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STRATEGIES FOR PROMOTING ADMINISTRATIVE AND CLINICAL LEADERSHIP AMONG NURSES: A SYSTEMATIC REVIEW

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ABSTRACT

Nurse leadership is central to improvement of patient outcomes, interprofessional collaboration, and quality of care delivery. With the constant increasing and expanding role of nurses, clinical and administrative leadership have become key prerequisites in different health care settings. The purpose of the research was to find and assess strategies that promote administrative and clinical leadership among nurses, and the effectiveness of the same strategies in other professional and geographical contexts. As per the PRISMA guidelines, the literature search was conducted in five databases, which included PubMed, Scopus, Web of Science, Cochrane Library, and CINAHL. Papers published in The past years (from 2000 through 2025) were considered eligible provided that they employed either quantitative or mixed-method design, participants were registered nurses or nursing students, and the article reviewed had evaluated an intervention targeting leadership improvement. The articles were identified, evaluated using JBI and MMAT tools, and synthesized narratively according to the nature of intervention, area of leadership, and the results. Twenty-three studies met the inclusion criteria. These studies comprised of randomized controlled trials, quasi-experimental designs, cross-sectional studies, and systematic reviews. Interventions included structured leadership programs, mentorship, empowerment strategies, training in emotional intelligence, and real leadership models. The measured results were knowledge and leadership behaviors to job satisfaction, empowerment, and patient safety. Empowerment always came out as an intermediary between leadership development and improved performance and morale. The evidence indicates that the most effective leadership development would be achieved were multi-component interventions are introduced into clinical and organizational contexts rather than existing as a single training program. Empowerment and relationship processes, including mentorship, true leaders' behavior, and emotional intelligence appear to positively contribute to the translation of leadership training to workplace practice, which has downstream effects on the staff performance and safety-related outcomes. However, there is a dearth of evidence on the scale and long-term viability of effects due to the heterogeneity of effects and interventions, the use of self-report measures, and in most studies, lack of longer-term follow-up limits the evidence. The findings point to the effectiveness of context-sensitive and multi-modal leadership interventions. Administrative and clinical competence can be enhanced through mentorship and emotional intelligence development along with the structured training. These findings suggest the necessity of integrating leadership education into nursing education and practice.

Keywords: Mentorship, Emotional Intelligence, Empowerment, Patient Safety

1 INTRODUCTION

The healthcare environment is undergoing a transformational shift and over the years the role of a nurse has experienced a job description beyond bedside care to include administration and clinical roles as a leader [1]. Nursing leadership remains a fundamental element in the successful enhancement of patient care quality, inter-professional practice, and system performance in healthcare institutions. The supervising roles of nurses are not a structural requirement in and of themselves; leadership refers to the capacity of guiding and empowering teams that lead to the improvement of patient and organizational performance [2].

Historically, nursing was viewed as a supportive profession with clinical care orientation. It has changed in response to the more intricate nature of healthcare delivery, patient acuity, and staffing gaps along with the new necessity of integrated care delivery models [3]. Nurses play a significant role in policy implementation, quality improvement efforts, and health equity efforts [1].

Nursing leadership has two dimensions administrative and clinical leadership. Administrative leadership deals with the planning and coordination of the provision of healthcare and strategic management and resource and workforce planning [4]. Administrative nurses are required to spearhead system-wide change, organize interprofessional teams and hold the organization to minimum standards and healthcare policy [5]. Conversely, clinical leadership refers to the leadership at the point of care where nurses influence the processes of care, champion the rights of patients and initiate change to the practice by collaborating with the healthcare team [3,6]. The two areas are significant and mutually enhance patient safety and quality and stability in the workforce. There is consistent evidence associating successful nurse leadership with enhanced patient outcomes, job satisfaction among nurses, and staff retention [5,7]. Transformational and authentic forms of relational leadership have had influence, leading to the establishment of trust, engagement, and innovation within nursing staff [4]. Transformational leaders express a clear vision, inspire employees, and enable individuals to provide high-quality care by having common objectives and formulating individualized support [2,4,8].

The Institute of Medicine report The Future of Nursing: Leading Change, Advancing Health has highlighted that nurses should be ready to be leaders of change and promote health, and suggested that leadership development and preparing nurses to work in leadership positions should be expanded to all levels of practice [9]. This is in line with the Nursing Professional Development Scope and Standards of Practice that define leadership as a core competency of all nurses including those not granted leadership positions [10].

Although more scholarly interest has been on nursing leadership, the available literature has been fragmented. Past systematic reviews have concentrated on either leadership styles or individual interventions without fully incorporating both clinical and administrative aspects of nursing leadership [3,5]. Moreover, much of the previous reviews did not incorporate low- and middle-income countries and did not provide recent reviews of new leadership competencies, including emotional intelligence, digital leadership, and interprofessional collaboration. The reason behind This review was that available evidence on nursing leadership development is disjointed and seldom combines administrative and clinical approaches within a single, current synthesis.

This literature synthesis between 2000 and 2025 is urgent to extract the new trends, especially as per the new demands in terms of leadership that the COVID-19 pandemic and the rapid changes occurring in healthcare delivery are creating [1]. This systematic review aims to identify and evaluate effective strategies for promoting administrative and clinical leadership among nurses across diverse healthcare settings.

2 METHODS

2.1 Review Design

The systematic review was done in accordance with the Preferred Reporting Items of Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The review protocol was systematic in nature in order to increase the extent of transparency, replicability and quality of the methodology. This systematic review was prospectively registered in PROSPERO.

2.2 Eligibility Criteria

Table 1 below summarizes the eligibility criteria

Table 1. Eligibility criteria

Component	Inclusion criteria	Exclusion criteria
Publication type	Peer reviewed journal articles	Editorials, opinion pieces, protocols, reviews, book chapters, commentaries
Language	English	Non-English
Time frame	January 2000 to jun2025	Published before January 2000

Population	Registered nurses, nurse managers, nursing students	Non nursing professionals or general healthcare staff without separable nursing data
Study design	Quantitative or mixed methods designs, including randomized controlled trials, quasi experimental studies, cohort studies, cross sectional studies	Designs not aligned with the inclusion criteria or lacking empirical evaluation
Focus	Interventions or strategies aimed at developing clinical or administrative nursing leadership	Studies not focused on leadership development or not reporting leadership related outcomes

2.3 Information Sources

To make sure that a broad range of studies are retrieved, five large academic databases were searched. These databases included PubMed, Scopus, Web of Science, Cochrane Library, and CINAHL (Cumulative Index to Nursing and Allied Health Literature). The last search was performed in 20th June 2025. The reference lists of the included articles and other relevant systematic reviews were manually screened to help supplement the database search to identify any other eligible studies.

2.4 Search Strategy

The search strategy was employed to search with the combination of key word search, controlled vocabulary searching strategy with combination of Boolean operator (AND, OR) and truncation techniques. The important keywords were "nursing leadership, clinical leadership, administrative leadership, leadership development program, nurse empowerment, leadership training and nursing education. Where relevant, MeSH terms were also used in order to enhance the sensitivity of selections. For example, the PubMed strategy combined free text and MeSH terms for nurs leadership and related concepts in leadership development, mentorship, empowerment, emotional intelligence, and nursing education. The full database specific search strategies for all sources are provided in a supplementary file (Appendix C).

2.5 Study Selection Process

The study selection process followed a two-stage screening protocol. In the first stage, two independent reviewers assessed all identified titles and abstracts for relevance based on the eligibility criteria. In the second stage, full-text versions of potentially eligible studies were retrieved and thoroughly evaluated to confirm eligibility. Any discrepancies between reviewers were resolved through discussion and, where necessary, adjudicated by a third reviewer; we did not calculate a formal inter-rater reliability statistic (e.g., Cohen's kappa) but documented disagreements and resolved them by consensus. A PRISMA 2020 flow diagram summarizing the study selection process has been included in the Results section (***Figure 1***).

2.6 Data Extraction Process

Data extraction was performed using a standardized form developed specifically for this review. Two reviewers independently extracted the following data: author(s) and year of publication, country and setting of the study, study design, sample size and population characteristics, type and duration of the leadership intervention, outcome measures, and key findings. Any discrepancies were addressed and resolved through third reviewer and consensus discussions.

2.8 Quality Appraisal

The methodological quality of the included studies was assessed using validated critical appraisal tools appropriate to each study design. For randomized controlled trials and quasi-experimental studies, the Joanna Briggs Institute (JBI) Critical Appraisal Checklists were used [35]. For mixed-methods studies, the Mixed Methods Appraisal Tool (MMAT) was employed [11]. For cross-sectional studies, the JBI Analytical Cross-Sectional Checklist was applied. Two independent reviewers conducted all appraisals, and any disagreements were resolved through consensus. We did not compute a formal kappa statistic for inter-rater reliability, which is acknowledged as a methodological limitation. Across the 23 included studies, 19 were rated high or very high quality and 4 were rated medium or medium high, with common limitations including nonrandomized designs, reliance on self-reported outcomes, and short follow up periods (Table 1). Table 1 provides an overview of the distribution of quality ratings, while detailed study level appraisals are presented in Appendix B.

Table 1. Summary of methodological quality ratings for the 23 included studies

Quality category	Number of studies	Studies (author and year)
High or very high quality	19	Chang et al. 2022; Aqtash et al. 2022; Omer 2024; Emam et al. 2024; Shirazi et al. 2015; Mushtaq et al. 2022; Dirik and Intepeler 2023; Cleary et al. 2020; Dahinten et al. 2013; MacPhee et al. 2013; Zhao et al. 2025; Chen et al. 2022; De Brún et al. 2019; Välimäki et al. 2018; Wong and

		Laschinger 2013; Xie et al. 2021; Hamed et al. 2023; Boamah 2018; Kim and Han 2019
Medium or medium high quality	4	Ming et al. 2024; Darragh et al. 2016; Johnson et al. 2021; Shen and Tucker 2024

2.8 Data Synthesis Approach

A narrative synthesis method was used due to the heterogeneity of study designs, interventions and measured outcomes. The studies were categorized according to the nature of interventions (e.g., leadership training, mentorship, empowerment strategies) and outcome focus (administrative or clinical leadership). Other cross-cutting themes found in the synthesis included emotional intelligence, transformational leadership and job satisfaction. These themes were examined and summarized in themes. The characteristics and findings of the studies were compared and contrasted using supporting tables. This method facilitated an in-depth perspective of the most effective strategies of promoting nursing leadership in various healthcare settings.. Given the heterogeneity of the evidence base and the small number of studies contributing to each outcome, we did not construct funnel plots or conduct formal tests such as Egger tests for publication bias; potential publication bias is addressed qualitatively in the Discussion chapter. This approach enabled a comprehensive understanding of the most effective strategies for fostering nursing leadership across diverse healthcare contexts.

3 RESULTS

3.1 Study Selection Summary

The initial literature search retrieved 2,192 records from five major electronic databases. Of the 1,214 titles and abstracts screened, 1,158 were excluded because of duplication. Among these, 56 full-text articles were evaluated based on pre-defined inclusion and exclusion criteria. After the complete-text screening, 32 records were eliminated because of the language (n = 8), the inappropriateness of the study design (n = 17) or the inaccurate outcome focus (n = 8). Finally, 23 studies characterized by various geographical locations, research design, and interventions relevant to clinical or administrative nursing leadership met the inclusion criteria. Figure 1 below shows a PRISMA flow diagram. A concise overview of intervention types, leadership domains, and main outcomes across all included studies is presented in Table 2, with full study level characteristics detailed in Appendix A.

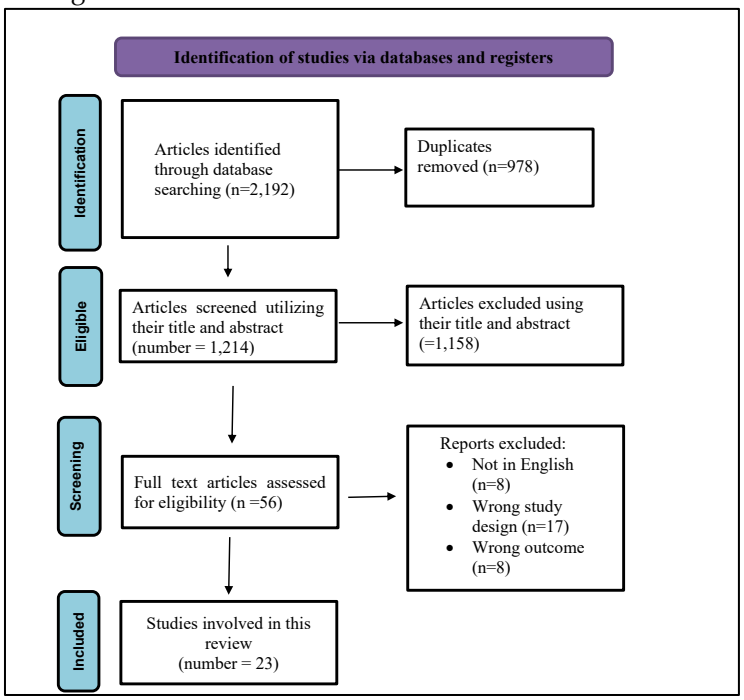

Figure 1: PRISMA 2020 Flow Diagram for Study Selection Process

3.2 Characteristics of Included Studies

The 23 studies included had diverse environments across the world, most of them taking place in Asia; in Taiwan, China, Saudi Arabia, Pakistan, and Iran.

Other works were based in Africa (Egypt, South Africa), North America (Canada), and Europe (Turkey), with several systematic or scoping reviews including multi-country analyses or global data.

Various types of study designs were included: 6 randomized controlled trials (RCTs), 8 quasi experimental studies, 4 cross-sectional or survey-based designs, and 5 systematic or scoping reviews. The target groups were nursing students, clinical nurses, head nurses, and nurse managers at junior and senior levels of leadership. The interventions were implemented in different environments including tertiary teaching hospitals, general hospitals, outpatient centers, and academic institutions.

Most of the studies (20 of 23) were published since 2018, which represents the current practices and the latest theories of leadership. Such diversity increases the applicability of results to healthcare systems, both publicly and privately, as well as in an academic or clinical setting. Table 2 summarizes the main characteristics of the primary intervention studies and associated outcomes, complementing the more detailed information presented in ***Appendix A***.

3.3 Intervention Types

The interventions implemented across the reviewed studies were varied but broadly grouped into five categories. Most studies employed structured leadership development programs, while others emphasized mentorship, empowerment, relational leadership styles, and emotional intelligence. These groupings are reflected in Table 2, which aligns each intervention family with its primary leadership domain and key outcome indicators.

Table 2. Summary of intervention families, leadership domains, and outcome patterns

Intervention family	Example studies	Typical participants and settings	Primary leadership domain(s)	Main outcome patterns
Structured leadership development programs	Omer [12]; Ming [13]; Chang [14]; Emam [25]; Dirik and Intepeler [22]	Nurse managers, head nurses, and master's students in tertiary or teaching hospitals and universities (Saudi Arabia, Taiwan, Canada, Turkey, Egypt)	Mainly administrative, with some clinical leadership components	Significant improvements in leadership knowledge, management competence, and empowering behaviours, often sustained at short follow-up. Some programs also improved team behaviour and safety climate.
Empowerment based leadership programs	MacPhee [16]; Dahinten [17]; Wong and Laschinger [20]; Boamah [21]; Kim and Han [23]	Front line nurses and nurse leaders in acute and general hospitals (Canada, South Korea)	Administrative and clinical	Structural and psychological empowerment increased, mediating links between leadership and job satisfaction, commitment, performance, and reduced adverse events. Effects often demonstrated using multivariate models or structural equation modelling.
Mentorship and coaching models	Shen and Tucker [15]; Johnson [32]	Emerging nurse leaders and mixed health professionals in leadership academies and regional programs (United States, sub Saharan Africa)	Administrative and clinical	Mentorship strengthened leadership identity, confidence, and strategic thinking. In LMIC programmes, sustainability depended on organisational support, funding, and integration into local career pathways.
Emotional intelligence and relational leadership training	Hamed [18]; Shirazi [8]; Mushtaq [26]	Head nurses and staff nurses in large hospitals (Egypt, Iran, Pakistan)	Mainly administrative, with spillover to clinical behaviour	Marked gains in emotional intelligence, situational leadership, and managerial competence, with associated improvements in staff performance and motivation. Some outcomes were sensitive to context and baseline organisational culture.
Patient safety and clinical leadership programmes	Xie [27]; Ming [13]; Boamah [21]	Head nurses and clinical nurses in tertiary hospitals (China, Taiwan, Canada)	Predominantly clinical, with links to administrative structures	Safety leadership programmes improved safety behaviours, reduced emotional exhaustion, and enhanced clinical leadership. In some cases, more conservative longitudinal analyses showed smaller or non significant time effects despite strong pre post gains.
Review level syntheses of leadership interventions	Cleary [29]; Chen [11]; Zhao [28]; De Brún [19]; Välimäki [34]; Darragh [33]; Johnson [32]	Not applicable (systematic, scoping, and integrative reviews across multiple countries)	Administrative and clinical	Reviews converged on the value of contextual, workplace embedded, and relational programmes, but highlighted heterogeneity in design, measures, and follow-up. They also identified evidence gaps in standardised outcomes, long term evaluation, and leadership development in low and middle income settings.

Interventions in the included studies were heterogeneous but clustered to five categories; structured leadership development programs, mentorship and coaching, empowerment focused

approaches, relational leadership models, and emotional intelligence training. Organized leadership courses were most typical and were generally a combination of didactic instruction and practical skill development. To illustrate, Omer. [12] introduced a 16-week competency based nurse manager program at King Abdulaziz medical city, which included evidence-based practice, communication and use of technology. Ming et al. [13] tested a multi-level program in Taiwan that combined classroom learning, hospital internship, and managerial mentorship among high performing nurses and found increased management function scores (D = +1.14, p <.001) and enhanced team behaviors. Likewise, Chang et al. [14] integrated leadership material into nine core courses of master-level nursing students and found a mean improvement of 8.94 points in leadership competence ($p < .01$), which confirms curriculum integrated models.

The interventions like mentoring and coaching emphasized relational learning and development of a leader identity. Shen and Tucker [15] reported well-organized mentor-mentee relationships in a leadership academy with documented improvements in confidence, professional identity, and long-term leadership performance, especially among nurses in their early careers.

Interventions were based on empowerment which focused on leader behaviors that empower staff autonomy and organizational commitment. Canadian studies conducted by MacPhee et al. [16] and Dahinten et al. [17], assessed the Nursing Leadership Institute and identified leader empowering behavior measured with tools like the CWEQ II, to be related with better staff empowerment and commitment, and mediators of staff outcomes.

An example of emotional intelligence focused training was that by Hamed et al. [18], who built situational leadership and EI development among head nurses in Egypt. The intervention raised the percentage of those who were classified as possessing high EI by 22.2 to 84.4 percent and enhanced managerial competency by 53.3 to 91.1 percent.

Finally, shared or authentic leadership models were evaluated in several studies linked transformational leadership with enhanced clinical leadership behaviors and fewer adverse patient outcomes via workplace empowerment mechanisms [19 - 22]. Wong and Laschinger [20] demonstrated that authentic leadership significantly enhanced job satisfaction and performance through structural empowerment, while Kim and Han [23] established empowerment as a full mediator between authentic leadership and nursing performance.

3.4 Leadership Domains Targeted

The reviewed interventions both targeted administrative and clinical leadership areas, although differently prioritized according to participant roles and organizational aims. Administrative leadership comprising skills like strategic planning, resource deployment, and coordination of departments featured as a key area of interest in middle and senior nurse manager studies. Aqtash *et al.* [24], for example, compared self-reported enhanced managerial proficiency after leadership development based on the SQUIRES framework, whereas Omer [12] and Emam *et al.* [25], prioritized administrative skills like financial management, evidence-based practice, and monitoring performance.

Conversely, clinical leadership featured as the area of concern for interventions on decision-making at the point-of-care level, patient advocacy as well as team coordination. Ming *et al.* [13], evaluated clinical skills like management function and team behavior in young elite nurses, and Boamah [21], proved the effect of transformational leadership by frontline nurses on clinical performance as well as workplace empowerment. Some of the interventions by Hamed et al. [18] and Mushtaq *et al.* [26] targeted both areas at the same time through interventions on situational leadership, emotional intelligence, and staff motivation. Generally speaking, the review points toward the variability of the leadership skills required in nursing and emphasizes the benefits of holistic interventions developing both administrative and clinical abilities as part of a single approach.

3.5 Outcome Measures Reported

These studies employed a variety of outcome measurements in the assessment of the effectiveness of leadership interventions. The most frequent measurement employed were self-reported competency and involved elements of leadership knowledge, decision-making self-confidence, emotional intelligence and managerial skill perception. These were generally measured through pre- and post-intervention questionnaires or established tools like the Nurse Manager Competency Instrument (NMCI), as in the case of research by Omer [12] and Hamed *et al.* [18]. Some studies also set out to measure observed outcomes, usually through feedback from peers or supervisors in a measurement of leadership behavior. In some

examples, *Ming et al.* [13] and Chen [11] used a combined approach of self-assessment and manager-rated team behavior as a measure of participant improvement.

Organizational markers of patient safety climate, burnout, job satisfaction levels, and turnover rates were also reported in several studies. Statistically significant decreases in emotional exhaustion and increases in personal accomplishment were reported by Xie *et al.* [27] for nurses after a patient safety leadership intervention. Likewise, authentic leadership correlated with enhanced nursing performance and job satisfaction by Kim and Han [23], and empowerment acted as a mediator. Among the most frequently used measurement instruments were the CWEQ-II (Conditions of Work Effectiveness Questionnaire) [11,16,17,20,22,23,24], the Maslach Burnout Inventory (MBI) [19,21], and structured job satisfaction surveys [8]. Seven out of the 23 included studies used validated leadership competence or empowerment scales, enhancing the reliability and comparability of findings across diverse contexts [13,14,12,24,2,8,27].

3.6 Effectiveness of Interventions

The studies reviewed documented generally positive effects of leadership interventions in leadership skills, staff motivation, and organizational performance. Leadership skills and knowledge were usually improved after structured instruction. Ming *et al.* [13], for example, noted a statistically significant difference in scores on the management function ($\Delta = +1.14$, $p < .001$) and long-term improvement in team behavior in high-performing young nurses. Chang *et al.* [14], also noted an 8.94-point improvement in leadership competency ($p < .01$) upon integrating modules on leadership in academic courses.

Empowerment manifested as a common thread, and multiple studies indicated it as a mediating or intervening effect of good leadership. Wong and Laschinger [20] and Kim and Han [23] confirmed the construct of authentic leadership as having a positive effect on structural empowerment, which subsequently affects increased job satisfaction and performance. Empowerment also acted as a mediator between leadership development and commitment in research conducted by MacPhee *et al.* [16] and Dahinten *et al.* [17], proving important in converting leadership behavior into staff commitment.

At an organizational level, positive changes were noted in patient safety behavior, staff morale, and burnout reduction. Xie *et al.* [27], found improved leadership behavior in head nurses and reduced emotional exhaustion in clinical nurses from participation in a safety leadership development program. Hamed *et al*. [18] also identified significant improvement in managerial competency through emotional intelligence training and inferred wider workforce benefits. Critically, some studies showed long-term maintenance of gains. Emam *et al.* [25] found continued leadership knowledge and self-perceived competency at three-month follow-up after the intervention and Ming *et al.* [13] showed maintained team behavior change at the same time interval. In Ming et al. [13], however, generalized estimating equation analysis did not find significant differences across time despite strong pre-post gains, and several review level studies (for example, De Brún *et al.* [19] and Johnson *et al.* [32]) described only moderate or context dependent effects where role ambiguity, limited organizational support, or short follow-up constrained impact. These results collectively demonstrate lasting effects of leadership development programs when well-designed and embedded in context, while also indicating that effectiveness is not uniform across all settings and outcomes.

3.7 Ethical Approval

This systematic review did not involve human participants and thus did not require ethical approval.

4 DISCUSSION

This review systematically sought and reviewed the available approaches to administrative and clinical leadership development among nurses in various clinical settings. The findings of the 23 studies incorporated indicate that leadership development interventions were determined to be applicable in the development of leadership skills, empowering individuals and enhancing organizational performance at both administrative and clinical levels. These were a geographically and methodologically diverse set of studies representatives of a snapshot of the development of nursing leadership between 2000 and 2025.Taken together, the evidence indicates that multi component interventions that blend education, experiential learning, and relational support tend to produce more consistent and sustainable gains than isolated training activities.

The most prominent type of intervention detected as current was structured leadership development programs in the form of modular training, curriculum integration, internships, and the most prominent type of intervention detected as the current was structured leadership development programs in the form of

modular training, curriculum integration, internships, and mentoring. Ming et al. [13], Chang et al. [14], and Omer [12] demonstrated statistically significant leadership knowledge, managerial function, and team behavior change during such interventions. The development of the participants in the leadership also changed with empowerment-based programs [16,17], mentorship and coaching [15,28], and emotional intelligence training [18]. also made a change in the development of the participants in leadership. Compared with stand alone workshops, longitudinal programs and those that embedded leadership content into academic curricula or workplace development pathways appeared more scalable, better aligned with organizational priorities, and more likely to demonstrate short term maintenance of effects.

The majority of interventions targeted nurse managers and senior staff in addressing administrative leadership, and fewer targeted clinical leadership at the bedside level [29]. Notably, though, interventions like those in Boamah [21] and Xie et al. [27] demonstrated clinical interventions even on system-wide outcomes, including patient safety and burnout reduction. There was a consistent mediator mechanism of empowerment between leadership input and performance, satisfaction, and team engagement. In comparative terms, mentorship and coaching were particularly effective for early career nurses and leadership identity formation, while emotional intelligence and relational leadership models were more strongly associated with improvements in communication, conflict management, and staff morale, and safety focused programs most directly influenced patient safety behaviors and burnout.

Together, the results demonstrate that well-contextualized and multi-dimensional leadership styles are effective. Another change noted in the review was a movement towards the combined approach comprising of didactic, experiential, and relational approaches in keeping with a drift in the educational philosophy of leadership in line with modern complexity in healthcare systems. This pattern suggests that sustainability and contextual fit may be enhanced when leadership development is treated as an ongoing system level investment rather than a one-time course.

Guidance development interventions have been observed to be positively influencing the level of nurse confidence, decision-making and staff turnover, [5] and Guibert-Lacasa and Vazquez-Calatayud, [3]. This has been extended in this review by the inclusion of other new studies like Chang et al. [14] and Ming et al. [13] that found that the addition of leadership modules to the nursing education led to quantifiable changes in the level of skill. This is also confirmed by the workplace-oriented information presented by a research study by Omer [12] in the form of the demonstrated financial management and evidence-based practice skill development after the formality education.

Blended learning, which entails a combination of classroom training, mentoring, and on-the-job training is consistent with IOM and WHO requirements of adaptive and continuous- models of leadership growth in the nursing field. One of such blended competency-model practices that can serve to exemplify the leadership development initiative is the one reported by Emam et al. [25] that used 360-degree feedback and follow-up support. Similarly, the model applied in Aqtash et al. [24] that corresponds to SQUIERS is consistent with the appeal in the global community to systematic evaluation and responsibility in professional development.

Shen and Tucker [15] reflected both mentoring and coaching, which have long been part of the paradigm of the Nursing Professional Development (NPD) [10]. The authors point out the significance of mentoring in developing leadership identity, especially when applied to early career nurses, a fact that is relational leadership theories and development experience. This echoes the mentoring principles stipulated in the study conducted by Gifford et al. [30], which name identity development and relational learning as the most significant processes that took place in leadership emergence.

In addition, emotional intelligence, a fairly recent entry in nursing leadership discussions, was enhanced extensively in Hamed et al.'s [18] study. The results concur with Goleman's [31] emotional competency approach, which states individuals with high EI perform better in regulating interpersonal dynamics, conflict resolution, and facilitating team alignment. The incorporation of EI in leadership development, as exemplified in Hamed's research [18], presents a fruitful area for clinical and administrative capacity development. Future program design should therefore consider empowerment, emotional intelligence, and mentoring not as isolated components but as mutually reinforcing pillars around which comprehensive leadership frameworks are built.

4.1 Impact on Administrative vs. Clinical Leadership

The results of this review show that there was a significant difference in how leadership intervention was formulated and implemented in an

administrative and clinical setting. The interventions aimed at administrative leadership concentrated mostly on middle and senior nurses.

managers and were centralized in strategic planning, budgeting, interprofessional coordination and organizational policy implementation. As an example, Aqtash et al. [24] and Omer [12] provided formal training in financial monitoring, human resources at workplace and evidence-based leadership, which are building blocks of administrative capacity. These programs often demanded substantial institutional resources and leadership buy in, yet they offered strong potential for system wide change through improved decision making and resource stewardship.

In contrast, clinical leadership interventions were less common and were mainly aimed at staff nurses and early-career professionals. Ming *et al.*'s [13] assessment of team coordination and management function development in frontline nurses and Boamah's [21] finding on empowering clinical leaders at the bedside and patient safety outcomes highlight the clinical leadership role in supporting bedside care, communication facilitation, and patient advocacy, although fewer interventions were directly aimed at those bedside dynamics. Clinical programmes were typically more local in scope and lower cost, which may enhance feasibility in resource constrained settings but can limit their reach unless integrated into broader organizational strategies.

Of particular interest, however, were those interventions by Mushtaq et al. [26] and Hamed et al. [18], which closed the gap by creating both administrative and clinical leadership skills. These dual-track approaches identify the increasing reality that nurse leaders need to be proficient in both areas. Future initiatives must make integration a priority so that development of leadership skills takes place not in a silo but rather prepares nurses to lead at the operation, strategic, and care levels. Accordingly, this review proposes an integrated conceptual model (Figure 2) in which administrative and clinical leadership capabilities are developed through shared intervention pillars of structured training, empowerment-focused strategies, mentoring, and emotional intelligence development, with empowerment conceptualised as a central structural and psychological mechanism that links these capabilities to improved patient safety, staff outcomes, and organisational performance.

Figure 2: Integrated nursing leadership development model

4.2 Emerging Themes and Novel Insights

Several overarching ideas and new knowledge came out of this review and contribute to the Nursing leadership development understanding as we know it today. Empowerment also acted as a mediating variable on leadership behavior and positive organizational and personal outcomes many times. The same has also been formed in the studies of Wong and Laschinger [20], Kim and Han [23] and MacPhee et al. [16] who noted that empowered nurses indicated higher levels of satisfaction, better performance and increased dedication to organizational objectives.

Secondly, emotional intelligence emerged as a new and promising area of leadership development. A comprehensive body of evidence on the enhancement of the leadership skills, emotional intelligence, and decision-making ability in the target group of head nurses were reported by Hamed et al. [18]. The inclusion of affective content like empathy, self-awareness, Relative to more traditional content on management tasks, EI focused programmes may be especially valuable in high stress environments because they equip leaders to buffer burnout,

manage conflict, and sustain a positive safety climate.

Thirdly, the review has observed a tendency of blended and layered interventions. The combination of classroom instruction, mentoring, and the application in the workplace, e.g., Shen and Tucker [15], Chang et al. [14] and Ming et al. [13] models were better than single dimensional training models. Hybrid methods are helpful to support experiential learning and help leaders develop the ability and competence in strategic thinking and operations.

Finally, cultural and contextual applicability as a matter of concern was revealed to be extremely significant in numerous studies. In the case of organization- or country-specific interventions, e.g. SQUIRES-friendly development in the UAE [24]; were more actively involved and better fitted to an outcome. This highlights the need to develop leadership interventions that are not only evidence based, but also sensitive to culture.

4.3 Implications for Nursing Education and Practice

The implications of this review on nursing education, workforce planning and policy making are immense. Firstly, the argument supporting the presence of leadership training in nursing education programs at an early age is quite convincing. A combination of curriculum leadership content also improves the acquisition of competencies and equips graduate nurses as the future leaders as depicted by Chang et al. [14]. Academic institutions should have leadership as a competency and a pyramid system of development created at the undergraduate level, and then the postgraduate.

The design of the program must be based on competency-based models of leadership. These models might help to codify expectations, increase assessment, and promote equity in accessing leadership in institutions. Organizational formal mentorship programs are also significant. The efficacy of mentorship on identity as a leader, on the growth of confidence and preparation especially in new or in-transit nurses agree with Shen and Tucker [15]. Healthcare institutions should be able to institutionalize mentorship initiatives in which future leaders are paired with seasoned mentors and given the opportunity to become active mentors in their mentorship follow-ups.

The development of nurse leadership cannot also be overlooked as an effective tool of nurse retention and the increase of their satisfaction rates, especially in highly stressful settings. According to Xie et al. [27] and Kim and Han [23], good leadership predicts lower burnout and better performance. Through specific interventions, therefore, the nursing staff can be stabilized especially in the understaffed or the overly high turnover units.

Finally, educational institutions and medical organizations collaboration has a central role in developing leadership modules that are based on actual challenges and requirements of the systems. These alliances will guarantee that leadership development initiatives remain applicable, scalable, and sustainable and eventually the quality and robustness of nursing services in additional healthcare settings [33].

4.4 Methodological Rigor and Limitations of Included Studies

Despite the moderate to high quality of the methodologies of the studies included, several limitations are to be stated. The key strength of most studies was the effective use of validated outcomes measures such as the Nurse Manager Competency Instrument (NMCI), Conditions of Work Effectiveness Questionnaire-II (CWEQ-II), and Maslach Burnout Inventory (MBI). These measures made the outcomes more stable and allowed to assess leadership competencies, empowerment, and organizational outcomes in a consistent manner. In addition, the inclusion of studies that used different geographical settings increases the external validity of the research results to other settings of the health system.

Some limitations existed. Self-reported data was also widely used in many studies, and it may lead to the social desirability bias and overestimation of perceived intervention effectiveness. Although studies like Ming et al. [13] attempted to debunk this by including a peer or manager rating, such triangulation was rare.

In addition, there were few longitudinal follow-up data. Despite the fact that other studies like Emam et al. [25] and Ming et al. [13] reported three-month post-intervention measurements, majority of the studies were not usually able to assess sustainability after the immediate intervention period. This restricts the possibility of ascertaining whether observed gains are transferred into permanent behavior change or improvements within the system.

Regarding design, there were six randomized controlled trials (RCTs) included, with most being quasi-experimental studies. This influences the power of causal inferences that may be made based on the outcome. Moreover, most of the studies have been carried out in high or upper middle incomes nations and very few (e.g., Johnson et al. [32]) of them have incorporated the leadership development in

low-resource settings. This geographic inequality poses the question of the magnitude and applicability of certain approaches in under-resource health systems in terms of the scale and the context. These restrictions suggest that a more longitudinal, multi-site and mixed method research with high designs is needed to substantiate leadership development intervention and their impact on the system in the larger context over time.

5 CONCLUSION

This systematic review summarized the evidence on strategies to enhance administrative and clinical leadership in nurses in various healthcare settings. It was steered by the perspective that nurses serve as frontline clinicians and leaders who impact patient outcomes, team performance, and system level priorities. With growing healthcare complexity, leadership competence is demanded at both ends of the role.

Among the 23 studies included leadership development interventions overall yielded positive effects on leadership competence, behaviors, and chosen workforce and service outcomes. The most tested and demonstrated benefits included structured leadership development programs, especially when designed to match role expectations and provided via blended learning models. The value of empowerment focused approaches also came by enhancing psychological and structural empowerment, which facilitated leadership effectiveness among emerging and established nurse leaders.

Despite such positive results, the evidence base is quite limited. The majority of the articles applied self-reported measures limiting objective measures and predisposing biased responses. The causal inferences were not so strong due to the relatively small sample size of randomized controlled trials and the sustainability of the benefits is also not clear, as the long-term follow-up was not common. These limitations indicate that stronger evaluation designs and improved reporting of intervention factors and result trajectories should be available.

Policy and educational aspects include the integration of leadership education into undergraduate and postgraduate nursing curricula with an emphasis on emotional intelligence, communication, ethical decision-making, and strategic planning. Healthcare organizations should also implement mentorship and empowerment practices that allow the translation of training into workplace behaviors alongside formal training. Future research should prioritize randomized trials were feasible, mixed methods designs where feasible to describe mechanisms, and longitudinal analyses to establish durability and system impact. Overall, theory informs the practice of safe, high quality, and equitable care that is context sensitive.

Abbreviations

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta Analyses
RCT: Randomized controlled trial
JBI: Joanna Briggs Institute
MMAT: Mixed Methods Appraisal Tool
EI: Emotional intelligence
CWEQ II: Conditions for Work Effectiveness Questionnaire II
MBI: Maslach Burnout Inventory
IOM: Institute of Medicine
NPD: Nursing Professional Development

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REFERENCES

1 Azar KMJ. The Evolving Role of Nurse Leadership in the Fight for Health Equity. Nurse Leader. 2021 Dec 1;19(6):571–5.

2.Iqbal K, Fatima T, Naveed M. The Impact of Transformational Leadership on Nurses' Organizational Commitment: A Multiple Mediation Model [Internet]. 2020 [cited 2025 May 22]. Available from: https://www.mdpi.com/2254-9625/10/1/21.

3.Guibert-Lacasa C, Vázquez-Calatayud M. Nurses' clinical leadership in the hospital setting: A systematic review - Guibert-Lacasa - 2022 - Journal of Nursing Management - Wiley Online Library [Internet]. 2022 [cited 2025 May 22]. Available from: https://onlinelibrary.wiley.com/doi/10.1111/jonm.13570

4.Brunt BA, Bogdan BA. Nursing Professional Development Leadership. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 [cited 2025 May 22]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK519064/

5.Cummings GG, Lee S, Tate K, Penconek T, Micaroni SPM, Paananen T, et al. The essentials of nursing leadership: A systematic review of factors and educational interventions influencing nursing leadership. International Journal of Nursing Studies. 2021 Mar 1;115:103842.
6.Daly J, Jackson ,Debra, Mannix ,Judy, Davidson ,Patricia M, and Hutchinson M. The importance of clinical leadership in the hospital setting. Journal of Healthcare Leadership. 2014 Nov 21;6:75–83.
7.Alsadaan N, Salameh B, Reshia FAAE, Alruwaili RF, Alruwaili M, Awad Ali SA, et al. Impact of Nurse Leaders Behaviors on Nursing Staff Performance: A Systematic Review of Literature. INQUIRY [Internet]. 2023 Jan [cited 2025 May 23];60. Available from: https://journals.sagepub.com/doi/10.1177/00469580231178528
8.Shirazi M, Emami AH, Mirmoosavi SJ, Alavinia SM, Zamanian H, Fathollahbeigi F, et al. The effects of intervention based on supportive leadership behaviour on Iranian nursing leadership performance: a randomized controlled trial. J Nurs Manag. 2016 Apr;24(3):400–8.
9.Medicine I of, Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing, at the Institute of Medicine. The Future of Nursing: Leading Change, Advancing Health. National Academies Press; 2011. 700 p.
10.Dickerson PS, Durkin GJ. Nursing Professional Development Standards of Practice: Standards 1–6. J Nurses Prof Dev. 2022 Jul;38(4):248–50.
11.Chen W, Modanloo S, Graham ID, Hu J, Lewis KB, Gifford W. A mixed-methods systematic review of interventions to improve leadership competencies of managers supervising nurses. J Nursing Management. 2022 Nov;30(8):4156–211.
12.Omer T. Leadership Development Training Program's Impact on Acquisition of Leadership Competencies for Nurses A Pilot Study. | EBSCOhost [Internet]. Vol. 13. 2024 [cited 2025 May 22]. p. 93. Available from: https://openurl.ebsco.com/contentitem/doi:10.61091%2Fjpms202413415?sid=ebsco:plink:crawler&id=ebsco:doi:10.61091%2Fjpms202413415
13.Ming JL, Lee SC, Chen SF, Huang HF, Chen YC, Li HJ, et al. Leadership training effectiveness for high-performing young nurses in a teaching hospital – A quasi-experimental study. Nurse Education Today. 2024 Jul 1;138:106155.
14.Chang YC, Hsieh LW, Chen TC, Yen M. Developing and Evaluating the Effectiveness of a Leadership Integrated Educational Program for Master's Nursing Students in Taiwan. Journal of Nursing. 2022 Oct;69(5):56–67.
15.Shen Q, Tucker S. Fostering leadership development and growth of nurse leaders: Experiences from Midwest Nursing Research Society Leadership Academy. Nursing Outlook. 2024 Nov 1;72(6):102293.
16.MacPhee M, Dahinten V s., Hejazi S, Laschinger H, Kazanjian A, McCutcheon A, et al. Testing the effects of an empowerment-based leadership development programme: part 1 – leader outcomes. Journal of Nursing Management. 2014;22(1):4–15.
17.Dahinten VS, Macphee M, Hejazi S, Laschinger H, Kazanjian M, McCutcheon A, et al. Testing the effects of an empowerment-based leadership development programme: part 2 – staff outcomes. Journal of Nursing Management. 2014;22(1):16–28.
18.El-sayed Hamed H, Mohamed Eid N, Ghoneimy Hasanin A. Enhancing Situational Leadership and Emotional Intelligence among Head Nurses and its' Effect on their Managerial Competencies. Journal of Nursing Science Benha University. 2023 Jan 1;4(1):175–90.
19.De Brún A, O'Donovan R, McAuliffe E. Interventions to develop collectivistic leadership in healthcare settings: a systematic review. BMC Health Serv Res [Internet]. 2019 Dec [cited 2025 May 22];19(1). Available from: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-3883-x
20.Wong CA, Laschinger HKS. Authentic leadership, performance, and job satisfaction: the mediating role of empowerment. Journal of Advanced Nursing. 2013 Apr;69(4):947–59.
21.Boamah S. Linking Nurses' Clinical Leadership to Patient Care Quality: The Role of Transformational Leadership and Workplace Empowerment. Can J Nurs Res. 2018 Mar;50(1):9–19.
22.Dirik HF, Seren Intepeler S. An authentic leadership training programme to increase nurse empowerment and patient safety: A quasi-experimental study. Journal of Advanced Nursing. 2024 Apr;80(4):1417–28.
23.Kim MJ, Han JY. Effect of Head Nurses' Authentic Leadership on Nurses' Job Satisfaction and Nursing Performance: Focusing on the Mediating Effects of Empowerment. J Korean Acad Nurs Adm. 2019;25(1):25.
24.Aqtash S, Alnusair H, Perinchery S. Evaluation of the Impact of an Education Program on Self-Reported

Leadership and Management Competence Among Nurse Managers - Salah Aqtash, Hussam Alnusair, Sharon Brownie, Rafi Alnjadat, Mariezl Fonbuena, Saleem Perinchery, 2022 [Internet]. 2022 [cited 2025 May 22]. Available from: https://journals.sagepub.com/doi/10.1177/23779608221106450

25.Emam SM, Fakhry SF, Abdrabou HM. Leaders development program by 360 degree feedback: reflection on head nurses' leadership practices. BMC Nursing. 2024 Oct 21;23(1):772.

26.Mushtaq K, Hussain M, Parveen K. Impact of transformational leadership intervention of head nurses among front-line solders (staff nurses) working in government hospital. J Pak Med Assoc [Internet]. 2022 May 18 [cited 2025 May 22]; Available from: https://ojs.jpma.org.pk/index.php/public_html/article/view/4167

27.Xie J, Ding S, Zhang X, Li X. Impact of a patient safety leadership program on head nurses and clinical nurses: a quasi-experimental study. Rev Latino-Am Enfermagem. 2021 Oct 29;29:e3478.

28.Zhao J jing, Shen Y, Li L hong, Zhang J ying, Ou M xing, Zhang X jie, et al. Concept, Influencing Factors, and Interventions of Nursing Health Leadership: A Scoping Review. Barr L, editor. Journal of Nursing Management [Internet]. 2025 Jan [cited 2025 May 22];2025(1). Available from: https://onlinelibrary.wiley.com/doi/10.1155/jonm/5212844

29.Cleary M, Kornhaber R, Thapa DK, West S, Visentin D. A Systematic Review of Behavioral Outcomes for Leadership Interventions Among Health Professionals. Journal of Nursing Research. 2020 Oct;28(5):e118.

30.Gifford, D. A. Authentic Leadership, Interpersonal Trust, and Psychological Capital: A Quantitative Study of Employees in Higher Education - ProQuest [Internet]. 2023 [cited 2025 May 23]. Available from: https://www.proquest.com/openview/d68a1ddce51f42b9d8a32ba9e8a14614/1?pq-origsite=gscholar&cbl=18750&diss=y

31.Boyatzis RE. CLUSTERING COMPETENCE IN EMOTIONAL INTELLIGENCE: INSIGHTS FROM THE EMOTIONAL COMPETENCIE INVENTORY.

32.Johnson O, Begg K, Kelly AH, Sevdalis N. Interventions to strengthen the leadership capabilities of health professionals in Sub-Saharan Africa: a scoping review. Health Policy and Planning. 2021 Feb 1;36(1):117–33.

33.Darragh M, Traynor V, Joyce-McCoach J. Effectiveness of interventions for the development of leadership skills among nurses: a systematic review protocol. JBI Evidence Synthesis. 2016 Jun;14(6):3.

34.Välimäki T, Partanen P, Häggman-Laitila A. An Integrative Review of Interventions for Enhancing Leadership in the Implementation of Evidence-Based Nursing. Worldviews Ev Based Nurs. 2018 Dec;15(6):424–31.

35.. Joanna Briggs Institute (2017). Checklist for systematic reviews and research syntheses. https://jbi.global/sites/default/files/2019-05/JBI_Critical_Appraisal-Checklist_for_Systematic_Reviews2017_0.pdf.

Appendix A. Summary of included studies

ID	Author(s)	Year	Country / setting	Design	Sample	Intervention	Domain	Outcomes	Key findings
1	Ming et al. [13]	2024	Taiwan / teaching hospital	Quasi experimental, longitudinal	102 young nurses, peers, managers	Multi component leadership training (classroom, internship, mentorship)	Clinical and administrative	Management Function Scale (self rated), Team Behavior Scale (manager rated)	Team behavior improved by 0.68 points post intervention and 0.65 at 3 months ($p < .001$); management function increased by 1.06 and 1.14 points at follow up ($p < .001$); GEE showed no significant time by group interaction
2	Chang et al. [14]	2022	Taiwan / master's program	Quasi experimental, single group pre post	48 master's nursing students	Year long leadership curriculum integrated into 9 core courses	Administrative	Custom 10 item Leadership Competence Scale	Total leadership competence increased by 8.94 points ($p < .01$); all four dimensions (leading people, vision, self growth, business management) improved
3	Aqtash et al. [24]	2022	UAE / hospitals and outpatient centers	Quantitative pre post	105 middle nurse managers	Leadership education aligned with SQUIRE framework	Administrative	Leadership and Management Competence Questionnaire	Overall and subdomain leadership scores increased after training ($p < .001$); largest gains in communication and team leadership
4	Omer [12]	2024	Saudi Arabia / King Abdulaziz Medical City	Quasi experimental, pre post	25 nurse managers	16 week training on technical, human, financial, and leadership competencies	Clinical and administrative	Nurse Manager Competency Instrument (NMCI)	Competency scores improved significantly across domains ($p < .001$); strongest gains in evidence based practice, technology use, and financial oversight
5	Emam et al. [25]	2024	Egypt / three tertiary institutions	Randomized controlled trial	80 head nurses	Six week leadership program using 360 degree feedback	Administrative	Leadership Knowledge Scale, Practice Self Assessment	Intervention group showed higher knowledge and practice scores versus control ($p < .001$); effects sustained at follow up in regression models
6	Shirazi et al. [8]	2015	Iran / public hospitals	Randomized controlled trial	110 head nurses	Supportive Leadership Behavior training workshop	Administrative	Leadership Behavior Inventory (subordinate rated)	Leadership behavior scores increased significantly after training ($p < .05$); greater improvement among male and married nurses; gains maintained at 3 months
7	Mushtaq et al. [26]	2022	Pakistan / large public hospital	Quasi experimental, pre post	Head nurses and staff nurses (exact n not fully reported)	Transformational leadership training for head nurses	Clinical and administrative	Staff nurse job performance ratings	Staff performance improved significantly after 16 week intervention; Cronbach's alpha > 0.89; qualitative data showed higher morale and leadership visibility
8	Dirik and Intepeler [22]	2023	Turkey / university hospital	Quasi experimental, pre post	36 head nurses, 153 staff nurses	Multifaceted authentic leadership training	Administrative	Authentic Leadership Scale, Empowerment Questionnaire, Safety Climate Scale	Authentic leadership increased ($p < .01$); structural and psychological empowerment improved ($p < .05$); leadership variables predicted better safety climate ($R^2 = 0.41$)
9	Cleary et al. [29]	2020	Multi country	Systematic review (31 studies)	Not applicable	Workplace based, reflective, and context sensitive leadership programs	Clinical and administrative	Qualitative synthesis of leadership outcomes	Most effective programs were in person, contextual, and linked to local needs; self assessment studies reported notable behavioral and cultural shifts
10	Dahinten et al. [17]	2013	Canada / hospital units	Quasi experimental, matched groups	129 staff nurses under NLI trained or control leaders	Empowerment based Nursing Leadership Institute (NLI) program	Administrative	Structural Empowerment Scale, Organizational Commitment Scale	Empowering leadership behaviors increased staff empowerment and commitment ($p < .05$); structural empowerment partially mediated effects
11	MacPhee et al. [16]	2013	Canada / hospitals	Quasi experimental, pre post	110 nurse leaders, 18 comparison	Empowerment based NLI leadership program	Administrative	CWEQ II, Psychological Empowerment Scale	NLI participation improved self rated empowering behaviors ($p < .01$); structural empowerment effects were mediated via psychological empowerment
12	Zhao et al. [28]	2025	Global	Scoping review (32 studies)	Not applicable	Interventions promoting "nursing health leadership" (planning, mentoring, communication)	Clinical and administrative	Thematic synthesis	Proposed conceptual framework of nursing health leadership; highlighted lack of standardised measures and intervention taxonomy
13	Chen et al. [11]	2022	Global	Mixed methods systematic review (69 studies)	Managers supervising nurses	Lectures, mentoring, peer collaboration, group activities	Administrative	Competency domains (support, recognition, etc.)	Most interventions improved leadership competence; organizational barriers and weak evaluation designs limited evidence of real world impact

14	Darragh et al. [33]	2016	International	Systematic review protocol	Not applicable	Planned evaluation of leadership skill interventions	Clinical and administrative	Planned relational and EI frameworks	Outlined comprehensive approach for identifying effective leadership development strategies across contexts
15	De Brún et al. [19]	2019	International	Systematic review (21 studies)	Healthcare professionals in teams	Collective and shared leadership, team training, co leadership	Clinical and administrative	Staff engagement, teamwork, communication, service quality	Interventions moderately effective; improved collaboration and morale but limited by role ambiguity and weak follow up
16	Johnson et al. [32]	2021	Sub Saharan Africa	Scoping review (28 programs)	Health professionals	Context specific leadership development programs	Administrative	Program design, sustainability, evaluation metrics	Marked variation in program design; called for long term models and evaluation frameworks tailored to low and middle income settings
17	Shen and Tucker [15]	2024	United States / leadership academy	Narrative account	Emerging nurse leaders	Structured mentorship phases (confidence, identity, strategic thinking)	Clinical and administrative	Reflections, phases of skill development	Mentorship strengthened leadership identity, confidence, and engagement; model appears experience based and scalable
18	Välimäki et al. [34]	2018	Europe	Integrative review (5 studies)	Nurse leaders in evidence based nursing contexts	Leadership interventions to support EBN implementation	Clinical	Implementation success, strategic leadership, team facilitation	Leadership support associated with better EBN uptake; designs often weak with limited follow up
19	Wong and Laschinger [20]	2013	Canada / acute care hospitals	Predictive survey	280 RNs	Observational study of authentic leadership	Administrative and clinical	Structural empowerment, job satisfaction, self rated performance	Authentic leadership increased empowerment ($p < .001$), which mediated higher satisfaction and performance; direct effects on satisfaction also observed
20	Xie et al. [27]	2021	China / tertiary hospital	Quasi experimental, pre post	60 head nurses, 240 clinical nurses	Twelve month patient safety leadership program	Clinical and administrative	Self efficacy, safety behavior, burnout (MBI), leadership behavior	Leadership and safety behaviors improved ($p < .01$); emotional exhaustion decreased and personal accomplishment increased ($p < .001$)
21	Hamed et al. [18]	2023	Egypt / Benha University Hospital	Quasi experimental, pre post	45 head nurses and assistants	Situational leadership plus emotional intelligence training	Administrative	Situational leadership skills, EI, managerial competence	Knowledge scores rose from 17.8 percent to 84.4 percent; high situational leadership from 8.9 percent to 73.3 percent; managerial competence from 53.3 percent to 91.1 percent (all $p < .001$)
22	Boamah [21]	2018	Canada / acute care hospitals	Cross sectional	378 RNs	Observational study of transformational leadership	Clinical	Workplace empowerment, clinical leadership, adverse patient outcomes	Transformational leadership reduced adverse events indirectly via empowerment and clinical leadership; tested using SEM
23	Kim and Han [23]	2019	South Korea / general hospitals	Cross sectional, mediation analysis	149 nurses	Observational study of authentic leadership	Administrative and clinical	Empowerment, job satisfaction, nursing performance	Empowerment partially mediated leadership to job satisfaction and fully mediated leadership to performance; all paths significant ($p < .01$)

Appendix B: Quality Appraisal Summary

Serial No.	Author(s)	Study design	Appraisal tool used
1	Ming *et al.* [13]	Quasi experimental, longitudinal	JBI-QE
2	Chang *et al.* [14]	Quasi experimental, single group, pre post	JBI-QE
3	Aqtash *et al.* [24]	Quantitative, pre and post	JBI-AX
4	Omer [12]	Quasi experimental, pre and post	JBI-QE
5	Emam *et al.* [25]	Randomized controlled trial	JBI-RCT
6	Shirazi *et al.* [8]	Randomized controlled trial	JBI-RCT
7	Mushtaq *et al.* [26]	Quasi experimental, pre and post	JBI-QE
8	Dirik and Intepeler [22]	Quasi experimental, pre and post	JBI-QE
9	Cleary *et al.* [29]	Systematic review	AMSTAR2
10	Dahinten *et al.* [17]	Quasi experimental, matched groups	JBI-QE
11	MacPhee *et al.* [16]	Quasi experimental, pre and post	JBI-QE
12	Zhao *et al.* [28]	Scoping review	JBI-ScoR
13	Chen *et al.* [11]	Mixed methods systematic review	MMAT, AMSTAR2
14	Darragh *et al.* [33]	Systematic review protocol	N/A
15	De Brún *et al.* [19]	Systematic review	AMSTAR2
16	Johnson *et al.* [32]	Scoping review	JBI-ScoR
17	Shen and Tucker [15]	Narrative account	N/A
18	Välimäki *et al.* [34]	Integrative review	JBI-IR
19	Wong and Laschinger [20]	Predictive, non experimental survey	JBI-CS
20	Xie *et al.* [27]	Quasi experimental, pre and post	JBI-QE
21	Hamed *et al.* [18]	Quasi experimental, pre and post	JBI-QE
22	Boamah [21]	Cross sectional, SEM analysis	JBI-AX
23	Kim and Han [23]	Cross sectional, mediation analysis	JBI-AX

- **JBI-QE**: Joanna Briggs Institute Critical Appraisal Checklist for Quasi Experimental Studies
- **JBI-AX**: JBI Critical Appraisal Checklist for Analytical Cross Sectional Studies
- **JBI-RCT**: JBI Critical Appraisal Checklist for Randomized Controlled Trials
- **JBI-ScoR**: JBI Critical Appraisal Checklist for Scoping Reviews
- **JBI-IR**: JBI Critical Appraisal Checklist for Integrative Reviews
- **JBI-CS**: JBI Critical Appraisal Checklist for Cross Sectional Studies
- **AMSTAR2**: A Measurement Tool to Assess Systematic Reviews 2
- **MMAT**: Mixed Methods Appraisal Tool
- **N/A**: Not applicable (design not suited to a formal checklist)

***Appendix C*: Full electronic search strategies**

Database	Years covered	Search string
PubMed	2000-2025	(("nurs* leadership"[Title/Abstract] OR "clinical leadership"[Title/Abstract] OR "administrative leadership"[Title/Abstract] OR "nursing leadership"[MeSH Terms]) AND ("leadership development"[Title/Abstract] OR "leadership program*"[Title/Abstract] OR mentorship OR coachi empowerment OR "emotional intelligence" OR "leadership traini OR "nursing education"[MeSH Terms]))
Scopus	2000-2025	TITLE-ABS-KEY("nurs* leadership" OR "clinical leadership" O "administrative leadership") AND TITLE-ABSKEY("leadership development" OR "leadership program*" OR mentorship OR coa OR empowerment OR "emotional intelligence" OR "leadership tr OR "nursing education")
Web of Science	2000-2025	TS=("nurs* leadership" OR "clinical leadership" OR "administrat leadership") AND TS=("leadership development" OR "leadership program*" OR mentorship OR coaching OR empowerment OR "emotional intelligence" OR "leadership traini "nursing education")
CINAHL	2000-2025	("nurs* leadership" OR "clinical leadership" OR "administrative leadership") AND ("leadership development" OR "leadership program*" OR mentorship OR coa OR empowerment OR "emotional intelligence" OR "leadership traini "nursing education")
Cochrane Library	2000-2025	("nurs* leadership" OR "clinical leadership" OR "administrative leadership") AND ("leadership development" OR "leadership program*" OR mentorship OR coa OR empowerment OR "emotional intelligence" OR "leadership traini "nursing education"):ti,ab,kw