

ARTICLE INFORMATION

Received: September, 29, 2025

Revised: March, 26, 2026

Available online: March, 27, 2026

at : <https://e-jurnal.iphorr.com/index.php/minh>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

Eva Suryanti Rajagukguk^{1*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹,
Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow. La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

Abstract

Background: The quality of nursing services within healthcare institutions is closely linked to the competence of nurses. Competence development is strongly supported by structured and effective mentoring, which facilitates the clinical adaptation of newly graduated nurses. Through preceptorship, novice nurses gain opportunities to integrate into clinical practice, while preceptors serve as role models and supervisors, guiding the professional growth of their mentees. Evaluating the implementation of preceptorship programs is essential to assess both the mentoring process and the experiences of preceptors and preceptees. Such evaluations provide valuable insights for strengthening and advancing preceptorship initiatives in hospital settings.

Purpose: To evaluate the implementation of preceptorship programs in hospitals.

Method: A scoping review was conducted, involving a comprehensive search of electronic databases such as PubMed, MEDLINE (via EBSCO), and ScienceDirect (Elsevier). The search strategy employed relevant keywords and MeSH terms related to nursing, preceptorship programs, and hospital contexts. Data extraction emphasized outcomes associated with program effectiveness, and the findings were synthesized through descriptive and narrative approaches, integrating both quantitative and qualitative evidence.

Results: Preceptorship programs facilitate the adaptation of novice nurses by enhancing clinical skills, confidence, and professional identity, while contributing to nurse retention and improved quality of care. However, challenges such as preceptor workload and limited institutional support remain. Overall, preceptorship demonstrates positive impacts, though issues of sustainability and standardization require further attention.

Conclusion: Preceptorship plays a significant role in strengthening nurse competence and improving organizational outcomes. Nevertheless, ensuring sustainability and establishing standardized frameworks are critical for optimizing its long-term effectiveness.

Keywords: Hospitals; Nurses; Preceptorship Program.

INTRODUCTION

Improving the quality of nursing services will have an impact on how patients receive health care. To provide quality nursing care to patients and the environment, it is critical to train excellent nursing personnel. Nurses must develop their competencies through a systematic educational program. The preceptorship program allows new nurses to adapt their clinical training to bridge the gap between

theory and practice (Jeong., Ju., Choi., Kim., 2021). This is based on the competency of nurses who provide patient care, which is influenced by mentorship and the learning process in the clinical practice setting. A preceptor in the field provides mentorship to nursing students and new nurses at the hospital. Preceptors serve as role models and supervisors, facilitating the development of

preceptees into professionals suitable for practice. A consistent approach to the preceptor experience is required, and preceptor competence must be measured or assessed to ensure the desired results (Bartlett, Um, Luca, Krass, & Schneider, 2020).

The preceptor program can increase the confidence and competence of newly graduated nurses (Irwin, Bliss, & Poole, 2018), with the aim of this program to develop competent nurses who are able to provide quality nursing care in integrating theory and practice. A preceptor has competencies that consist of a combination of knowledge and skills, the ability to implement them in clinical practice with effective communication. To ensure a consistent approach or assessment for preceptors with preceptorship experience, their competencies can be measured or assessed to ensure that delivery is of a standard that achieves the desired outcomes. Assessment to establish benchmarks for comparison of the effects of change over time such as the effects of educational interventions such as training (Bartlett et al., 2020). To determine the effectiveness of this program, it is necessary to evaluate it by collecting feedback on the nursing mentorship program from preceptors who provide clinical mentorship (Tucker, Atkinson, Kelly, Parkin, McKenzie, Scott, & Davidson, 2019; Gonzalez, Drescher, Neil, & Eberman, 2023). Mentors need support and training in performing their role, evaluation can be done to assess this program in terms of antecedents, transactions, outcomes and behaviors (Anwar, Supriyati, & Tolla, 2019). The evaluation was conducted by administering an eight-item questionnaire with a four-point Likert scale and separate interviews of preceptors and preceptees (Gatewood, De Gagne, Kuo, & O'Sullivan, 2020).

RESEARCH METHOD

This scoping review was conducted to map existing evidence on preceptorship and clinical mentoring in nursing. The search strategy targeted three electronic databases: PubMed, MEDLINE (via EBSCO full-text), and ScienceDirect (Elsevier). Keywords were developed using MeSH terms and

structured according to the PCC framework:

Population: (((Nurses) OR (Nursing Personnel)) OR (Health care Professionals)) OR (Registered Nurse).

Concept: (((("Preceptorship"[Mesh]) AND ("Preceptorship"[Mesh] OR (Clinical Mentorings))) AND (((("Preceptorship"[Mesh]) OR (Clinical Mentorings)) OR (Clinical Supervision))) AND (((("Preceptorship"[Mesh]) OR (Clinical Mentorings)) OR (Clinical Supervision)) OR (Clinical Practicum))).

Context: ((Hospitals) OR (Health Facilities)) OR (Health Services).

Articles retrieved from the databases will be subjected to predefined inclusion and exclusion criteria. The inclusion criteria encompass studies published in English between 2018 and 2025 involving nurses, preceptor nurses, and novice nurses engaged in preceptorship programs, as well as evaluations conducted within relevant conceptual frameworks and contextual settings. Exclusion criteria will apply to studies that do not involve nurses or fail to explicitly address preceptorship programs.

Both published and unpublished studies were sought. An initial limited search of PubMed was performed to identify relevant articles, and text words from titles, abstracts, and index terms were used to refine the full search strategy for each database. Reference lists of included studies were also screened for additional sources.

All identified citations were imported into Mendeley, where duplicates were removed. Screening was conducted in Covidence. Titles and abstracts were independently reviewed by at least two reviewers against predefined inclusion criteria, with potentially relevant articles retrieved in full for detailed assessment. Reasons for exclusion at the full-text stage were documented. Disagreements were resolved through discussion, and when consensus was not reached, a third reviewer adjudicated.

The study selection process and search results were reported in full using the PRISMA-ScR flow diagram.

Eva Suryanti Rajagukguk^{1*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

RESEARCH RESULTS

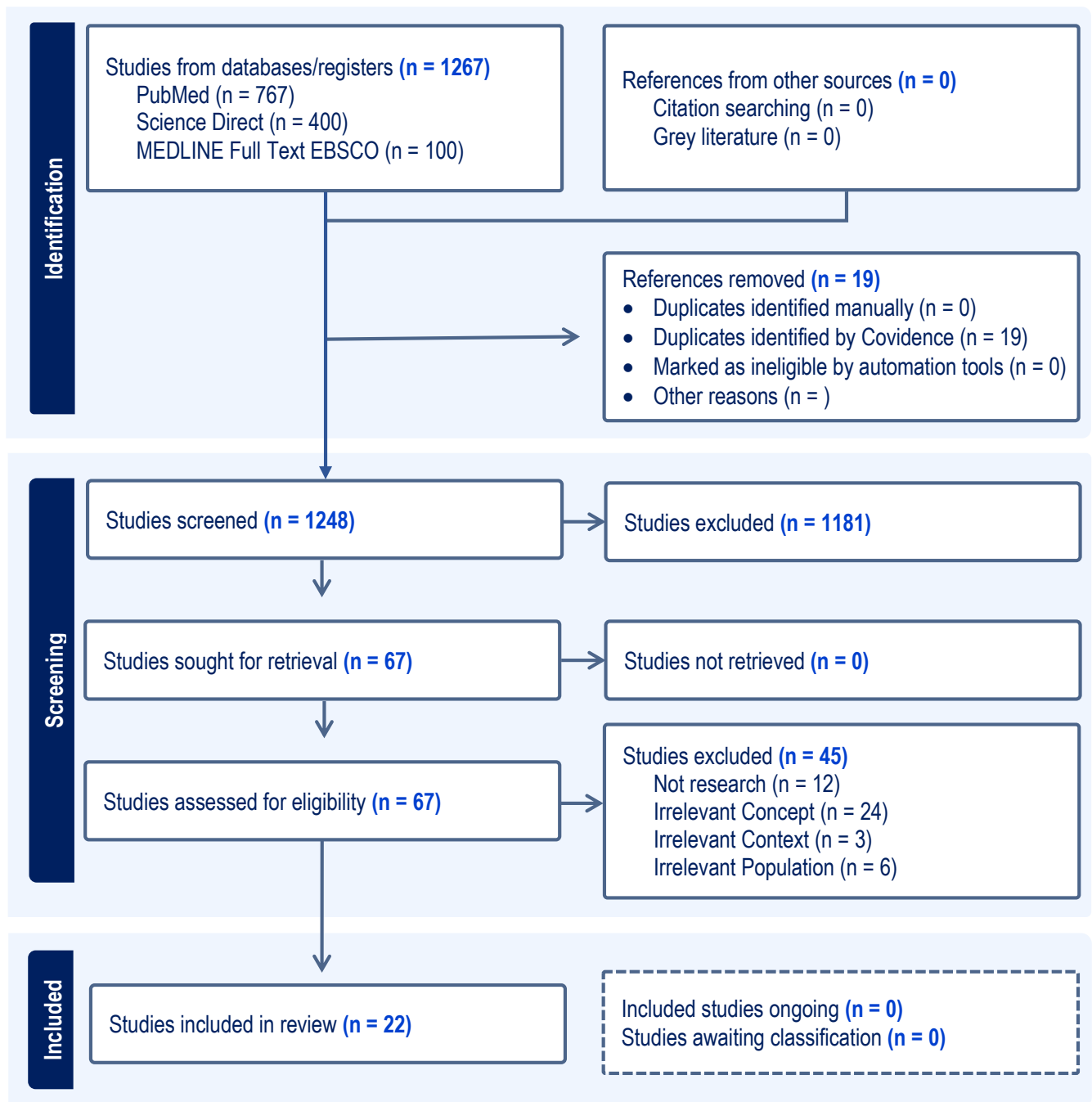


Figure 1. PRISMA Flow Diagram

Eva Suryanti Rajagukguk^{1*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Table 1. The Main Characteristics of the Included Studies

(Author, Year) (Country)	Purpose	Method	Results
(Alhassan et al., 2022) (Ghana)	To explore the perceptions of preceptors regarding the support they receive in the preceptorship role, their commitment to the role, and the incentives that are important to them.	A quantitative descriptive cross-sectional study. Quantitative methods were used for all aspects of data collection and analysis. An online survey that incorporated three questionnaires and a demographic information section was used to collect data from 54 preceptors in four hospitals in the northern part of Ghana. Data was analyzed using the Statistical Package for Social Sciences (SPSS) for Windows, version 26. Descriptive statistics, correlations, and multiple linear regression were used to analyze the data.	Preceptors reported high levels of support in the preceptor role and perceived themselves to be highly committed to the role. Preceptors identified preceptor training, continuing education opportunities, and textbooks on effective preceptorship as the three most important incentives to them. No associations were found between perceived commitment and demographic characteristics of participants.
(Boakye et al., 2025) (Ghana)	To explore the experiences, preparedness, instructional practices and roles of preceptors supervising nursing students in a clinical setting.	Exploratory descriptive study that used qualitative data collection method to gather data on receptors' roles, preparedness and familiarity with the basic principles of teaching and learning.	The study highlights the need for comprehensive preceptor training programs that provide robust onboarding, set clear expectations and equip preceptors with diverse evidence-based teaching methodologies tailored to healthcare contexts. Continued research involving larger samples, multimodal data and stakeholder perspectives can inform ongoing program refinement.
(Mashayekh et al., 2024) (Iran)	To determine the effectiveness of the preceptorship training program for the participation of clinical nurses in the education of nursing students	This quasi-experimental study was conducted in 2023 at the teaching hospital in Tehran, Iran. The sample consisted of 66 nurses from a teaching hospital selected using the accessible method and randomly were put into two groups. The workshop addressed the educational needs of preceptors and students, their readiness for their role, and strategies to effectively support students. Prior to the study, the nurses' level of participation was assessed utilizing a valid IMSOC questionnaire that gauged their involvement in guiding nursing students. The participation rate	The two groups were homogeneous in terms of demographic characteristics. The average score for nurses' participation in the education of students before the intervention was 101.84 ± 15.42 in the test group and 107.24 ± 10.53 in the control group; these two groups were not significantly different ($P=0.10$). After the intervention, the scores reached 118.90 ± 15.11 in the test group and 106.21 ± 11.96 in the control group, indicating a significant difference ($P<0.001$). A comparison of the

Eva Suryanti Rajagukguk^{*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

(Author, Year) (Country)	Purpose	Method	Results
		was reassessed after one month using the same questionnaire. The data were analyzed using SPSS version 19.	nurses' participation scores in the test group indicated a significant difference from the pretest to the posttest, with the improvement in all nurses' participation scores ($P<0.001$). However, in the control group, this difference was not significant ($P=0.41$).
(Al Harbi et al., 2021) (Saudi Arabia)	To compare expatriate and Saudi nursing staff's perceptions of factors that influence their role as preceptors of nursing students	A descriptive comparative study design using a self-administered survey (Grove, Burns, & Gray, 2012) composed of three sections was used. The first section gathered general information about respondents, including their demographic information, education history, work history and current practices for the recruitment and education of preceptors. The second section consisted of a previously validated survey tool adapted from O'Brien et al. (2014): the Clinical Preceptor Experience Evaluation Tool (CPEET). Permission to use the tool was sought from and provided by the original author. The CPEET comprises 39 items with four domains, including the preceptors' role, challenges, education and experience, and satisfaction. The third section was developed by the researcher to further address the study aims. It included factors related to organizations and was based on items gathered from the literature about preceptorship and culture. These items were obtained from the Saudi nurses' experience in clinical practice and selected domains from the Purnell Framework. The Purnell Framework helps all healthcare providers to learn about cultural characteristics and ideas, and to identify the various circumstances that influence an individual's cultural identity.	Most preceptors were expatriate nurses (70.5%), while Saudi preceptors represented only 29.5%. The findings show that there is a difference between Saudi and expatriate nurses in their perception of the role, that cultural factors influence the role of expatriate preceptors and that organizational factors influence both groups.

Eva Suryanti Rajagukguk*, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

(Author, Year) (Country)	Purpose	Method	Results
(Lau et al., 2024) (Singapore)	To explore the preceptors' experience to understand their challenges and support received in the facilitation of the preceptorship and learning experience of the nursing students in an acute care hospital in Singapore.	The descriptive qualitative exploratory design was adopted for researchers to gain insight and understand the preceptors' experience in precepting final year nursing students based on their direct description of their experiences and providing a comprehensive summary. Semi-structured interviews were conducted from June to October 2021 with ten registered nurses working in an acute hospital. Thematic analysis was conducted.	Three main themes emerged from the thematic analysis: (1) preceptor-student relationship; (2) barriers and challenges to successful preceptorship; and (3) outcomes of successful preceptorship.
(Gholizadeh et al., 2022) (Iran)	To assess preceptor nurses' perceived benefits, rewards, support, and commitment to the role in a new nurse preceptorship program in Iran and to examine the relationships between these concepts.	An exploratory descriptive correlational design was employed to examine the experience of preceptor nurses being engaged in a new nurse preceptorship program. A descriptive correlational study was employed, and using total population sampling method, 45 preceptor nurses were recruited from a tertiary referral teaching hospital in Iran. Data were collected using the Preceptor's Perception of Benefits and Rewards Scale, the Preceptor's Perception of Support Scale, and the Commitment to the Preceptor Role Scale. Descriptive statistics and correlational analysis were used to analyze data.	Participants were all female and with age range between 26 to 46 years (35.86 ± 4.62). All participants were employed on a full-time basis, and they had a bachelor's degree in nursing, except for two participants who had postgraduate degrees. Their work experience as registered nurses ranged from 5 to 20 years ($12.5 \text{ years} \pm 4.12$), and they had precepted at least ten new nurses previously, with their preceptorship experience ranging from 1 to 5 years (3.15 ± 1.46). None of participants had received any form of formal preceptorship training at the time of the study.
(Kim et al., 2022) (South Korea)	To determine the preliminary effects of developing and applying a reflective practice program for preceptor nurses who experience stressful situations to convert negative emotions into positive ones.	A mixed research design was used to develop and apply the PRPP and to evaluate the preliminary effect produced. post-test design was utilized. Qualitative research was conducted by adopting a generic qualitative research design to explore participants' views and experiences to understand the phenomenon in depth and to help researchers articulate participants' perspectives [29,30]. The contents of self-reflective journals prepared by preceptor nurses who participated in the program were analyzed to explore their experience and reflective practice process during the preceptorship. To assess the effectiveness of PRPP, a one-group pretest-This	The PRPP helped nurses improve their emotional intelligence through reflective practice and convert stress into a more positive direction. Therefore, at the organizational and national levels, a reasonable compensation system to provide support workforce and to the work of preceptor nurses should be established.

Eva Suryanti Rajagukguk^{*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

(Author, Year) (Country)	Purpose	Method	Results
		study was conducted over 12 weeks from March to May 2022 on 47 participant nurses in South Korea. Preceptor Reflective Practice Program (PRPP) was conducted in parallel with writing a reflective journal and a reflective practice workshop. Data collection was integrated through quantitative and qualitative approaches. Quantitative data were collected through questionnaires on stress coping, the burden of preceptors, social support, and emotional intelligence, and analyzed by SPSS WIN 26.0 program. The questionnaire data were analyzed after the preceptor nurses had written a reflective journal.	
(Ryan et al., 2024) (Australia)	To develop an evidence-based framework of nurse preceptor competency domains and competency descriptors for use in nurse preceptor professional development.	A modified e-Delphi study. Methods: A three-phase e-Delphi method informed the study that was conducted between March and September 2023. In the first preparatory phase an expert group distilled the results of a previous literature review identifying seven preceptor competency domains and more than 200 competency descriptors. Two e-Delphi rounds followed. A 70% rater agreement response threshold was chosen as appropriate in this study. The CREDES reporting framework was followed.	In the preparatory phase, the expert group (n=6) reached consensus on six preceptor domains and 57 preceptor descriptors. In Round 1, nurse preceptors (n= 89) rated the domains and descriptors using a four-point Likert scale; from not important to very important. Six domains and 34 competency descriptors were ranked as very important Round 2 participants (n=30) who opted in from Round 1 indicated their 100% agreement with the Round 1 results. The results reveal that preceptors resonate intuitively with the six domains Role model, Facilitator, Leader, Evaluator, Teacher and Coach and the related descriptors.
(Amaral et al., 2023) (Portugal)	To identify the aspects that should be considered when selecting a nurse preceptor.	A qualitative study was carried out based on Grounded Theory using Strauss and Corbin's version. The study took place in a medicine ward and a surgery ward of a hospital in the Lisbon metropolitan area. The authors conducted fourteen semi-structured interviews with nurses who were at different stages of Benner's Professional Development Model and with different outlooks on nursing preceptorship. The initial script was reorganized after the pilot test. It was also adjusted after the first	In the skills category, supported by all participants, five subcategories were evidenced: Communicational skills are fundamental to establish a relationship with the student and to ensure permanent communication that is open and assertive. Relational skills, which are strongly related to communication skills, enable an efficient preceptorship with regular feedback on the student's performance. Reflective skills are important to analyze the nurse's practice in order to

Eva Suryanti Rajagukguk*, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow. La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

(Author, Year) (Country)	Purpose	Method	Results
		exploratory interviews and after the in-depth interviews in order to reflect the interviewees' work experience and outlooks on preceptorship. The interviews had an average duration of 45 min and were audio recorded. Theoretical sampling was conducted considering the needs identified in data coding until we reached theoretical saturation. Data analysis began after the first interview, first by open coding, followed by axial and selective coding, always in a logic of constant comparison with theory. Ethical principles, scientific integrity and methodological rigour were ensured throughout the study.	improve it and to analyze the student's characteristics and style of learning, as well as to assess them. When it comes to technical-scientific skills, it is recognized that the theoretical knowledge and the professional experience within one's clinical area are important in preceptorship. Emotional skills help the nurse to begin and maintain a relationship with the student, as well as to manage conflicts and to face challenges. In the individual characteristics category, also supported by all interviewees, four subcategories emerged. Perceptiveness, or the ability to observe, is important to integrate attitudes and postures that nurses use in preceptorship and also to observe the performance of the student. There must be responsibility not only towards the nurse's professional practice but also towards the preceptorship, ensuring the safety of the patient, the health team and of the student. The motivation to be a preceptor, to take on a role one enjoys, gives greater satisfaction to the preceptor, who develops a more efficient relationship with the student and, thus, allows for a more successful preceptorship. Professional initiative, which manifests itself through self-learning and the subsequent professional growth, promotes the development of the nurse's skills, which are fundamental to the preceptorship.
(Joseph et al., 2022) (India)	To identify the transitional challenges among new nursing graduates and the role of preceptor in various transitional challenges.	The study adopted descriptive correlational design. The data were collected from 314 participants working in six different tertiary level public hospitals situated in six states of India. Casey-Fink graduate nurse experience survey-revised was used to collect the data and methods of this study were in line with the guidelines of Strengthening the Reporting of Observational studies in Epidemiology (STROBE). Descriptive and Inferential statistics were calculated using SPSS software version 16.	New nursing graduates are uncomfortable in performing numerous procedures independently and in accordance with them increased support would help them feel more supported or integrated into the unit. The study also found positive relationship between preceptor support and organizing and prioritizing, communication/leadership, professional satisfaction, and job satisfaction.

Eva Suryanti Rajagukguk^{*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

(Author, Year) (Country)	Purpose	Method	Results
(Hansen. W., 2021) (South Africa)	To assess the perceptions of newly qualified nurses on the guidance given by their preceptors towards becoming experts in practice at a Level II regional hospital in the Western Cape.	The study was descriptive, as it attempted to assess and describe 'what' the perceptions of newly qualified nurses are of guidance by preceptors towards becoming experts in practice. There was no manipulation of any variables or interventions, hence, the study was non-experimental. It was cross-sectional, because the data were collected only once. The design was quantitative, because the description was in the form of measurement (numerical) The researcher developed the instrument information obtained from the literature and personal experiences of the researcher.	Respondents had more positive experiences than negative ones. The respondents indicated that for the role and characteristics of the preceptor expectations were met for knowledgeability, professionalism and contribution to teamwork. Furthermore, the results indicated that the respondents would recommend preceptorship.
(Kim & Shin, 2025) (South Korea)	To identify significant factors affecting clinical teaching behavior among South Korean preceptor nurses	The study used a cross-sectional design. Methods: Participants included 216 preceptor nurses in Seoul, Republic of Korea, who responded to an online questionnaire based on the Critical Reflection Competency Scale, Nurse Clinical Reasoning Scale, Perception of Importance of Patient Safety Management Scale, and Clinical Teaching Behavior Inventory. Collected data were analyzed using descriptive statistics, an independent t-test, one-way ANOVA, Scheffe's test, Pearson's correlation coefficient, and hierarchical multiple regression using IBM SPSS Statistics 29.0.	Factors influencing clinical teaching behavior included the perception of importance of patient safety management ($\beta = 0.35$, $p < .001$), clinical reasoning ($\beta = 0.34$, $p < .001$), critical reflection ($\beta = 0.17$, $p = .007$), preceptor nurses' workload reduction ($\beta = 0.12$, $p = .005$), and the preceptor–preceptee work–match ratio of schedule alignment in shift rotations ($\beta = 0.09$, $p = .042$). These factors accounted for 66.7 % of the variance in preceptors' clinical teaching behavior ($F = 48.81$, $p < .001$).
(Jeong et al., 2021) (South Korea)	To confirm the implementation process and effect of developing and applying a preceptor education program based on the One- Minute Preceptor Model to foster the competence of preceptor clinical nurse.	This PAR study based on the conceptual model of Zuber-Skerritt and colleagues involved collecting and analyzing data in an integrated research method through a mixed-method approach while going through the plan, action, evaluation, and reflection stage.	There was no significant change in CCCP or GICC-15 results among preceptor nurses. However, nurses' experiences were associated with the growth and development of competencies such as evidence-based practice, quality feedback, and self-reflection.

Eva Suryanti Rajagukguk^{*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow. La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

(Author, Year) (Country)	Purpose	Method	Results
(Chen et al., 2023) (Taiwan)	To explore the differences in perspectives on the core competencies of nurse preceptors among postgraduate-year nurses, clinical nursing preceptors and head nurses	Cross-sectional design with nominal group technique (NGT). The sample consisted of 32 postgraduate-year nurses, 42 preceptors and 27 head nurses. Two rounds of NGT were used to collect the group opinions.	While the rank/level of importance varied, three groups all agreed that teaching traits, clinical nursing profession, communication and collaboration, teaching pedagogy, reaction of contingency and consultation of academic writing were important core competencies for nurse preceptors. The three groups disagreed on critical thinking and reflection, as well as lifelong learning. This study clarifies cognitive differences and expectations among three groups and can assist medical institutes in designing preceptor training courses.
(Hong et al., 2021) (South Korea)	To investigate preceptors' experiences in educating new graduate nurses and the effect they had on clinical teaching behavior (CTB) based on whether they participated in a preceptor training program	A descriptive online survey method was used, and the participants included 180 registered nurses who were preceptors. The Clinical Teaching Behavior Inventory (CTBI-22) was used, and perceptions of teaching experiences were measured by six items. Data was analyzed using multiple linear regression.	Preceptors working at general hospitals or hospitals were less likely to have participated in a preceptor training program than those working at tertiary hospitals. The overall mean score of CTB was 89.30, and "guiding inter-professional communication" showed the lowest mean score. Positive perceptions of preceptorship experiences were positively related with CTB, and the number of precepting experiences affected CTB only for nurses having undergone preceptor training courses.
(Chen et al., 2021) (Taiwan)	To explore core competencies of nurse preceptors based on the perspectives of postgraduate-year nurses, nurse preceptors and head nurses.	This study adopted a consensus-building approach which comprised two phases: usage of the NGT and an expert panel discussion. The participants of the NGT comprised of nurse preceptors, postgraduate-year (PGY) nurses and head nurses. This study was conducted from May to November 2020.	Seven core competencies of nurse preceptors were derived, in order of declining importance: teaching traits, clinical nursing profession, communication and collaboration, teaching pedagogy, reaction of contingency, critical thinking and reflection and consultation on academic writing. All participants perceived that teaching traits (198 points) and clinical nursing profession (161 points) were the most important. Consultation of academic writing is unique, which may be due to the clinical ladder system still being implemented in Taiwan.

Eva Suryanti Rajagukguk*, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

(Author, Year) (Country)	Purpose	Method	Results
(Çamveren et al., 2022) (Turkey)	To examine the effect of an organizational socialization model-based preceptorship program on the organizational outcomes of newcomer nurses.	The sample consist of newcomer nurses from the university hospital of Izmir (N = 56) in Turkey. Data were collected using scales on turnover intention, professional and organizational commitment and job satisfaction. The dependent t-test was used for data analyses.	The newcomer nurses' intention to leave their unit and profession, organizational and professional continuance commitment, professional normative commitment and job satisfaction levels were similar at the end of the one-year preceptorship program compared with the baseline ($p > .05$).It was also determined that the participants' intention to leave the organization increased ($t = -4.153, p < .001$), while their affective ($t = 4.443, p < .001$) and normative commitment to the organization ($t = 3.443, p < .001$) and their professional affective commitment decreased ($t = 7.390, p < .001$) by the end of the program.
(Pohjamies et al., 2022) (Finland)	To identify distinct orientation competence profiles amongst nurse preceptors and explain the associated factors	A cross-sectional study design. The data were collected during the winter of 2020–2021 from registered nurses (N = 8279, n = 844) at one university hospital in Finland through an online questionnaire that included a self-administered electronic version of the Preceptors' Orientation Competence Instrument. K-means clustering was then used to identify nurse preceptor profiles. Chi-square, Fisher's exact test, Kruskal–Wallis and Mann–Whitney tests were used to analyze factors associated with competence profiles. The results were reported as frequencies, percentages, mean and standard deviation	A total of three distinct orientation competence profiles (A, B, C) were identified. Profile A nurses evaluated their orientation competence at the highest level, whereas profile C nurses evaluated their competence at the lowest level. Sufficient clinical and theoretical experience, a motivation to work, willingness to orient new employees and participation in orientation and/or mentoring education were found to be associated with competence profiles
(Alonso et al., 2022) (United States)	To investigate whether the type of help provided by preceptors (i.e., autonomous or dependent help) influences preceptees' evaluations of relationship quality and psychological safety with their preceptor. Furthermore, we investigate the role	Convenience sampling was used to collect data via a cross-sectional survey of 217 in-patient RNs hired between June 2016 and May 2018 to a magnet hospital within the Southwestern United States Recently hired nurses evaluated their preceptor's help-giving tendencies, and reported on their perceived support, relationship quality and feelings of psychological safety with their preceptor	We found that autonomous help was more positively related than dependent help for both relationship quality ($b = -0.62, p < .001, 95\% \text{ CI } [-0.67, -0.55]$) and psychological safety ($b = -0.23, p < .001, 95\% \text{ CI } [-0.33, -0.15]$). We found that instrumental support did not mediate the relationship

Eva Suryanti Rajagukguk*, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow. La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

(Author, Year) (Country)	Purpose	Method	Results
	of instrumental support and emotional support as explanatory mechanisms.		between dependent help and relationship quality ($B = 0.01$, $s.e. = 0.01$, $p = .59$) nor the relationship between dependent help and psychological safety ($B = 0.01$, $s.e. = 0.01$, $p = .64$). We found that instrumental support partially mediated the relationship between autonomous help and relationship quality ($B = 0.17$, $s.e. = 0.03$, $p < .01$), and the relationship between autonomous help and psychological safety ($B = 0.21$, $s.e. = 0.07$, $p < .01$). Thus, Hypothesis 3 was fully supported. We found that emotional support partially mediated the relationship between autonomous help and relationship quality ($B = 0.06$, $s.e. = 0.02$, $p < .01$) and the relationship between autonomous help and psychological safety ($B = -0.27$, $s.e. = 0.06$, $p < .01$).
(Araújo et al., 2021) (Brazil)	To present actions to qualify preceptorship and teaching-health service integration to strengthen nursing training in PHC internship.	Qualitative type of study, developed based on Appreciative Inquiry Research (AIR), following the Consolidated Criteria for Reporting Qualitative Research (COREQ) instrument to guide the methodology. Qualitative research, developed through the Appreciative Inquiry Research carried out with eight nurses, both from the fields of teaching and health service, within Primary Health Care. The production and documentation of information took place between April and June 2019, through five meetings that characterized the four phases that make up the "4D cycle": Discovery, Dream, Design, and Destiny. Ethical issues were respected.	The participants dreamed of the best scenario for preceptorship and built a schedule of actions related to the qualification of preceptorship in Nursing and the strengthening of teaching-health service integration.

Eva Suryanti Rajagukguk^{1*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

(Author, Year) (Country)	Purpose	Method	Results
(Boyce et al., 2022) (United States)	To better understand APRN and PA preceptors' perceived levels of support during precepting, facilitating factors, and barriers to the precepting process.	An electronic survey was distributed via REDCap to a convenience sample of APRN and PA preceptors at an academic medical center. Data collected from the survey were analyzed using both descriptive statistics and qualitative thematic analysis.	One hundred fifty-four participants completed the survey. Motivating factors for precepting included "giving back" to the profession, and barriers included inadequate time to precept while in the clinical role. Participants indicated that financial incentives, heightened communication, protected teaching time, preceptor training, meaningful recognition, and organizational support could enhance the precepting process.
(Ferrier et al., 2024) (United States)	To implement an IPM to alleviate the preceptor burden, promote preceptor buy-in of the new precepting model, and transition NGNs to practice successfully	A plan, do, check, act (PDCA) methodology was used for this project. A PDCA cycle is a four-step model for continuous improvement of processes and change management (American Society for Quality, n.d.). Interested parties were identified at all levels, including nurse executive leadership, unit-level continued orienting two NGNs. The transition from one LCC to one NGN began on Week 8 and finished on Week 15. Please see Figures 1 and 2 for a visual depiction.	The themes that emerged from the preceptor feedback analysis included learning to be a leader on the unit, handling two NGNs, being a leader simultaneously, being flexible, and improving their precepting teaching skills. The themes that emerged from NGNs' feedback included the benefits of peer learning, bouncing ideas off each other, developing a relationship with someone at the same level, observing and then engaging in skill learning, and providing advice to their peers. Of the NGNs, 82% reported liking the IPM, 72% reported less anxiety with peer learning, 65% found being paired with another nurse increased their learning opportunities, and 87% enjoyed having a peer NGN (N = 11). Engagement scores on the unit increased from 56% to 71%, following the implementation of IPM. The vacancy rate in the unit improved from 41% to 14% over a 12-month period. Lastly, retention rates of NGNs for two consecutive cohorts (N = 21) were 100% at 6 and 9 months and 71% at 24 months.

Eva Suryanti Rajagukguk^{1*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>

DISCUSSION

The preceptorship program in hospital has an important role in enhancing competence, clinical adaptation, and professional growth of newly graduated nurses. Through effective mentoring, the program not only benefits preceptees but also contributes to improved retention, quality of care, and organizational outcomes. Nurses value the individual characteristics they possess and the skills they develop. A comprehensive preceptor training program that provides strong initial orientation, sets clear expectations, equips preceptors with evidence-based teaching methodologies tailored to the healthcare context, and is well-structured will lead to a sustainable and continuously evolving program (Boakye, Amoah, Boateng, Antwi, Yeboah, & Owusu, 2025; Lestari, Jauhar, Puspitaningrum, Shobirun, & Sriningsih, 2021).

The success of the preceptorship program is supported by two influential aspects: the preceptor's skills in communication, relational, reflective, technical-scientific, and emotional domains, and individual characteristics such as sensitivity, responsibility, motivation, and professional initiative (Amaral, & Figueiredo, 2023). The role of both preceptors and preceptees in the effectiveness of the program is essential, as it supports successful implementation. Through active participation of all parties involved in teaching and practice, the development of collective goals and actions is possible, with the aim of improving the quality of nursing education. Since new graduate nurses often have limitations in performing many procedures independently, they require greater support from preceptors to build confidence and feel integrated within the unit. Positive relationships that may develop between preceptors and preceptees include improved organizational and prioritization skills, communication and leadership, professional satisfaction, and job satisfaction (Ke, Kuo, & Hung, 2017; Joseph, Issac, George, Gautam, Jiji, & Mondal, 2022).

The identified gap in clearly defining preceptor roles, responsibilities, and expectations from the outset highlights the need for strong preceptor training and professional development initiatives. Although preceptors demonstrate many strengths despite limited formal preparation and training, this

evidence indicates clear pathways to improve role readiness, instructional practice, supporting resources, and sustainable program improvements (Huett, & Wessel, 2022). Investment in preceptor development and the optimization of the clinical learning environment can empower these influential preceptors to effectively transfer knowledge, skills, and professional competence to future generations of healthcare providers. Positive experiences have also been reported regarding preceptors' roles and characteristics in meeting expectations in terms of knowledge, professionalism, and teamwork, making preceptor ship programs highly recommended (Hansen, 2021; Luhanga, McCrystal, & Domm, 2020). In fulfilling their role, preceptors should undergo training in communication, which supports inter professional communication within preceptorship programs (Kulsum, Fitryasari, & Qur'aniati, 2024).

Preceptors' competencies support program implementation, including teaching in clinical nursing practice, communication and collaboration, pedagogical approaches, the ability to handle contingency situations, critical thinking, and reflection (Chen, Hsiao, Chu, Chen, Liao, & Hung, 2021; McMullan, Woodfin, Richey, & Yerdon, 2025). The Integrated Preceptorship Model (IPM) provides significant benefits for preceptors, as they develop leadership, flexibility, and teaching skills, while also gaining from peer learning, reducing anxiety, and fostering stronger relationships, thereby expanding learning opportunities (Ferrier, Porter, & Tellson, 2024).

CONCLUSION

This systematic review shows that preceptorship programs facilitate the adaptation of newly graduated nurses by strengthening clinical skills, confidence, and professional identity, while improving retention and care quality. Persistent challenges include preceptor workload and limited institutional support. Although the programs yield positive outcomes, sustainability and standardization remain critical. Institutional backing is essential to ensure continuity, offering both practical and emotional support. Key competencies and personal attributes required of preceptors include effective communication,

Eva Suryanti Rajagukguk^{1*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

constructive feedback, reflective practice, responsibility, motivation, relationship-building, and initiative in self-directed learning and competency development.

ACKNOWLEDGEMENT

This research is supported by the Center for Research and Community Development (CRCD), Universitas Pelita Harapan, under grant number: 251/LPPM-UPH/VII/2025.

REFERENCES

- Al Harbi, A., Donnelly, F., Page, T., Edwards, S., & Davies, E. (2021). Factors that influence the preceptor role: a comparative study of Saudi and expatriate nurses. *International journal of nursing education scholarship*, 18(1), 20210035.
- Alhassan, A., Fuseini, A. G., Osman, W., Dadinkai, I. A., & Mahama, S. S. (2022). Preceptors' perceptions of support, commitment to the preceptor role, and preferred incentives: A cross-sectional study. *Nurse Education Today*, 116, 105457.
- Alonso, N. A., Porter, C. M., Graves, K., & Gordon, M. (2022). How nurse preceptors provide help to new nurses influences perceived relationship quality. *Nurse Education Today*, 115, 105420.
- Amaral, G., & Figueiredo, A. S. (2023). How to choose a preceptor: aspects to consider based on a grounded theory study. *BMC nursing*, 22(1), 90.
- Anwar, S., Supriyat, Y., & Tolla, B. (2019). Evaluation of clinical nursing practice program with preceptorship supervision (stake's countenance evaluation model). *Jurnal Ners*, 14(1), 75-81.
- Araújo, J. A. D., Vendruscolo, C., Adamy, E. K., Zanatta, L., Trindade, L. D. L., & Khalaf, D. K. (2021). Strategies for changing the nursing preceptorship activity in Primary Health Care. *Revista Brasileira de Enfermagem*, 74(Suppl 6), e20210046.
- Bartlett, A. D., Um, I. S., Luca, E. J., Krass, I., & Schneider, C. R. (2020). Measuring and assessing the competencies of preceptors in health professions: a systematic scoping review. *BMC medical education*, 20(1), 165.
- Boakye, D. S., Amoah, V. M. K., Boateng, E. A., Antwi, J., Yeboah, J., & Owusu, J. (2025). Qualitative study on nurse preceptors' preparedness, roles and familiarity with the basic principles of teaching and learning in a district hospital in Ghana. *BMJ open*, 15(2), e090743.
- Boyce, D. J., Shifrin, M. M., Moses, S. R., & Moss, C. R. (2022). Perceptions of motivating factors and barriers to precepting. *Journal of the American Association of Nurse Practitioners*, 34(11), 1225-1234.
- Çamveren, H., Kocaman, G., & Vatan, F. (2022). The effects of a preceptorship program on newcomer nurses' turnover intention, commitment and job satisfaction: Quasi-experimental study. *Nurse education in practice*, 63, 103358.
- Chen, T. T., Hsiao, C. C., Chu, T. P., Chen, S. H., Liao, M. N., & Hung, C. C. (2021). Exploring core competencies of clinical nurse preceptors: A nominal group technique study. *Nurse Education in Practice*, 56, 103200.
- Chen, T. T., Hsiao, C. C., Chu, T. P., Chen, S. H., Liao, M. N., & Hung, C. C. (2023). Are we of one mind about core competencies of nurse preceptors? A nominal group technique study. *Nursing Open*, 10(2), 1144-1150.
- Ferrier, Y. A., Porter, M. T., & Tellson, A. (2024). Stressed and Short: Creating a Balanced and Innovative Preceptor Model in a Medical Intensive Care Unit. *Journal for Nurses in Professional Development*, 40(4), 190-194.
- Gatewood, E., De Gagne, J. C., Kuo, A. C., & O'Sullivan, P. (2020). The one-minute preceptor: Evaluation of a clinical teaching tool training for

Eva Suryanti Rajagukguk^{1*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow, La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

- nurse practitioner preceptors. *The Journal for Nurse Practitioners*, 16(6), 466-469.
- Gholizadeh, L., Shahbazi, S., Valizadeh, S., Mohammadzad, M., Ghahramanian, A., & Shohani, M. (2022). Nurse preceptors' perceptions of benefits, rewards, support, and commitment to the preceptor role in a new preceptorship program. *BMC Medical Education*, 22(1), 472.
- Gonzalez, K., Drescher, M. J., Neil, E. R., & Eberman, L. E. (2023). Preceptor training: evaluation of an on-line educational module to improve preceptor feedback. *Internet Journal of Allied Health Sciences and Practice*, 21(2), 19.
- Hansen, W. (2021). The perceptions of newly qualified nurses on the guidance by preceptors towards becoming experts in nursing. *Curationis Journal of the Democratic Nursing Organisation of South Africa*, 44(1), 2205.
- Hong, K. J., & Yoon, H. J. (2021). Effect of nurses' preceptorship experience in educating new graduate nurses and preceptor training courses on clinical teaching behavior. *International Journal of Environmental Research and Public Health*, 18(3), 975.
- Huett, J. L. R., & Wessel, R. D. (2022). Exploring best practices in preceptorships: preceptor selection. *Athletic Training Education Journal*, 17(1), 106-116.
- Irwin, C., Bliss, J., & Poole, K. (2018). Does preceptorship improve confidence and competence in newly qualified nurses: A systematic literature review. *Nurse education today*, 60, 35-46.
- Jeong, H. W., Ju, D., Choi, M. L., & Kim, S. (2021). Development and evaluation of a preceptor education program based on the one-minute preceptor model: Participatory action research. *International journal of environmental research and public health*, 18(21), 11376.
- Joseph, H. B., Issac, A., George, A. G., Gautam, G., Jiji, M., & Mondal, S. (2022). Transitional challenges and role of preceptor among new nursing graduates. *Journal of caring sciences*, 11(2), 56.
- Ke, Y. T., Kuo, C. C., & Hung, C. H. (2017). The effects of nursing preceptorship on new nurses' competence, professional socialization, job satisfaction and retention: A systematic review. *Journal of Advanced Nursing*, 73(10), 2296-2305.
- Kim, H. S., Jeong, H. W., Ju, D., Lee, J. A., & Ahn, S. H. (2022). Development and preliminary evaluation of the effects of a preceptor reflective practice program: A mixed-method research. *International journal of environmental research and public health*, 19(21), 13755.
- Kim, K. H., & Shin, S. (2025). Factors influencing preceptor nurses' clinical teaching behavior: A cross-sectional study. *Nurse Education Today*, 146, 106555.
- Kulsum, U., Fitryasari, R., & Qur'aniati, N. (2024). Effectiveness of Interventions to Improve Preceptor Performance in Nursing Student Competencies. *Indonesian Journal of Global Health Research: Global Health Science Group*, 7(1), 147-156.
- Lau, K. Y., Chan, S. K., Le Cheah, L., Jabbar, A. B. A., & Lim, S. H. (2024). Experiences of preceptorship in Singapore: A qualitative exploratory study of preceptors' experience in precepting nursing students during pre-registration of clinical placement in an acute hospital. *Nurse education in practice*, 75, 103875.
- Lestari, K. P., Jauhar, M., Puspitaningrum, I., Shobirun, S., & Sriningsih, I. (2021). Evaluation of Preceptorship and Mentorship Clinical Learning Method on Nursing Students'critical Thinking in Providing Nursing Care in a Teaching Hospital. *Jurnal Riset Kesehatan*, 10(1), 45-51.

Eva Suryanti Rajagukguk^{1*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow. La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

Evaluation of nursing preceptorship programs in hospital settings: A scoping review

- Luhanga, F., McCrystal, S., & Domm, E. (2020). Evaluating preceptor perception of role development and support initiatives in a collaborative bachelor of science in nursing program. *Quality Advancement in Nursing Education-Avancées En Formation Infirmière*, 6(3).
- Mashayekh, R., Ebadi, A., Nehrir, B., & Moayed, M. S. (2024). The effect of the preceptorship training program on the participation of clinical nurses in training nursing internship students: a quasi-experimental study. *BMC nursing*, 23(1), 395.
- McMullan, S. P., Woodfin, K. O., Richey, R., & Yerdon, A. (2025). Giving Your Preceptors What They Need: Developing an Innovative Clinical Preceptor Education Program. *Nursing Education Perspectives*, 46(5), 332-333.
- Pohjamies, N., Haapa, T., Kääriäinen, M., & Mikkonen, K. (2022). Nurse preceptors' orientation competence and associated factors—A cross-sectional study. *Journal of advanced nursing*, 78(12), 4123-4134.
- Ryan, C., Cant, R., Ossenberg, C., Ahchay, D., Hughes, L., & Bogossian, F. (2024). Competency domains for registered nurse preceptor professional development: Evidence from a modified e-Delphi study. *Nurse education in practice*, 77, 103952.
- Tucker, G., Atkinson, J., Kelly, J., Parkin, L., McKenzie, A., Scott, S., & Davidson, D. (2019). Evaluation of a structured preceptorship program. *British journal of community nursing*, 24(11), 554-557.

Eva Suryanti Rajagukguk^{1*}, Enjelika Putri Manalu¹, Erica Dorellia Pajuk¹, Kyela Friska Br Sinurat¹, Ni Gusti Ayu Eka^{1,2}

¹Fakultas Keperawatan, Universitas Pelita Harapan, Tangerang, Indonesia

²Adjunct Research Fellow. La Trobe University, Melbourne, Australia

Corresponding author; *E-mail: evarajagukguk78@gmail.com

DOI: <https://doi.org/10.33024/minh.v9i1.1654>