Review Article

Journal of Advances in Medical Education & Professionalism

A Systematic Review of Interventions Aiming to Promote Leadership Skills among Nursing Students: From In-Class Strategies to Curriculum Revisions

REZA MOHAMMADPOURHODKI[1], PhD Candidate; FATEMEH HESHMATI NABAVI[2,3*], PhD

[1]Student Research Committee, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran; [2]Nursing and Midwifery Care Research Center, Mashhad University of Medical Sciences, Mashhad, Iran; [3]Nursing Management Department, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract

Introduction: Leadership skills are key to providing safe and standardized care in complex clinical settings. Nursing instructors and educational institutions' understanding of successful teaching techniques for enhancing leadership skills allows for the implementation of suitable measures to increase teaching efficacy and leadership competencies among nursing students. The objective of this study was to systematically review studies on educational strategies aiming to develop leadership skills among nursing students.

Methods: A systematic review was conducted to recruit studies published between 2000 and July 2023 in PubMed, Web of Science, Google Scholar, and Scopus using a combination of predetermined keywords. Two independent reviewers screened and selected studies, and methodological quality was assessed using the Joanna Briggs Institute (JBI) scale and mixed-methods appraisal tool (MMAT).

Results: Nine out of 419 articles were selected based on the PRISMA protocol and entered the structured review process. Most studies were conducted in the university and clinical environments, and the duration of training interventions in most of the studies was more than six months. Effective teaching methods for enhancing leadership skills among nursing students included student-oriented conferences, student-led dedicated education, integrating leadership development programs into the curriculum, hosting leadership development courses, utilizing interactive mobile applications, such as mPreceptor, and implementing the near-peer supervision educational model.

Conclusions: Implementing different educational strategies based on the capacities and facilities of educational institutions can improve leadership skills in nursing students. Our findings may be interested in lecturers and university professors who look for developing nursing leadership education.

Keywords: Leadership; Nursing student; Teaching; Systematic review

**Corresponding author:*
Fatemeh Heshmati Nabavi, PhD; School of Nursing and Midwifery, Mashhad University of Medical Sciences, Ebn-e Sina Street, Postal code: 91771-13355, Mashhad, Iran
Tel: +98-5138591511
Fax: +98-5138597313
Email: heshmati.nabavi@gmail.com

Please cite this paper as:
Mohammadpourhodki R, Heshmati Nabavi F. A Systematic Review of Interventions Aiming to Promote Leadership Skills among Nursing Students: From In-Class Strategies to Curriculum Revisions. J Adv Med Educ Prof. 2025;13(2):83-92. DOI: 10.30476/jamp.2024.103763.2022.

Received: 18 August 2024
Accepted: 29 September 2024

Introduction

Leadership skills are necessary for empowering nurses to provide standard and safe nursing care and solve complex health problems (1, 2). Providing effective and high-quality treatment is more crucial than ever in the modern world because patient and healthcare provider requirements are changing quickly (3). Nurses, as frontline care providers, are expected to take the lead in meeting the needs and demands of clients and to effectively establish a supportive relationship with them (4). Leadership is the complex process of influencing people to accomplish a task, goal, or mission (5). A growing shortage of nursing staff worldwide has significantly hampered standard care provision. A total of 5.9 million nurses are currently providing services globally, of whom 17% are expected to retire within the next 10 years, so the remaining 4.7 million are expected to maintain the current workforce (6).

Considering the complexity of nursing care, an increase in the number of patients, and lack of sufficient nursing forces to fulfill health needs, leadership skills become more and more essential for the nursing community (7). Leadership skills embrace a series of social skills (8), including the four essential dimensions of emotional intelligence, influence, strategic thinking, and teamwork (9), which are believed to be teachable similar to personal characteristics (4). Leadership abilities are now seen as vital characteristics for nurses; thus, there is a need to enhance these talents beginning with their education (2). To have a prominent role and become effective leaders in their profession, today's nurses should learn leadership skills and behavioral manners during their education and in clinical environments. This important notion requires nursing students to learn and acquire leadership skills beyond the classroom (4).

Some studies show that graduate nursing students have low confidence in their competence in leading and providing coordinating care (10, 11), suggesting the need for some modifications in educational programs and policies to strengthen the leadership qualifications of graduated nurses (6). Leadership is a complex and multi-dimensional phenomenon. Universities lack a standardized and academically accepted method for presenting and teaching leadership education content (12). It is important to note that leadership skills can be developed at expert levels via various interventions. Therefore, investigating the characteristics of appropriate leadership development interventions for undergraduate nursing students is important to provide valuable insights for educators.

In recent years, various educational interventions have been offered to develop leadership skills among nursing students; however, our current understanding of effective leadership promoting interventions is limited. Our search in scientific databases retrieved only one review on this subject, investigating educational strategies for developing leadership skills among nurses. The main objective of the present studywas to outline the characteristics of the various leadership development interventions that are currently available, ranging from classroom-based tactics to program modifications, and to provide educational institutions and nursing educators with direction in choosing the best strategies that are appropriate for their workplace context and available resources. In essence, the focus and objectives of our study iare not in the same line with those of prior investigations (13), and this disparity is evident across all facets of our review, including the search strategy, screening and qualification of articles, data presentation, and classification of interventions. This review entailed a detailed analysis of the properties of these educational interventions and offered suggestions for future research efforts.

Methods

Design

This systematic review scrutinizes and integrates evidence on strategies aiming to develop leadership skills among nursing students. We followed the PRISMA guideline (14) and adhered to the Patient/Population, Intervention, Comparison, and Outcome (PICO) framework. The population included nursing students; interventions were leadership teaching strategies and the outcome encompassed leadership skills. No comparison group was incorporated in this study.

Search Strategy

Data were gathered from studies in the following electronic databases: PubMed, Scopus, Google Scholar (the first 100 articles), and Web of Science. English language articles published between 2000 and 2 July 2023 were collected. We considered this extended time frame to include as many studies and evidence as possible. The mentioned databases were searched using a combination of keywords, such as 'Nursing student' and 'leadership skill'. The following search strategy was generated in PubMed: (((Leadership skill*[Title/Abstract])) OR (Leadership competence [Title/Abstract])) OR (Leadership Competencies[Title/Abstract])) AND ((“Students, Nursing”[MeSH]) OR (Nursing

Student*[Title/Abstract])). The accuracy of the search strategy was supervised by a highly experienced informatics expert. To further expand the scope of the search process, manual search was performed in the reference lists of retrieved articles. Grey literature was also looked into.

Eligibility Criteria

The following inclusion criteria were used: [1] being published in English language, [2] employing an interventional study design (i.e., RCT), and [3] being published between 2000 and 2023. Letters to the editor, brief reports, conference papers, qualitative studies, reviews, non-English articles, and studies conducted on subjects other than nursing students were excluded.

Study Selection and Data Extraction

Eligible studies were selected by two of the authors based on the inclusion and exclusion criteria. The study selection procedure was independently conducted by these authors, who were trained for systematic review studies and had extensive experience in this field, through title/abstract/full-text screening. Face-to-face and virtual discussions were conducted between the researchers to achieve a consensus in the event of disagreements at each stage. The PRISMA guideline (Figure 1) was used to conduct the study selection process step-by-step.

Quality Appraisal

Based on the study design, an appropriate quality assessment tool was selected. Quasi-experimental studies were evaluated using Joanna Briggs Institute (JBI) quasi-experimental appraisal tool, which consists of nine items, such as selection bias, control of the experimental group, the presence of a control group, and outcome measurement (15). Mixed-method studies were evaluated using the mixed-method appraisal tool (MMAT), which consists of five items (16). The researchers' final determination regarding the eligibility of the studies for each item was achieved on consensus, as the quality appraisal instruments employed in this study lacked a systematic scoring system (17).

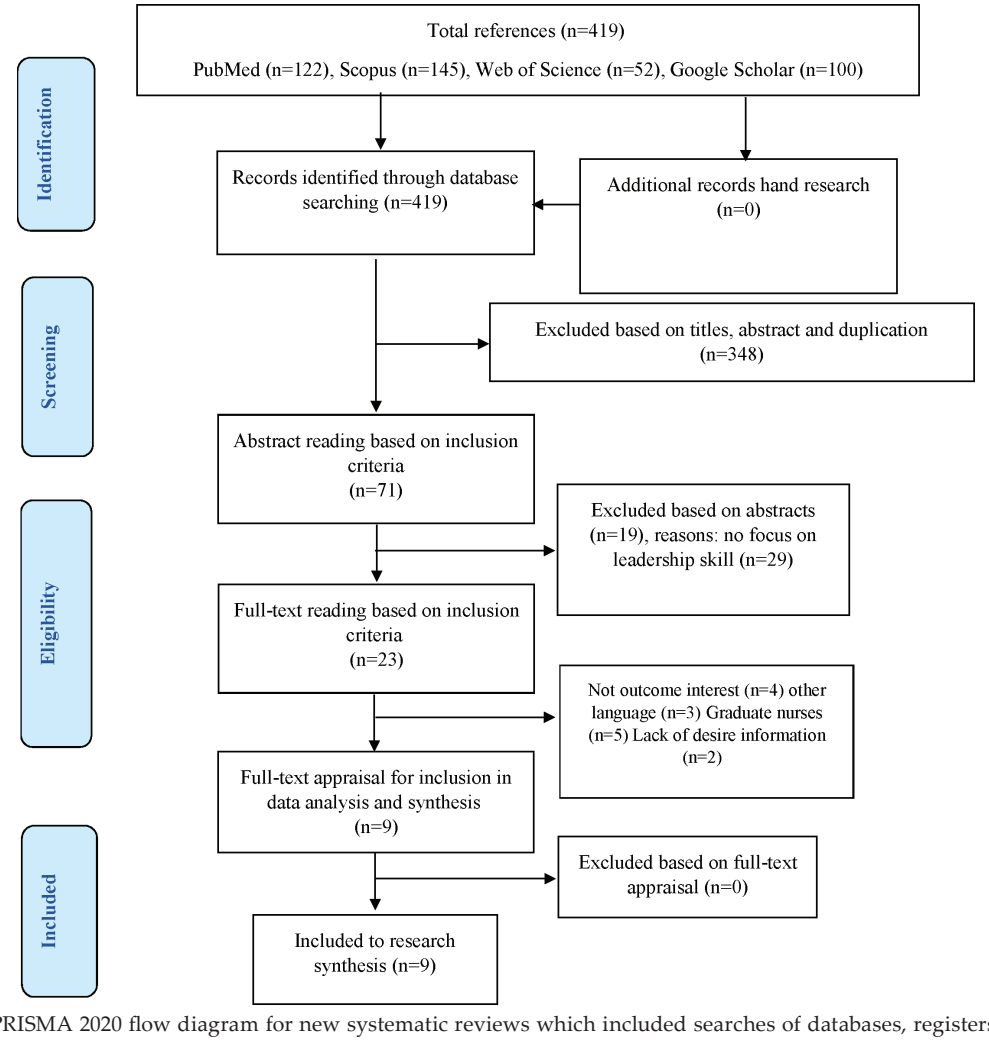

Figure 1: PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources.

Hawker *et al*.'s criteria were used to assess the overall structure and quality of different sections of studies, such as objectives, methodology, protocols, and conclusions (18). Finally, the researchers independently evaluated the finally selected studies, and in the case of any disagreement, group discussions were held to reach an agreement to include or exclude a study.

Data Extraction and Data Synthesis

To extract the data, authors prepared a checklist to gather the following information: last name(s) of first author(s), study place, study design, sample size, type of interventions (if any), year of publication, target population, and main results. Owing to the constraints of the research undertaken in this domain and significant discrepancies among the chosen studies regarding aims, results, and study design, a meta-analysis was deemed inapplicable. Therefore, after exchanging opinions on this matter and considering the high importance of this issue, we decided to report our findings in the form of a narrative review.

Ethical Considerations

This study was approved by the Research Ethics Committee of Mashhad, Faculty of Medical Sciences (Code: IR.MUMS.NURSE.REC.1402.124). All ethical principles were considered in this article.

Table 1: The quality of the studies was assessed using JBI and MMAT scales

First Author (Publication Year)	JBI critical appraisal checklist for Quasi-Experimental studies								
	1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	**2. Were the participants included in any comparisons similar?**	**3. Were the participants included in any comparisons receiving similar treatment/ care, other than the exposure or intervention of interest?**	**4. Was there a control group?**	**5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?**	**6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed**	**7. Were the outcomes of participants included in any comparisons measured in the same way?**	**8. Were outcomes measured in a reliable way?**	**9. Was appropriate statistical analysis used?**
(Pardo et al., 2021)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
(Aggar et al., 2021)	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Unclear	Unclear
(Marath, 2015)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Waite and McKinney, 2015)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
(Hsieh et al., 2022)	Yes	Yes	Yes	No	Yes	Yes	Yes	Unclear	Yes
(Hendricks et al., 2010)	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Unclear
(Groh et al., 2011)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
(Pardo et al., 2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

	Mixed-Method Appraisal Tool (MMAT)				
	Is there an adequate rationale for using a mixed methods design to address the research question?	**Are the different components of the study effectively integrated to answer the research question?**	**Are the outputs of the integration of qualitative and quantitative components adequately interpreted?**	**Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?**	**Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?**
(van de Mortel et al., 2021)	Yes	Yes	Yes	Yes	Yes

Results

Included Studies

The primary literature search on the subject (i.e., leadership skills among nursing students) led to the retrieval of 419 articles from the four main electronic databases (n=122 from PubMed, n=55 from Web of Science, n=100 from Google Scholar, and n=145 from Scopus). Following the exclusion of 148 duplicate items, the evaluators assessed all papers according to their titles and abstracts. Finally, the full texts of 23 studies were carefully reviewed, and based on inclusion/exclusion criteria, 9 studies were eventually selected. The reference lists of these studies and grey literature were also looked into, but no additional articles were identified (Figure 1).

Among 9 eligible studies, 8 were non-randomized controlled trials (2, 7, 19-24), and one study employed a mixed method design (25). These studies were conducted in Australia (n=3), Spain (n=2), the United States (n=2), India (n=1), and Taiwan (n=1). The total sample size ranged from 10 (24) to 306 (20). Three of the quasi-experimental studies had control groups. Table 1 describes the main characteristics of the selected studies.

Methodological Quality Appraisal

All eight quasi-experimental studies (2, 7, 19-24) (Table 2) evaluated a clear cause-and-effect relationship and had a follow-up test. However, appropriate statistical analyses and measurement tools were in question in two studies (22, 24). The quality of the studies was assessed using JBI and MMAT scales (Table 1). As noted, control subjects were enrolled in three studies (2, 22, 23). All studies provided detailed descriptions of their participants and study settings and used valid and reliable outcome measurement tools along with appropriate statistical methods.

Interventions' Specifications

Intervention Strategies

To develop leadership skills in nursing students, different strategies and interventions were employed by studies as follows.

Near-peer Supervision

In this method, first-year students were supervised by third-year students in clinical settings. First, third-year students learned the basic principles of clinical supervision in a two-hour training session. The entire investigation persisted for four weeks. Initially, third-year students were in the presence of a mentor while practicing in the clinical environment at the start of the course. Subsequently, they were afforded the opportunity to enhance their abilities for a week without a mentor. Finally, third-year students performed near-peer supervision on the performance of first-year nursing students for two weeks, and quantitative and qualitative feedback was received from third-year students regarding the development of leadership skills (25).

Student-led Conferences

Pardo *et al.* (2021) designed a semi-experimental study to enhance leadership skills among nursing students. In this study, last-year nursing students were trained for 30 hours (two hours per session, twice weekly), with almost half of the training hours being focused on organizing the conference. The remaining training hours were allocated to theoretical lectures and simulation lab exercises that addressed the topics of interdisciplinary care for senior adults. Finally, the students were assigned to a group project and instructed to deliver an oral presentation and participate in a multiple-choice exam with a series of short-answered questions during the course (7).

Leadership Development Program Embedded into the Curriculum

One study developed a comprehensive educational framework to improve the knowledge and attitudes of nursing students towards leadership skills. First, the learning objectives related to leadership competence were identified using Delphi method; then, the objectives were revised, and a list of educational strategies was prepared. Finally, the leadership development program was embedded into the curriculum of nursing. The students participating in this course evaluated themselves at the beginning and the end of the same academic year (21).

An Interactive Mobile Application (mPreceptor)

Agger *et al.* designed an interactive mobile application (mPreceptor) to improve nursing students' leadership skills. The application was developed under the guidance of a clinical teacher to enhance the communication and leadership abilities of nursing students. The mPreceptor application included educational content and structured weekly learning activities provided to students for six weeks. The students finally took part in a post-test evaluation phase (22).

Leadership Development Courses

In one study, training courses aiming to develop leadership skills were held during the academic semester and in parallel with routine courses.

Table 2: Characteristics of the Included Studies

Authors, Year, Country	Design	Participants, Number	Intervention, Duration and interval, Setting	Outcomes (measurements)	Outcome findings post intervention
(Waite and McKinney, 2015), United States	Non-experimental pretest posttest survey design	Female undergraduate prelicensure nursing students, 14	Education base on Kouzes and Posner Leadership Practices In six one-credit courses, 18months, university	Student Leadership Practices Inventory 360 (S-LPI)	The results indicated that observers' scores and participants' self-reporting perception of their leadership abilities improved in the posttest compared to pretest ($p<0.05$).
(van de Mortel et al., 2021), Australia	Mixed methods	First year nursing students and third year nursing students, 70	Near-peer supervision model, 4weeks, university and clinical placement	An anonymous online questionnaire and Interview	Third-year students reported improvement in their confidence and leadership skills (4.21–4.49/5). Qualitative responses supported the quantitative findings.
(Pardo et al., 2021), Spain	Quasi-experimental pre-post study	Fourth year nursing students, 31	Student-led conference, 2months, university	Self-Assessment Leadership Instrument (ES-SALI)	The student-led conference led to a statistically significant increase in self-perceived leadership competence among nursing undergraduates ($p<0.001$).
(Hsieh et al., 2022), Taiwan	Pretest/posttest design	Undergraduate Nursing Students, 120	Education leadership competency into the undergraduate nursing curriculum, 24 months, university	Nursing Leadership Competence Assessment Scale (NLCAS)	Leadership competence was improved among students regarding the nine items of the NLCAS ($t=2.282$ to 5.741, $p=0.001$ to 0.030).
(Aggar et al., 2021), Australia	Quasi-experimental pre and post-test	Nursing students, 152	Support internationby mobile application (mPreceptor), 6weeks, clinical placement	The Nurse Self-Concept Questionnaire (NSCQ)	Leadership scores were significantly higher in post-intervention than in pre-intervention for the experimental group ($p<0.001$, $d=0.70$) but not for the control group ($p=0.200$, $d=0.22$).
(Marath, 2015), India	Quasi experimental pretest multiple posttest control group design	Undergraduate Nursing Students, 60	leadership development package, 4weeks, university	Leadership Practice Inventory (LPIKouzes and Posner's)	There was a significant increase in the mean leadership practice score for all five leadership functions from the pretest to posttest in the experimental group but not in the control group ($p<0.05$).
(Hendricks et al., 2010), Australia	Pre and post assessment	Nursing students, 10	The Edith Cowan University leadership program, 6 months, university and clinical placement	Personal leadership characteristics and their ability to lead	There was a statistically significant improvement in key leadership skills ($p<0.05$).
(Groh et al., 2011), US state	Per and posttest design	Senior-level nursing students, 306	10 hours of face to face service-Learning, 6 months, university and clinical placement	Service-Learning Self-Evaluation Tool (SLSET)	Statistically significant differences were noted between pre- and post-service-learning experience, with students rating themselves higher on leadership after the experience ($p<0.025$).
(Groh et al., 2011), Spain	Pre-test/post-test with control group design	Nursing students in either the third or fourth year of the BSN, 62	Student-led dedicated education, One year, Institute and clinical placement	Self-Assessment Leadership Instrument (SALI)	In phase II and the expansion phase, students in the intervention group reported a significant increase in perceived leadership skills ($p=0.005$).

The university conducted six consecutive sessions (each equivalent to a one-unit course) every three months for undergraduate nursing students who had successfully completed their studies. Evaluation of the 360-degree leadership course was performed using the Kouzes and Posner Framework (Kouzes and Posner, 1988, 2006). To benefit from the advantages of different methods, role-play activities, network building, small group discussions, and reflective practice were utilized (19).

In another study by Marath *et al*., a 4-section training package was used. This leadership development package was modeled using the five leadership styles of Kozs and Posner. This four-week training package (one day per week) was conducted using various training techniques (such as group activities and ongoing self-learning). Finally, students were evaluated for the development of leadership skills (23).

In another study, researchers at Cowan University designed a program to develop leadership skills among nursing students. In this program, students were initially instructed on the fundamental principles of leadership skills for half a day. Subsequently, volunteer students participated in six 2-hour sessions over the course of six months and completed a minimum of 30 hours of a leadership-in-action project in conjunction with a leader mentor at a local health care organization to evaluate their acquired skills (24). Groh *et al*. tried to promote the leadership skills of nursing students using face-to-face presentations and community experience in comparison with reflection exercises (20).

Student-led Dedicated Education

Padro *et al*. used student-led dedicated education to improve the leadership skills of nursing students. The intervention was conducted in three phases: I: Designing; II: Acceptability and implementation; III: Expansion to desired setting. In this strategy, students were responsible for assessing the health education needs of caregivers, as well as patients and their families and preparing educational materials in accordance with the health literacy model and the abilities and weaknesses of each individual or group (2) (Figure 2).

Major Outcomes of Leadership Development Interventions

The results showed that student-led conferences (7), student-led dedicated education (2), leadership development programs embedded into the curriculum (21), leadership development courses (19, 20, 23, 24), interactive mobile applications (e.g., mPreceptor) (22), near-peer supervision models (25), and educational sessions with leader mentors could significantly boost leadership skills in nursing students. In most of these training methods, the intervention lasted for more than six months (2, 20, 24). Moreover, some of the studies reviewed were conducted in universities (7, 19, 21, 23), while others were carried out in both universities and clinical environments (2, 20, 22, 24, 25). Most of the studies also verified the validity and reliability of the instrument used to measure leadership skills (2, 7, 19, 20, 22, 23).

Discussion

This systematic review aimed to explore the educational strategies used to improve leadership skills among nursing students and scrutinize their characteristics, such as the content, delivery method, strategy, and main outcomes. Nine relevant studies were thoroughly examined for this aim, and all of them emphasized the need for creating interventions to enhance nursing students' leadership abilities. Based on the results, multiple educational instructions and strategies can be applied to achieve this goal.

The findings of this review, despite all disparities in interventions, verified the effectiveness of leadership development

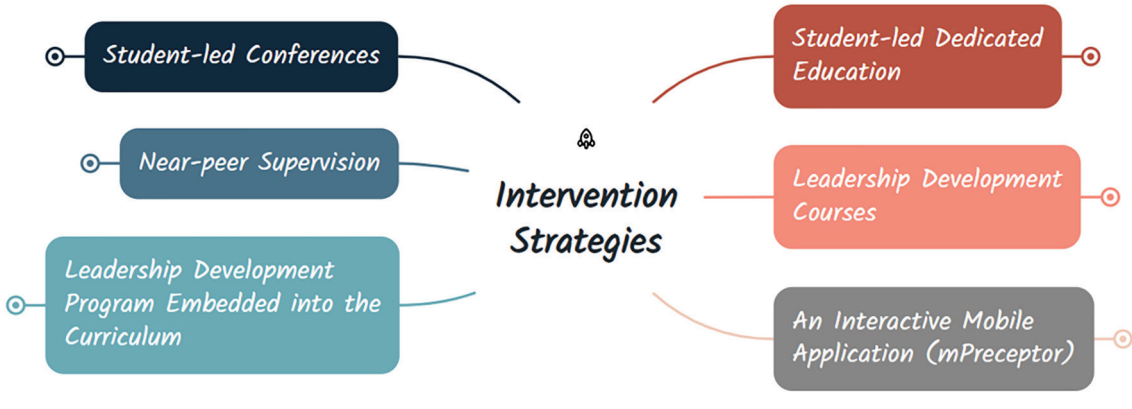

Figure 2: Intervention strategies to develop leadership skills in nursing students

programs in boosting the desired skills among nursing students. The necessity for comparative research in this area is highlighted by the fact that, despite the good impacts of practically all of these treatments, specific conclusions about the best and most standardized methods of leadership development and pertinent training materials could not be drawn. Most of the studies investigated had single-group designs, lacked a methodology appraisal model, and used convenient rather than random sampling. Therefore, it seems necessary to conduct RCTs with plausible methodological rigor to boost our understanding of the functionality mechanisms and effectiveness of these interventions.

Leadership is a process demanding individuals' behavioural modification. Therefore, long-term educational strategies, constant monitoring, and standardized assessment approaches should be employed, an approach that was disregarded in most of the studies reviewed. Based on the concept evaluated, student-oriented educational approaches appear to be superior to traditional teaching methods such as lectures. Qualitative and mixed-method investigations can help assess students' experiences and choose the optimal teaching method.

Nurses need leadership skills and knowledge to deliver quality and safe care in the complex healthcare environment (26). It is believed that training undergraduate nursing students in leadership skills is necessary for them to achieve full competency. As noted, different teaching strategies can be used to enhance leadership skills among nursing students.

A digital communication/leadership application was one of the educational approaches used to strengthen nursing students' leadership skills. The interactive interface of this mobile application (mPreceptor) was based on the experiential learning theory. The mPreceptor application was specifically designed to facilitate critical reflective learning required to develop social and emotional competence (27). The interactive mobile app (mPreceptor) (22) was efficient in promoting critical reflective learning, enabling coordinated supervision, and facilitating students' collaboration with peers and proactive communication.

Dedicated educational courses could be used to improve leadership skills. Dedicated health education courses appeared to be a practical way to increase nursing students' perceived leadership competence. In this strategy, students are entrusted with responsibilities beyond their routine roles and duties, and this is crucial for helping them develop their leadership and teamwork skills (2). Similarly, student-led conferences are effective strategies for nurturing student leadership capacities (7). In fact, organizing and presenting a conference can provide students who have already learned relevant knowledge with the opportunity to develop their interpersonal and professional skills, such as group work, time management, and leadership. Allowing senior students to interact with and supervise junior students was another educational approach for strengthening leadership skills (25). Various studies showed that near-peer clinical supervision can help students enhance their knowledge, delegation, clinical, and leadership skills, as well as self-confidence (28).

The incorporation of comprehensive training courses into the curriculum seems to be beneficial to improving leadership skills in nursing students (19, 21). It is important to teach leadership skills to undergraduates since several nurse managers said that they felt overwhelmed, unsupported, and less confident when they first took on management responsibilities (29). The American Association of Colleges of Nursing (2014) acknowledged leadership qualities as a key issue for effective university education (30). Overall, leadership and management skills are suggested to be learned in the context of the undergraduate program to effectively boost such skills.

Strengths and Limitations

This study explicitly and systematically highlighted and described educational strategies that could improve the leadership skills of nursing students. This comprehensive review encompassed various databases and was safeguarded with manual search and grey literature screening following standardized guidelines (PICO and PARISMA). Furthermore, two researchers and library experts were involved in all steps of literature search, study selection, and quality appraisal. Since the studies used different tools to measure leadership skills, we could not conduct meta-analysis. Finally, this review was limited to English language studies, so some effective and high-quality studies might have been missed.

Conclusions

Various educational interventions can be used to promote the leadership skills of nursing students. In order to perform their patient care and teamwork responsibilities at the hospital, nursing students are required to acquire leadership abilities throughout their undergraduate studies, given the complexity of health care environments and the significance of safe and high-quality care. Nursing leaders and managers at different positions and roles are suggested to

focus on interventions to promote these skills. Furthermore, the perception and attitudes of nursing instructors regarding this issue should be improved to boost the quality of relevant teaching methods. Ultimately, researchers and institutions are recommended to focus on interventions and programs to strengthen leadership skills among nursing students, which requires conducting sophisticated experimental studies to increase the credibility and quality of evidence in this area.

Identified Gaps and Future Research

This study focused on characterizing the existing leadership development interventions, from classroom-based strategies to curriculum reforms. The results suggest that researchers should first employ robust experimental designs to enhance the credibility and quality of evidence. Secondly, they should conduct research using qualitative and mixed approaches to elucidate the students' perspective on the structure, content, and educational strategies.

Implications of Research

Based on the results of this study, we have four suggestions for implementation. First, because the scope of nursing leadership is broad and diverse, nursing leaders in various roles and settings can be invited to teach students about a wide range of leadership knowledge. Second, the benefit of students from leadership skills can be used as a criterion and index for the evaluation of educational institutions. Third, It is recommended that this skill should be strengthened and practiced and independent leadership roles should be defined for students in clinical learning courses. Fourth, to teach this skill, it would be better to use information technology and practical applications

Acknowledgement

The authors would like to express their gratitude to all those who helped conduct this systematic review.

Authors' Contribution

F.H.N Writing – review & editing, Validation, Supervision, Revising or critically reviewing the article, Project administration, Methodology, Investigation, Data acquisition and analysis, Conceptualization. R.M Writing – review & editing, Manuscript writing, Validation, Data extraction, Project administration, Methodology, Investigation, Conceptualization.

Conflict of Interest

The authors declare no conflicts of interest.

References

1. Glazer G, Erickson JI, Mylott L, Mulready-Shick J, Banister G. Partnering and leadership: Core requirements for developing a dedicated education unit. JONA: The Journal of Nursing Administration. 2011;41(10):401-6.
2. Pardo MÁDJ, Vissandjee B, Olives MG, Torre MÁC, Fernández-Puebla AG. Enhancing perceived leadership of nursing students through a student-led dedicated education unit in a community setting: A feasibility study. Journal of Professional Nursing. 2022;43:152-61.
3. Makarem A, Heshmati-Nabavi F, Afshar L, Yazdani S, Pouresmail Z, Hoseinpour Z. The comparison of professional confidence in nursing students and clinical nurses: A cross-sectional study. Iranian Journal of Nursing and Midwifery Research. 2019;24(4):261-7.
4. Duygulu S, Hicdurmaz D, Akyar I. Nursing students' leadership and emotional intelligence in Turkey. Journal of Nursing Education. 2011;50(5):281-5.
5. Dube A, Jooste K. The leadership characteristics of the preceptor in selected clinical practice settings in Botswana. Curationis. 2006;29(3):24-40.
6. Lee TW, Damiran D, Konlan KD, Ji Y, Yoon YS, Ji H. Factors related to readiness for practice among undergraduate nursing students: A systematic review. Nurse Education in Practice. 2023;69:103614.
7. Pardo MDJ, Fuster P, Gallart A, Rodríguez E, Wennberg L, Martin-Ferreres M. Fostering leadership competence and satisfaction in nursing undergraduates through a student-led conference: A quasi-experimental pre-post study. Nurse education today. 2021;98:104748.
8. Walumbwa FO, Avolio BJ, Gardner WL, Wernsing TS, Peterson SJ. Authentic leadership: Development and validation of a theory-based measure. Journal of management. 2008;34(1):89-126.
9. Linares PF, Higueras ER, Martin-Ferreres ML, Torre MÁC, Capellades LW, Fernández-Puebla AG. Dimensions of leadership in undergraduate nursing students; Validation of a tool. Nurse education today. 2020;95:104576.
10. van de Mortel TF, Nilsson J, Lepp M. Validating the nurse professional competence scale with Australian baccalaureate nursing students. Collegian. 2021;28(2):244-51.
11. Nilsson J, Mischo-Kelling M, Thiekoetter A, Deufert D, Mendes AC, Fernandes A, et al. Nurse professional competence (NPC) assessed among newly graduated nurses in higher educational institutions in Europe. Nordic journal of nursing research. 2019;39(3):159-67.
12. Scully NJ. Leadership in nursing: The importance of recognising inherent values and attributes to secure a positive future for the profession. Collegian. 2015;22(4):439-44.
13. Akdeniz C, Duygulu S. Systematic Review on Characteristics and Effects of Leadership Development Interventions for Nursing Students. Nurse Educator. 2024;49(3):E147-52.
14. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021;29:372.
15. Institute JB. Critical appraisal tools [Internet]. 2020

[Cited: 28 August 2020]. Available from: https://jbi.global/critical-appraisal-tools.
16. Hong QN, Fàbregues S, Bartlett G, Boardman F, Cargo M, Dagenais P, et al. The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. Education for information. 2018;34(4):285-91.
17. Choi GW, Lee KE, Chang SJ, Kim HJ. Health education interventions for individuals with hearing impairment: A systematic review. Patient Education and Counseling. 2023;114:107830.
18. Hawker S, Payne S, Kerr C, Hardey M, Powell J. Appraising the evidence: reviewing disparate data systematically. Qualitative health research. 2002;12(9):1284-99.
19. Waite R, McKinney NS. Findings from a study of aspiring nursing student leaders. Nurse education today. 2015;35(12):1307-11.
20. Groh CJ, Stallwood LG, Daniels JJ. Service-learning in nursing education: Its impact on leadership and social justice. Nursing education perspectives. 2011;32(6):400-5.
21. Hsieh LW, Chang YC, Yen M. Improving leadership competence among undergraduate nursing students: Innovative objectives development, implementation, and evaluation. Nursing Education Perspectives. 2022;43(1):24-9.
22. Aggar C, Shinners L, Penman O, Mainey L, Kurup C, Hallett J, et al. Evaluation of a digital application to support internationally qualified nurses' communication and leadership skills. Nurse education today. 2021;104:104982.
23. Marath U. Impact of Leadership Development Package on Leadership Competencies of Undergraduate Nursing Students. Asian Journal of Nursing Education and Research. 2015;5(2):221-8.
24. Hendricks JM, Cope VC, Harris M. A leadership program in an undergraduate nursing course in Western Australia: Building leaders in our midst. Nurse education today. 2010;30(3):252-7.
25. van de Mortel TF, Needham J, Henderson S. Facilitating learning on clinical placement using near-peer supervision: A mixed methods study. Nurse education today. 2021;102:104921.
26. Alilyyani B, Althobaiti E, Al-Talhi M, Almalki T, Alharthy T, Alnefaie M, et al. Nursing experience and leadership skills among staff nurses and intern nursing students in Saudi Arabia: a mixed methods study. BMC nursing. 2024;23(1):87.
27. Poell RF, Van der Krogt FJ. An empirical typology of hospital nurses' individual learning paths. Nurse education today. 2014;34(3):428-33.
28. Williamson GR, Kane A, Plowright H, Bunce J, Clarke D, Jamison C. 'Thinking like a nurse'. Changing the culture of nursing students′ clinical learning: Implementing collaborative learning in practice. Nurse Education in Practice. 2020;43:102742.
29. Tyczkowski B, Vandenhouten C, Reilly J, Bansal G, Kubsch SM, Jakkola R. Emotional intelligence (EI) and nursing leadership styles among nurse managers. Nursing administration quarterly. 2015;39(2):172-80.
30. Nursing AAoCo. Competencies and curricular expectations for clinical nurse leader education and practice [Internet]. 2013 [Cited 2 Oct 2013]. Available from: https://www.aacnnursing.org/portals/0/PDFs/CNL/CNL-Competencies-October-2013.pdf.