience ($\beta = 0.312$, $p < .001$) and stronger at high experience ($\beta = 0.471$, $p < .001$). The findings suggest that professional experience may represent a boundary condition for transformational leadership effectiveness in nursing innovation. However, all reported inferential results are statistically realistic simulations and must not be interpreted as empirical evidence.

Keywords: Transformational Leadership, Organizational Innovation, Professional Experience, Nurses, Saudi Arabia, Moderation

Introduction

Healthcare organizations face continuous pressure to improve services in response to changing patient needs, technological development, and organizational complexity. In Saudi Arabia, these pressures are particularly relevant to public hospitals undergoing healthcare

transformation. Nurses, as the largest professional group, have an important role in clinical improvement and organizational innovation (Alghamdi et al., 2026; Alshammari, 2024).

Transformational leadership emphasizes idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Such behaviours can encourage nurses to challenge established practices and develop improved practices (Qassim, 2026). Transformational Leadership Theory explains how leadership can elevate motivation and adaptability, while Situational Leadership Theory suggests that effectiveness depends partly on follower readiness and maturity (Alalwan, 2016; Salvador et al., 2026).

Professional experience may therefore shape how nurses respond to transformational leadership. Experienced nurses possess accumulated clinical knowledge, contextual understanding, and professional networks that may help them convert leadership vision into practical innovation. Conversely, extensive experience may also reinforce established routines (Ateah et al., 2026). This study tests the former proposition while acknowledging the alternative possibility.

The research gap is particularly relevant in Saudi public hospitals. Existing nursing research has often emphasized job satisfaction, retention, and workforce issues, while less attention has been paid to contextual conditions that shape leadership effectiveness for innovation (Almugathawi et al., 2024). Tabuk provides a useful setting because its healthcare system is participating in the broader transformation agenda associated with Saudi Vision 2030 (Aljabr et al., 2026).

The study asks four related questions: (1) Does transformational leadership predict organizational innovation among nurses in Tabuk public hospitals? (2) Does professional experience predict organizational innovation? (3) Does the interaction between transformational leadership and professional experience explain additional variance in organizational innovation? and (4) Does professional experience moderate the leadership–innovation relationship?

Accordingly, the study proposes four hypotheses. H1 states that transformational leadership positively predicts organizational innovation. H2 proposes that professional experience positively predicts organizational innovation. H3 proposes that the interaction between transformational leadership and professional experience significantly predicts organizational innovation. H4 proposes that professional experience moderates the relationship between transformational leadership and organizational innovation, such that the positive relationship becomes stronger at higher levels of experience.

Literature Review

Transformational Leadership and Organizational Innovation

Transformational leadership is widely conceptualized as a leadership approach that mobilizes followers around a shared vision while encouraging motivation, learning, and adaptability. Its four dimensions idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, provide different routes through which leaders can support innovation (Albargi et al., 2026). In nursing environments, these behaviours can encourage

risk-taking, creative problem solving, and improvements to established practices (Alshammari, 2024).

Prior work cited in the source manuscript generally reports a positive association between transformational leadership and nurses' innovative behaviour (Qassim, 2026; Masood & Afsar, 2017; Weng et al., 2015). The relationship has also been linked to psychological empowerment and innovation self-efficacy as potential mechanisms (Bektaş et al., 2025; Vu et al., 2025; Li et al., 2026). Nevertheless, the magnitude of the leadership effect may differ across followers and settings.

Professional Experience as a Boundary Condition

Professional experience represents accumulated exposure to clinical situations, organizational procedures, patient needs, and professional networks. From a human-capital perspective, experience can provide contextual knowledge and problem-solving resources (Lambert et al., 2012). Situational Leadership Theory provides a complementary explanation because followers with greater readiness may be better able to translate a leader's vision into action (Alalwan, 2016; Lismeni et al., 2025).

Saudi Healthcare Context

Saudi Arabia's healthcare system is undergoing substantial organizational and technological transformation. Public hospitals must improve quality, patient-centred care, workforce capability, and service processes while managing a culturally diverse nursing workforce (Aljabr et al., 2026; Almugathawi et al., 2024). Within this environment, transformational leadership may be particularly valuable because innovation requires both strategic direction and staff willingness to implement new practices.

The Tabuk setting is important because it provides a regional context in which healthcare transformation and nursing leadership intersect. Previous Saudi nursing research has concentrated more heavily on workforce and retention outcomes than on contextual factors shaping innovation (Almugathawi et al., 2024). The present moderation model therefore examines not only whether leadership predicts innovation, but also when the relationship may be stronger.

Theoretical Foundation

Transformational Leadership Theory is the principal theoretical foundation. It proposes that leaders can elevate followers' motivation, commitment, adaptability, and willingness to exceed routine expectations through vision, role modelling, intellectual stimulation, and individualized support (Masood & Afsar, 2017).

Situational Leadership Theory provides a supplementary explanation for the moderator. Leadership effectiveness may depend on follower readiness, including ability and willingness to perform. Professional experience can represent one aspect of readiness because accumulated practice provides clinical competence and contextual understanding (Alalwan, 2016; Salvador et al., 2026).

The conceptual model is parsimonious: transformational leadership is the independent variable (X), organizational innovation is the dependent variable (Y), and professional

experience is the moderator (W). The direct paths correspond to H1 and H2, while the interaction term $X \times W$ corresponds to H3 and H4.

Variable	Role	Operationalization
Transformational Leadership	Independent (X)	Composite score from 20-item TLQ
Organizational Innovation	Dependent (Y)	Composite score from 15-item OICQ
Professional Experience	Moderator (W)	Total years of nursing practice, mean-centred

Hypotheses

H1: Transformational leadership positively predicts organizational innovation.

H2: Professional experience positively predicts organizational innovation.

H3: The interaction between transformational leadership and professional experience significantly predicts organizational innovation.

H4: Professional experience positively moderates the relationship between transformational leadership and organizational innovation.

Methods

This study is framed as a secondary quantitative moderation analysis using baseline pre-intervention observations from a larger pre-test/post-test parent study. The purpose is to examine naturally occurring associations among the variables; no causal effect of a leadership-training intervention is claimed. Importantly, the statistical results presented in this article are simulated and are included for methodological demonstration and manuscript-development purposes.

Population and Sample

The target population comprised registered nurses employed in major public hospitals in the Tabuk region of Saudi Arabia. The parent study used convenience sampling across medical-surgical wards, intensive care units, emergency departments, and outpatient clinics. Inclusion required a current nursing licence, at least six months of continuous hospital employment, and direct involvement in patient care or unit-level decision-making.

The analytical sample contained 151 nurses with complete baseline information. The source file reports a mean age of 34.2 years ($SD = 7.8$), 78.8% female participants, and mean professional experience of 9.6 years ($SD = 6.4$), with experience ranging from 1 to 28 years. Because the sample was determined by the available parent-study observations rather than an a priori moderation power calculation, the source manuscript also describes a post-hoc G*Power sensitivity assessment.

Measures

Transformational leadership was measured with a 20-item Transformational Leadership Questionnaire (TLQ), covering idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Responses used a five-point frequency scale. The composite score demonstrated strong internal consistency ($\alpha = .92$), with sub-dimension coefficients ranging from .84 to .89. The measure is grounded in the transformational leadership tradition associated with Bass and Avolio.

Organizational innovation was assessed using a 15-item Organizational Innovativeness Construct Questionnaire (OICQ), covering technical, administrative, and incremental innovation. Items used a five-point agreement scale. The composite scale showed strong reliability ($\alpha = .89$), with subscale coefficients from .81 to .87.

Professional experience was measured as total years worked as a registered nurse. The variable was mean-centred by subtracting the sample mean of 9.6 years from each participant's reported experience, producing a centred variable with a standard deviation of 6.4 years.

Moderation was tested using hierarchical multiple regression with PROCESS Model 1 (Hayes et al., 2017). Transformational leadership was entered first, professional experience second, and the interaction term third. The interaction was interpreted using its coefficient, p-value, and 95% confidence interval. Simple slopes were examined at one standard deviation below the mean, at the mean, and one standard deviation above the mean.

Moderation was tested using hierarchical multiple regression with PROCESS Model 1. Transformational leadership was entered first, professional experience second, and the interaction term (transformational leadership $\times$ centred professional experience) third. The interaction was interpreted using its coefficient, p-value, and 95% confidence interval. Simple slopes were examined at one standard deviation below the mean, at the mean, and one standard deviation above the mean. The source analysis used 5,000 bootstrap samples and assessed multicollinearity and standard regression assumptions.

Results

All numerical findings in this section are derived from statistically realistic simulations and are explicitly non-empirical. They should therefore be interpreted as an illustration of the proposed analytical model, not as evidence of actual relationships among nurses in Tabuk.

Descriptive Statistics and Correlations

The simulated mean transformational leadership score was 3.742 and organizational innovation was 3.518 on five-point scales. Mean professional experience was 9.6 years. Transformational leadership was positively associated with organizational innovation ($r = .487$, $p < .001$), while professional experience was also positively associated with organizational innovation ($r = .312$, $p < .001$). These patterns are consistent with literature reporting positive leadership–innovation relationships among nurses (Masood & Afsar, 2017; Weng et al., 2015).

Main Moderation Test

The central simulated moderation coefficient was positive and statistically significant ($\beta_3 = 0.042$, $p < .001$, 95% CI [0.021, 0.063]). This indicates that, within the simulated model, the positive association between transformational leadership and organizational innovation increased as professional experience increased. The finding provides simulated support for H3 and H4.

Hypothesis / Effect	Coefficient	p	95% CI	Decision
H1: Transformational Leadership → Innovation	Positive; $r = .487$	$< .001$	—	Supported*
H2: Experience → Innovation	Positive; $r = .312$	$< .001$	—	Supported*
H3/H4: TL × Experience	$\beta_3 = .042$	$< .001$	[.021, .063]	Supported*

upported only within the simulated, non-empirical analysis; these results do not establish empirical or causal relationships.

Simple Slopes

The conditional effect of transformational leadership on organizational innovation varied by professional experience. At low experience, the slope was positive but not statistically reliable ($\beta = .153$, $p = .089$); at mean experience it was significant ($\beta = .312$, $p < .001$); and at high experience it was stronger ($\beta = .471$, $p < .001$). The pattern is consistent with the human-capital and follower-readiness arguments discussed by Lambert et al. (2012) and Alalwan (2016).

Transformational Leadership Sub-Dimensions

The source manuscript also examined the four transformational leadership dimensions. Inspirational motivation was the strongest simulated predictor of organizational innovation, followed by idealized influence, individualized consideration, and intellectual stimulation. This pattern is consistent with the broader literature emphasizing leadership vision and role modelling as important resources for innovation (Albargi et al., 2026; Masood & Afsar, 2017).

Sub-dimension	β	SE	t	p	95% CI
Inspirational Motivation	.321	.072	4.458	$< .001$	[.179, .463]
Idealized Influence	.257	.068	3.779	$< .001$	[.123, .391]
Individualized Consideration	.187	.065	2.877	.005	[.059, .315]
Intellectual Stimulation	.180	.063	2.857	.005	[.056, .304]

Separate simulated moderation tests indicated significant interactions for inspirational motivation ($\beta_3 = .038$, $p = .012$, 95% CI [.008, .068]) and idealized influence ($\beta_3 = .031$, $p = .028$, 95% CI [.003, .059]), but not for individualized consideration ($\beta_3 = .019$, $p = .146$) or intellectual stimulation ($\beta_3 = .015$, $p = .213$). These results are exploratory and simulated.

Robustness and Interpretation

The source manuscript explored a quadratic interaction, innovation sub-dimensions, and controls for education, hospital tenure, and prior innovation training. The quadratic interaction was non-significant ($\Delta R^2 = .009$, $p = .185$). In a controlled hierarchical model, the interaction remained significant ($\beta_3 = .039$, $p = .010$, 95% CI [.009, .069]). These robustness checks are methodological demonstrations because the underlying coefficients are simulated.

Overall, the core pattern is straightforward: transformational leadership is positively related to organizational innovation, and the positive association becomes stronger at higher levels of professional experience in the simulated data. This pattern provides the basis for the discussion below.

Discussion

The principal finding of the simulated analysis is that professional experience conditions the relationship between transformational leadership and organizational innovation. The positive interaction and simple-slopes pattern indicate that transformational leadership is more strongly associated with innovation among nurses with greater professional experience. This interpretation is compatible with Transformational Leadership Theory and prior nursing evidence (Masood & Afsar, 2017; Weng et al., 2015).

Transformational Leadership Theory explains why leadership behaviours may encourage innovation through vision, motivation, intellectual stimulation, and individualized support. Experienced nurses may benefit more from these inputs because they possess richer clinical and organizational knowledge that can support implementation (Bektaş et al., 2025; Masood & Afsar, 2017).

Situational Leadership Theory provides a complementary interpretation by emphasizing follower readiness. Professional experience can reflect part of that readiness, although it should not be treated as its complete measure. Less experienced nurses may require structured coaching and skill development before broad transformational messages can be translated into innovation (Alalwan, 2016; Salvador et al., 2026).

The sub-dimension analysis provides a more nuanced picture. Inspirational motivation and idealized influence showed significant simulated moderation, whereas individualized consideration and intellectual stimulation did not. If replicated empirically, experienced nurses might be especially responsive to leaders who articulate a compelling vision and model desired behaviours (Albargi et al., 2026).

Relationship with Previous Literature

The pattern is broadly consistent with literature showing positive links between transformational leadership and nurses' innovative behaviour (Bektaş et al., 2025; Masood & Afsar, 2017; Weng et al., 2015). Previous studies have also proposed psychological empowerment and innovation self-efficacy as mechanisms linking leadership to innovation (Vu et al., 2025; Li et al., 2026). The distinctive contribution of the present framework is its focus on professional experience as a boundary condition.

The study therefore adds a contextual perspective to nursing leadership research. Rather than asking only whether transformational leadership is effective, the moderation framework asks for whom and under what conditions it may be more effective. This contextual approach is relevant to Saudi healthcare organizations undergoing workforce and service transformation (Almugathawi et al., 2024; Alshammari, 2024).

Implications, Limitations and Conclusion

Theoretical Implications

The study extends transformational leadership research by conceptualizing professional experience as a boundary condition of leadership effectiveness. It also demonstrates how Situational Leadership Theory can complement transformational leadership theory by explaining why follower readiness may alter the strength of a leadership–innovation

relationship. The model remains parsimonious because it focuses on one independent variable, one outcome, and one moderator.

Practical Implications

For nurse managers, the simulated pattern suggests that leadership-development strategies should recognize differences in professional experience. Experienced nurses may be positioned to lead process improvements, mentor colleagues, and translate strategic priorities into operational changes. Less experienced nurses may benefit from coaching, structured participation in improvement projects, and opportunities to develop confidence before being expected to drive complex innovations. (Hariri et al., 2024).

For hospital administrators, transformational leadership programmes could emphasize inspirational communication, ethical role modelling, and mechanisms that allow nurses to propose and test improvements. Innovation initiatives should also create safe channels for staff participation, because leadership behaviours alone may be insufficient when organizational resources, authority, or implementation support are limited.

Limitations

The most important limitation is that the reported statistical results are simulated rather than empirical. They cannot establish the actual strength, significance, or direction of relationships among nurses in Tabuk. In addition, the proposed analysis is based on baseline observations from a parent study and therefore does not establish causality. The convenience sampling strategy and regional focus also limit generalizability. Finally, professional experience is treated as a single continuous indicator and may not capture other dimensions of readiness, expertise, specialization, or organizational influence.

Future Research

Future studies should test the model using genuine primary data from multiple Saudi hospitals and, where possible, longitudinal designs. Researchers could examine whether professional experience interacts with leadership across different nursing specialties and hospital units. Additional moderators such as professional autonomy, psychological safety, organizational support, and leadership climate may also be considered. Mediation models involving psychological empowerment or innovation self-efficacy could further explain why leadership produces different innovation outcomes across experience levels. (Bellibaş et al., 2026).

Conclusion

This study examined professional experience as a moderator of the transformational leadership–organizational innovation relationship among nurses in Tabuk, Saudi Arabia. The simulated analysis produced a positive interaction and stronger conditional leadership effects at higher experience levels. The conceptual contribution lies in identifying professional experience as a potential boundary condition rather than assuming a uniform leadership effect. Nevertheless, because the numerical results are simulated, the findings should be regarded solely as a methodological demonstration. Empirical validation with real nursing data is required before substantive conclusions or policy recommendations are made.

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