

Comparative Effectiveness of E-Learning versus Instructor-Led Training on Nursing Knowledge and Documentation Proficiency: A Systematic Review

Constance C. Uzoma-Ogbuku*, Daprim S. Ogaji and Elsie O. Ugege

Midwifery and Child Health Division, Africa Centre of Excellence in Public Health and Toxicological Research, University of Port Harcourt, Nigeria.

*Corresponding author e-mail address: uzomaconstance1@gmail.com; Phone: 07065570068, 07086626527.

Abstract

Background: E-learning and instructor-led training have emerged as prominent educational modalities for imparting nursing documentation knowledge and proficiency, but their comparative effectiveness remains underexplored.

Methods: A systematic review was conducted using PRISMA guidelines. Electronic databases were searched to track studies published between 2009 and 2024. Studies comparing e-learning and/or instructor-led training interventions for nursing documentation were included. Data extraction, quality assessment, and meta-analysis were performed.

Results: Five (5) randomised and non-randomized studies were included. A total of 51 records were identified through database and manual searches and 5 eligible records were included in the study after screening. The included studies were conducted across Canada, Singapore, UK, and Iran. The studies consisted of one randomized controlled trial and four quasi-experimental designs, involving 352 individuals in e-learning groups and 370 in instructor-led groups, with interventions varying in duration from a few hours to seven weeks. The meta-analysis showed no significant difference in overall effect of e-learning and instructor-led approaches in enhancing nursing knowledge ($p = 0.48$) and nursing documentation ($p = 0.72$).

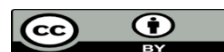
Conclusion: Both e-learning and instructor-led training show promise in enhancing nursing knowledge and documentation proficiency. Tailored educational programs, organizational support, long-term follow-up, standardized outcome measures, cost-effectiveness analysis, and interdisciplinary collaboration are recommended to advance nursing documentation education and practice.

How to Cite this Article

Uzoma-Ogbuku, C. C., Ogaji, D. S., & Ugege, E. O. (2025). Comparative Effectiveness of E-Learning versus Instructor-Led Training on Nursing Knowledge and Documentation Proficiency: A Systematic Review. *Journal of Nursing, Midwifery and Allied Health Sciences*, 4(1), 13–18.

<https://doi.org/10.54117/jnmahs.v4i1.46>

Keywords: Documentation, education, e-learning, instructor-led training, nursing



1. Introduction

Instructor-led training has long been a cornerstone of nursing education and professional development, providing learners with structured, interactive, and personalized learning experiences under the guidance of qualified instructors or facilitators (Gholami *et al.*, 2023). Unlike self-paced learning approaches, instructor-led training involves direct engagement with an instructor who leads and facilitates learning activities, including lectures, discussions, demonstrations, and hands-on exercises (Wu *et al.*, 2020). This traditional form of training has been widely utilized across various domains, including academia, corporate training, vocational education, and healthcare, owing to its effectiveness in fostering meaningful learning outcomes and skill acquisition (Zamiri & Esmaeili, 2024).

In recent years, electronic learning, or e-learning, has revolutionized the landscape of education across various disciplines, offering unprecedented flexibility, accessibility, and efficiency in learning (Ding *et al.*, 2024). E-learning refers to the use of digital technologies and the internet to deliver educational content, allowing learners to access materials and participate in activities remotely, often at their own pace and convenience (Alfaleh *et al.*, 2023). This innovative approach to learning has gained traction in diverse sectors, including academia, corporate training, and professional development, reshaping traditional notions of education and expanding opportunities for lifelong learning (Song & Park, 2021).

Nursing knowledge keeps changing over time. About half of what nurses know becomes outdated in about every decade (Marufu *et al.*, 2021). So, nurses need to keep learning new things throughout their careers to stay up-to-date. Nonetheless, it is difficult to do this through regular instructor-led education programs. There are a lot of nurses who want to learn new skills, but there are not enough human and material resources available (Hockenberry *et al.*, 2020). One potential solution to this problem is e-learning, where nurses can learn online instead of going to classes in person. E-learning may suit different kinds of learners, which may not be the case with traditional instructor-led method (Alfaleh *et al.*, 2023).

In the fast-paced landscape of modern healthcare, nursing documentation stands as a cornerstone for quality patient care, effective communication among healthcare professionals, and legal accountability (Molla *et al.*, 2024). Over the past few decades, the healthcare industry has seen a paradigm shift towards electronic health records and digital documentation systems, marking a departure from traditional paper-based methods (Tertulino *et al.*, 2024). This transition has necessitated nurses to acquire computer-related knowledge, new skills, and competencies to effectively navigate these technological advancements while maintaining the highest standards of patient care.

As nursing practices evolve to embrace digital transformation, the methods of imparting essential documentation knowledge and proficiency to nurses have also undergone significant changes. Among the various approaches employed, e-learning and instructor-led training have emerged as prominent educational modalities, offering flexible, accessible, and efficient means of delivering educational content to nursing students and professionals (Wu *et al.*, 2020). However, the comparative effectiveness of these two modes of instruction in enhancing nursing documentation knowledge and proficiency remains an area of ongoing exploration and debate (Berga *et al.*, 2021).

This systematic review aimed to provide a synthesis of existing literature spanning a fifteen-year period, focusing on the effectiveness of e-learning and instructor-led training in improving nursing knowledge and proficiency. To the best of the review team's knowledge, there is scarcity of published systematic reviews on this subject matter within the past one and half decades. By analysing and synthesizing findings from a diverse range of studies, this review sought to elucidate the relative effect size of each educational modality, identify gaps in current research, and offer insights into the optimal approaches for educating nurses in documentation practices.

The significance of this review lies in its potential to inform nursing educators, healthcare administrators, and policymakers about the most effective strategies for enhancing nursing documentation competencies in the digital age. By systematically evaluating the existing body of literature, this review aimed to contribute to evidence-based practices in nursing education and ultimately improve patient outcomes through proficient and accurate documentation practices.

2. Methods

2.1 Search Strategy: The systematic review utilized a search strategy to identify relevant studies published over a fifteen-year period (from 2009 to 2024). This timeframe was chosen to ensure that the systematic review captures a range of contemporary research that reflect fairly current e-learning practices and technologies related to e-learning and instructor-led training in nursing education. Electronic databases including PubMed (MEDLINE) and ScienceDirect (Scopus) were searched using the search string (keywords combined with Boolean operators): (nursing) AND (documentation) AND (e-learning) AND (instructor-led training) AND (education OR knowledge) AND (proficiency OR competence) NOT (attitude). Additionally, reference lists of identified articles and relevant systematic reviews were hand-searched using the ancestral and descendant approach to ensure inclusivity.

2.2 Inclusion Criteria: Studies were included if they focused on nursing training/education programmes (Population), comparing nursing knowledge and documentation proficiency, based on e-learning (Intervention) and instructor-led training (Comparator) interventions, changes in nursing knowledge and documentation proficiency (Outcomes), primary research studies, including randomized controlled trials and quasi-experimental designs, published in peer-reviewed journals between 2009 and 2024, and available in English.

2.3 Exclusion Criteria: Studies were excluded if they lacked a control or comparison group, were conference abstracts, editorials, commentaries, non-peer-reviewed articles, duplicate publications, and secondary analyses of previously published data.

2.4 Study Selection: All members of the review team independently screened titles and abstracts of identified studies for relevance based on the inclusion criteria. Full-text articles of the studies were also assessed independently for eligibility and appraised for quality of evidence before final inclusion in the review. Disagreements between reviewers were resolved through discussion and consensus.

2.5 Data Extraction: A data extraction form was developed by the review team and used to extract relevant information from included studies. Extracted data included study characteristics such as author, publication year, study design, sample, details of intervention and control groups, outcomes assessed and key findings.

2.6 Quality Assessment: The methodological quality of included studies was assessed using the Johns Hopkins Nursing Research Evidence Appraisal Tool (JHnREAT) for randomized controlled trials and non-randomized controlled trials. Quality assessment was conducted independently by members of the review team, with discrepancies resolved through discussion and consensus.

2.7 Data Analysis: A meta-analysis was conducted using a forest plot to illustrate nursing knowledge and documentation proficiency outcomes based on e-learning and instructor-led training across the included studies.

2.8 Ethical Considerations: Ethical approval was not required for this systematic review as it involved the synthesis of publicly available data from previously published studies.

2.9 Reporting Standards: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed to ensure transparent and comprehensive reporting of the review process and findings.

3. Results

Figure 1 illustrates the study selection process using a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram. A total of 43 records were initially identified through electronic database searches, with an additional 8 records identified through manual searches of reference lists making a total of 51 records. After removing duplicates ($n = 2$), the remaining 49 records were screened for titles and abstracts to remove 42 non-nursing records. Furthermore, two (2) studies with unavailable full-text versions were removed. The remaining five (5) full-text articles were assessed for eligibility. Following the application of inclusion and exclusion criteria, the five (5) studies were included in the systematic review.

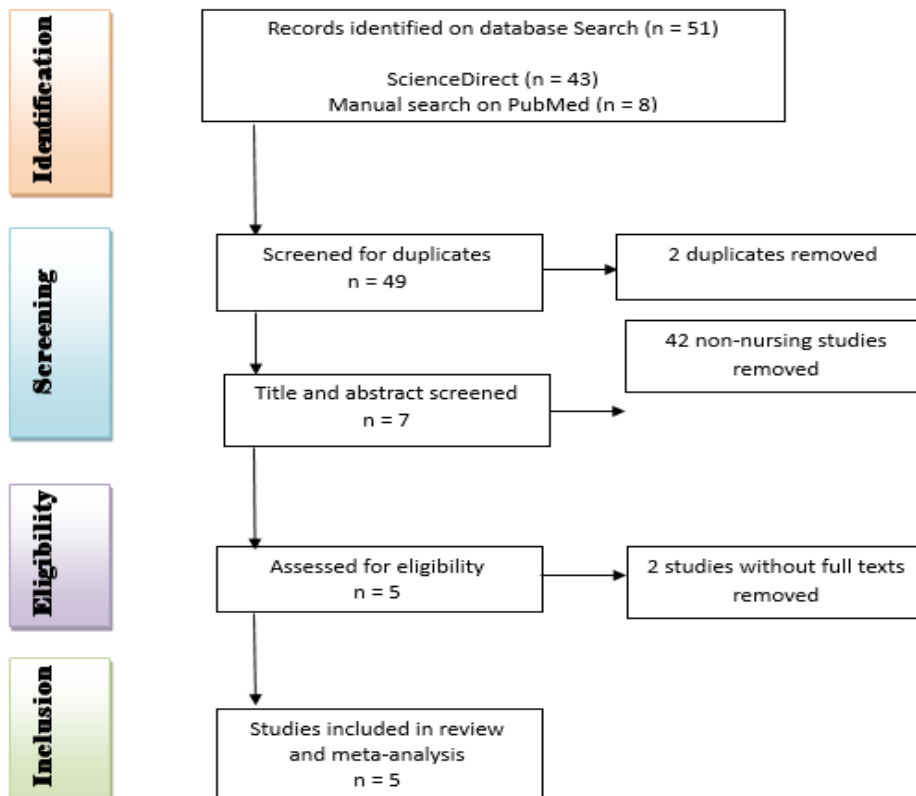


Figure 1: PRISMA flow diagram

Table 1 presents the characteristics of the studies included in this review. The included studies were conducted in Canada ($n = 1$), Singapore ($n = 1$), UK ($n = 1$), and Iran ($n = 2$) and encompassed a randomized controlled trial ($n = 1$) and quasi-experimental designs ($n = 4$). The studies involved a total of 352 persons in the e-learning group and 370 in instructor-led group. Sample sizes varied widely, ranging from small-scale interventions involving less than 50 participants to larger studies with 150 participants. Interventions primarily focused on e-learning and instructor-led training with durations ranging from a few hours to seven weeks.

Figure 2 presents a comparison of the effect of e-learning and instructor-led approaches on nursing knowledge and documentation proficiency. Four out of the five included studies, compared the effectiveness of e-learning with instructor-led training on improving nursing knowledge. Two out of the five studies examined the effectiveness of e-learning versus instructor-led training on improving nursing documentation proficiency. Among the studies that examined nursing knowledge, two studies reported significant differences between the two modalities, suggesting that instructor-led training was more effective than e-learning in enhancing nursing knowledge. Among the studies that examined documentation proficiency, one study found e-learning to be more effective in enhancing documentation proficiency and cited factors such as cost-effectiveness, flexibility, and accessibility as key advantages. Conversely, one study found instructor-led training to be more effective and attributed the effectiveness to interactive teaching methods and personalized feedback. Considering overall effect, the meta-analysis shows no significant difference between e-learning and instructor-led approaches in enhancing nursing knowledge ($p = 0.48$) and nursing documentation ($p = 0.72$).

Table 1: Characteristics of included studies reviewed (n = 5)

Author /Year	Country	Aim	Design	Sample	Treatment	Control	Outcome parameter and Result	Level of Evidence
Berga <i>et al.</i> (2021)	Canada	To examine knowledge outcomes associated with the introduction of a new course delivered via e-learning compared to the instructor-led method	Quasi experimental (pre-post test)	Census selected university-based nursing students (n = 188)	E-learning (n = 84) <i>Duration:</i> 7 weeks	Instructor-led (n = 104) <i>Duration:</i> 7 weeks	Knowledge Scores: 75.59 (12.14) for e-learning group vs. 75.66 (9.70) for instructor-led group (p = 0.100)	II
Wu <i>et al.</i> (2020)	Singapore	To assess the efficacy of the e-learning program in enhancing nurses' clinical proficiency in comparison to the instructor-led method.	Quasi experimental (single group pre-post test)	Conveniently selected Nurses (n = 150)	E- learning (n = 150) <i>Duration:</i> 1 day workshop	Instructor-led (n = 150) <i>Duration:</i> 1 day workshop	Proficiency Scores: 129.95 (16.38) for e-learning vs. 113.41 (16.67) for instructor led group (p < 0.001)	II
McCutcheon <i>et al.</i> (2018)	UK	To determine whether nurses who underwent skills training through instructor-led learning would achieve higher knowledge scores compared to those who underwent e-learning.	Randomized Controlled Trial	Randomly selected University-based nursing students (n = 113)	E-learning (n = 57) <i>Duration:</i> 1 weeks	Instructor-led (n = 56) <i>Duration:</i> 1 weeks	Knowledge Scores: 3.51 (1.51) for e-learning group vs. 4.2 (1.43) for instructor-led group (p = 0.015)	I
Pourghaznein <i>et al.</i> (2015)	Iran	To examine the impact of e-learning and instructor-led lectures on knowledge of nursing students.	Quasi experimental	Census selected college-based nursing students (n = 60)	E-learning (n = 31)	Instructor-led (n = 29)	Knowledge scores: 15.50 (1.44) for e-learning and 16.45 (1.23) for instructor-led group (p < 0.001)	II
Abbaszadeh <i>et al.</i> (2011)	Iran	To compare the effect of two teaching methods (e-learning and lecture) on nursing documentation and examine the differences in acquiring competency on documentation	Quasi experimental (pre-post test)	Conveniently selected hospital-based Nurses (n = 61)	E-learning, (n = 30) <i>Duration:</i> 2 weeks	Instructor –led method, (n = 31) <i>Duration:</i> 2 weeks	Knowledge scores: 10.9(1.9) for instructor-led group vs. 11.6 (1.5) for e-learning group (p < 0.001) Proficiency Scores: 30.8 (11.7) for instructor-led group vs. 26.9 (8.0) for e-learning group (p < 0.001)	II

4. Discussion

The finding of this study revealed that e-learning and instructor-led hold the potential to enhance nursing knowledge. Moreover, this study found no significant difference in the overall effect of e-learning versus instructor-led trainings on nursing knowledge outcomes. The reason for this finding could be because e-learning participants have prompt access to a larger volume of related online information. This assertion was supported by Bock *et al.* (2021) who revealed that e-learning students tended to look through a greater volume of information online, thereby enhancing their learning experiences. This finding aligns with the observations of Wetsch *et al.* (2024), who similarly reported no significant difference in learning rates between e-learning and instructor-led methods. Furthermore, this finding corroborates Ranjbar *et al.* (2024), whose research demonstrated that nurses significantly bolstered their nursing knowledge through self-directed e-learning initiatives. Nevertheless, Kalogirou *et al.* (2022) contrasted this finding and reported a statistically significant increase in nursing knowledge with instructor-led methods compared to e-learning. The disparity in findings may be attributed to the design and implementation of e-learning programmes and disparities in the quality and engagement levels of instructors. Additionally, contextual factors such as organisational support and technological infrastructure may have influenced the effectiveness of e-learning initiatives in different settings. Further exploration and comparative analyses are warranted to better understand the underlying mechanisms driving these discrepant findings and to inform future educational strategies.

This study also observed no significant difference in nursing documentation proficiency outcomes between the e-learning and instructor-led methods. One potential reason for this finding is that learners may have had similar opportunities to develop and refine their documentation skills as those in instructor-led sessions if the e-learning modules were developed with a focus on interactivity, hands-on practice, and simulation exercises that closely mirror real-world documentation scenarios. The e-learning method may have facilitated skill development comparable to traditional instructor-led training methods due to the incorporation of immediate feedback and opportunities for reflection on documentation practices in e-learning modules. The notion that e-learning can enhance proficiency is supported by Currat *et al.* (2022), who observed that e-learning led to improved clinical skills among nurses. This finding aligns with the results of Barnes and Vance (2022), who found no significant difference in nursing proficiency between e-learning and instructor-led methods. Furthermore, Kim and Kim (2023) concluded that there was no significant difference in outcomes between e-learning and instructor-led methods, which further supports the notion. Another reason for this similarity in findings may be the consistent delivery of educational content and assessment criteria across both modalities, ensuring that learners receive comparable learning experiences regardless of the instructional method employed. Similarly, Terry *et al.* (2018) found that clinical documentation proficiency was retained equally well using both e-learning and instructor-led instruction methods.

Strengths and limitations

The strengths of this systematic review include a combined search of multiple electronic databases and manual searches of reference lists, ensuring the identification of relevant studies spanning a fifteen-year period. This approach enhances the robustness and inclusivity of the review process, minimizing the risk of missing pertinent literature. On the flip side, the limitations include study heterogeneity, a lack of a long-term follow-up, and multiple contextual factors. While efforts were made to synthesize findings across studies, the heterogeneity across could not be eliminated but the extent of this was accounted for with a forest plot; even so, heterogeneity of the studies may have negatively affected the generalizability of the review findings and introduce challenges in drawing definitive conclusions. Moreover, this review identified limited evidence regarding the long-term retention of knowledge and documentation skills acquired through e-learning and instructor-led training. The lack of long-term follow-up data limits the ability to assess the sustainability of training effects over time and may hinder the formulation of recommendations for sustaining nursing documentation competencies in the long term. This review highlighted the importance of contextual factors, such as organizational support and technological infrastructure, in influencing the effectiveness of training interventions. However, the extent to which these factors impact training outcomes may vary across different healthcare settings, limiting the generalizability of findings to diverse contexts.

Implications for policy, practice, and research

The findings of this review are relevant for informing policy decisions, guiding nursing continuing education and practice, and directing future research endeavours. The evidence indicating no significant difference between e-learning and instructor-led approaches in enhancing nursing knowledge and documentation proficiency suggests that policymakers should consider utilizing e-learning where instructor-led approach is not feasible for immediate improvements in nursing knowledge and documentation proficiency. This may involve allocating resources for the development and implementation of high-quality e-learning programs, as well as creating guidelines and standards to ensure their effectiveness and accessibility.

For nursing continuing education and practice, the findings suggest that both e-learning and instructor-led approaches can be viable options for enhancing nursing knowledge and documentation proficiency. Nursing and healthcare institutions may benefit from the flexibility and accessibility offered by e-learning, particularly in addressing the ongoing need for knowledge updates and skill development. However, it is essential to ensure that e-learning programs are designed to meet the specific needs and preferences of nursing learners and to provide adequate support and resources for their implementation.

The lack of significant differences between e-learning and instructor-led approaches in the meta-analysis underscores the need for longitudinal studies. Examining the long-term retention of knowledge and documentation skills acquired through e-learning

and instructor-led training would provide valuable insights into the long-term effects of e-learning versus instructor-led training interventions.

5. Conclusion

This systematic review found that e-learning and instructor-led training demonstrated similar effectiveness in improving nursing knowledge and documentation proficiency. Nursing education programs should be tailored to meet the specific needs and preferences of nursing learners, incorporating elements of both e-learning and instructor-led training to capitalize on their respective strengths. Programs should emphasize interactive learning experiences, personalized feedback, and opportunities for practice and reinforcement to enhance nursing documentation knowledge and proficiency. Additionally, future research should prioritize long-term follow-up assessments to evaluate the sustainability of training effects on nursing documentation competencies. Studies should examine factors influencing long-term retention of knowledge and skills, including opportunities for ongoing education and training, practice, and organizational support.

References

- Abbaszadeh, A., Sabeghi, H., Borhani, F., & Heydari, A. (2011). A comparative study on effect of e-learning and instructor-led methods on nurses' documentation competency. *Iranian Journal of Nursing And Midwifery Research*, *16*(3), 235.
- Alfaleh, R., East, L., Smith, Z., & Wang, S. Y. (2023). Nurses' perspectives, attitudes and experiences related to e-learning: A systematic review. *Nurse Education Today*, *23*(1) e105800.
- Barnes, E. R., & Vance, B. S. (2022). Transitioning a graduate nursing physical examination skills lab to an online learning modality. *Nurse Educator*, *47*(6), 322-327.
- Berga, K. A., Vadnais, E., Nelson, J., Johnston, S., Buro, K., Hu, R., & Olaiya, B. (2021). Blended learning versus face-to-face learning in an undergraduate nursing health assessment course: A quasi-experimental study. *Nurse Education Today*, *96*(1), e104622.
- Bock, A., Kniha, K., Goloborodko, E., Lemos, M., Rittich, A. B., Möhlhenrich, S. C., ... & Modabber, A. (2021). Effectiveness of face-to-face, blended and e-learning in teaching the application of local anaesthesia: a randomised study. *BMC Medical Education*, *21*(1), 137.
- Curat, L., Suppan, M., Gartner, B. A., Daniel, E., Mayoraz, M., Harbarth, S., ... & Stuby, L. (2022). Impact of face-to-face teaching in addition to electronic learning on personal protective equipment doffing proficiency in student paramedics: randomized controlled trial. *International Journal of Environmental Research and Public Health*, *19*(5), e3077.
- Ding, Y., Qian, J., Zhou, Y., & Zhang, Y. (2024). Effect of e-learning program for improving nurse knowledge and practice towards managing pressure injuries: A systematic review and meta-analysis. *Nursing Open*, *11*(1), e2039.
- Gholami, M., Fayazi, M., Hosseinabadi, R., Anbari, K., & Saki, M. (2023). Effect of triage training on nurses' practice and triage outcomes of patients with acute coronary syndrome. *International Emergency Nursing*, *68*(1), e101288.
- Hockenberry, M., Mulemba, T., Nedege, A., Madumetse, K., & Higgins, J. (2020). Distance-based education for nurses caring for children with cancer in Sub-Saharan Africa. *Journal of Pediatric Oncology Nursing*, *37*(5), 321-329.
- Kalogirou, M. R., Dahlke, S., Pietrosanu, M., & Hunter, K. F. (2022). Using an E-learning activity to enhance student nurses' understanding of cognitive impairment. *Nurse Education Today*, *108*(1), e105167.
- Kim, J. Y., & Kim, M. E. (2023). Can online learning be a reliable alternative to nursing students' learning during a pandemic?—A systematic review and meta-analysis. *Nurse Education Today*, *122*(1), 105710.
- Marufu, T. C., Collins, A., Vargas, L., Gillespie, L., & Almghairbi, D. (2021). Factors influencing retention among hospital nurses: systematic review. *British Journal of Nursing*, *30*(5), 302-308.
- McCutcheon, K., O'Halloran, P., & Lohan, M. (2018). Online learning versus blended learning of clinical supervisee skills with pre-registration nursing students: A randomised controlled trial. *International journal of nursing studies*, *82*(1), 30-39.
- Molla, F., Temesgen, W. A., Kerie, S., & Endeshaw, D. (2024). Nurses' documentation practice and associated factors in eight public hospitals, Amhara Region, Ethiopia: A cross-sectional study. *SAGE Open Nursing*, *10*(1), e23779608241227403.
- Pourghaznein, T., Sabeghi, H., & Shariatinejad, K. (2015). Effects of e-learning, lectures, and role playing on nursing students' knowledge acquisition, retention and satisfaction. *Medical journal of the Islamic Republic of Iran*, *29*(1), e162.
- Ranjbar, F., Sharif-Nia, H., Shiri, M., & Rahmatpour, P. (2024). The effect of spaced E-Learning on knowledge of basic life support and satisfaction of nursing students: a quasi-experimental study. *BMC Medical Education*, *24*(1), 537.
- Song, C. E., & Park, H. (2021). Active learning in e-learning programs for evidence-based nursing in academic settings: A scoping review. *The Journal of Continuing Education in Nursing*, *52*(9), 407-412.
- Terry, V. R., Terry, P. C., Moloney, C., & Bowtell, L. (2018). Face-to-face instruction combined with online resources improves retention of clinical skills among undergraduate nursing students. *Nurse Education Today*, *61*(1), 15-19. <https://doi.org/10.1016/j.nedt.2017.10.014>
- Tertulino, R., Antunes, N., & Morais, H. (2024). Privacy in electronic health records: a systematic mapping study. *Journal of Public Health*, *32*(3), 435-454.
- Wetsch, W. A., Link, N., Rahe-Meyer, N., Dumcke, R., Stock, J. M., Böttiger, B. W., & Wingen, S. (2024). Comparison of blended e-learning and face-to-face-only education for resuscitation training in German schools—A cluster randomized-controlled prospective study. *Resuscitation Plus*, *20*(1), 100767.
- Wu, X. V., Chi, Y., Selvam, U. P., Devi, M. K., Wang, W., Chan, Y. S., ... & Ang, N. K. E. (2020). A clinical teaching blended learning program to enhance registered nurse preceptors' teaching competencies: Pretest and posttest study. *Journal of medical Internet research*, *22*(4), e18604.
- Zamiri, M., & Esmaili, A. (2024). Methods and technologies for supporting knowledge sharing within learning communities: A systematic literature review. *Administrative Sciences*, *14*(1), 17.