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Effects of a nursing leadership program on self-leadership, interpersonal relationships, clinical performance, problem-solving abilities, and nursing professionalism among nursing students in South Korea: a quasi-experimental study

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Purpose: This study investigated the effects of a nursing leadership program on self-leadership, interpersonal relationships, clinical performance, problem-solving abilities, and nursing professionalism among nursing students in South Korea.

Methods: A quasi-experimental study was conducted. The Practice-Driven Nursing Leadership Program for Students (PDNLP-S) was developed based on the ADDIE model (analysis, design, development, implementation, and evaluation). This quasi-experimental study design included 60 nursing students. The experimental group (n=30) participated in the PDNLP-S for 120-minute sessions over 5 weeks, while the control group (n=30) received usual lectures. The PDNLP-S included lectures, discussions, and individual and group activities to cultivate core nursing leadership competencies such as individual growth, collaboration, nursing excellence, creative problem-solving, and influence. Data were analyzed using descriptive statistics, the Mann-Whitney U-test, and the independent t-test with IBM SPSS Windows ver. 26.0.

Results: The experimental group demonstrated significant improvements in self-leadership ($t=3.28$, $p=.001$), interpersonal relationships ($t=3.07$, $p=.002$), clinical performance ($U=268.50$, $p=.004$), and problem-solving abilities ($t=2.20$, $p=.017$) compared to the control group. No significant difference was observed in nursing professionalism ($t=0.50$, $p=.311$).

Conclusion: This study demonstrates that the PDNLP-S improved nursing students' self-leadership, interpersonal relationships, clinical performance, and problem-solving abilities. The PDNLP-S can play a significant role in cultivating future nurse leaders by enhancing these nursing leadership competencies among nursing students.

Keywords: Leadership; Nursing; Program; Students

Introduction

Leadership is a process of exerting influence on individuals and organizations to drive them toward achieving a common goal [1]. It involves not only facilitating work performance but also inspiring, motivating, and enthusing members of an organization to achieve its goals [1]. Over the past decade, the exploration of nursing leadership has substantially increased. Nursing leadership is not only demanded of nurse managers but is also a vital competency for all members of the nursing organization, with varying competency levels based on their individual experi-

ence [2]. The level of leadership among nursing organization members is positively related to nursing productivity, a supportive work environment, and job satisfaction with the nursing profession [3]. Nursing leadership is developed and enhanced through education and training [4,5]. Thus, providing systematic education and training is important to gradually enhance leadership from baccalaureate education when students are ready to gain clinical exposure in various nursing settings [2,6].

Nursing students are prospective nursing professionals who are expected to undertake their roles in clinical settings and nursing organizations immediately upon graduation, thus enhancing nursing leadership competencies is one of the major objectives of nursing curricula to ensure that students can demonstrate creativity, collaboration, autonomy, and effective communication [2,7]. A systematic review revealed that targeted educational interventions for nurses were an effective method of leadership development [8]. A structured approach to education and training is vital for the progressive enhancement of leadership skills in nursing. This process should begin at the undergraduate level, where students gain clinical experience across various settings and develop these competencies [2,3]. Both the American Association of Colleges of Nursing (AACN) and the Korean Accreditation Board of Nursing Education, responsible for evaluating the quality of nursing education in their respective countries, emphasize the importance of leadership development as a key educational outcome for nursing students [9,10]. Academic institutions and accrediting organizations acknowledge their roles in preparing nurses for leadership roles, recognizing this as a critical focus area for new graduates [6]. Interviews with nursing graduates further support the need for leadership courses to be integrated into the core curriculum from the outset, rather than being offered as optional modules. Graduates emphasize the necessity of a curriculum founded on leadership principles, asserting that leadership courses should be mandatory components of nursing education [2,11]. Therefore, it is essential that leadership competencies in nursing be systematically cultivated from the undergraduate level.

Nursing leadership empowers nurses to enhance the quality of patient care, lead teams, drive change, and make effective decisions [12]. A systematic review of the nursing leadership elements reported that self-awareness and leadership education were positively correlated with nursing leadership among nurse managers [8]. Effective nursing leadership is closely linked to deep self-understanding, continuous individual development, and the ability to manage both oneself and others effectively [13]. These attributes enable nurses to collaborate effectively in multidisciplinary teams, ultimately improving the quality of patient care [14]. Addi-

tionally, nurse leaders must utilize critical thinking and problem-solving skills to deliver advanced, specialized patient care while addressing complex nursing problems [15,16]. Effective nursing leadership positively impacts healthcare organizations and patient outcomes [16].

A previous concept analysis of nursing leadership identified key attributes, including individual growth, collaboration, nursing excellence, creative problem-solving, and influence [3,7]. Individual growth involves self-reflection, self-regulation, self-management, and self-actualization, all of which contribute to developing nursing leaders' competencies and qualities [3,15]. Individual growth is closely related to self-leadership, which emphasizes the importance of self-awareness and effectively leveraging personal strengths through self-reflection. Self-leadership supports the effective use of personal strengths in nursing practice [17,18]. Collaboration is essential for addressing patient care challenges by fostering respectful interdisciplinary teamwork that aims to achieve organizational goals [2,3,19]. Strong interpersonal relationships are fundamental to building effective multidisciplinary collaboration [20].

Nursing excellence involves advanced skills, professionalism, and role modeling, all of which significantly influence clinical decision-making and patient care [3,15]. This excellence is demonstrated through clinical competencies, including accurate patient assessments and the delivery of appropriate care [21,22]. Enhancing nursing excellence in students improves clinical performance, judgment, and the ability to function competently in diverse settings. Developing nursing excellence in students enhances their ability to apply knowledge, exercise sound judgment, and perform competently in various clinical settings [23,24]. Nurse leaders are driven to continuously advance their expertise by engaging in education to maintain high levels of clinical competency, serving as role models within the nursing team [22]. Additionally, creative problem-solving involves performing innovative nursing tasks by employing critical thinking and utilizing various sources of information to address diverse nursing challenges [3,15,25]. A systematic review indicated that improving leadership among clinical nurses requires strategies that enhance their problem-solving abilities, based on autonomy, control, and sufficient competency [26].

Influence in nursing leadership refers to the autonomous power that employs specific behavioral and cognitive strategies to guide individuals toward achieving high performance in pursuit of organizational goals [3,15]. Through this influence, nursing leadership enables members to share a common vision and goals, while fostering professional and creative problem-solving, cultivating

organizational culture, leading change, and establishing health policies [15]. Moreover, nursing professionalism encompasses nurses' beliefs, philosophy, and values, reflecting their intrinsic motivation and their ability to influence others as leaders [27]. This is closely linked to various attributes of influence [28]. In other words, nursing leadership includes a strategic approach that encourages members to share organizational goals and achieve high performance through autonomy, while nursing professionalism provides intrinsic motivation and leadership abilities to nurses throughout this process [22]. According to prior research, nursing students or nurses with high levels of nursing professionalism tend to exhibit high self-leadership [29], which improves the quality of patient care, positively influence collaboration and teamwork within healthcare teams, and contribute to policy changes aimed at improving healthcare services [30].

Students who receive leadership education develop stronger self-directed learning skills and motivation, which in turn prepares them to become more effective nurses in clinical settings. This lays a critical foundation for the practical skills required in clinical practice [31]. In particular, leadership education fosters increased self-confidence, autonomy, and teamwork skills, all of which play a crucial role in enabling graduates to manage patient care and function as team leaders in clinical settings [32]. Specifically, fourth-year nursing students, having already gained some clinical experience through practical training, can maximize the benefits of leadership education.

Despite the recognized importance of nursing leadership, previous studies have primarily focused on leadership development programs for second- and third-year nursing students, addressing only a limited subset of leadership attributes [33]. Studies involving fourth-year students often include leadership education as a small part of the curriculum, lacking a comprehensive approach to assess and practice leadership competencies [34]. Given the challenges nursing students face in fully understanding the role of leadership in nursing, there is a clear need for a structured and comprehensive model in undergraduate programs to effectively foster leadership competencies

Therefore, this study aims to develop a nursing leadership program based on the five attributes of nursing leadership derived from previous studies and examine its effects on self-leadership, interpersonal relationships, clinical performance, problem-solving abilities, and nursing professionalism for nursing students.

Methods

1. Design and setting

A prospective, single-blind, quasi-experimental study was conducted.

2. Participants and sample size

The study population comprised fourth-year students from two nursing schools in South Korea. Given the need for nursing students to adapt quickly to both clinical settings and various organizations after graduation, while effectively demonstrating their nursing competencies [35,36], fourth-year students were selected as participants for this study to receive nursing leadership education and training. Two nursing colleges in Jeonbuk State, which offer similar competency-based curricula and have comparable student populations, were selected using convenience sampling to minimize potential cross-contamination of interventions.

Students at J University in Jeonju City were assigned to the experimental group, while students at W University in Iksan City were assigned to the control group. The inclusion criteria were: (1) fourth-year nursing students, (2) students taking the nursing management II course in the second semester of 2021, (3) students who voluntarily signed informed consent, and (4) students with no prior exposure to a leadership program. The exclusion criteria were: (1) Students who repeated the nursing management-related courses, 'nursing management 1' and 'introduction to nursing,' were excluded from the study because they had already taken the same courses while repeating them. It was assumed that these students would demonstrate a disparate level of knowledge than students who had not repeated the courses, and (2) students taking other courses that may affect nursing leadership.

The GPower software (version 3.1.9.2, Heinrich-Heine-Universität Düsseldorf) was used to determine the sample size [37]. Regarding the effect size reported in previous studies [33,34], we calculated the sample size to achieve a large effect size (d) of .80, power ($1-\beta$) of .80, and significance level (α) of .05 for independent t-tests and one-tailed tests, and the minimum sample size was calculated to be 21 for each group. A total of 60 participants were enrolled, with 30 in each group, to account for a 30% potential dropout rate. Of 64 participants who volunteered to participate in the study after reading the recruitment announcement, four who were ineligible per the inclusion and exclusion criteria were excluded, and 60 were included in the final analysis (Figure 1).

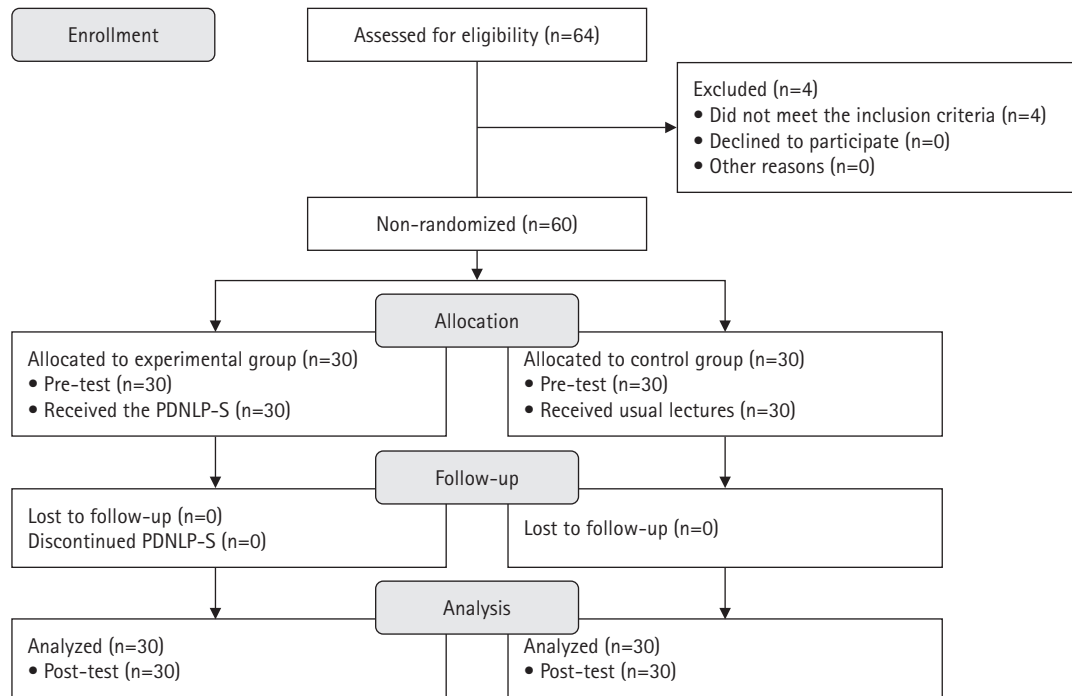


Figure 1. Flow chart of participant enrollment. PDNLP-S, Practice-Driven Nursing Leadership Program for Students.

3. Intervention

A Practice-Driven Nursing Leadership Program for Students (PDNLP-S) was developed based on the nursing leadership model [3] and previous studies [7], and the ADDIE model (analysis, design, development, implementation, and evaluation) [38]. First, in the analysis stage, a content analysis was conducted by reviewing existing literature to identify foundational data for the nursing leadership program. The program content was based on an analysis of five nursing leadership attributes from the concept analysis by Kim et al. [3], the leadership development model by Miles and Scott [7], and previous nursing leadership studies [33,34]. Key attributes for nursing students, including individual growth, collaboration, nursing excellence, creative problem-solving, and influence, were identified. After defining and analyzing these attributes, it was verified whether they were reported in other studies. Additionally, relevant leadership literature was reviewed to derive program measurement variables that closely align with the five attributes. Self-leadership is the ability to manage one's actions and goals, fostering continuous individual growth [17,18]. Interpersonal relationships are key to successful collaboration [20]. Nursing excellence, characterized by high levels of clinical knowledge and skills, directly contributes to clinical performance [21,22]. Creative problem-solving involves developing new strategies beyond traditional methods, enhancing problem-solving abilities

[26]. Influence, as a leadership quality in nurses, brings positive changes to organizations, patients, and others. Nurses with strong professional identity demonstrate greater influence in clinical settings, positively impacting the quality of care and nursing organizations [26,28].

Second, in the design phase, the program's learning objectives, key themes, components, curriculum, and instructional methods were devised in line with the analysis stage findings. The program contents were developed with reference to practice-driven nursing leadership [15], incorporating the five leadership attributes, connecting to both antecedents and consequences (Figure 2A).

Third, in the development stage, the PDNLP-S was developed by our research team consisting of three nursing professors and two nursing PhDs with extensive educational and clinical experience. A nursing management professor with over 30 years of experience validated the program. This study developed a leadership program that employed a differentiated approach that integrated lectures, individual and team activities, and feedback, departing from the traditional lecture-centric format. Participants created individual leadership development plans during the program, which were designed to be integrated into their daily lives for sustained practice and evaluation. This approach aimed to foster personal transformation through active engagement and reflection. The program focused on core nursing leadership attributes, providing opportunities for participants to continuously revise and

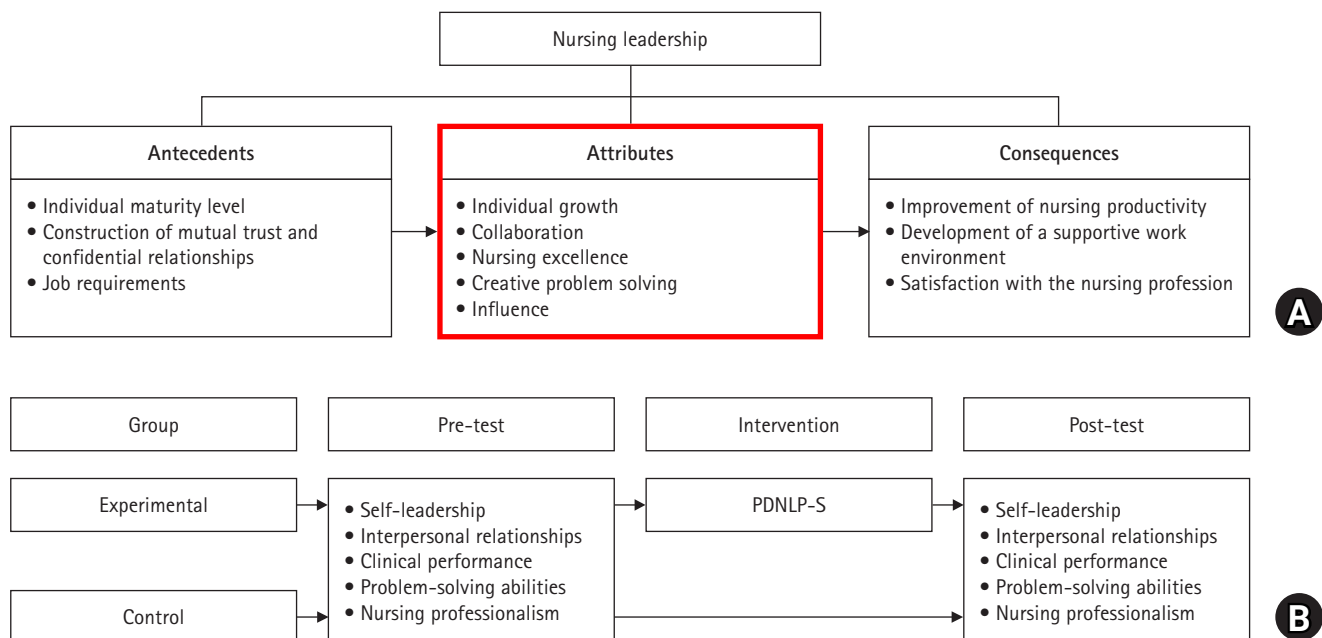


Figure 2. Conceptual framework. (A) Attributes, antecedents, and consequences of nursing leadership. (B) Study design. PDNLP-S, Practice-Driven Nursing Leadership Program for Students.

refine their development plans. Individual and team-based feedback ensured that these plans were actionable and conducive to real-world leadership application. Participants also shared their progress and exchanged feedback with peers, facilitating a deeper understanding and practical application of nursing leadership attributes (Table 1).

Sessions 1–3 focused on team building, leadership understanding, and communication, motivating the program and building rapport and trust among participants. Sessions 4 emphasized self-understanding, self-analysis, understanding of others, and nursing leadership development plans. Sessions 5–9 involved an introduction to success stories, empathy training, activities designed to cultivate the five leadership attributes. For instance, in the context of individual growth, among the session 5 activities presented in Table 1, “learn about success stories” introduced people who are authentic leaders, and “self-monitoring and activity records” section, participants conducted self-assessment of their self-leadership and authentic leadership using questionnaires and then set goals, developed achievement plans, and monitored and recorded the achievement levels to develop lacking competencies. In addition, for the “developing an individual growth plan,” participants listed their negative and positive habits, identified the most urgent habits to change and shared them through presentations. For collaboration, students self-assessed and presented their emotional intelligence, which is needed to understand and care for others. For nursing excellence, students were asked to write about

who they are now and who they want to be in the future through career development. For creative problem-solving, students were provided with creative idea generation and convergence methods (idea relay, lotus flower opening method, random word, and so forth). For Influencing, students were asked to identify and present a nursing leader in the hospital or school that they believe is influential. Session 10 included presenting individual activities and performance outcome reports, and sharing thoughts on program participation, and final evaluation (Table 1).

Fourth, in the implementation stage, the PDNLP-S program was implemented with fourth-year nursing students at Jeonbuk National University. This program was implemented during the nursing leadership course, an elective offered in the second semester of the fourth year. The details regarding the program’s operation were communicated in advance through the course syllabus. The experimental group participated in 10 sessions, held twice a week for 2 hours each. Before the program began, researchers aligned the learning content, teaching strategies, and evaluation methods. The sessions were divided between two researchers, with one overseeing session 1 to 4 and the other managing sessions 5 to 10, using standardized educational materials. Student participation was actively monitored to ensure consistent engagement and feedback throughout the program. Unlike traditional lecture-based methods, this program employed an experiential learning approach, incorporating individual and team activities, discussions, writing, presentations, and feedback. Each

Table 1. The contents of the practice-driven nursing leadership program for students

Session	Activity name	Learning objectives	Key themes	Methods	Main contents	Tool	Duration (min)
1	Understanding leadership	• Understand the concept of leadership.	• Concept and rationale for leadership	• Lecture	• Introduction to the program	• PPT	20
		• Understand theories of leadership.	• Understanding of leadership theories	• Team discussion and team presentations	• Lecture	• PPT	30
					• Team activities: Team building, introduction of self, team activity plan	• Notebook; Smartphone	50
					• Team presentation: Topic selection and sharing		
2	Empathy class: Understanding others' leadership styles	• Understand leadership.	• Understanding of leadership	• Key summary	• Summary of leadership theories	• PPT	20
		• Recognize the importance of teamwork.	• Teamwork training	• Team presentations	• Team activities: Share each leadership style and team discussion for understanding the nursing leadership	• PPT; Video	60
		• Communicate effectively with team members.	• Communication	• Feedback	• Team presentation: Leadership styles and survey results; Introduce persons based on leadership styles		
					• Feedback: Sharing and empathizing with team presentations	-	20
3	Discovering myself: Understanding my leadership style	• Understand nursing leadership.	• Understanding of nursing leadership	• Key summary	• Summary of self-understanding and self-exploration	• PPT	20
		• Communicate effectively with team members.	• Communication	• Individual activities and presentations	• Individual activity: Identifying one's leadership style	• Survey	20
				• Feedback	• Individual leadership development plan: Goal setting; SMART planning (specific, measurable, action-oriented, realistic, time-bound)	• Notebook; Smartphone	40
					• Feedback: Sharing and empathizing with individual activities	-	20
4	My commitment	• Recognize the importance of self-understanding.	• Self-understanding and self-analysis	• Key summary	• Summary of the importance of self-understanding	-	20

(Continued on next page)

Table 1. Continued

Session	Activity name	Learning objectives	Key themes	Methods	Main contents	Tool	Duration (min)
		Establish nursing leadership development plans.	Living with others	Individual presentations and feedback	Individual presentations: Leadership development plan; Reflecting on self; Understanding and exploring your current leadership; Setting your own visions and goals for a nurse leader; Understanding others	PPT; Smartphone	60
			Self-leadership development plans		Feedback: Sharing and empathizing with leadership plans	-	20
5-7	Understanding and practicing nursing leadership 1	Understand the attributes of nursing leadership.	Develop and apply nursing leadership: Individual growth; Collaboration; Nursing excellence	Lecture	Lecture: Nursing leadership: Understand individual growth, collaboration and nursing excellence; Learn about success stories	PPT; Video	30
		Execute nursing leadership development plans.	Individual growth, collaboration and nursing excellence development plans	Team discussion and presentations	Team activity: Discussion about cases based on individual growth, collaboration or nursing excellence	Notebook; Textbook; Worksheet	50
		Recognize the importance of self-management.		Feedback	Individual activity: Doing develops plans for individual growth, collaboration and nursing excellence; Self-monitoring and activity records	Self-record for leadership improvement: Vlog, gratitude journal, exercise log, nursing policy scrapbook, study plan, etc.	20
8-9	Understanding and practicing nursing leadership 2	Understand the attributes of nursing leadership.	Develop and apply nursing leadership: Creative problem solving; Influence	Lecture	Lecture: Nursing leadership: Understanding creative problem solving and influence; Learn about success stories	PPT; Video	30
		Execute nursing leadership development plans.	Creative problem solving and influence development plans	Team discussion and presentations	Team activity and presentation: Discussion about cases based on creative problem solving and influence; Introducing influential figures	Notebook; Textbook; Worksheet	50
		Recognize the importance of self-management.		Feedback	Individual activity: Doing develops plans of creative problem solving and influence; Self-monitoring and activity records	Self-record for leadership improvement: Vlog, gratitude journal, exercise log, nursing policy scrapbook, study plan, etc.	20
10	Reflecting on myself	Attain the core nursing leadership competencies.	Evaluate nursing leadership	Key summary	Explanation of nursing leadership	-	10

(Continued on next page)

Table 1. Continued

Session	Activity name	Learning objectives	Key themes	Methods	Main contents	Tool	Duration (min)
				• Individual activities and presentations	• Individual presentations and feedback: Sharing results based on individual leadership development action plans	• PPT; Self-record for leadership improvement: Vlog, gratitude journal, exercise log, nursing policy scrapbook, study plan, etc.	70
				• Feedback	• Evaluate program: Reflecting on the program and setting future goals	-	20

PPT, PowerPoint presentations.

session began with a brief overview of the program's goals, content, and schedule. Evaluation was used not only to assess program outcomes but also to provide feedback on both individual and team efforts. Worksheets were used to engage students. The control group was given educational materials on nursing leadership after the data collection had been complete (Figure 2B).

Fifth, in the evaluation phase, the experimental group began the 10-session PDNLP-S following the baseline test. The same questionnaire used for the baseline test was administered 1 week after the conclusion of the 10-session program, and the same questionnaire was administered to the control group at the same baseline and post-test periods.

4. Instrument

1) Demographic questionnaire

Gender, age, religion, satisfaction with major, and academic performance were surveyed.

2) Self-leadership

The questionnaire was translated by researchers into Korean after obtaining e-mail permission from the developers of the Revised Self-Leadership Questionnaire [39]. Three nursing professors, one nursing major, and one non-nursing major who are fluent bilinguals in Korean and English translated and back-translated the questionnaire. The finalized translated tool was administered in a pilot test to identify any areas for translation revisions. The Korean version of the Self-Leadership Questionnaire was content-validated by three nursing professors, and the content validity index was $\geq .80$. This 35-item tool comprises three dimensions (i.e., behavior-focused strategies, natural reward strategies, and constructive thought pattern strategies) and nine subscales: self-goal setting (five items), self-reward (three items), self-punishment (four items), self-observation (four items), self-cueing

(two items), focusing on natural rewards (five items), visualizing successful performance (five items), self-talk (three items), and evaluating beliefs and assumptions (four items). Each item is rated on a 5-point Likert scale. The total score ranges from 35–175, and a higher score indicates higher self-leadership. The Cronbach's α was .74–.93 upon development [39] and that of the entire questionnaire was .90 in this study.

3) Interpersonal relationships

The Interpersonal Competence Questionnaire was developed by Buhrmester et al. [40] and adapted into Korean and validated for use on college students by Han and Lee [41]. This 31-item tool comprises five domains: initiation (eight items), negative assertion (seven items), emotional support (seven items), conflict management (six items), and disclosure (three items). Each item is rated on a 5-point Likert scale. The total score ranges from 31–155, and a higher score indicates higher interpersonal competence. The Cronbach's α was .87 upon development, .84 in the study by Han and Lee [41], and .89 in this study.

4) Clinical performance

Clinical performance was assessed using the instrument developed by Lee et al. [42] and modified and adapted by Choi [23]. This 45-item tool comprises five domains: nursing process (11 items), nursing skills (11 items), educational/collaborative relationships (eight items), interpersonal relationship/communication (six items), and professional development (nine items). Each item is rated on a 5-point Likert scale. The total score ranges from 45–225, and a higher score indicates better clinical performance. Cronbach's α was .96 upon development [42], .92 in the study by Choi [23], and .97 in this study.

5) Problem-solving ability

Problem-solving ability was assessed using the tool developed

by Lee et al. [25]. This 30-item tool comprises five domains: problem clarification (six items), solution exploration (six items), decision making (six items), solution implementation (six items), and evaluation and reflection (six items). Each item is rated on a 5-point Likert scale. The total score ranges from 35–150, and a higher score indicates better problem-solving ability. Cronbach's α was .93 upon development [25] and .97 in this study.

6) Nursing professionalism

Han et al. [43] tested the construct validity (via factor analysis) of 29 items developed by Yeun et al. [27] and abbreviated the scale down to 18 items. We used these 18 items to assess nursing professionalism. This instrument comprises five domains: professional self-concept (six items), social recognition (five items), nursing expertise (three items), roles in nursing practice (two items), and nursing practice autonomy (two items). Each item is rated on a 5-point Likert scale. The total score ranges from 15–90, and a higher score indicates higher nursing professionalism. Cronbach's α was .92 upon development [27], .91 in the study by Han et al. [43], and .87 in this study.

5. Data collection

Data were collected from October 7 to December 23, 2021. To maintain blinding and minimize experimental interference, the experimental and control groups were established at two universities in different regions with similar sizes and curricula, thereby minimizing interactions between the two groups of participants. The participant recruitment announcement was posted on the department's bulletin board and student communities of each school, and participants who met the inclusion criteria were enrolled. A well-trained research assistant explained the study's purpose, duration, and procedures, emphasizing that participation was voluntary and non-participation would not lead to any disadvantage. The first page of the online questionnaire requested the participant's consent. Further, the research assistant left the room after providing the online survey link to ensure that the participants could make their decision to completely and voluntarily participate. Afterward, the research assistant provided the link to the online survey and then left the explanation area before participants could respond. The online survey was conducted to ensure participant autonomy. The research assistant was not directly involved in the PDNLP-S.

6. Data analysis

The IBM SPSS Statistics ver. 24.0 (IBM Corp.) was used for data analyses. Continuous data were expressed as mean $\pm$ standard deviation. The Shapiro-Wilk test was adopted for the normality test of study variables. The chi-square test and independent t-test were conducted to test the homogeneity of the general characteristics and dependent variables. A one-tailed Mann-Whitney U-test and independent t-test were conducted to compare differences in dependent variables between the groups. *p*-values of $<.05$ was considered statistically significant.

7. Ethical consideration

The Institutional Review Board at the Jeonbuk National University approved this study (JBNU 2021-09-003-001), in adherence to the Declaration of Helsinki. From the recruitment announcement, an impartial researcher explained the study's purpose and methods to participants without revealing their assignment to experimental or control groups, enabling them to make informed, voluntary decisions about participation. The study's objectives, methods, interventions, expected outcomes, and associated risks were clearly and transparently outlined, ensuring the successful acquisition of informed consent. The explanations were crafted to be easily understandable, enhancing student engagement and facilitating ongoing dialogue. Strict measures were implemented to guarantee data confidentiality and participant anonymity. Participants were fully informed of their rights to voluntarily participate, including the options to abstain or withdraw at any time without consequences. The experimental intervention was maintained as entirely separate from academic evaluations to ensure a fair and non-coercive environment. Any potential connections between the intervention and the students' academic performance or evaluations were rigorously eliminated, with all intervention activities founded on voluntary student participation. The control group was provided with educational materials about nursing leadership upon the conclusion of data collection. Both groups were given a small gift in appreciation of their participation. The clinical trial registration was completed (KCT0006878).

Results

1. General characteristics and homogeneity test

The demographic characteristics were not significantly different

between the two groups (all $p>.05$), confirming baseline homogeneity (Table 2).

2. Test for homogeneity of dependent variables before PDNLP-S

Self-leadership, interpersonal relationships, clinical performance, problem-solving abilities, and nursing professionalism were not significantly different between the two groups at the baseline (all $p>.05$), confirming the homogeneity of dependent variables at the baseline (Table 2).

3. Effect of the PDNLP-S in study variables

Self-leadership increased by 0.72 ± 0.39 in the experimental group and 0.44 ± 0.29 in the control group after the PDNLP-S. The difference between the two groups was significant ($t=3.28$, $p=.001$). Interpersonal relationships increased by 0.40 ± 0.68 in the experimental group and decreased by -0.03 ± 0.37 in the control group, showing significant differences between the two groups ($t=3.07$, $p=.002$). Clinical performance increased by 0.42 ± 0.58 and 0.09 ± 0.26 in the experimental group and control group, respectively, showing significant differences between the two groups

($U=268.50$, $p=.004$). Problem-solving abilities increased by 0.41 ± 0.76 and 0.07 ± 0.36 , respectively, showing significant differences between the two groups ($t=2.20$, $p=.017$). Nursing professionalism increased by 0.15 ± 0.56 and 0.09 ± 0.33 but with no significant differences between the two groups ($t=0.50$, $p=.311$) (Table 3).

Discussion

To ensure that newly graduated nurses can effectively adapt to clinical practice and demonstrate their nursing competencies, nursing leadership education and training should be provided from the undergraduate level [35,36]. This study developed the PDNLP-S based on a nursing leadership model [3] and applied the program to fourth-year nursing students. The program was effective in enhancing self-leadership, interpersonal relationships, clinical performance, and problem-solving abilities.

First, the PDNLP-S enhanced self-leadership, which measures “individual growth,” the first attribute of nursing leadership. Previous studies have shown that programs using films, lectures, presentations, team activities, and other methods with first- and second-year university students improved participants’ self-leadership [5,44]. The PDNLP-S developed in this study is a more intensive

Table 2. Homogeneity Test of Demographic Characteristics and Dependent Variables Before PDNLP-S (N=60)

Variable	Experimental (n=30)	Control (n=30)	χ^2 or t or U	p
Gender			0.22 ^{a)}	.500
Women	27 (90.0)	28 (93.3)		
Men	3 (10.0)	2 (6.7)		
Age (yr)	23.6 $\pm$ 1.10 (22–27)	23.6 $\pm$ 1.99 (22–32)	0.01	.500
Religion			0.08	.391
Yes	10 (33.3)	9 (30.0)		
No	20 (66.7)	21 (70.0)		
Satisfaction with the nursing major			1.31 ^{a)}	.171
Satisfied	17 (56.7)	19 (63.3)		
Neutral	8 (26.7)	10 (33.3)		
Dissatisfied	5 (16.6)	1 (3.4)		
Academic achievement			1.30 ^{a)}	.309
High	13 (43.3)	14 (46.7)		
Middle	16 (53.3)	13 (43.3)		
Low	1 (3.4)	3 (10.0)		
Self-leadership (range, 1–5)	3.43 $\pm$ 0.32	3.46 $\pm$ 0.42	–0.29	.387
Interpersonal relationships (range, 1–5)	3.37 $\pm$ 0.57	3.49 $\pm$ 0.46	–0.87	.194
Clinical performance (range, 1–5)	3.65 $\pm$ 0.52	3.85 $\pm$ 0.61	343.00 ^{b)}	.057
Problem-solving abilities (range, 1–5)	3.75 $\pm$ 0.72	3.85 $\pm$ 0.63	–0.58	.282
Nursing professionalism (range, 1–5)	3.75 $\pm$ 0.57	3.73 $\pm$ 0.51	0.16	.437

Values are presented as number (%) or mean $\pm$ standard deviation (range). PDNLP-S, Practice-Driven Nursing Leadership Program for Students.

^{a)}By Fisher’s exact test. ^{b)}By Mann-Whitney U test.

Table 3. Effects of the PDNLP-S on dependent variables (N=60)

Variable	Pre-test	Post-test	Difference	t or U	p	Effect size d	Power
Self-leadership				3.28	.001	.82	.93
Exp. (30)	3.43±0.32	4.15±0.38	0.72±0.39				
Con. (30)	3.46±0.42	3.89±0.48	0.44±0.29				
Interpersonal relationships				3.07	.002	.78	.91
Exp. (30)	3.37±0.57	3.77±0.66	0.40±0.68				
Con. (30)	3.49±0.46	3.46±0.57	-0.03±0.37				
Clinical performance				268.50 ^{a)}	.004	.73	.88
Exp. (30)	3.65±0.52	4.07±0.58	0.42±0.58				
Con. (30)	3.85±0.61	3.94±0.59	0.09±0.26				
Problem solving abilities				2.20	.017	.57	.71
Exp. (30)	3.75±0.72	4.16±0.50	0.41±0.76				
Con. (30)	3.85±0.63	3.92±0.69	0.07±0.36				
Nursing professionalism				0.50	.311	.13	.13
Exp. (30)	3.75±0.57	3.90±0.53	0.15±0.56				
Con. (30)	3.73±0.51	3.82±0.47	0.09±0.33				

Values are presented as number (%) or mean±standard deviation (range).

PDNLP-S, Practice-Driven Nursing Leadership Program for Students; Exp, Experimental Group; Con, Control Group.

^{a)}By Mann-Whitney U test.

program that required participants to develop their own leadership development plans and implement them over the course of 10 sessions [8,15]. Compared to the study by Park [44], which used the same measurement tool, our study showed a more significant change. This may be because participants cultivated self-confidence and a sense of ownership during the program. Nurses in clinical settings must make decisions and lead the organization of various professionals, making self-leadership crucial for enhancing their own capabilities. Therefore, it is necessary to provide opportunities to improve self-leadership at the student level. In the future, it is necessary to develop and verify the effectiveness of student-led leadership competency development rather than instructor-led approaches.

Secondly, the PDNLP-S enhanced interpersonal relationships, which measures the second attribute of nursing leadership “collaboration.” The AACN has mentioned collaboration with team members, patients, families, communities, and other stakeholders as a core competency for nursing professionals [9]. Interpersonal skills, involving interaction and cooperation with individuals from diverse backgrounds, are essential for nurses at all levels [2]. Furthermore, nurses must assume various complex roles, such as advocates, coordinators, educators, and problem solver, while caring for patients [19,45]. It can be inferred that the PDNLP-S was effective in helping participants understand the importance of collaborative interpersonal relationships with diverse team members and patients, and in acquiring these skills. This serves as a foundation for nursing students to become clinical nurses who can

achieve organizational goals through effective collaboration with various healthcare professionals [9].

Thirdly, the PDNLP-S enhanced clinical performance, which measures the third attribute of nursing leadership “nursing excellence.” It is believed that the participants’ clinical performance improved because the small successes and accomplishments they experienced while implementing their self-established plans boosted their confidence in clinical practice. All nurses need to make continuous efforts to provide evidence-based nursing care and advance nursing practices [15]. Nursing educational institutions should enhance students’ competencies through evidence-based nursing education in undergraduate programs and implement comprehensive career development systems to promote professional growth among nurses in clinical settings, thereby providing effective motivation for their continued development [15,46].

Fourthly, the PDNLP-S enhanced problem-solving abilities, which measures the fourth attribute of nursing leadership “creative problem-solving.” Nurses encounter numerous challenges and obstacles in various nursing duties, ranging from communication difficulties and work-related issues to institutional constraints and even natural disasters [45]. The PDNLP-S improved problem-solving skills by facilitating case analysis, team discussions, and feedback, enabling participants to find and evaluate solutions from various perspectives. Creative problem-solving allows nurses to identify changes in the healthcare environment and go beyond conventional methods to address issues in a creative and proactive manner. Therefore, undergraduate nursing programs should rec-

ognize the importance of creative problem-solving and strive to cultivate this ability [47].

Finally, there was no significant difference in nursing professionalism, which measures the fifth attribute of nursing leadership “influence,” after the implementation of the PDNLP-S. The concept of nursing professionalism encompasses an individual’s philosophy, values, and beliefs [27]. Nursing professionalism, which includes an individual’s perspective on nursing and the nursing profession, is shaped by continuous experiences gained through nursing practice, making it difficult to establish in a short period [46,48]. The lack of improvement in nursing professionalism among the PDNLP-S participants may be attributed to the relatively short duration of the program. As the participants were fourth-year nursing students nearing graduation, they had likely already developed a nursing professionalism to some extent [49]. Consequently, the educational intervention may have resulted in limited observable changes. However, it is noteworthy that, although the increase in nursing professionalism scores in the experimental group compared to the control group was not statistically significant, the post-intervention scores showed an improvement from the pre-intervention levels. This outcome can be regarded positively from the standpoint of nursing education.

Furthermore, this study incorporated activities such as identifying influential nurse leaders, setting organizational goals, and conducting self-evaluations on adaptability to change and innovation to strengthen nursing professionalism. Previous research has demonstrated that professional mentoring, which aids students in establishing role models and understanding the values and ethical responsibilities of nurses in clinical practice, can enhance nursing professionalism [50]. Additionally, simulation training in real patient care scenarios has been shown to develop clinical judgment and professional problem-solving skills, further reinforcing nursing students’ professionalism [50]. Therefore, the development of diverse programs that include self-reflection and active one-on-one feedback from nursing professors or leaders is recommended to effectively foster nursing professionalism.

In this study, the PDNLP-S was implemented with fourth-year nursing students. A previous study has shown that professional values increase as students’ progress through their academic years [11]. Therefore, providing education on nursing professionalism from the first year of nursing school could allow for sufficient time to cultivate a professional nursing outlook. Additionally, negative and unprofessional behaviors among nurses can hinder the development of professionalism in nursing students, and therefore clinical nurses should serve as role models for student nurses [48]. Furthermore, nurses should continuously develop their leadership

competencies to serve as role models for nursing students [46]. Future research should identify factors that influence nursing professionalism and develop more effective programs to enhance and develop these factors.

Unlike previous leadership programs, our study involved participants in developing and implementing their own leadership development plans. Students were informed in advance that they would be evaluated based on SMART goals (specific, measurable, achievable, relevant, and time-bound), the duration and consistency of behavior implementation, and self-reflection. Additionally, providing detailed information about the leadership evaluation method appeared to motivate the experimental group to work harder and more proactively to achieve their goals. Therefore, our findings confirm that the intervention not only enhances nursing leadership but also contributes to achieving the desired learning outcomes in nursing education.

Individuals need to continuously develop their leadership competencies to fulfill their roles [4,15]. Therefore, we propose implementing the PDNLP-S for nursing students in other regions and countries. Furthermore, follow-up studies are needed to develop and evaluate the effectiveness of nursing leadership programs for clinical nurses.

Several limitations have been identified that should be addressed in future research. The experimental and control groups were composed of students from different schools, which may have introduced heterogeneity in educational environments and student characteristics, potentially affecting the results. Future studies should consider assigning both groups within the same school or identifying additional variables to control for the effects of inter-school heterogeneity. The nursing leadership intervention developed in this study was designed as a 20-hour program; however, future studies should explore adjusting the intervention duration to improve the feasibility of the program and assess potential differences in outcomes based on varying intervention periods. Furthermore, while this study utilized practice-oriented textbooks to implement the program, a limitation was the lack of nursing expert validation prior to its execution. Future research would benefit from conducting program validation when implementing interventions. This approach would help verify the adaptability and feasibility of the nursing leadership program. Additionally, future studies should aim to develop a stepwise program designed to enhance nursing professionalism, with careful consideration of students’ academic levels and clinical practice experience.

Conclusion

This study demonstrates that the PDNLP-S enhances nursing students' self-leadership, interpersonal relationships, clinical performance, and problem-solving abilities. Hence, the PDNLP-S can foster nursing leadership competencies in nursing students and contribute to developing future nursing leaders. Our findings indicate that leadership competencies should be nurtured among student nurses as they begin their undergraduate education. Additionally, future studies should select and organize important content to develop a more systematic and standardized nursing leadership program.

Article Information

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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Data Sharing Statement

Please contact the corresponding author for data availability.

Author Contributions

Conceptualization or/and Methodology: SK, YJJ, HSK, SHJ, EJJ. Data curation or/and Analysis: SK, YJJ. Funding acquisition: HSK. Investigation: SK, YJJ. Project administration or/and Supervision: HSK, SHJ. Resources or/and Software: SK, YJJ. Validation: SK, YJJ, HSK, SHJ, EJJ. Visualization: SK, YJJ, HSK, SHJ, EJJ. Writing: original draft or/and Review & Editing: SK, YJJ, HSK, SHJ, EJJ. Final approval of the manuscript: all authors.

References

1. Northouse PG. Leadership: theory and practice. 7th ed. SAGE Publications; 2016.
2. Booher L, Yates E, Claus S, Haight K, Burchill CN. Leadership self-perception of clinical nurses at the bedside: a qualitative descriptive study. *J Clin Nurs*. 2021;30(11-12):1573-1583. <https://doi.org/10.1111/jocn.15705>
3. Kim JS, Kim YM, Jang KS, Kim BN, Jeong SH. Concept analysis of nursing leadership. *J Korean Acad Nurs Adm*. 2015; 21(5):575-586. <https://doi.org/10.1111/jkana.2015.21.5.575>
4. Aqtash S, Alnusair H, Brownie S, Alnjadat R, Fonbuena M, Perinchery S. Evaluation of the impact of an education program on self-reported leadership and management competence among nurse managers. *SAGE Open Nurs*. 2022;8: 23779608221106450. <https://doi.org/10.1177/23779608221106450>
5. Kim J, Kim MA, Lee SJ, Kim EJ. Effects of leadership program on self-leadership and self-esteem in nursing students. *J Korean Data Anal Soc* [Internet]. 2015 [cited 2023 Aug 30];17(1B): 575-586. Available from: <https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE08964828>
6. Brown A, Crookes P, Dewing J. Clinical leadership in pre-registration nursing programmes: an international literature review. *Contemp Nurse*. 2015;51(1):39-55. <https://doi.org/10.1080/10376178.2015.1095055>
7. Miles JM, Scott ES. A new leadership development model for nursing education. *J Prof Nurs*. 2019;35(1):5-11. <https://doi.org/10.1016/j.profnurs.2018.09.009>
8. Cummings GG, Lee S, Tate K, Penconek T, Micaroni SP, Paananen T, et al. The essentials of nursing leadership: a systematic review of factors and educational interventions influencing nursing leadership. *Int J Nurs Stud*. 2021;115:103842. <https://doi.org/10.1016/j.ijnurstu.2020.103842>
9. American Association of Colleges of Nursing. The essentials: core competencies for professional nursing education [Internet]. American Association of Colleges of Nursing; 2021 [cited 2024 Dec 30]. Available from: <https://www.aacnnursing.org/Essentials/Download-Order>
10. Korean Accreditation Board of Nursing Education. Standard book for accreditation board of nursing education [Internet]. Korean Accreditation Board of Nursing Education; 2017 [cited 2024 Dec 30]. Available from: <http://www.kabone.or.kr/eng/edu/accreditation.do>
11. Démeh W, Rosengren K. The visualisation of clinical leadership in the content of nursing education: a qualitative study of nursing students' experiences. *Nurse Educ Today*. 2015;35(7): 888-893. <https://doi.org/10.1016/j.nedt.2015.02.020>
12. Cummings GG, MacGregor T, Davey M, Lee H, Wong CA, Lo E, et al. Leadership styles and outcome patterns for the nursing workforce and work environment: a systematic review. *Int J Nurs Stud*. 2010;47(3):363-385. <https://doi.org/10.1016/j.ijnurstu.2009.08.006>
13. Harley J. Developing self-awareness for effective nurse leadership. *Nurs Manag* (Harrow). 2024 May 22 [Epub]. <https://doi.org/10.7748/nm.2024.e2124>
14. Kaiser L, Conrad S, Neugebauer EA, Pietsch B, Pieper D. Interprofessional collaboration and patient-reported outcomes in inpatient care: a systematic review. *Syst Rev*. 2022;11(1):169.

<https://doi.org/10.1186/s13643-022-02027-x>

15. Jang KS, Lee MH, Kim BN, Kim YM, Kim EA, Kim JS, et al. Practice-driven nursing leadership. Hakjisa Medical; 2018.
16. Kohnen D, De Witte H, Schaufeli WB, Dello S, Bruyneel L, Sermeus W. Engaging leadership and nurse well-being: the role of the work environment and work motivation-a cross-sectional study. *Hum Resour Health*. 2024;22(1):8. <https://doi.org/10.1186/s12960-023-00886-6>
17. Neck CP, Manz CC, Houghton JD. Self-leadership: the definitive guide to personal excellence. 2nd ed. Sage Publications; 2019.
18. Ntshingila N, Downing C, Hastings-Tolsma M. A concept analysis of self-leadership: the “bleeding edge” in nursing leadership. *Nurs Forum*. 2021;56(2):404-412. <https://doi.org/10.1111/nuf.12551>
19. Kowalski MO, Basile C, Bersick E, Cole DA, McClure DE, Weaver SH. What do nurses need to practice effectively in the hospital environment?: an integrative review with implications for nurse leaders. *Worldviews Evid Based Nurs*. 2020;17(1):60-70. <https://doi.org/10.1111/wvn.12401>
20. Leonard JC, Whiteman K, Stephens K, Henry C, Swanson-Biearman B. Improving communication and collaboration skills in graduate nurses: an evidence-based approach. *Online J Issues Nurs*. 2022;27(2):Man03. <https://doi.org/10.3912/OJIN.Vol27No02Man03>
21. Ariga RA, Aurelia R, Anak Ampun PT, Hutabarat CP, Panjaitan FB. Enhancing nursing excellence: exploring the relationship between nurse deployment and performance. *Int J Environ Res Public Health*. 2024;21(10):1309. <https://doi.org/10.3390/ijerph21101309>
22. Nachtergaele S, De Roo N, Allart J, De Vriendt P, Embo M, Cornelis E. Exploring influencing factors to clinical leadership development: a qualitative study with healthcare professionals in Flemish nursing homes. *BMC Health Serv Res*. 2024;24(1):1169. <https://doi.org/10.1186/s12913-024-11613-9>
23. Choi MS. A study on the relationship between teaching effectiveness of clinical nursing education and clinical competency in nursing students [master's thesis]. Seoul: Ewha Woman's University; 2005.
24. Nabizadeh-Gharghozar Z, Alavi NM, Ajorpaz NM. Clinical competence in nursing: a hybrid concept analysis. *Nurse Educ Today*. 2021;97:104728. <https://doi.org/10.1016/j.nedt.2020.104728>
25. Lee WS, Park SH, Choi EY. Development of a Korean problem solving process inventory for adults. *J Korean Acad Fundam Nurs* [Internet]. 2008 [cited 2024 Dec 30];15(4):548-557. Available from: <https://j.kafn.or.kr/upload/pdf/jkafn-15-4-548.pdf>
26. Guibert-Lacasa C; Vázquez-Calatayud M. Nurses' clinical leadership in the hospital setting: a systematic review. *J Nurs Manag*. 2022;30(4):913-925. <https://doi.org/10.1111/jonm.13570>
27. Yeun EJ, Kwon YM, Ahn OH. Development of a nursing professional values scale. *J Korean Acad Nurs*. 2005;35(6):1091-1100. <https://doi.org/10.4040/jkan.2005.35.6.1091>
28. He X, Mao Y, Cao H, Li L, Wu Y, Yang H. Factors influencing the development of nursing professionalism: a descriptive qualitative study. *BMC Nurs*. 2024;23(1):283. <https://doi.org/10.1186/s12912-024-01945-6>
29. Jung KS, Oh EJ. The effects of nursing professionalism, nurse's image on self-leadership in nursing students. *J Korean Acad Ind Coop Soc*. 2021;22(10):66-75. <https://doi.org/10.5762/KAIS.2021.22.10.66>
30. Hajizadeh A, Zamanzadeh V, Kakemam E, Bahreini R, Khodayari-Zarnaq R. Factors influencing nurses participation in the health policy-making process: a systematic review. *BMC Nurs*. 2021;20(1):128. <https://doi.org/10.1186/s12912-021-00648-6>
31. Välimäki M, Hu S, Lantta T, Hipp K, Varpula J, Chen J, et al. The impact of evidence-based nursing leadership in health-care settings: a mixed methods systematic review. *BMC Nurs*. 2024;23(1):452. <https://doi.org/10.1186/s12912-024-02096-4>
32. Williamson GR, Kane A, Evans S, Attrill L, Cook F, Nash K. Student nurses as a future general practice nursing workforce: implementing collaborative learning in practice: implications for placement learning and patient access: a mixed methods study. *BMC Nurs*. 2023;22(1):326. <https://doi.org/10.1186/s12912-023-01501-8>
33. Bae SH, Park JS. Development and evaluation of extracurricular coaching programs for improving communication skills and leadership among nursing students. *J Korean Acad Soc Nurs Educ*. 2015;21(2):202-214. <https://doi.org/10.5977/jkasne.2015.21.2.202>
34. Kim KH. The effects of action learning on self-leadership and class satisfaction in nursing students. *J Learn Cent Curric Instr*. 2019;19(23):1221-1236. <https://doi.org/10.22251/jlcci.2019.19.23.1221>
35. Huston CJ. Leadership roles and management function in nursing: theory and application. 11th ed. Lippincott Williams & Wilkins; 2023.
36. James AH, Watkins D, Carrier J. Perceptions and experiences of leadership in undergraduate nurse education: a narrative

- inquiry. *Nurse Educ Today*. 2022;111:105313. <https://doi.org/10.1016/j.nedt.2022.105313>
37. Statistical power analyses using G*Power 3. 1: tests for correlation and regression analyses. *Behav Res Methods*. 2009;41(4):1149-1160. <https://doi.org/10.3758/BRM.41.4.1149>
 38. Dick W. A model for the systematic design of instruction. In: Tennyson RD, Schott F, Seel NM, Dijkstra S, editors. *Instructional design: international perspectives: theory, research, and models*. Routledge; 2013. p. 361-370.
 39. Houghton JD, Neck CP. The revised self-leadership questionnaire: testing a hierarchical factor structure for self-leadership. *J Manag Psychol*. 2002;17(8):672-691. <https://doi.org/10.1108/02683940210450484>
 40. Buhrmester D, Furman W, Wittenberg MT, Reis HT. Five domains of interpersonal competence in peer relationships. *J Pers Soc Psychol*. 1988;55(6):991-1008. <https://doi.org/10.1037//0022-3514.55.6.991>
 41. Han N, Lee DG. Validation of the Korean version of the Interpersonal Competence Questionnaire in Korean college students. *Korean J Couns Psychother* [Internet]. 2010 [cited 2024 Dec 30];22(1):137-156. <https://www.kci.go.kr/kciportal/ci/sereArticleSearch/ciSereArtiView.kci?sereArticleSearchBean.artiId=ART001422199>
 42. Lee WH, Kim CJ, Yoo JS, Hur HK, Kim KS, Lim SM. Development of a clinical competency measurement tool for students. *J Nurs Sci*. 1991;13:17-29.
 43. Han SS, Kim MH, Yun EK. Factors affecting nursing professionalism. *J Korean Acad Soc Nurs Educ*. 2008;14(1):73-79. <https://doi.org/10.5977/JKASNE.2008.14.1.073>
 44. Park JH. The effect of self-leadership program for nursing students on empowerment, self-directed learning, and happiness. *J Korea Acad Ind Coop Soc*. 2019;20(7):61-67. <https://doi.org/10.5762/KAIS.2019.20.7.61>
 45. Wakefield MK, Williams DR, Le Menestrel S, Flaubert JL; National Academies of Sciences, Engineering, and Medicine. *The future of nursing 2020-2030: charting a path to achieve health equity*. National Academies Press; 2021. <https://doi.org/10.17226/25982>
 46. Ni YX, Wu D, Bao Y, Li JP, You GY. Nurses' perceptions of career growth: a qualitative descriptive study. *J Adv Nurs*. 2022;78(11):3795-3805. <https://doi.org/10.1111/jan.15376>
 47. Ma X, Yang Y, Wang X, Zang Y. An integrative review: developing and measuring creativity in nursing. *Nurse Educ Today*. 2018;62:1-8. <https://doi.org/10.1016/j.nedt.2017.12.011>
 48. Bimray P, Jooste K, Julie H. Professionalism experiences of undergraduate learner nurses during their 4-year training programme at a Higher Education Institution in the Western Cape, South Africa. *Curationis*. 2019;42(1):e1-e8. <https://doi.org/10.4102/curationis.v42i1.2030>
 49. Park HR, Jun H, Ban MK. The effects of transitional shock and incivility experienced by nursing student on nursing professionalism. *J East West Nurs Res*. 2021;27(1):78-86. <https://doi.org/10.14370/jewnr.2021.27.1.78>
 50. Miao C, Liu C, Zhou Y, Zou X, Song L, Chung JW, et al. Nurses' perspectives on professional self-concept and its influencing factors: a qualitative study. *BMC Nurs*. 2024;23(1):237. <https://doi.org/10.1186/s12912-024-01834-y>