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Research Article

DIGITAL CLINICAL PRACTICE ASSESSMENT IN NURSING EDUCATION: A LITERATURE REVIEW AS A FOUNDATION FOR DEVELOPING THE E-ASKEP APPLICATION

Ardenny[1]
[1] Poltekkes Kemenkes Riau, Indonesia

Corresponding Author:

Ardenny,
Poltekkes Kemenkes Riau, Indonesia.
Jl. Melur No.103, Harjosari, Sukajadi, Kota Pekanbaru, Riau 28156
Email: ardenny_2010@yahoo.co.id

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Abstract

Clinical practice assessment is central to ensuring nursing students' competence, yet paper-based assessment conducted separately by faculty and clinical instructors risks inconsistency, delayed feedback, and poor traceability. This review aimed to synthesize evidence on clinical practice assessment in nursing education and the use of digital technology to support it, as a foundation for developing the E-Askep application. A narrative literature review was conducted on articles published between 2013 and 2026 and retrieved from PubMed, ScienceDirect, BMC, JMIR, Crossref, and national nursing journal portals; 14 articles met the inclusion criteria and were analyzed thematically. Five themes emerged: the need for valid, reliable, and standardized instruments; faculty–clinical instructor collaboration and feedback; digital platforms (e-portfolios, mobile applications, and e-logbooks) that improve accessibility, transparency, and progress monitoring but have mixed effects on competence outcomes; structured electronic documentation that supports learning of the nursing process; and implementation factors, including training, digital literacy, infrastructure, and user acceptance. No study was found that evaluated a web application automatically combining faculty and clinical instructor scores in Indonesian nursing education. The evidence supports standardized, collaborative digital clinical assessment; the design of E-Askep is consistent with this evidence, but its effectiveness requires evaluative research.

Keywords: Clinical Assessment, E-Portfolio, Nursing Education

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INTRODUCTION

Clinical practice is a core component of nursing education. At this stage, students apply the nursing process, from assessment, diagnosis, planning, and implementation to evaluation, in real or simulated care settings. Assessing student competence during clinical practice is complex because it encompasses professional attributes, ethics, communication, application of the nursing process, and critical thinking (Immonen et al., 2019). This complexity calls for consistent and systematic assessment instruments and procedures.

In practice, clinical assessment generally involves two parties: faculty members from the educational institution and clinical instructors (*preceptors*) from the clinical setting. Collaboration between the two has proven important, yet it is often constrained by preceptor readiness, differing standards, and limited communication (Arvidsson & Blomqvist, 2026; Wu et al., 2016). In many Indonesian institutions, including Poltekkes Kemenkes Riau, assessment is still paper-based. As a result, scores from the two assessors are compiled manually, feedback is delayed, and documents are easily lost. Meanwhile, experience in the same setting has shown that an online nursing documentation system can significantly improve documentation ability (Ardenny & Sakhnan, 2023). This finding suggests that a similar approach could be applied to clinical practice assessment.

Advances in digital technology offer opportunities to redesign this process through e-portfolios, mobile applications, e-logbooks, and academic electronic health records. To provide a foundation for developing **E-Askep**, an online nursing assessment application based on dual evaluation by faculty and clinical instructors, a review of the available scientific evidence is needed. This literature review aimed to identify and synthesize research findings on clinical practice assessment in nursing education and the use of digital technology to support it.

RESEARCH METHOD

Research Design

This study employed a narrative literature review design with thematic analysis to synthesize findings from studies with diverse research designs.

Search Strategy

The search was conducted in October 2026 using PubMed, ScienceDirect, BMC, JMIR, Crossref metadata, national nursing journal portals, and the institutional repository of Poltekkes Kemenkes Riau. Keywords included *clinical assessment*, *clinical evaluation*, *nursing students*, *preceptor*, *e-portfolio*, *mobile application*, *academic electronic health record*, and *electronic assessment*, as well as Indonesian-language keywords such as *aplikasi penilaian praktik klinik keperawatan* (nursing clinical practice assessment application), *e-logbook*, and *aplikasi berbasis web* (web-based application).

Inclusion and Exclusion Criteria

The inclusion and exclusion criteria used for article selection are presented in Table 1.

Table 1. Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Population	Nursing students, nurses, faculty, or clinical instructors	Other health professions not involving nursing
Focus	Clinical practice assessment, or digital technology for clinical learning and assessment	Clinical technology unrelated to education or competence assessment
Publication type	Peer-reviewed research articles or reviews	Opinion pieces, editorials, institutional guidelines, and promotional materials
Year and language	2013–2026, in English or Indonesian	Outside this period or these languages
Availability	Abstract or full text accessible and verifiable	Bibliographic data could not be verified

Study Selection and Data Analysis

Articles were screened for relevance based on their titles and abstracts and then verified through publisher websites or databases. A total of **14 articles** met the criteria. Extracted data included authors, year, country, design, sample, focus or intervention, and main findings. The findings were analyzed thematically by grouping shared meanings across articles.

RESULTS AND DISCUSSION

Characteristics of the Included Articles

The 14 articles originated from Europe (Finland, Norway, Sweden, Spain, and Belgium), Asia (Singapore, Iran, and Indonesia), and North America (Canada and the United States). Study designs comprised systematic reviews or reviews of reviews (n = 3), a *scoping review* (n = 1), quasi-experimental or pre-experimental studies (n = 4), mixed-methods studies (n = 3), qualitative studies (n = 2), and an educational innovation report (n = 1). A summary is presented in Table 2.

Table 2. Data Extraction of the Reviewed Articles

Author (Year), Country	Design and Sample	Focus / Intervention	Main Findings
Immonen et al. (2019)	Systematic review of reviews; 6 reviews	Instruments for assessing students' clinical competence	Instruments assess professional attributes, ethics, communication, the nursing process, and critical thinking; a consistent and systematic approach, reliable instruments, clear criteria, and structured feedback are needed.

Author (Year), Country	Design and Sample	Focus / Intervention	Main Findings
Wu et al. (2015)	Systematic review	Clinical assessment methods for undergraduate nursing students	Clinical competence is multidimensional and therefore requires multiple assessment methods; highlights the need for valid and reliable instruments.
Wu et al. (2016), Singapore	Qualitative; 17 preceptors	Preceptors' perspectives on clinical assessment	Five themes: need for valid and reliable instruments, importance of feedback, varied assessment methods, preceptor commitment, and strengthened support systems.
Arvidsson & Blomqvist (2026)	Systematic review (PRISMA); 6 studies, 183 participants	Nursing teachers' experiences of assessing students in clinical practice	Three categories: assessment as learning, effective faculty–clinical instructor collaboration, and assessment challenges (competence standards, marginal performance); institutional support and collaboration are crucial.
Garrett et al. (2013), Canada	Mixed methods; web analytics, survey, FGDs	E-portfolio for clinical competence assessment	Faculty valued ease of use, transparency, and progress monitoring; students valued accessibility but were concerned about openness and assessment consistency; faculty training is needed.
Janssens et al. (2022), Belgium	Scoping review; 37 articles (68% nursing)	Role of e-portfolios in eight healthcare disciplines	Purposes included competence documentation, reflection, feedback/assessment, and theory–practice integration; barriers included time, digital literacy, internet access, and privacy; most studies measured perceptions only.
Najaffard et al. (2024), Iran	Quasi-experimental; 30 nurses per group	E-portfolio for nurses' clinical competence	Post-test scores in the intervention group were significantly higher in most

Author (Year), Country	Design and Sample	Focus / Intervention	Main Findings
			domains, except initial patient assessment.
Guzmán-Almagro et al. (2026), Spain	Quasi-experimental; 149 students (48 intervention, 101 control)	EVENS mobile application for student evaluation	No significant differences in clinical competence or self-efficacy; tutors rated usability at 3.8/5 and reported that the application supported their mentoring role.
Dunker et al. (2025)	Educational innovation report	Mobile application for preceptor development	Weekly messages containing reminders, learning resources, and course information were well received by preceptors; effects on preceptor competence require further study.
Kleib et al. (2021), Canada	Mixed methods (pilot); 13 students, FGDs with 7 students and 3 educators	Academic electronic health record (DocuCare)	Knowledge increased significantly (mean 2.95 to 3.83; $P < 0.001$); documentation accuracy improved; attitudes toward electronic records did not change ($P = 0.70$); satisfaction was high.
Reierson et al. (2025), Norway	Qualitative; 21 students (3 FGDs)	Learning EHR documentation on campus and during clinical placement	Academic learning served as an important reference, but guidance on formulating nursing diagnoses and care plans was lacking; the quality of clinical instructors' feedback varied.
Nasir et al. (2023), Indonesia	Pre-experimental; 58 clinical practice students	Android application for pain scale determination in nursing assessment	Ability scores increased from 71.97 to 78.69 ($p = 0.001$).
Marwiati & Fahrurrozi (2021), Indonesia	Quasi-experimental, *one-group pretest–posttest*	E-logbook for assessing clinical nurses' competency performance	The e-logbook was more effective than the paper logbook for competency performance assessment ($p < 0.05$).

Author (Year), Country	Design and Sample	Focus / Intervention	Main Findings
Ardenny & Sakhnan (2023), Indonesia	Mixed methods; 15 nurses (*purposive sampling*)	Online *Problem-Oriented Record* (POR) documentation model	Documentation ability improved significantly (mean difference 31.17; $p < 0.001$); qualitative data supported integrated digital documentation.

Thematic Synthesis

Theme 1: The need for valid, reliable, and standardized assessment instruments

All reviews emphasized that clinical competence is multidimensional; therefore, its assessment requires instruments with clear criteria that are applied consistently (Immonen et al., 2019; Wu et al., 2015). Preceptors themselves expressed a need for valid and reliable instruments (Wu et al., 2016). Faculty also face difficulties in establishing expected competence standards, particularly for students with marginal performance (Arvidsson & Blomqvist, 2026).

Theme 2: Faculty–clinical instructor collaboration and feedback

A close partnership between faculty and clinical instructors is a prerequisite for fair assessment. Barriers include clinical instructors who are underprepared or reluctant to communicate unfavorable assessments (Arvidsson & Blomqvist, 2026). Feedback is the most valued component, yet its quality varies across instructors (Reierson et al., 2025; Wu et al., 2016). Technology can also be used to support and equip preceptors on an ongoing basis (Dunker et al., 2025).

Theme 3: Digital platforms improve accessibility and transparency, with variable effects on competence

E-portfolios were perceived as convenient and transparent and as enabling the monitoring of student progress (Garrett et al., 2013); they also supported competence documentation, feedback, and theory–practice integration (Janssens et al., 2022). Several studies reported improved outcomes, for example, e-portfolios for nurses (Najaffard et al., 2024), an Android application for pain assessment (Nasir et al., 2023), and an e-logbook for performance assessment (Marwiati & Fahrurrozi, 2021). However, the EVENS mobile application showed no significant differences in students' competence or self-efficacy (Guzmán-Almagro et al., 2026), and most e-portfolio studies measured perceptions rather than objective outcomes (Janssens et al., 2022).

Theme 4: Structured electronic documentation supports learning of the nursing process

Academic electronic health records improved students' knowledge and documentation accuracy (Kleib et al., 2021). Among nurses, an online *Problem-Oriented Record* documentation model significantly improved their ability to complete documentation, and the nurses endorsed integrated digital documentation (Ardenny & Sakhnan, 2023). Learning electronic documentation on campus also served as a reference when students encountered suboptimal documentation practices in clinical settings. Nevertheless, students still needed specific guidance in formulating nursing diagnoses and care plans (Reierson et al., 2025).

Theme 5: Factors in successful implementation

The successful adoption of assessment technology is not determined by application functionality alone. Other contributing factors include faculty training and a transparent assessment culture (Garrett et al., 2013), as well as digital literacy, internet access, data privacy, and time burden (Janssens et al., 2022). This is consistent with the *Technology Acceptance Model*, which identifies perceived usefulness and perceived ease of use as determinants of technology acceptance (Davis, 1989). Supporting evidence from outside the review sample shows that health applications designed with attention to interface and ease of use can achieve very high acceptance: 97.50% of users rated the application interface as good, and 94.82% found it easy to operate (Ardenny et al., 2024).

Discussion

The findings of this review indicate that the main problem in clinical practice assessment is not merely the medium (paper or digital). The core issues are instrument consistency, collaboration between assessors, and feedback quality. Digital technology is most beneficial when it is designed to strengthen these three aspects. Table 3 maps the literature findings onto the features of E-Askep and opportunities for its further development.

Table 3. Mapping of Literature Findings to the E-Askep Design

Literature Finding	Relevant E-Askep Feature	Development Recommendation
Instruments must be standardized with clear criteria (Theme 1)	Staged forms following the nursing process; a 1–4 scoring rubric for each aspect with automatic conversion to scores and competence categories	Content validation of the rubric through expert consensus (Delphi) and I-CVI/S-CVI/Ave (Ardenny & Idayanti, 2026; Ardenny, Khan, & Hussain, 2026); behavioral descriptors for each score
Faculty–clinical instructor collaboration is crucial (Theme 2)	*Dual-evaluator* assessment and automatic score aggregation	Inter-rater reliability testing between faculty and clinical instructors (CIs) using Cohen's kappa and ICC (Ardenny & Idayanti, 2026); a case discussion feature for assessors
Feedback is valued, but its quality varies (Themes 2 and 4)	Notes and faculty feedback field; Reject / Request Revision function	Feedback notifications to students; structured feedback templates
Digital tools improve transparency and monitoring (Theme 3)	Student progress dashboard and faculty statistics; real-time report status	Analytics of achievement for each competence to support program quality assurance
Effects on competence are not yet consistent (Theme 3)	—	Quasi-experimental research measuring competence outcomes, not only perceptions
Training, privacy, and user acceptance determine adoption (Theme 5)	Role-based access and account verification by administrators; user guide	Training for faculty and CIs; HTTPS and data protection; evaluation of user acceptance

Literature Finding	Relevant E-Askep Feature	Development Recommendation
		(TAM) and usability (Ardenny et al., 2024)

This search did not identify any study that specifically evaluated a web application for nursing clinical practice assessment that automatically combines faculty and clinical instructor scores in the context of Indonesian nursing education. The national studies identified focused on applications for specific skills (Nasir et al., 2023), performance assessment of clinical nurses (Marwiati & Fahrurrozi, 2021), or online nursing documentation by nurses (Ardenny & Sakhnan, 2023). This gap indicates the potential contribution of E-Askep, as well as the need to test it empirically.

Implications for Future Research

a. Content validation of the E-Askep assessment rubric through a two-round Delphi expert consensus, which has proven effective for validating evidence-based nursing protocols with a 94.4% expert panel retention rate (Ardenny, Khan, & Hussain, 2026), followed by calculation of the I-CVI and S-CVI/Ave (Ardenny & Idayanti, 2026).
b. Inter-rater reliability testing of faculty and clinical instructor scores using Cohen's kappa and the *Intraclass Correlation Coefficient* (ICC), as applied in the development of a community-based screening model (Ardenny & Idayanti, 2026).
c. A quasi-experimental study comparing E-Askep-based and paper-based assessment in terms of documentation completeness, feedback time, and competence achievement.
d. A *usability* evaluation covering interface, ease of operation, content presentation, and language (Ardenny et al., 2024), together with an assessment of user acceptance based on the *Technology Acceptance Model*.
e. An implementation evaluation using a structure, process, and barriers approach, as used in the analysis of cardiovascular health screening management in Pekanbaru City (Ardenny, Idayanti, & Rusdi, 2026).
f. A qualitative study exploring the experiences of faculty, clinical instructors, and students in using the application.

Limitations

This is a narrative rather than a systematic review. Consequently, the search did not comprehensively cover all databases, no formal methodological quality appraisal was performed, and article selection was conducted by a single reviewer. The number of verifiable national articles was also limited. Future work should conduct a systematic search (e.g., following PRISMA 2020) of databases such as Scopus, CINAHL, and Garuda, with two independent reviewers.

CONCLUSION

The literature indicates that nursing clinical practice assessment requires standardized instruments, strong collaboration between faculty and clinical instructors, and high-quality feedback. Digital technologies such as e-portfolios, mobile applications, e-logbooks, and academic electronic health records have been shown to improve accessibility, transparency, and progress monitoring, although their effects on competence outcomes remain variable. The design

of E-Askep, which integrates staged instruments, digital rubrics, and dual assessment, is consistent with this evidence. The next step is an empirical evaluation of the application's validity, effectiveness, and acceptance.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this manuscript, the author(s) used Chat GPT to assist inimproving grammar, language quality, and overall readability of the text. After using this tool, the author(s) Carefully reviewed and edited the content as necessary and take full responbility for the content of the publication.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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