Comprehensive Review of Evidence-Based Methods in Preventive Cardiology Education: Perspective from Analytical Studies

Dr. Arjun Das[1], Dr. Sanya Kapoor[2]

[1] *Professor of Anesthesiology, Jaipur National Medical Academy, Rajasthan, India.*

[2] *Professor of Anesthesiology, Jaipur National Medical Academy, Rajasthan, India.*

Received: 18/September/2024; Revised: 23/October/2024; Accepted: 20/November/2024; Published: 30/December/2024

Abstract

Evidence-based Methods (EBM) are essential for guaranteeing patient safety. Despite recommending teaching tactics to improve EBM understanding and abilities, new research suggests that nurses lack adequate preparation to implement EBM. A proposed three-tiered framework for the instruction of EBM emphasizes the necessity of interactive clinical experiences within EBM teaching methodologies. The article delineates the pedagogical strategies in undergraduate nursing courses to impart EBM expertise and abilities in cardiology. The research delineates the perspectives of pupils and teachers regarding learning outcomes and obstacles. Six qualitative investigations and one mixed-method study fulfilled the inclusion requirements and were rigorously assessed using the Critical Assessment Skills Course. The seven articles were analyzed inductively and conceptually using Braun and Clarke's six processes to identify themes. Four topics of teaching techniques were found, each encompassing subtopics: interactive instructional strategies, merged interactive and clinical teaching methods, results from learning, and impediments. While four studies had an ambiguous emphasis on instructing EBM rules, they all used research utilization and interactive pedagogical methodologies. Documented learning outcomes encompass improved analytical and critical thinking abilities and research application to guarantee patient security. Four of the seven examined studies exhibited an ambiguous emphasis on the implementation of EBM teaching methodologies. Interactive methods of instruction are employed, although the primary focus is on locating and critically evaluating research for practical application. Despite encompassing a limited body of literature, this study suggests a necessity for additional qualitative work focused on interactive and clinically integrative teaching methodologies to augment further EBM knowledge and abilities among first-year cardiology nursing pupils.

Keywords: Evidence-Based Methods, Cardiology, Education, Healthcare.

1 INTRODUCTION

Evidence-based Method (EBM) is the amalgamation of the most reliable research evidence, clinical competence, and the distinct values and tastes of the patient, including personal concerns, demands, cultural factors, and individual traits throughout clinical interactions (Connor et al., 2023). The Institute of Medicine (IOM), accrediting councils, and other medical professional organizations regard EBM as essential for healthcare providers (Nantsupawat et al., 2023). EBM has become an integral component of undergraduate, graduate, and ongoing educational curricula for health professionals.

Although there is a recognized interest in EBM as an essential ability for doctors, the research on effective teaching methods is still inadequate. Fifteen years prior, the quantity and caliber of evidence for effectively teaching EBM was insufficient. Ironically, recommendations for teaching EBM derived from these outcomes would be founded on the lowest tier of evidence. The excessive emphasis on critical evaluation relative to the other four stages of the EBM process—question composition, looking, applying, and self-assessment—constitutes a significant deficiency in the existing cardiology literature on EBM education (Hu et al., 2024). A review of 20 EBM instructional initiatives for cardiology healthcare learners revealed that these treatments emphasized some EBM phases (formulating clinical questions, acquiring evidence, and conducting critical appraisals) while neglecting others (application, assessment, and reflection).

The article sought to discover techniques for instructing EBM in undergraduate nursing courses. The review objectives were: "What instructional methods are employed to augment knowledge and skills in EBM within cardiology undergraduate nursing schooling, and what are the associated results of learning and obstacles?"

2 IDENTIFICATION OF STUDIES

The structure of qualitative studies was employed to formulate the review questions, strategize the search, and delineate the inclusion requirements. The subjects evaluated were learners in nursing, instruction in nursing, and nursing programs (Özbay & Çınar, 2021). The focus of the study was pedagogy, specifically within the context of EBM instruction. The ideas were converted into the specific topic headings and text utilized in the Medline search method, illustrating the truncation and combination of concepts through Boolean and proximity operations in all database queries.

The search parameters encompassed qualitative research published in English between 2010 and 2024. This variety was selected based on a preliminary search in the PubMed library, which indicated that most research on EBM instruction in nursing had been published since 2010, when EBM became established in nursing education (Chandran et al., 2023). The research analyzed the references mentioned in the acquired papers and cardiology research in Google Scholar that referenced the acquired studies.

The requirements for Inclusion were: 1) a unique qualitative study concentrating on EBM teaching strategies in undergraduate nursing instruction, specifically aimed at obtaining a comprehensive understanding of the experiences of both educators and students with these tactics; 2) Peer-reviewed, original study; 3) investigations concerning educators, student engagement, or both; and 4) research assessed as medium or high quality per the Critical Appraisal Skills Plan (CASP) (Jefferies et al., 2021). The omitting criteria included reviews, empirical investigations, theoretical investigations, and non-original cardiology studies. Publications about instructional methodologies aimed at healthcare professionals, master's programs, or postgraduate studies in nursing were likewise omitted.

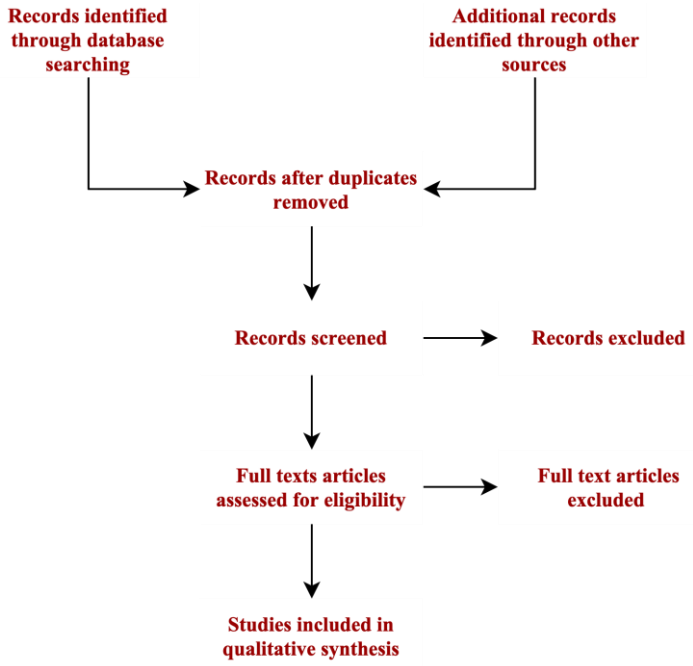

Figure 1: Workflow of the Study

The research employed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) protocol in the collection and choice procedure (Figure 1), identifying 980 documents from an initial library search and a further 36 from manual examination of the bibliographies of those cardiology research studies (Page et al., 2021). After removing copies, the research evaluated the abstracts of 725 papers. Out of these, 710 articles failed to satisfy the requirements for inclusion, resulting in 15 full-text papers selected for further study. All four writers reviewed the 15 publications, of which nine were removed due to low quality, emphasis on clinical action, or insufficient relevance to undergraduate nursing instruction. The review encompassed the remaining seven pieces.

2.1 Criteria for Inclusion and Removal

The article defines an undergraduate pupil as an individual pursuing their initial formal college degree in a specific discipline; it recognizes that global variations in course structures, terminology, and times across health disciplines restrict the synthesis of outcomes (Htay & Whitehead, 2021). The reviewed papers recognized one or all of the five stages of the EBM approach. Empirical or comparative research projects were eligible for inclusion if they documented any educational and/or psychological concepts as a component of their treatment. According to the initial protocol, the results of interest encompassed EBM behavior, understanding, abilities, mindsets, self-efficacy, convictions, principles, and the utilization of prospective utilization of EBM.

2.2 Critical Evaluation

All four research independently evaluated the seven final papers for their methodology utilizing CASP, with medium and high quality defined as fulfilling 5-8 and 8-10 elements of the CASP checklist. The research deliberated on disputes until an agreement was achieved.

2.3 Data Extraction and Synthesizing

Two stages of gathering information were conducted. Initially, precise details were collected regarding the treatment, geographic region, people, methodology, techniques, outcomes pertinent to the review issue, and particular objectives, including information on the underlying theory. In addition, data about the actual cardiology outcomes of measures, including statistical information, was collected. The variability in actions, results, and measuring instruments, both between and within studies, precluded meta-analysis; hence, a story-based and tabular analysis is provided.

2.4 Examination

A thematic evaluation was performed to discern themes according to the six stages, utilizing a deduction method that identifies themes from a top-down perspective, specifically coded themes in alignment with the designated review topic. While the study advocates for using stories, the incorporated qualitative investigations and mixed-methods research yielded text-based information. During the initial phase, every author acquainted themselves with their studies by thoroughly reading and reviewing the results from every investigation. In the second step, the primary research conducted a thorough manual coding of characteristics, resulting in the first codes, before identifying themes in the third stage. Stage four entailed examining the themes for alignment with the coding and determining the presence of subtopics. Following identifying themes in step five, the results were assessed for their pertinence to the study topic. The experts convened multiple times to deliberate on the analytical procedure and to achieve consensus regarding the labeling.

3 RESULTS

Of 1830 items from the research, 960 articles and abstracts were evaluated for eligibility. Three hundred full-text publications were evaluated for participation, and 218 papers were discarded. Out of 82 papers analyzed, 45 comprised randomized tests, 50 involved postgraduate-level individuals, and 62 educated physicians.

3.1 Coverage of EBM Stages in the Research Included

In EBM educational programs, step 3 (critical assessment of data) was the most commonly taught step (n = 62), then step 2 (acquiring proof; n = 50) and step 1 (questioning a clinical query; n = 50). Approximately one-third of the cardiology research investigations (n = 30; 36%) addressed solely one of the five EBM processes, with step 3 (critical assessment of evidence) being the most prevalent. Merely 11 research, constituting 13%, addressed all five phases of EBM. The percentage of investigations that taught all five phases rose with time, from 1 research (5% of 40) before 2010 to six investigations (23% of 32) between 2015 and 2021, notably with a rise in the scope of steps 4 and 5.

3.2 Measured Result Categories and the Quality of EBM Musical Instruments

Among the 86 studies considered, 520 assessed EBM abilities, 40 evaluated expertise, 33 examined attitudes, 17 analyzed behaviors, 14 tested self-efficacy, and 6 gauged students' responses to the learning experience. No measurable advantages to patients were connected with EBM. Tools of superior quality (demonstrating three or more categories of proven validity data) were utilized: Fourteen of 50 studies assessed EBM skills, fourteen of 40 studies evaluated EBM knowledge, and eight of 32 research examined EBM attitude. All tools employed to determine EBM self-efficacy and behavior lacked outstanding craftsmanship. It presents the comprehensive outcome domains evaluated and the quality of EBM tools utilized in the included cardiology research.

3.3 Premium Tools Utilized in EBM Educational Research

Seven of the 25 previously designed tools utilized in the included investigations were assessed as excellent quality (Figure 2). Five of these were utilized to evaluate both EBM knowledge and competencies. The remaining two were used to determine either EBM's expertise or abilities. The Fresno Test, Berlin Survey, and the Assessing Competence in EBM "ACE" instrument assessed three EBM stages: ask, gain, evaluate, and explain. The study assessed EBM steps 2 and 3 (gain, evaluate, and interpretation), while the Utrecht survey examined EBM steps 3 and 4 (evaluate, comprehend, implement). Another study focused solely on EBM stage 3.

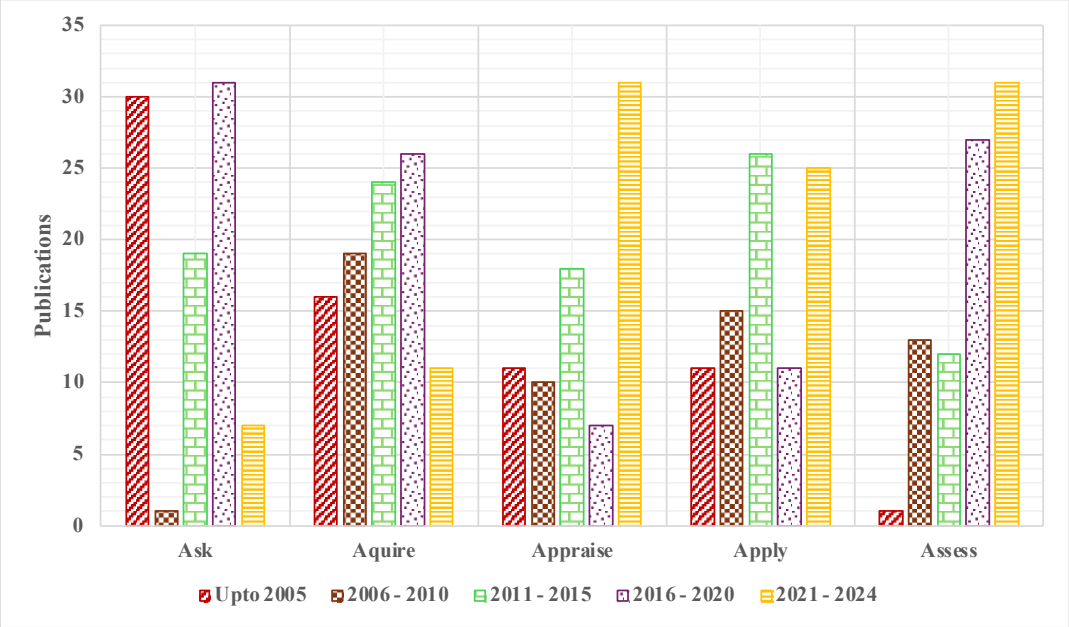

Figure 2: Publication Analysis

3.4 Methodological Constraints

This review has several restrictions. The research utilized a limited sample of publications and eliminated studies in languages other than English. This has resulted in the omission of specific research on improving EBM abilities and expertise in cardiology nursing education. The utilization of many databases reduced the likelihood of bias during selection. The six qualitative investigations used in this

study were uniform regarding their qualitative study methodology and adherence to the inclusion requirements. Qualitative cardiology information from the mixed-methods research pertinent to the study's issue was incorporated. Cultural variety and differences in respondent viewpoints have influenced the analysis in this research. Notwithstanding these constraints, the research achieved the objective of analyzing instructional methodologies, learning results, and obstacles in undergraduate training in nursing from the viewpoints of teachers and learners.

4 CONCLUSION

Inadequate emphasis has been placed on the use of EBM concepts in the training of nurses. The teaching tactics mentioned in the studies indicate that collaborative techniques are employed in conjunction with conventional instruction to improve research utilization skills in the education of nurses. Working with physicians to augment EBM understanding was only superficially addressed in most of these investigations. In conclusion, enhancing cardiology educators' awareness and competencies in teaching EBM concepts is essential, which entails employing interactive and clinically integrating instructional methodologies. Only seven papers fulfilled the criteria for selection in this study, highlighting the necessity for additional focused qualitative inquiry.

REFERENCES

[1] Connor, L., Dean, J., McNett, M., Tydings, D. M., Shrout, A., Gorsuch, P. F., ... & Gallagher-Ford, L. (2023). Evidence-based practice improves patient outcomes and healthcare system return on investment: Findings from a scoping review. *Worldviews on Evidence-Based Nursing*, *20*(1), 6-15. https://doi.org/10.1111/wvn.12621

[2] Nantsupawat, A., Wichaikhum, O. A., Abhicharttibutra, K., Udkunta, K., Poghosyan, L., & Shorey, S. (2023). Factors influencing evidence-based practice among undergraduate nursing students: A cross-sectional analysis. *International Journal of Nursing Sciences*, *10*(3), 367-372. https://doi.org/10.1016/j.ijnss.2023.06.002

[3] Hu, X., Li, J., Wang, X., Guo, K., Liu, H., Yu, Q., ... & Xiong, N. (2024). Medical education challenges in Mainland China: An analysis of the application of problem-based learning. *Medical Teacher*, 1-16. https://doi.org/10.1080/0142159X.2024.2369238

[4] Özbay, Ö., & Çınar, S. (2021). Effectiveness of flipped classroom teaching models in nursing education: A systematic review. *Nurse Education Today*, *102*, 104922. https://doi.org/10.1016/j.nedt.2021.104922

[5] Chandran, V. P., Balakrishnan, A., Rashid, M., Khan, S., Devi, E. S., Kulyadi, G. P., ... & Thunga, G. (2023). Teaching and learning strategies of evidence based medicine: A meta-synthesis of learners and instructors perspective. *Clinical Epidemiology and Global Health*, *21*, 101280. https://doi.org/10.1016/j.cegh.2023.101280

[6] Jefferies, D., Glew, P., Karhani, Z., McNally, S., & Ramjan, L. M. (2021). The educational benefits of drama in nursing education: A critical literature review. *Nurse Education Today*, *98*, 104669. https://doi.org/10.1016/j.nedt.2020.104669

[7] Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). Updating guidance for reporting systematic reviews: development of the PRISMA 2020 statement. *Journal of clinical epidemiology*, *134*, 103-112. https://doi.org/10.1016/j.jclinepi.2021.02.003

[8] Htay, M., & Whitehead, D. (2021). The effectiveness of the role of advanced nurse practitioners compared to physician-led or usual care: A systematic review. *International Journal of Nursing Studies Advances*, *3*, 100034. https://doi.org/10.1016/j.ijnsa.2021.100034