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IMPACT OF TRANSFORMATIONAL LEADERSHIP TRAINING PROGRAM ON NURSE MANAGERS' KNOWLEDGE

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Abstract

Nurse Managers' transformational leadership (TL) is consistently associated with better nurse, organizational, and patient outcomes; however, structured TL education for nurse manager's remains limited in Saudi Arabia. This study aimed to evaluate the impact of a TL training program on nurse managers' knowledge. A quasi-experimental, one-group pretest–posttest design with a three-month follow-up was conducted with all nurse managers (n = 25) at Alnoor Specialist Hospital, Makkah, Saudi Arabia. Data were collected using a personal characteristics data sheet and a 25-item TL knowledge questionnaire covering four domains (concept, importance, characteristics, and components of TL) before the program, immediately after it, and three months later. The program consisted of nine two-hour sessions (18 hours) delivered over six weeks. None of the nurse managers had previously attended TL training. The total mean knowledge score increased from 11.76 ± 2.51 before the program to 21.84 ± 1.59 immediately after it and was 19.44 ± 2.03 at the three-month follow-up ($F = 7.55$, $p < 0.001$). Before the program, 64.0% of nurse managers had a poor knowledge level; immediately after it, all of them (100.0%) had a good level, and three months later 64.0% retained a good level while the remaining 36.0% had a fair level (chi-square, $\chi^2 = 64.4$, $p < 0.001$). Knowledge scores did not differ significantly according to gender, age, marital status, educational level, or years of experience. The TL training program significantly improved nurse managers' knowledge, and most of the gain was retained after three months. Periodic refresher training and the integration of TL content into continuing professional development for nurse managers are recommended.

Index Terms: Continuing Education, Knowledge, Leadership Training, Nurse Managers, Nursing Administration, Quasi-Experimental Design, Saudi Arabia, Transformational Leadership.

1. INTRODUCTION

Nurse managers occupy a pivotal position between hospital executives and frontline nurses. They translate organizational strategy into daily practice, shape the work environment, and directly influence the quality and safety of care. The World Health Organization's State of the World's Nursing 2025 report reaffirms that strengthening nursing requires sustained investment not only in education and jobs but also in nursing leadership [1]. Among contemporary leadership approaches, transformational leadership (TL) has received the most attention in nursing. Transformational leaders articulate a shared vision, act as role models, stimulate followers intellectually, and attend to individual needs; Kouzes and Posner [2] operationalize these behaviors as five practices:

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model the way, inspire a shared vision, challenge the process, enable others to act, and encourage the heart. A substantial body of recent evidence links nurse managers' TL with favorable outcomes. Systematic reviews show that TL improves the nursing work environment and patient outcomes [3] and is associated, directly and indirectly, with the quality of patient care [4]. A review of reviews concluded that relational leadership styles, of which TL is the most studied, have wide-ranging benefits for staff, organizations, and patients [5]. TL has also been associated with staff nurse retention [6], [7], organizational commitment [8], job satisfaction [9], work-related well-being [10], staff performance [11], and work engagement [12], and it has been shown to buffer burnout during periods of crisis such as the COVID-19 pandemic [13].

Leadership is not merely an innate trait; it can be learned. A systematic review of factors and educational interventions influencing nursing leadership found that participation in leadership interventions had a positive effect on leadership in 44 of 49 intervention studies, supporting targeted education as an effective method of leadership development [14]. Recent quasi-experimental studies in the region have reported significant improvements in nurse managers' knowledge and competencies after authentic leadership and mindfulness education [15], 360-degree feedback-based leadership development [16], green TL education [17], and a TL educational program for nursing leaders [18], while structured courses have improved self-reported leadership and management competence among middle nurse managers [19] and frontline nursing leaders [20].

In Saudi Arabia, the health sector is undergoing a major transformation, which places new demands on nurse managers. Nevertheless, research on nursing leadership in the Kingdom remains limited and is dominated by descriptive designs [21]. Staff nurses have rated their supervisors' TL capacities only at a moderate level [22], although nurse managers' TL has been associated with staff nurses' work engagement [23] and intent to stay [24]. Authors from Saudi Arabia and neighboring Gulf countries have therefore called for regular, structured TL training for nurse leaders [23], [25]. Despite these calls, few interventional studies have examined whether a TL training program improves Saudi nurse managers' knowledge and whether such improvement is retained over time.

Therefore, the present study aimed to evaluate the impact of a TL training program on nurse managers' knowledge. It was hypothesized that nurse managers' TL knowledge scores after the implementation of the training program would be higher than before.

2. MATERIALS AND METHODS

2.1 Study Design

A quasi-experimental, one-group pretest–posttest design with a three-month follow-up assessment was used. Nurse managers' knowledge was measured at three time points: before the program (pre-program), immediately after the program (post-program), and three months later (follow-up).

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2.2 Setting

The study was conducted at Alnoor Specialist Hospital in Makkah, Saudi Arabia, a major governmental hospital and trauma center that serves both residents of the region and pilgrims. The hospital has a total capacity of 500 beds distributed across 25 departments, each managed by a head nurse and an assistant head nurse. The inpatient and critical care departments include the intensive care unit (31 beds), burn unit (21 beds), emergency department (60 beds), operating rooms (10 beds), day care unit (20 beds), male and female medical isolation departments (36 and 30 beds), male and female medical departments (36 and 30 beds), male and female surgical departments (28 beds each), orthopedic department (45 beds), chemotherapy department (13 beds), male and female subspecialty surgical departments (30 and 25 beds), neurosurgery department (43 beds), endoscopy department (10 beds), and angiography department (4 beds). Other departments include home care services, cardiac and general outpatient clinics, hemodialysis, the diabetes center, the eye center, and radiology.

2.3 Participants

A convenience sample comprising all nurse managers working in the previously mentioned departments who were able to read and write English was included. The total number of participants was 25 nurse managers.

2.4 Data Collection Tools

Two tools were used to collect the data presented in this paper:

1) **Nurse Managers' Personal Characteristics Data Sheet:** developed by the investigator to collect data on age, gender, marital status, educational qualification, years of experience in the hospital and in the current workplace, and previous attendance of training courses on TL.

2) **Nurse Managers' TL Knowledge Questionnaire:** developed by the investigator, guided by the transformational leadership theory of Burns and Bass, to assess nurse managers' knowledge of TL. It included 25 items divided into four domains: TL concept (six items), importance of TL (five items), characteristics of TL (seven items), and components of TL (seven items addressing idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration). Each correct answer was scored one and each incorrect answer zero, giving a total score ranging from 0 to 25. A total score of 75% or higher indicated good knowledge, 50% to less than 75% indicated fair knowledge, and less than 50% indicated poor knowledge.

2.5 Validity and Reliability

Content and face validity were established by three experts from the Nursing Administration Department, Faculty of Nursing, Cairo University, who reviewed the tools for content coverage, clarity, wording, length, format, and overall presentation; the necessary modifications, such as paraphrasing of some items, were made accordingly. The reliability of the knowledge questionnaire was tested using Cronbach's alpha coefficient, which was 0.95, indicating a high level of internal consistency.

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2.6 The Transformational Leadership Training Program

The program was developed by the investigator on the basis of the educational needs identified in the pre-program assessment and recent literature on TL in nursing [2], [3], [14], and it was reviewed by experts in nursing administration. Its aim was to enhance nurse managers' TL capabilities. Its specific objectives were to enable nurse managers to identify the concept of TL and its importance in health care; differentiate TL from other leadership styles; discuss the principles, characteristics, and components of TL; discuss and apply TL skills and advanced techniques and strategies; and analyze the challenges to applying TL.

The program comprised 18 hours of classroom instruction delivered in nine two-hour sessions. The sessions addressed: (1) program aim and the concept and importance of TL; (2) characteristics of TL and the difference between leadership and management; (3) the difference between TL and other leadership styles; (4) principles, advantages, and disadvantages of TL; (5) components of TL; (6) features of the transformational leader and his or her role in health care organizations; (7, 8) advanced TL techniques and strategies; and (9) barriers to applying TL. Teaching methods included lectures, group discussions, and brainstorming, supported by handouts, presentations, video recordings, and PowerPoint slides.

2.7 Procedure

The study was carried out in four phases. In the preparatory phase, the tools were developed and validated, a list of nurse managers and their work schedules was obtained, the purpose of the study was explained, and written informed consent was obtained. The baseline knowledge assessment was then conducted from the end of May to the end of June 2025; each nurse manager needed approximately 25 to 30 minutes to complete the questionnaire, which was administered during break time. In the planning phase, the program content, objectives, teaching methods, and timetable were prepared according to the identified needs. In the implementation phase, the program was delivered by the investigator over six weeks, from early July to mid-August 2025, in both morning and afternoon shifts to suit the nurse managers' schedules; at the beginning of each session the participants were oriented to its objectives, and feedback was obtained at its end. In the evaluation phase, the same questionnaire was administered immediately after the program (September to mid-October 2025) and again three months later (mid-January to mid-February 2026).

2.8 Ethical Considerations

Ethical approval was obtained from the Scientific Research Ethical Committee, Faculty of Nursing, Cairo University, and from the Institutional Review Board of the Ministry of Health, Makkah Region (IRB No. H-02-K-076-0525-1348; 26 May 2025), in accordance with ICH-GCP guidelines. Official permission was also obtained from the administration of Alnoor Specialist Hospital. Each nurse manager was informed about the nature and purpose of the study and signed an informed consent form. Participants were assured that participation was voluntary, that they could withdraw at any time without

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consequences, that no risks were involved, and that the findings would be used for research purposes only. Confidentiality and anonymity were maintained by coding the questionnaires without recording names.

2.9 Statistical Analysis

Data were analyzed using IBM SPSS Statistics, version 29.0. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to describe the data. One-way analysis of variance (ANOVA, F test) was used to compare mean knowledge scores across the three assessment periods and across categories of personal characteristics, and the chi-square test (χ^2) was used to compare the distribution of knowledge levels across the assessment periods. Statistical significance was set at $p < 0.05$.

3. RESULTS

3.1 Personal Characteristics of Nurse Managers

Table 1 shows that 72.0% of the nurse managers were aged 30 to less than 40 years, slightly more than half (52.0%) were male, and the majority (88.0%) were married. Most (80.0%) held a bachelor's degree in nursing. About one third (32.0%) had five to less than ten years of experience in the hospital, and about half (52.0%) had five to less than ten years of experience in their current workplace. Notably, none of the nurse managers (0.0%) had previously attended a training program on TL.

Table 1: Personal Characteristics of the Studied Nurse Managers (N = 25)

Personal characteristics	No.	%
Age (years)		
30 – < 40	18	72.0
40 – < 50	7	28.0
Gender		
Male	13	52.0
Female	12	48.0
Marital status		
Single	3	12.0
Married	22	88.0
Educational level		
Bachelor's degree	20	80.0
Master's degree	5	20.0
Years of experience in the hospital		
< 5	3	12.0
5 – < 10	8	32.0
10 – < 15	7	28.0
≥ 15	7	28.0
Years of experience in the current workplace		
< 5	9	36.0
5 – < 10	13	52.0
10 – < 15	2	8.0
≥ 15	1	4.0

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Previous TL training		
Yes	0	0.0
No	25	100.0

TL = transformational leadership.

3.2 Nurse Managers' Knowledge Scores across Assessment Periods

Table 2 shows highly statistically significant differences in all TL knowledge domains and in the total knowledge score across the three assessment periods ($p < 0.001$). The total mean score increased from 11.76 ± 2.51 (47.0% of the maximum score) before the program to 21.84 ± 1.59 (87.4%) immediately after it and was 19.44 ± 2.03 (77.8%) three months later. The largest relative gain was observed in the importance of TL domain, whose mean score almost doubled (from 2.32 to 4.56 out of 5), while the components of TL domain showed the best retention at follow-up (5.28 compared with 5.60 immediately after the program, out of 7). Overall, approximately 76% of the immediate gain in the total score was retained after three months.

Table 2: Comparison of Nurse Managers' Mean Knowledge Scores Regarding Transformational Leadership Domains across Assessment Periods (N = 25)

Knowledge domain (score range)	Pre-program Mean ± SD	Immediately post-program Mean ± SD	Three months later Mean ± SD	F	p
1. TL concept (0–6)	2.96 ± 0.60	5.36 ± 0.36	4.76 ± 0.48	6.52	< 0.001*
2. Importance of TL (0–5)	2.32 ± 0.51	4.56 ± 0.28	4.00 ± 0.40	9.01	< 0.001*
3. Characteristics of TL (0–7)	3.40 ± 0.71	6.32 ± 0.41	5.40 ± 0.57	8.10	< 0.001*
4. Components of TL (0–7)	3.08 ± 0.69	5.60 ± 0.52	5.28 ± 0.57	6.57	< 0.001*
Total knowledge score (0–25)	**11.76 ± 2.51**	**21.84 ± 1.59**	**19.44 ± 2.03**	**7.55**	**< 0.001***

SD = standard deviation; TL = transformational leadership. *Statistically significant at $p < 0.05$.

3.3 Nurse Managers' Knowledge Levels across Assessment Periods

As presented in Table 3 and Fig. 1, nearly two thirds (64.0%) of the nurse managers had a poor level of TL knowledge before the program, and none had a good level. Immediately after the program, all nurse managers (100.0%) achieved a good knowledge level. Three months later, the knowledge level declined slightly but remained markedly higher than before the program: 64.0% of the nurse managers had a good level and 36.0% had a fair level, with no nurse manager at the poor level. These differences were highly statistically significant ($\chi^2 = 64.4$, $p < 0.001$).

Table 3: Distribution of Nurse Managers' Transformational Leadership Knowledge Levels across Assessment Periods (N = 25)

Knowledge level	Pre-program		Immediately post-program		Three months later		χ^2	p
	No.	%	No.	%	No.	%		
Poor (< 50%)	16	64.0	0	0.0	0	0.0	64.4	< 0.001*
Fair (50% – < 75%)	9	36.0	0	0.0	9	36.0		

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Good (≥ 75%)	0	0.0	25	100.0	16	64.0		

*Statistically significant at $p < 0.05$.

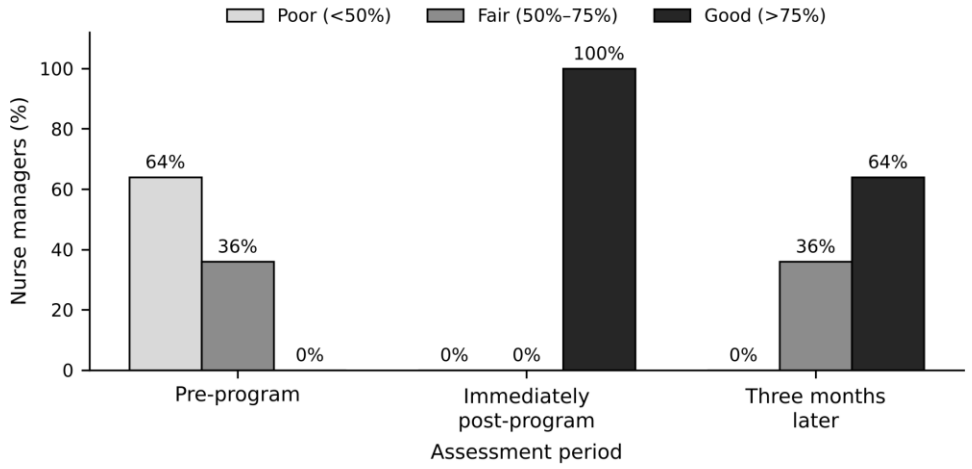

Figure 1: Distribution of Nurse Managers' Transformational Leadership Knowledge Levels Before, Immediately After, and Three Months after the Training Program (N = 25)

All nurse managers reached a good level immediately after the program, and no participant returned to the poor level at follow-up.

3.4 Knowledge Scores in Relation to Personal Characteristics

Table 4 shows that there were no statistically significant differences in nurse managers' total TL knowledge scores according to gender ($F = 0.01$, $p = 0.90$), age ($F = 0.05$, $p = 0.80$), marital status ($F = 0.30$, $p = 0.50$), educational level ($F = 0.40$, $p = 0.50$), years of experience in the hospital ($F = 0.07$, $p = 0.90$), or years of experience in the current workplace ($F = 0.04$, $p = 0.90$) across the three assessment periods. All subgroups showed the same pattern of a marked increase immediately after the program followed by a slight decline at follow-up.

Table 4: Total Transformational Leadership Knowledge Scores of Nurse Managers According To Personal Characteristics across Assessment Periods (N = 25)

Personal characteristics	Pre-program Mean ± SD	Immediately post-program Mean ± SD	Three months later Mean ± SD	F	p
Gender					
Male (n = 13)	11.77 ± 1.88	21.18 ± 0.69	20.01 ± 3.00	0.01	0.90
Female (n = 12)	11.75 ± 1.86	21.15 ± 0.69	19.98 ± 2.98		
Age (years)					
30 – < 40 (n = 18)	12.00 ± 1.88	21.60 ± 0.70	20.40 ± 3.01	0.05	0.80
40 – < 50 (n = 7)	11.14 ± 1.68	20.06 ± 0.62	18.94 ± 2.68		
Marital status					
Single (n = 3)	12.67 ± 1.53	22.80 ± 0.57	21.53 ± 2.44	0.30	0.50

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Married (n = 22)	11.64 ± 1.87	20.95 ± 0.69	19.78 ± 2.98		
Educational level					
Bachelor's (n = 20)	12.05 ± 1.73	21.69 ± 0.64	20.49 ± 2.77	0.40	0.50
Master's (n = 5)	10.60 ± 1.95	19.08 ± 0.72	18.02 ± 3.12		
Years of experience in the hospital					
< 5 (n = 3)	13.00 ± 1.73	23.40 ± 0.64	22.10 ± 2.77	0.07	0.90
5 – < 10 (n = 8)	11.63 ± 2.13	20.93 ± 0.79	19.76 ± 3.41		
10 – < 15 (n = 7)	12.00 ± 1.73	21.60 ± 0.64	20.40 ± 2.77		
≥ 15 (n = 7)	11.14 ± 1.68	20.06 ± 0.62	18.94 ± 2.68		
Years of experience in the current workplace					
< 5 (n = 9)	11.33 ± 2.18	20.40 ± 0.81	19.27 ± 3.49	0.04	0.90
5 – < 10 (n = 13)	12.31 ± 1.55	22.15 ± 0.57	20.92 ± 2.48		
10 – < 15 (n = 2)	10.50 ± 2.12	18.90 ± 0.78	17.85 ± 3.39		
≥ 15 (n = 1)	11.00 ± 0.01	19.80 ± 0.00	18.70 ± 0.02		

SD = standard deviation. No difference was statistically significant at $p < 0.05$.

4. DISCUSSION

This study evaluated the impact of a TL training program on nurse managers' knowledge at Alnoor Specialist Hospital in Makkah. The findings support the study hypothesis: knowledge improved significantly in all four domains immediately after the program, and most of this improvement was retained three months later. In terms of personal characteristics, most nurse managers were in their thirties, married, and held a bachelor's degree, which is similar to the profile of nurse managers reported by Moustafa Saleh et al. [17].

Slightly more than half of the present sample were male, whereas female participants predominated in a large Saudi survey of nurses rating their supervisors' TL [22]; this difference may reflect the staffing pattern of the study hospital.

Before the program, nearly two thirds of the nurse managers had poor TL knowledge and none had a good level, even though most of them had more than five years of hospital experience. This deficit is understandable given that none of them had ever attended TL training. Similarly, nurse managers in Nigeria showed only a superficial understanding of TL and often confused it with democratic leadership [26], and only one third of frontline nursing leaders in a recent pre–post study had received formal leadership training before the intervention [20]. The finding is also consistent with reports that staff nurses rate Saudi nurse supervisors' TL capacities as moderate [22] and supports repeated calls for structured, regular leadership development for nurse managers in Saudi Arabia and the Gulf region [21], [23], [25]. A plausible explanation is that nurse managers are often appointed on the basis of clinical seniority, while organizations focus their training efforts on clinical and administrative skills rather than on contemporary leadership models.

Immediately after the program, all nurse managers achieved a good knowledge level, and the total mean score nearly doubled. Comparable results have been reported by recent quasi-experimental studies. Shurab et al. [15] found significant improvements in nurse managers' knowledge after an authentic leadership and mindfulness educational

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program, with large effect sizes at both the post-program and three-month follow-up assessments. Emam, Fakhry, and Abdrabou [16] reported that head nurses' leadership knowledge scores rose from 25.1 to 93.0 after a 360-degree feedback-based program, and Moustafa Saleh et al. [17] showed that green TL education improved nurse managers' behavior and creativity. Ahmed and Ibrahim [18] demonstrated, using a control group, that a TL educational program significantly improved nursing leaders' understanding of TL dimensions in Iraq. In Saudi Arabia, Omer [27] found that a competency-based leadership training program significantly improved nurses' leadership knowledge, and structured leadership courses have improved nurse managers' self-reported competence in the United Arab Emirates [19]. These results are in line with the conclusion of Cummings et al. [14] that targeted educational interventions are an effective method of leadership development in nursing. The improvement in the present study may be attributed to the content being tailored to the needs identified at baseline and closely related to the participants' managerial responsibilities, as well as to the use of group discussion and brainstorming, which encouraged nurse managers to relate TL concepts to their own work situations.

At the three-month follow-up, knowledge declined slightly but remained significantly higher than baseline: no nurse manager returned to the poor level, and about three quarters of the immediate gain was retained. A similar pattern of partial decline with sustained improvement was observed by Emam, Fakhry, and Abdrabou [16], whose participants' knowledge scores decreased from 93.0 immediately after the program to 83.2 at follow-up, and by Moustafa Saleh et al. [17], who found that the improvement persisted three months after the intervention.

Some decay of knowledge over time is expected after a single training episode, which highlights the need for reinforcement strategies, such as refresher sessions, coaching, mentoring, and the integration of TL content into continuing professional development, to consolidate learning and support its transfer to practice.

The present study found no significant differences in knowledge scores according to nurse managers' gender, age, marital status, educational level, or years of experience, and all subgroups showed the same pattern of improvement. This suggests that the program was equally beneficial to nurse managers regardless of their personal and professional backgrounds and that male and female managers had comparable opportunities to acquire TL concepts. In agreement, Alluhaybi et al. [23] found no significant differences in TL according to gender, age, or educational level among clinical nurse managers in Saudi Arabia, Al-Thawabiya et al. [25] reported no significant association between gender and TL among nurse leaders in Qatar, and Ibrahim et al. [28] found similar levels of TL across marital status groups in a Saudi hospital. In contrast, Alrashidi et al. [29] reported that male nurse managers in Hail, Saudi Arabia, demonstrated higher levels of TL than their female counterparts. Such differences may relate to variations in the outcomes measured (knowledge versus leadership style), organizational settings, and sample sizes; the small size of several subgroups in the present study limits the power to detect differences.

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Improving nurse managers' TL knowledge is an important first step toward changing leadership behavior. Given the robust associations between TL and the quality of care [4], patient outcomes [3], staff retention [6], [7], [24], organizational commitment [8], and work engagement [12], investment in TL training for nurse managers can be expected to benefit nurses, patients, and organizations alike. The effect of the program on nurse managers' observed TL skills will be reported separately.

4.1 Limitations

This study has several limitations. The one-group design without a control group cannot rule out the influence of external factors, maturation, or a testing effect resulting from the repeated use of the same questionnaire. The sample was small, was selected by convenience, and was drawn from a single hospital, which limits the generalizability of the findings. The follow-up period was limited to three months, and longer-term retention of knowledge remains unknown. Finally, the knowledge questionnaire was developed by the investigator; although it showed high validity and reliability, further psychometric testing in larger samples is recommended.

5. CONCLUSION

The TL training program significantly improved nurse managers' knowledge in all four domains: concept, importance, characteristics, and components of TL. All nurse managers reached a good knowledge level immediately after the program, and most of this gain was retained three months later, regardless of their personal characteristics. These findings support the inclusion of structured TL training in the orientation and continuing professional development of nurse managers, ideally followed by periodic refresher sessions and coaching to sustain learning. Future studies should use controlled, multicenter designs with longer follow-up periods and should examine the effect of TL training on nurse managers' leadership practices and on nurse and patient outcomes.

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