

Influence of Head Nurses' Transformational Leadership Style Training Program on Nurses' Work Motivation and Engagement at Zulfi General Hospital, Kingdom of Saudi Arabia

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Abstract

Background: Transformational leadership inspires and empowers nurses, creating a supportive work environment that enhances motivation and engagement. **Aim:** This study evaluated the effect of a transformational leadership training program for head nurses on staff nurses' work motivation and engagement at Zulfi General Hospital, Riyadh Region. **Methods:** A quasi-experimental one-group pretest-posttest design was conducted among 95 head nurses and 105 staff nurses using four instruments: the Transformational Leadership Knowledge Questionnaire, the Multifactor Leadership Questionnaire, the Work Motivation Questionnaire, and the Work Engagement Questionnaire. **Results:** Prior to the intervention, over half of the head nurses had low transformational leadership knowledge (55.8%) and low leadership levels (52.6%). Following the training, 92.6% achieved high knowledge levels, while transformational leadership scores improved significantly across all dimensions ($P < 0.001$). Staff nurses also demonstrated substantial improvements. Low work motivation decreased from 67.6% at baseline to 16.2% post-training, while high motivation increased from 3.8% to 36.2%. Similarly, low work engagement declined from 52.4% to 3.8%, whereas high engagement increased from 7.6% to 69.5% after the intervention. Although engagement levels declined slightly at the three-month follow-up, more than half (53.3%) maintained high engagement, indicating sustained program effects. Significant positive correlations were consistently observed between work motivation and work engagement at pretest ($r = 0.302$, $P = 0.002$), posttest ($r = 0.261$, $P = 0.007$), and follow-up ($r = 0.273$, $P = 0.005$). **Conclusion:** The training program significantly enhanced transformational leadership knowledge and behaviors, as well as nurses' work motivation and engagement. Positive relationships among these variables across all study phases highlight the importance of transformational leadership development as an effective strategy for fostering a motivated and engaged nursing workforce.

Keywords: Head Nurses' Transformational Leadership Style, Program, Work Motivation, Engagement.

Introduction

Healthcare systems continue to experience increasing demands that require effective leadership approaches capable of promoting innovation, collaboration, and high-quality patient care. Transformational leadership has emerged as one of the most effective leadership styles in nursing because it inspires and motivates nurses to achieve their full potential while fostering a supportive and positive work environment (Broome, 2025). As healthcare becomes more complex, transformational leaders play an essential role in empowering nurses, strengthening teamwork, and promoting continuous quality improvement, thereby contributing to improved organizational performance and patient outcomes (Goens & Giannotti, 2024).

Transformational leadership is a leadership style that motivates followers to move beyond their personal interests and work toward achieving organizational goals and improving patient care (Tsapnidou et al., 2024). Within nursing practice, transformational leaders actively involve nurses in decision-making processes, encourage autonomy and accountability, and create an environment where creativity and innovation can flourish. Through effective communication, shared vision, and empathy toward staff members, these leaders foster collaboration and strengthen professional relationships (Tsapnidou et al., 2024).

Transformational leaders inspire their followers by communicating a shared vision and encouraging them to view organizational goals as collective achievements (Labrague, 2024). They stimulate nurses to approach existing problems from new perspectives, recognize the unique strengths of each individual, and establish relationships based on trust, respect, and commitment. Such leadership enables healthcare organizations to respond effectively to rapidly changing and complex clinical environments while maintaining high standards of nursing practice (Labrague, 2024).

The importance of transformational leadership in nursing has been widely recognized because it contributes to higher job satisfaction, improved patient outcomes, and lower staff turnover rates (Al-Thawabiya et al., 2023). By creating a supportive workplace characterized by open communication and collaboration, transformational leaders strengthen teamwork and empower nurses to expand their knowledge and clinical competencies. This supportive culture encourages innovation and ultimately enhances the quality and safety of patient care (Hamdan et al., 2024).

The effectiveness of transformational leadership is reflected through four core components: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Ystaas et al., 2023). Idealized influence enables leaders to serve as ethical role models who earn the trust and respect of their followers. Inspirational motivation allows leaders to communicate a compelling vision that encourages enthusiasm and commitment toward shared organizational goals (Nguyen, 2024). Intellectual stimulation promotes creativity by encouraging nurses to challenge conventional practices and explore innovative solutions to clinical problems. Individualized consideration emphasizes recognizing the unique needs and abilities of each nurse while providing personalized guidance and mentorship that support professional development (Alwali, 2024).

Several organizational and individual factors influence the successful implementation of transformational leadership. Organizational cultures that promote collaboration, continuous learning, and open communication strengthen the effectiveness of transformational leadership practices (Gebreheat, Teame, & Costa, 2023). Likewise, leadership development programs enhance nurse managers' competencies and prepare them to adopt transformational leadership behaviors effectively. Adequate staffing levels, sufficient organizational resources, administrative support, and positive interpersonal relationships among healthcare professionals further facilitate the successful application of transformational leadership within healthcare organizations (Haoyan et al., 2023).

Healthcare organizations can promote transformational leadership by investing in leadership development programs that enhance the competencies of current and future nurse leaders (Haoyan et al., 2023). Organizations should also encourage open communication that allows nurses to express ideas, concerns, and feedback without hesitation while establishing mentorship programs that facilitate knowledge transfer and professional development between experienced nurse leaders and newly employed nurses (Haoyan et al., 2023).

Work motivation is another essential determinant of nursing performance because it directly influences nurses' productivity, job satisfaction, and quality of patient care (Kohnen et al., 2024). Nursing is a demanding profession associated with considerable physical and emotional challenges; therefore, understanding the factors that influence motivation is essential for maintaining an effective workforce. Highly motivated nurses demonstrate greater commitment to patient care, remain actively engaged in their professional

responsibilities, and contribute to improved healthcare outcomes (Kohnen et al., 2024).

Work motivation refers to the internal and external factors that encourage nurses to perform their professional responsibilities effectively and enthusiastically (Meng & Yang, 2024). Internal motivation arises from personal fulfillment, professional achievement, and enjoyment of nursing practice, whereas external motivation is influenced by salary, recognition, promotion opportunities, and career advancement. Understanding these motivational factors enables healthcare organizations to implement strategies that strengthen employee engagement and improve organizational performance (Meng & Yang, 2024).

High levels of work motivation are consistently associated with increased job satisfaction, reduced burnout, lower turnover intentions, and improved collaboration among nursing staff (Goens & Giannotti, 2024). Motivated nurses are more likely to communicate effectively, participate in teamwork, and proactively solve clinical problems, all of which contribute to higher-quality patient care and healthier workplace environments (Goens & Giannotti, 2024).

Multiple factors influence nurses' work motivation. Individual characteristics, including age, educational level, professional experience, and personal values, affect motivational levels differently throughout nurses' careers (Ahlstedt et al., 2023). Organizational factors such as leadership support, staffing adequacy, workload, recognition systems, and opportunities for professional development also play significant roles in enhancing or reducing nurses' motivation (Bahlman-van Ooijen et al., 2023). Additionally, intrinsic motivators including professional fulfillment and teamwork, together with extrinsic incentives such as salary increases, promotions, and employee recognition, significantly influence motivation within healthcare settings (Bahlman-van Ooijen et al., 2023).

Healthcare organizations can strengthen nurses' work motivation by implementing leadership development initiatives that prepare nurse managers to effectively support and motivate their teams (Heidari et al., 2024). Creating positive work environments characterized by psychological safety, open communication, and flexible scheduling further enables nurses to balance professional and personal responsibilities while maintaining high levels of motivation (Heidari et al., 2024).

Work engagement represents another important concept in nursing because it reflects nurses' emotional, cognitive, and psychological commitment to their

work (Midje et al., 2024). It is characterized by vigor, dedication, and absorption, indicating high levels of energy, enthusiasm, resilience, and concentration while performing professional responsibilities. Nurses with high work engagement demonstrate stronger commitment to patient care and contribute positively to team performance and organizational effectiveness (Morales-García et al., 2024).

The importance of work engagement extends beyond individual performance because engaged nurses provide higher-quality patient care, experience greater job satisfaction, and report lower levels of burnout (BowenXue et al., 2024). Furthermore, organizations with highly engaged nursing staff benefit from stronger teamwork, improved staff retention, and enhanced organizational performance, helping address ongoing nursing workforce shortages (BowenXue et al., 2024).

Several factors influence nurses' work engagement, including organizational support, healthy work environments, autonomy in decision-making, recognition and reward systems, opportunities for professional development, and work-life balance (Rawson et al., 2024). Healthcare organizations that invest in these factors are more likely to maintain an engaged workforce capable of delivering safe, high-quality, patient-centered care (Rawson et al., 2024).

Transformational leadership creates an environment where nurses feel valued, respected, and empowered, making it an important determinant of work motivation and engagement (Ystaas et al., 2023). Understanding this relationship enables healthcare organizations to implement evidence-based strategies that foster supportive workplace cultures while improving nurses' commitment to their professional roles and the quality of patient care (Labrague & Obeidat, 2022).

Investigating the influence of head nurses' transformational leadership on nurses' work engagement is essential because engaged nurses demonstrate greater productivity, creativity, and commitment toward both patients and colleagues (Labrague & Obeidat, 2022). Through effective communication, collaboration, empowerment, and professional development, transformational leaders strengthen workplace engagement and contribute to healthier organizational environments (Labrague & Obeidat, 2022).

The findings of this study may provide valuable implications for nursing practice and healthcare management by emphasizing the importance of leadership development programs that equip head nurses with transformational leadership

competencies (Lai et al., 2020). Such investments not only enhance nurses' motivation and engagement but also strengthen organizational culture through collaboration and innovation. Ultimately, promoting transformational leadership may improve nurse retention, increase job satisfaction, enhance patient outcomes, and support the long-term success of healthcare organizations operating within increasingly complex healthcare systems (Ree & Wiig, 2020). Therefore, this study aimed to evaluate the influence of a transformational leadership training program for head nurses on nurses' work motivation and work engagement at Zulfi General Hospital in the Riyadh Region.

Aim of the Study

The study aimed to evaluate the influence of a transformational leadership training program for head nurses on nurses' work motivation and work engagement at Zulfi General Hospital in the Riyadh Region.

Research Hypotheses

- Head nurses' knowledge of transformational leadership will improve after implementing the training program.
- Head nurses' transformational leadership level will improve after implementing the training program.
- Staff nurses' work motivation will increase after implementing the training program.
- Staff nurses' work engagement level will improve after implementing the training program.

Methods

Study Design and Setting

A quasi-experimental one-group pretest–posttest design was employed to evaluate the influence of a transformational leadership training program on head nurses' transformational leadership knowledge and behaviors, as well as staff nurses' work motivation and work engagement. The study was conducted at Zulfi General Hospital, Riyadh Region, Saudi Arabia.

Participants

A convenience sampling technique was used to recruit the study participants. The study included 95 head nurses and 105 staff nurses who were available during the study period and agreed to participate. Participants were eligible if they had at least one year of professional experience at the study setting. Nurses

who were absent during the data collection period or declined participation were excluded from the study.

Data Collection Instruments

Four structured instruments were utilized to collect the study data.

Transformational Leadership Style Knowledge Questionnaire

This questionnaire was developed by the researcher after reviewing relevant literature (Montuon & Donnelly, 2018; Broome & Marshall, 2021; Pellikaan, 2021; Bajcar & Babiak, 2022; Fu et al., 2022). It consisted of two sections. The first section collected participants' demographic characteristics, including age, gender, marital status, educational qualification, and years of experience. The second section assessed head nurses' knowledge regarding transformational leadership using true/false and multiple-choice questions covering the concepts, characteristics, dimensions, and application of transformational leadership.

Multifactor Leadership Questionnaire (MLQ)

Transformational leadership behaviors were assessed using the Multifactor Leadership Questionnaire (MLQ) developed by Bass and Avolio (2004). The instrument consists of 20 items distributed across five dimensions: Builds Trust (Idealized Influence–Attributes), Acts with Integrity (Idealized Influence–Behaviors), Encourages Others (Inspirational Motivation), Encourages Innovative Thinking (Intellectual Stimulation), and Coaches and Develops People (Individualized Consideration). Responses were rated using a five-point Likert scale ranging from 0 (Not at all) to 4 (Frequently, if not always).

Work Motivation Questionnaire

Staff nurses' work motivation was measured using the Work Motivation Questionnaire developed by Mottaz (1985). The questionnaire contains 16 items distributed equally across two domains: intrinsic motivation and extrinsic motivation. Responses were recorded on a five-point Likert scale ranging from strongly agree to strongly disagree.

Work Engagement Questionnaire

Work engagement was measured using the Utrecht Work Engagement Scale developed by Schaufeli and Bakker (2010). The instrument includes 17 items measuring three dimensions of work engagement: vigor (6 items), dedication (5 items), and absorption (6 items). Responses were rated using a five-point Likert scale ranging from strongly disagree to strongly agree.

For all study instruments, total scores were converted into percentage scores and classified as low (<60%), moderate (60–75%), or high (>75%) according to predetermined cutoff points.

Validity and Reliability

Face and content validity of the study instruments were established by a panel of five experts in nursing administration and nursing education. Their feedback focused primarily on the clarity, wording, sequence, and relevance of questionnaire items, and the recommended modifications were incorporated before data collection.

The reliability of the study instruments was evaluated using Cronbach's alpha coefficient with the Statistical Package for the Social Sciences (SPSS), version 25. The Transformational Leadership Knowledge Questionnaire, Multifactor Leadership Questionnaire, Work Motivation Questionnaire, and Work Engagement Questionnaire demonstrated good internal consistency, with Cronbach's alpha coefficients of 0.88, 0.89, 0.89, and 0.94, respectively.

Pilot Study

A pilot study was conducted on approximately 10% of the study sample, including nine head nurses and ten staff nurses, to evaluate the clarity, applicability, and feasibility of the study instruments and estimate the time required to complete the questionnaires. Necessary modifications were made based on the pilot findings. Participants included in the pilot study were excluded from the final study sample.

Educational Intervention

The transformational leadership training program was developed by the researcher based on the identified learning needs of the participants and an extensive review of the relevant literature. The program was designed to strengthen head nurses' transformational leadership knowledge and behaviors and to enhance staff nurses' work motivation and work engagement. The educational content focused on the fundamental concepts and dimensions of transformational leadership, including idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. In addition, the program emphasized practical leadership strategies that promote effective communication, teamwork, empowerment, motivation, and employee engagement within healthcare settings.

The intervention was implemented over a two-month period from October to November 2024. Head nurses participated in small-group sessions to facilitate active participation while accommodating work schedules and unit workload. Various educational methods were employed throughout the program, including interactive lectures, brainstorming sessions, group discussions, case-based learning, educational videos, and printed handouts prepared by the researcher. These teaching strategies were selected to encourage active learning, critical thinking, knowledge exchange, and the practical application of transformational leadership principles in clinical practice.

The educational program consisted of three sequential phases. During the pre-program phase, participants' baseline knowledge and leadership behaviors were assessed, and the educational needs were identified. The implementation phase focused on delivering the educational content using interactive teaching methods and real clinical scenarios that enabled participants to apply transformational leadership principles in everyday nursing practice. The post-program phase evaluated the effectiveness of the intervention by assessing changes in transformational leadership knowledge and behaviors as well as staff nurses' work motivation and work engagement immediately after the intervention and at the three-month follow-up.

Data Collection Procedure

After obtaining the required administrative and ethical approvals, the researcher met the eligible participants, explained the purpose of the study, and obtained written informed consent before data collection. Baseline assessment (pretest) was then conducted using the four study instruments. Head nurses completed the Transformational Leadership Style Knowledge Questionnaire and the Multifactor Leadership Questionnaire, whereas staff nurses completed the Work Motivation Questionnaire and the Work Engagement Questionnaire.

Following completion of the baseline assessment, the transformational leadership training program was delivered to the participating head nurses. Upon completion of the intervention, the same study instruments were re-administered immediately to evaluate the immediate effect of the program (posttest). A follow-up assessment was subsequently conducted three months after completion of the training program to determine the sustainability of the intervention outcomes. Each questionnaire required approximately 20–30 minutes to complete, and the researcher remained available throughout the data collection process to answer participants' questions and ensure accurate completion of the instruments.

Ethical Considerations

Ethical approval for the study was obtained from the Research Ethics Committee, Faculty of Nursing, Mansoura University. Administrative approval was subsequently obtained from the management of Zulfi General Hospital before commencing data collection. All participants received a full explanation of the study objectives, procedures, expected benefits, and their rights as research participants before providing written informed consent.

Participation in the study was entirely voluntary, and participants were informed of their right to withdraw from the study at any stage without any consequences. Confidentiality and anonymity were maintained throughout all phases of the research, and the collected data were used exclusively for scientific research purposes.

Statistical Analysis

Data were coded, entered, and analyzed using the Statistical Package for the Social Sciences (SPSS), version 25 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize the study variables, with categorical variables presented as frequencies and percentages, and continuous variables expressed as means and standard deviations.

The normality of the data distribution was examined before inferential analyses. Repeated measurements of continuous variables across the three study phases (pretest, posttest, and follow-up) were analyzed using two-way repeated-measures analysis of variance (ANOVA), whereas Friedman's test was applied to ordinal variables. Independent *t*-tests and one-way ANOVA were used to compare continuous variables between and across participant characteristics, as appropriate. Pearson's correlation coefficient was used to examine the relationships between transformational leadership, work motivation, and work engagement. Statistical significance was established at $p < 0.05$.

Results

Table 1: Personal characteristics of the studied head nurses at Zulfi General Hospital, Kingdom of Saudi Arabia (n=95).

Personal characteristics	The studied head nurses	
	n	%
■Age years		
20< 30	2	2.1
31< 40	74	77.9
41> 50	19	20.0
Mean±SD	32.60±	5.46
■Sex		
Male	17	17.9
Female	78	82.1
■Marital status		
Single	21	22.1
Married	62	65.3
Widow	9	9.5
Divorced	3	3.2
■Educational qualification		
Diploma in nursing	16	16.8
BSC in nursing	75	78.9
MSc in nursing	4	4.2
■Experience years		
1-5 Years	11	11.6
6-10 Years	44	46.3
More than 10 Years	40	42.1
Mean±SD	9.71±2.77	

Table 1 illustrates the personal characteristics of the studied head nurses at Zulfi General Hospital. The data reveals that the majority of participants (77.9%) were aged between 31 and 40 years (Mean± SD: 32.60±5.46), indicating a relatively young leadership workforce. The sample was predominantly female (82.1%), with most being married (65.3%). Regarding educational qualifications, the majority (78.9%) held a Bachelor of Science in nursing. In terms of experience, nearly half (46.3%) had 6-10 years of experience (Mean ±SD: 9.71±2.77), suggesting a moderately experienced nursing leadership team.

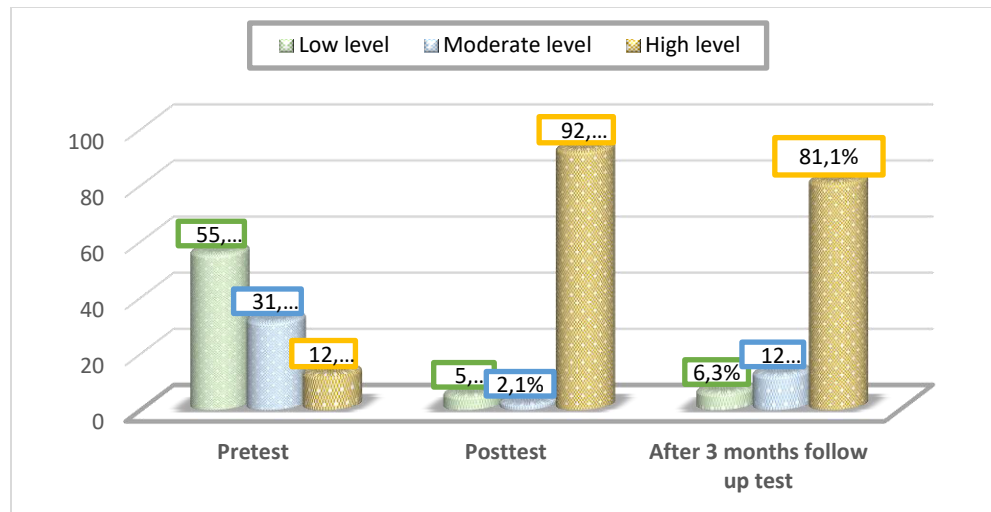


Figure 1: Total Transformational Leadership Style knowledge level of the studied head nurses throughout the training program (n=95).

Figure 1 categorizes head nurses' knowledge levels across training phases, revealing dramatic shifts in knowledge distribution ($\chi^2=146.049$, $P<0.001^{**}$). At pretest, more than half (55.8%) demonstrated low knowledge levels, with only 12.6% achieving high knowledge. Post-training, this pattern reversed dramatically, with 92.6% achieving high knowledge and only 5.3% remaining at low levels. At 3-month follow-up, 81.1% maintained high knowledge levels, indicating excellent knowledge retention.

Table 2: Transformational Leadership Style levels of the studied head nurses throughout the training program phases (n=95).

Transformational Leadership total score level	Total Transformational Leadership level of the studied head nurses throughout the training program phases					
	Pretest		Posttest		Follow up test	
	No.	%	No.	%	No.	%
Low level (5-59)	50	52.6	7	7.4	10	10.5
Moderate level (60-75)	17	17.9	13	13.7	24	25.3
High level (76-100)	28	29.5	75	78.9	61	64.2
χ^2 test	102.820					
P value	<0.001**					

N.B. Transformational Leadership level was classified into: Low level (<60% of total scores), Moderate level (60-75% of total scores), and High level (>75% of total scores).

Table 2 categorizes transformational leadership style levels of the studied head nurses throughout the training program phases, revealing dramatic shifts ($\chi^2=102.820$, $P<0.001^{**}$). At pretest, more than half (52.6%) demonstrated low transformational leadership levels, with only 29.5% at high levels. Post-training, this pattern reversed dramatically, with 78.9% achieving high levels and only 7.4% remaining low. At 3-month follow-up, 64.2% maintained high levels, indicating excellent behavior retention.

Figure 2 presents the transformational leadership style dimensions' mean scores of the studied head nurses throughout the training program phases. Highly significant improvements ($P<0.001^{**}$) were observed across all dimensions. Pretest mean scores ranged from 10.96 ± 5.32 to 12.60 ± 3.97 (out of 20 points), indicating moderate baseline performance. Post-training, scores increased substantially from 16.94 ± 3.04 to 17.78 ± 3.17 , representing approximately 40-58% improvement. Follow-up scores remained elevated (16.17 ± 3.45 to 17.63 ± 2.56), demonstrating sustained behavioral changes. Total transformational leadership scores increased from 60.46 ± 21.37 (pretest) to 87.31 ± 14.93 (posttest), maintaining 83.92 ± 12.61 at follow-up.

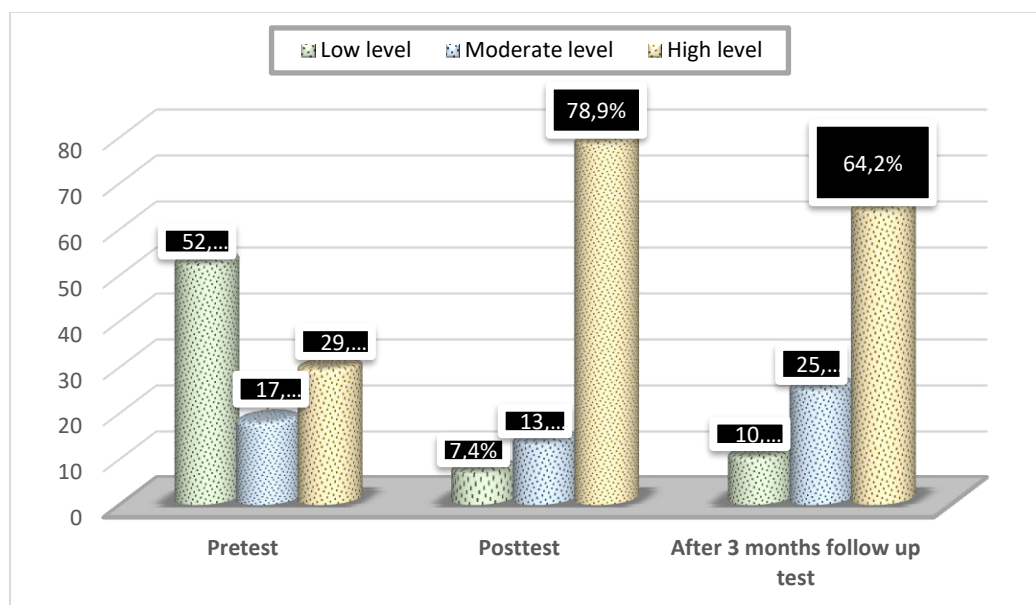


Figure 2: Total transformational Leadership Style levels of the studied head nurses throughout the training program phases (n=95).

Table 3: Work motivation score levels among the studied staff nurses throughout the training program phases (n=105).

Work motivation total score level	Total Work motivation level of the studied staff nurses throughout the training program phases					
	Pretest		Posttest		Follow up test	
	No.	%	No.	%	No.	%
Low level (16-47)	71	67.6	17	16.2	23	21.9
Moderate level (48-60)	30	28.6	50	47.6	49	46.7
High level (61-80)	4	3.8	38	36.2	33	31.4
x ² test	107.052					
P value	<0.001**					

N.B. Work motivation level was classified into: Low level (<60% of total scores), Moderate level (60-75% of total scores), and High level (>75% of total scores).

Table 3 categorizes work motivation score levels among the studied staff nurses throughout the training program phases, revealing dramatic shifts ($x^2=107.052$, $P<0.001^{**}$). At pretest, more than two-thirds (67.6%) demonstrated low motivation levels, with only 3.8% at high levels. Post-training, this pattern transformed dramatically, with 36.2% achieving high levels and only 16.2% remaining low. At 3-month follow-up, 31.4% maintained high levels, with 21.9% at low levels. Most notably, the moderate motivation category expanded substantially from 28.6% (pretest) to 47.6% (posttest) and 46.7% (follow-up), suggesting the training program successfully elevated the majority of staff nurses from low to at least moderate motivation levels.

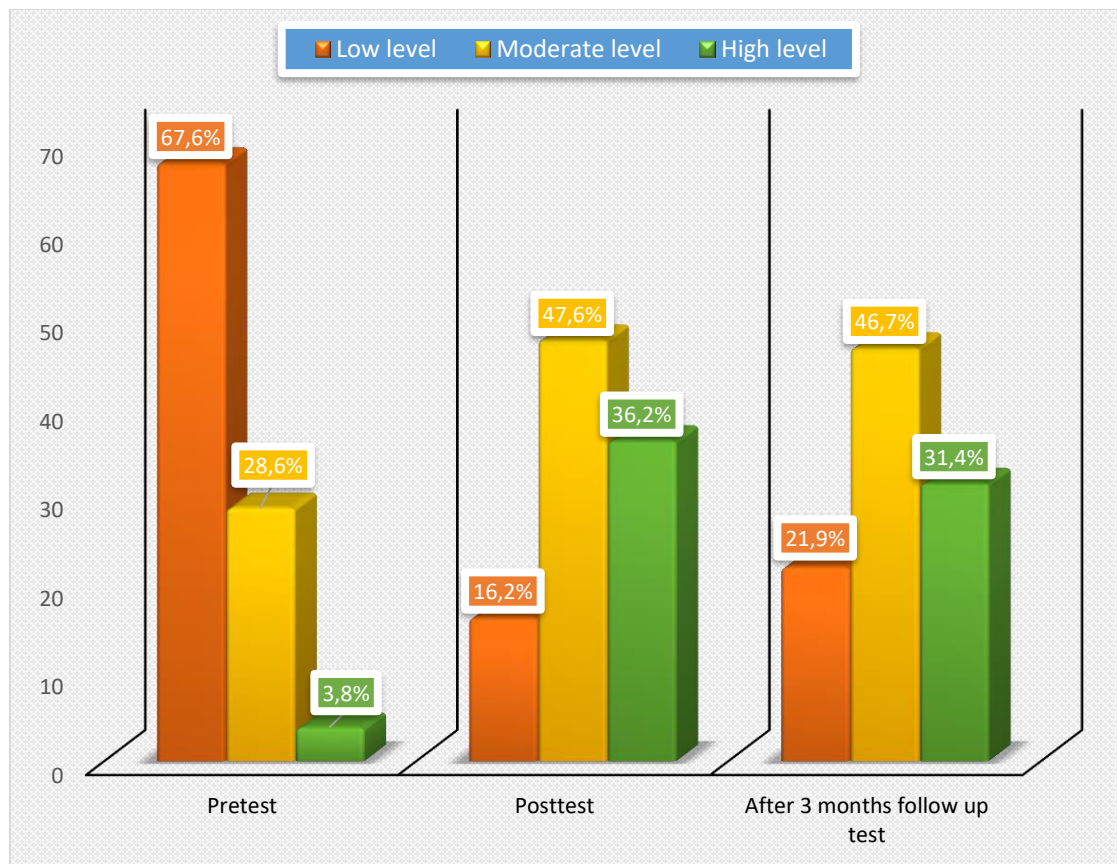


Figure 3: Total work motivation Style levels of the studied staff nurses throughout the training program phases (n=105).

Figure 3 categorizes work motivation score levels among the studied staff nurses throughout the training program phases, revealing dramatic shifts ($\chi^2=121.107$, $P<0.001^{**}$). At pretest, more than half (52.4%) demonstrated low engagement levels, with only 7.6% at high levels. Post-training, this pattern reversed dramatically, with 69.5% achieving high engagement levels and only 3.8% remaining low. At 3-month follow-up, 53.3% maintained high levels, indicating good retention despite some decline from immediate post-training. The moderate engagement category remained relatively stable (26.7%-40.0% across phases), while the most dramatic shift occurred in the low-to-high transition, demonstrating the training program's effectiveness in substantially elevating staff nurses' work engagement.

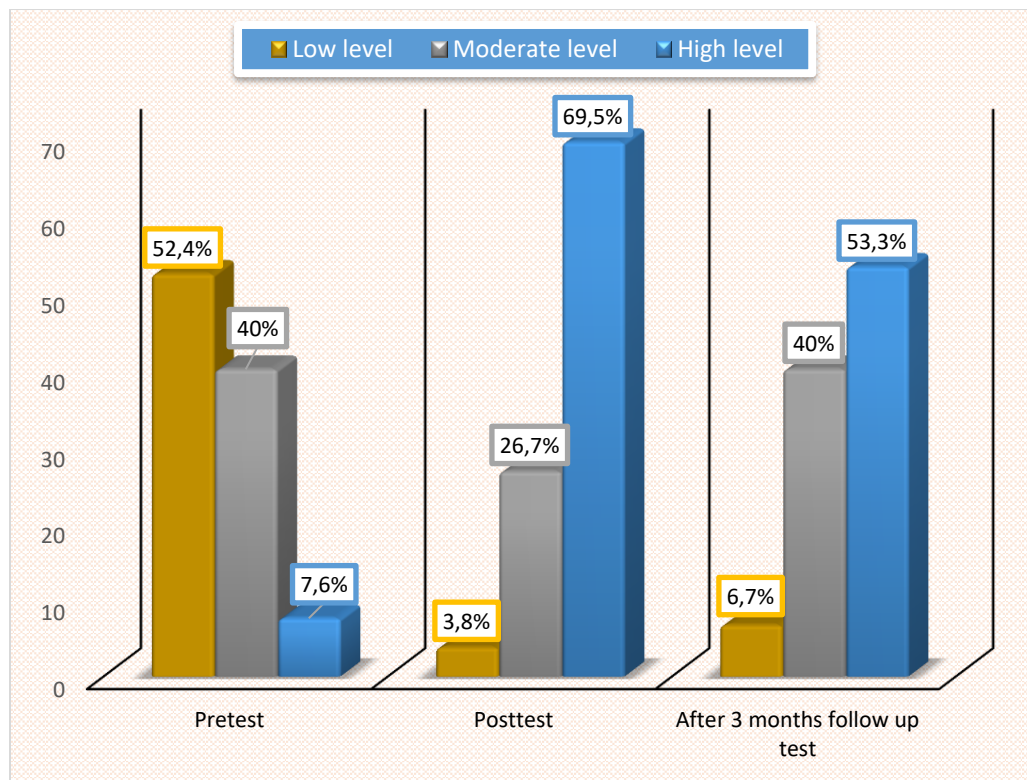


Figure 4: Total work motivation Style levels of the studied staff nurses throughout the training program phases (n=105).

Table 4: Correlation between total Perceived work motivation and Total Perceived work engagement throughout the study periods among the studied nurses (n=105)

Variable	Total Perceived work motivation		
	Time	r	p
Total Perceived work engagement	Pretest	0.302	0.002**
	Posttest	0.261	0.007**
	Follow up test	0.273	0.005**

Table 4 examines the correlation between total perceived work motivation and Total Perceived work engagement throughout the study periods among the

studied nurses. Weak to moderate positive correlations were found at all time points: pretest ($r=0.302$, $P=0.002^{**}$), posttest ($r=0.261$, $P=0.007^{**}$), and follow-up ($r=0.273$, $P=0.005^{**}$). These consistent positive correlations indicate that staff nurses with higher motivation scores also demonstrated higher engagement scores, suggesting a meaningful motivation-engagement relationship. The relatively stable correlation coefficients across phases (ranging from 0.261 to 0.302) indicate that this relationship was maintained throughout the training program period, supporting the theoretical linkage between motivation and engagement constructs in nursing practice.

Discussion

Transformational leadership is recognized as an effective leadership approach that enhances nurses' professional performance by fostering a supportive work environment characterized by trust, empowerment, and shared vision. Leaders who practice transformational leadership inspire nurses through individualized support, intellectual stimulation, and recognition of individual contributions, thereby strengthening intrinsic motivation and encouraging greater commitment to organizational goals (Al-Thawabiya et al., 2023).

In turn, motivated nurses are more likely to demonstrate higher levels of work engagement, reflected in greater vigor, dedication, and absorption in their professional roles. Moreover, transformational leadership contributes indirectly to work engagement by creating a positive organizational climate that promotes autonomy, collaboration, and professional growth, ultimately improving teamwork and quality of patient care (Haoyan et al., 2023; Gebreheat, Teame, & Costa, 2023). Accordingly, the present study evaluated the influence of a transformational leadership training program for head nurses on staff nurses' work motivation and engagement at Zulfi General Hospital, Kingdom of Saudi Arabia.

Head nurses' knowledge about transformational leadership throughout the training program phases

The present study demonstrated a substantial improvement in head nurses' knowledge of transformational leadership following implementation of the training program. Before the intervention, more than half of the participants demonstrated low knowledge levels, whereas only a small proportion achieved high knowledge levels. Following the training, the majority of head nurses reached a high level of knowledge, and this improvement was largely maintained

at the three-month follow-up, indicating satisfactory knowledge retention over time.

The observed improvement may be attributed to the comprehensive educational content and interactive teaching strategies incorporated into the training program. By emphasizing the core concepts of transformational leadership and linking theoretical knowledge with practical nursing leadership situations, the program enhanced participants' understanding of transformational leadership principles and facilitated the application of newly acquired knowledge in daily clinical practice. The sustained improvement observed during the follow-up period further suggests that the educational intervention promoted long-term knowledge retention through repeated practice and continuous application within the work environment.

The current findings are consistent with those of Kılıç and Uludağ (2021), who highlighted the important role of transformational leadership in strengthening organizational knowledge management processes, while Lei, Gui, and Le (2021) reported that transformational leadership facilitated both explicit and tacit knowledge sharing. Collectively, these findings support the substantial improvement and sustained retention of transformational leadership knowledge observed among head nurses in the present study.

Head nurses' perception of transformational leadership throughout the training program phases

The present study also demonstrated significant improvements in head nurses' transformational leadership behaviors following the educational intervention. Before the implementation of the training program, more than half of the head nurses demonstrated low transformational leadership levels. Following the intervention, this pattern changed considerably, with the majority achieving high transformational leadership levels. Although a slight decline was observed at the three-month follow-up, most participants continued to demonstrate high levels of transformational leadership, indicating that the behavioral improvements were largely sustained over time.

These findings suggest that the training program successfully translated theoretical knowledge into leadership practice. By strengthening competencies related to inspirational motivation, intellectual stimulation, individualized consideration, and idealized influence, the intervention enabled head nurses to incorporate transformational leadership behaviors into their daily managerial responsibilities. The persistence of high levels of transformational leadership

during follow-up further indicates that the continuous application of these leadership behaviors in the clinical setting helped maintain the intervention's effectiveness beyond the immediate post-training period.

The current findings agree with those of Yu et al. (2024), who reported that higher levels of transformational leadership among head nurses were associated with greater professional competence and effective leadership practices. Similar findings were reported by Suwarno (2023), who demonstrated that head nurses practicing transformational leadership exhibited more effective leadership behaviors than those adopting other leadership styles.

Furthermore, Gebreheat, Teame, and Costa (2023) concluded that transformational leadership is a developable leadership style that can positively influence nursing outcomes through structured educational interventions. Haoyan et al. (2023) identified transformational leadership as one of the most influential leadership styles in strengthening nurses' organizational commitment across healthcare settings. In addition, Hussain and Khayat (2021) concluded that transformational leadership among nurse managers contributes to improved leadership effectiveness, organizational commitment, and job satisfaction, further supporting the sustained behavioral improvements observed in the current study.

Staff nurses' perception of work motivation throughout the training program phases

The present study demonstrated a significant improvement in staff nurses' work motivation following implementation of the transformational leadership training program. At baseline, more than two-thirds of the participants reported low levels of work motivation, whereas only a small proportion demonstrated high motivation. Following the intervention, the proportion of nurses with high motivation increased markedly, while the proportion with low motivation declined considerably. Although a slight reduction was observed at the three-month follow-up, motivation levels remained substantially higher than those reported before the intervention. Furthermore, the moderate motivation category increased considerably throughout the study phases, indicating that the training program successfully shifted the majority of nurses from low to at least moderate levels of work motivation.

The observed improvement may be attributed to the influence of transformational leadership behaviors practiced by head nurses after the educational intervention. By communicating a clear vision, providing

individualized support, encouraging participation in decision-making, and recognizing nurses' contributions, head nurses likely created a more supportive work environment that enhanced both intrinsic and extrinsic motivation. The maintenance of higher motivation levels during the follow-up period further suggests that the positive influence of transformational leadership extended beyond the immediate training phase and became integrated into routine nursing practice.

The present findings are consistent with those of Morkevičiūtė and Endriulaitienė (2020), who reported that transformational leadership significantly enhanced employees' intrinsic and extrinsic work motivation, particularly among individuals with initially low motivation levels. Similarly, Wijayanti (2020) demonstrated that transformational leadership positively influenced employees' work motivation and subsequently improved job performance through increased motivational levels. Collectively, these findings support the current results, confirming that transformational leadership contributes substantially to improving nurses' motivation and sustaining these improvements over time.

Staff nurses' perception of work engagement throughout the training program phases

The findings of the present study also revealed significant improvements in staff nurses' work engagement following the transformational leadership training program. Before the intervention, more than half of the participants demonstrated low engagement levels, whereas only a limited proportion reported high engagement. Immediately after the intervention, the majority of staff nurses achieved high work engagement, accompanied by a marked reduction in low engagement levels. Although engagement scores declined slightly at the three-month follow-up, more than half of the participants continued to demonstrate high engagement, indicating that the beneficial effects of the intervention were largely maintained over time.

These findings may be explained by the positive organizational environment created through transformational leadership practices. Following the training, head nurses were better equipped to motivate staff, encourage participation, strengthen interpersonal relationships, and provide continuous feedback, thereby increasing nurses' enthusiasm, dedication, and psychological attachment to their work. The sustained improvement observed during follow-up suggests that continued exposure to transformational leadership behaviors promoted long-term engagement despite the expected decline after completion of

the formal educational program. The present findings are supported by Monje-Amor, Vázquez, and Faíña (2020), who reported that transformational leadership enhanced employees' work engagement through structural empowerment and strengthened motivational processes within organizations.

Correlation between total knowledge of transformational leadership style and total perceived transformational leadership style

The present study demonstrated a positive relationship between head nurses' knowledge of transformational leadership and their perceived transformational leadership behaviors throughout the study period. This finding suggests that increasing knowledge of transformational leadership concepts may facilitate the implementation of transformational leadership behaviors in clinical practice. Head nurses who possess a better understanding of transformational leadership principles are more likely to apply idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration during their daily interactions with staff nurses.

This relationship may also reflect the effectiveness of the educational intervention in translating theoretical knowledge into practical leadership behaviors. As head nurses became more familiar with transformational leadership concepts, they appeared more capable of incorporating these behaviors into their managerial practices, thereby strengthening their overall leadership performance.

The present findings are consistent with those of Hoang and Le (2025), who reported that greater knowledge of transformational leadership was associated with stronger leadership practices and enhanced knowledge-sharing behaviors among employees. Similarly, Nguyen (2023) found that leaders with a better understanding of transformational leadership principles were more likely to be perceived by employees as transformational leaders. These findings support the positive association observed in the current study between transformational leadership knowledge and perceived leadership behaviors.

Correlation between total perceived work motivation and total perceived work engagement

The present study identified statistically significant positive correlations between staff nurses' work motivation and work engagement throughout all study phases. Although the strength of the correlations ranged from weak to moderate, the relationship remained consistent before the intervention, immediately afterward, and at the three-month follow-up. These findings indicate that nurses who

reported higher levels of work motivation also tended to demonstrate higher levels of work engagement, supporting the close relationship between these two constructs.

The persistence of this relationship throughout the study period suggests that improvements in work motivation may contribute to sustained work engagement among nursing staff. As transformational leadership practices enhanced nurses' motivation, they also appeared to strengthen nurses' enthusiasm, dedication, and involvement in their professional roles, thereby reinforcing overall engagement within the clinical environment.

The present findings are supported by Xin et al. (2023), who reported significant positive associations between nurses' work motivation and work engagement, with self-efficacy and achievement motivation acting as important mediating factors. Likewise, Abu-Qutaish et al. (2025) demonstrated that motivated nurses were more likely to report higher levels of work engagement in governmental hospitals. Similar findings were reported by Karaferis, Aletras, Raikou, and Niakas (2022), who found that work motivation and engagement were consistently and positively associated among healthcare professionals. Together, these studies support the current findings and reinforce the theoretical relationship between work motivation and work engagement in nursing practice.

Conclusion

The findings of the present study demonstrated that the transformational leadership training program significantly improved head nurses' knowledge and transformational leadership behaviors, with these improvements largely maintained at the three-month follow-up. The intervention also resulted in significant improvements in staff nurses' work motivation and work engagement, indicating that enhancing head nurses' leadership competencies positively influences important workforce outcomes. Furthermore, the significant positive correlation between work motivation and work engagement highlights the close relationship between these two constructs and emphasizes the importance of transformational leadership in fostering a motivated and engaged nursing workforce. Overall, the findings support the integration of transformational leadership development programs into nursing management as an effective strategy for improving leadership practice and promoting positive organizational outcomes.

Recommendations

Based on the study findings, the following recommendations are proposed:

- Healthcare organizations should implement regular transformational leadership training programs for head nurses to strengthen leadership competencies and sustain positive changes in nursing practice.
- Head nurses should consistently incorporate transformational leadership behaviors, including inspirational motivation, idealized influence, individualized consideration, and intellectual stimulation, into their routine leadership practices while engaging in periodic self-evaluation to support continuous professional development.
- Healthcare administrators should promote supportive work environments that encourage staff participation, empowerment, and professional development to enhance nurses' work motivation and engagement.
- Future longitudinal and multicenter studies are recommended to examine the long-term sustainability of transformational leadership interventions and to investigate organizational and environmental factors that may influence their effectiveness across different healthcare settings.

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Conflict of interest

The authors declare no conflict of interest in the preparation of this study.

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