JOURNAL LA MEDIHEALTICO

VOL. 06, ISSUE 03 (774-785), 2025
DOI: 10.37899/journallamedihealtico.v6i3.2118

Evidence-Based Nursing: Management of Radial Access Complications Post PCI

Abda Ali[1,2], Rizadin Anshar [2]

[1]*STRADA University of Indonesia, Kediri, Indonesia*
[2]*Hasna Medika Heart Hospital, Cirebon, Indonesia*

**Corresponding Author: Abda Ali*
E-mail: aliabda792@gmail.com

Article Info

Article history:
Received 24 March 2025
Received in revised form 27 May 2025
Accepted 30 June 2025

Keywords:
Evidence-Based Nursing
Percutaneous Coronary Intervention
Radial Access Complications
Nursing Management
Patient Safety

Abstract

The advancement of interventional cardiology technology has enhanced the effectiveness of patient care for coronary artery disease, particularly through Percutaneous Coronary Intervention (PCI) using radial access. Although this approach is safer than femoral access, post-procedural complications such as hematoma, radial artery occlusion, and neuropathy remain clinical challenges. Evidence-Based Nursing Management plays a crucial role in minimizing the risk of complications through evidence-based interventions, including nurse education, optimization of compression techniques, and rehabilitation strategies. This study aims to analyze research trends related to evidence-based management in addressing post-radial PCI complications using bibliometric analysis with VOSviewer. The methodology includes a systematic literature review following the PRISMA protocol and bibliometric analysis of publications from 2020 to 2025 sourced from Google Scholar, ScienceDirect, and Wiley Online Library. The analysis results highlight emerging research trends in post-radial PCI complication management, identification of research gaps, and evidence-based policy recommendations. This study contributes to strengthening evidence-based nursing practices to enhance patient safety and care efficiency in PCI procedures.

Introduction

The development of cardiovascular interventional technology has brought significant changes in the care of patients with coronary artery disease. One of the commonly performed procedures is Percutaneous Coronary Intervention (PCI), which utilizes radial access as a safer approach compared to femoral access (Batra et al., 2020). The main advantages of radial access include a lower risk of bleeding, faster patient mobilization, and shorter hospital stays (Imbrìaco et al., 2022). However, post-procedural complications remain a challenge in clinical practice, including hematoma, radial artery occlusion, and neuropathy (Khan et al., 2025). Therefore, Evidence-Based Nursing Management is an essential approach to enhance patient safety and care efficiency.

Evidence-Based Nursing Management in the context of post-PCI complications using radial access aims to implement evidence-based interventions to minimize complication risks and improve clinical outcomes (Clark & Hyrkas, 2024). The implementation of evidence-based practice includes nurse education on early identification of complications, optimization of compression techniques, and appropriate rehabilitation strategies (Ren et al., 2025; Ruiz et al., 2024; Liang et al., 2025). With the increasing number of studies on post-PCI complications and their management strategies, a bibliometric approach using software such as VOSviewer

becomes an effective method for analyzing research trends and identifying gaps in the scientific literature.

Bibliometric approaches have been widely used in nursing research to identify publication patterns, citation trends, and collaboration among researchers in specific fields (Holmberg, 2025; Li et al., 2024; Zhu et al., 2021). By using VOSviewer, this study can map the research network related to Evidence-Based Nursing Management in post-radial PCI complications, identify frequently discussed topics, and evaluate the interconnections between various studies. This analysis is expected to provide a more comprehensive understanding of research developments in this field and serve as a basis for more targeted future research (Cullen et al., 2022; Sharma et al., 2025). Post-radial PCI complications remain a major concern in nursing practice, particularly in terms of monitoring and early management to prevent long-term patient impacts (Liu et al., 2025). One of the main challenges in implementing evidence-based management is the lack of understanding of effective prevention and management strategies, as well as variations in practice standards across healthcare facilities (McArthur et al., 2021; Cullen et al., 20220. Therefore, the literature mapping conducted in this study may help identify trends and best practices that can be adapted into evidence-based nursing policies.

Previous studies have shown that bibliometric analysis can help identify conceptual relationships in health and nursing fields, as well as provide insights into future research directions. In the context of post-radial PCI complications, this approach can reveal the extent of scientific attention to this topic and highlight aspects that have received limited attention in past research. Hence, the findings of this study are expected to contribute to the formulation of evidence-based policy recommendations for nurses involved in the care of post-radial PCI patients. Based on the urgency and relevance of this topic, this study aims to analyze publication trends related to Evidence-Based Nursing Management of post-radial PCI complications using a bibliometric method with VOSviewer software. By identifying research patterns and researcher connections, the results of this study may offer deeper insights into scientific developments in this field and provide guidance for the development of more effective and efficient evidence based nursing policies.

Methods

This study uses a systematic literature review (SLR) and bibliometric analysis (Bartolini et al., 2019; Huang et al., 2020). The protocol stages used as the foundation or guideline are based on the PRISMA Protocol, which consists of identification, screening, eligibility, and inclusion (Page et al., 2021). The bibliometric analysis procedure begins with determining the research objectives, formulating research questions, and developing a search strategy to collect the dataset (Huang et al., 2020). This study combines systematic SLR stages with bibliometric analysis, as both follow similar procedures starting from defining research objectives, formulating research questions, developing a search strategy for data collection, and conducting analysis. The entire review process is carried out systematically, including the dataset search stage.

All steps in this article review are conducted systematically. The flow of actions outlined in the design (planning section) is followed to guide the implementation of the research. A dataset covering one decade is considered sufficient to track research developments in this field. The dataset collection stage is carried out chronologically beginning with (1) accessing Google Scholar, ScienceDirect, or Wiley Online Library; (2) entering keywords, as listed in Table 1, in the title, abstract, and keyword search fields.

The keywords used are: Evidence-Based Nursing, Percutaneous Coronary Intervention (PCI), Radial Access Complications, Nursing Management, and Patient Safety; (3) then setting document type filters (articles and reviews), and (4) setting the publication year range (between 2020 and 2025), (5) After clicking the search button, the data is collected in CSV format and

stored in a reference manager, Mendeley. For the bibliometric analysis, the CSV data will be visualized using the VOSviewer software. Meanwhile, the next step is the screening or extraction of documents by applying inclusion and exclusion criteria that were determined in the earlier identification phase.

At this stage, all articles and reviews are extracted (screened) to determine which data are suitable for SLR analysis. The selection criteria are presented in Table 1.

Table 1. Selection Criteria

No.	Selection Criteria	Exclusion Results
1	Articles written in English	34 Articles in non English
2	Inappropriate articles (No keywords in title, abstract, or keywords)	30 related articles
3	Duplication	1 related article

Data extraction using the specified exclusion criteria resulted in 65 articles. These articles were then assessed for eligibility.

The collected data will be evaluated using the following quality assessment questions: a) Was the article published in a journal listed in Google Scholar, ScienceDirect, or Wiley Online Library between 2020 and 2025?; b) Does the article cover the concept of Radial Access Complication Management Post-PCI?

If the answers to these questions are "yes," the article passes the quality assessment for eligibility.

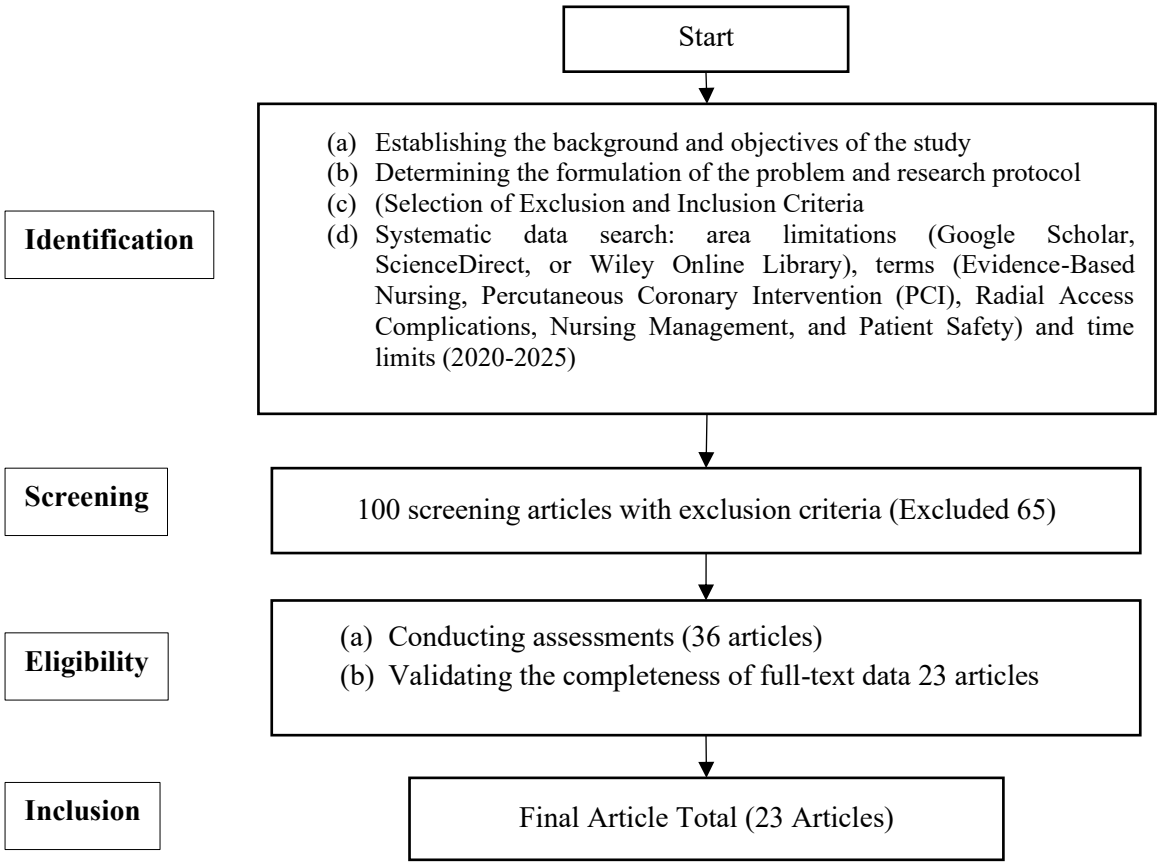

Figure 1. PRISMA Flow Diagram

The flow diagram in Figure 1 provides a detailed summary of the SLR and bibliometric analysis through the following steps: (1) In the identification stage, the research objective is first described. Then, it is essential to develop a review protocol. This is followed by defining the

conceptual boundaries of the study. The next steps involve a systematic data search from Google Scholar and journal articles published between 2020 and 2025. (2) In the screening stage, 100 articles were extracted using exclusion criteria. Subsequently, 65 articles were excluded, and 35 articles proceeded to the next stage. (3) In the eligibility stage, the articles must be validated and finalized. (4) Finally, the inclusion stage identifies 23 full-text articles that are eligible for bibliometric analysis using VOSviewer, and their contents are manually reviewed. The next critical phases are reporting and dissemination of the findings.

VOSviewer Online version 1.6.17 (Visualization of Similarities) was used to map and analyze the data, which can be downloaded from http://www.vosviewer.com. Notably, this software was developed by Leiden University, CWTS (Centre for Science and Technology Studies). The online version of VOSviewer is a valuable tool for visualizing bibliometric networks or metadata in the bibliographic domain, such as titles, authors, journals, abstracts, and keywords. The latest online version of VOSviewer is equipped with a sharing menu that helps readers independently and interactively explore the visualization results.

Result and Discussion

Network Visualization

The network visualization generated by VOSviewer in this study illustrates the relationships between concepts in the management of radial access complications following Percutaneous Coronary Intervention (PCI) procedures, based on an Evidence-Based Nursing approach. Each cluster represents thematic connections among frequently occurring terms in the literature, helping to understand the clinical dynamics, patient care, as well as the challenges and benefits of radial access in PCI procedures.

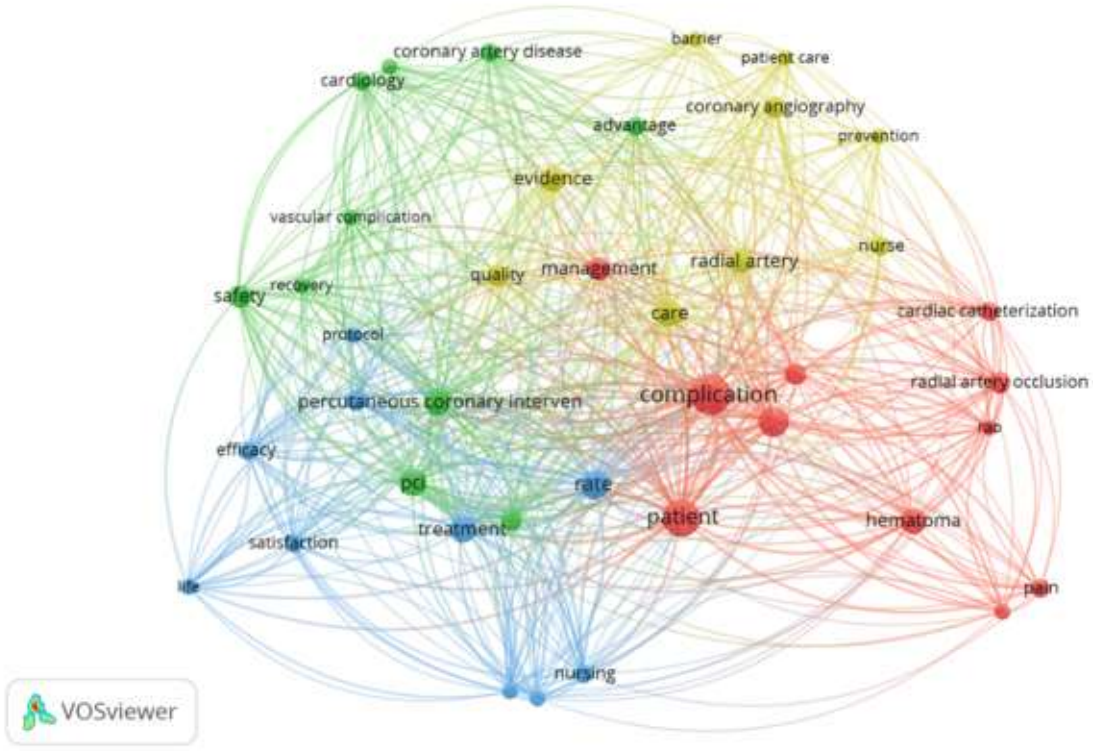

Figure 2. Network Visualization Vosviewer

Based on the VOSviewer diagram shown in Figure 2, the first cluster highlights aspects of complications that may occur following PCI procedures via radial access. Terms such as "complication", "hematoma", "radial artery occlusion (RAO)", and "risk factor" indicate that the primary risks after the procedure involve circulatory disturbances due to vascular trauma.

"Cardiac catheterization" and "ultrasound" reflect the involvement of technology in monitoring and preventing complications. Literature discussing this aspect includes studies focusing on hematoma incidence and RAO risk factors, emphasizing the importance of proper catheter insertion techniques and strict monitoring during and after the procedure (Sanchez et al., 2020; Kim et al., 2021).

The second cluster focuses more on the benefits and impact of radial access on procedural safety and patient outcomes. Terms such as "advantage", "patient outcome", "safety", and "vascular complication" reflect that, compared to femoral access, radial access has a lower complication rate. "Percutaneous coronary intervention" and "coronary artery disease" show that this method is widely used in patients with coronary artery disease. Several studies in the literature indicate that choosing radial access can reduce hospital stays and improve patient safety, as described by Bernat et al. (2019) and Bertrand et al. (2021).

The third cluster relates to patient care and satisfaction with the procedure. Terms such as "efficacy", "nursing", "protocol", and "satisfaction" suggest that the success of care greatly depends on standardized nursing procedures and the effectiveness of complication management. Shorter hospital stays are also an advantage of radial access, as discussed in the study by Lee et al. (2020), which found that patients with radial access experienced faster recovery and reported higher satisfaction compared to femoral access.

The fourth cluster emphasizes the role of healthcare providers in preventing complications and improving care quality. Terms such as "barrier", "nurse", "prevention", and "quality" indicate challenges in implementing evidence-based nursing standards. Related literature, such as the study by Malik et al. (2022), stresses that nurses play a crucial role in patient monitoring and education to prevent complications such as RAO and hematoma.

From these four clusters, it can be concluded that the Evidence-Based Nursing approach in managing radial access complications post-PCI encompasses various aspects, including risks and complications, clinical benefits, care effectiveness, and the role of healthcare professionals in ensuring safe procedure implementation. Findings from published studies support the importance of close monitoring, appropriate interventional techniques, and the nursing role in improving patient outcomes and reducing long-term complication risks.

Overlay Visualization

The Overlay Visualization in VOSviewer provides a temporal view of how research concepts have evolved over time. The colors used in this visualization indicate the publication period of articles associated with certain terms. Older terms (blue) originate from earlier studies, while newer terms (yellow) indicate concepts that have gained attention in more recent research. Thus, this analysis helps identify current research trends in the management of radial access complications following Percutaneous Coronary Intervention (PCI).

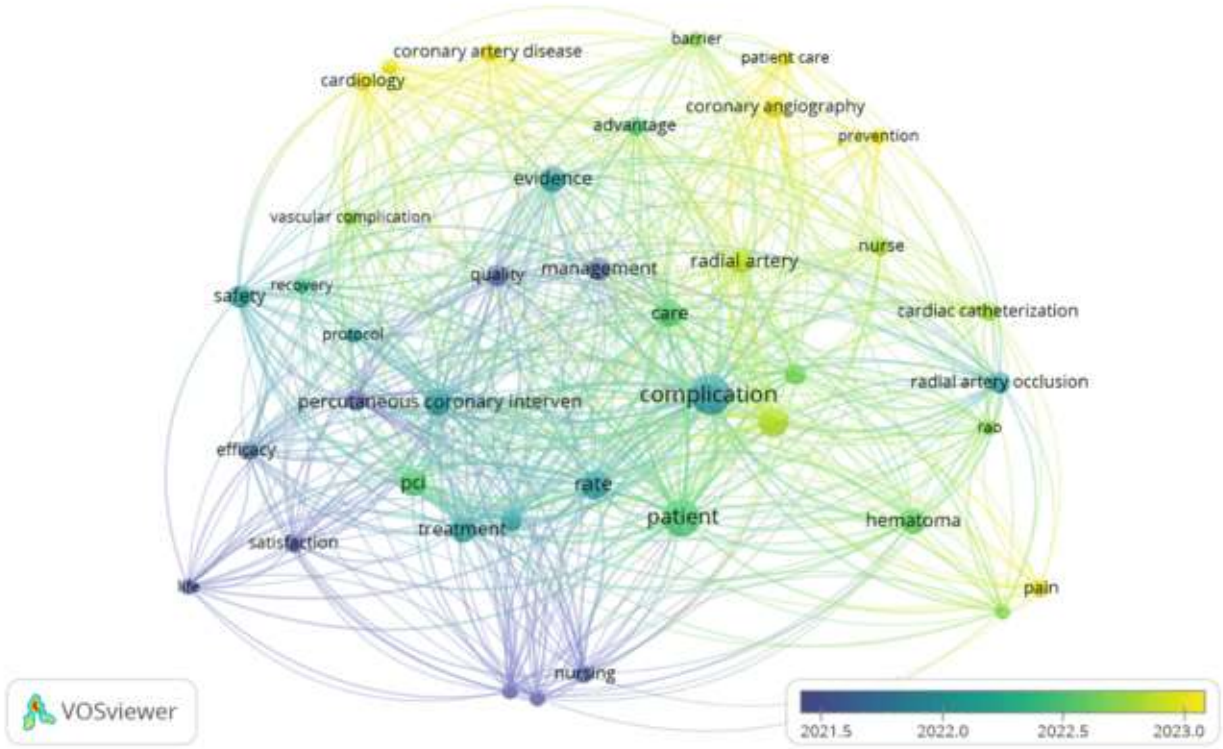

Figure 3. Network Visualization

In the Overlay Visualization diagram (Figure 3), the terms *cardiac catheterization*, *complication*, and *radial artery occlusion* appear in darker colors, indicating that these aspects have long been a focus in research on post-PCI complications. This aligns with previous literature that highlights the primary risks associated with radial access techniques, particularly vascular complications such as hematoma and radial artery occlusion.

Over time, newer concepts such as *recovery*, *safety*, and *patient outcome* have begun to gain more attention, as indicated by their lighter colors. This shift reflects an increasing focus on evaluating the effectiveness of complication prevention and recovery strategies, which are increasingly supported by evidence-based research.

In addition, terms like *nursing* and *quality* also appear in lighter shades, suggesting that the role of nurses in complication management is gaining more recognition in recent studies.

Table 2. Frequency of Articles Based on Year of Publication

Year	Article Frequency	Percentage (%)
2020	5	21.74
2021	3	13.04
2022	4	17.39
2023	3	13.04
2024	7	30.43
2025	1	4.35
Total	**23**	**100**

Meanwhile, the distribution of publications by year, as shown in Table 2, indicates that the peak of research occurred in 2024, with 7 articles (30.43%). This surge reflects a growing interest in the management of radial access complications post-PCI, in line with advancements in interventional cardiology technology and the implementation of evidence-based practice in nursing. In previous years, research focused more on the fundamental aspects of complications and risk factors, as reflected in the more stable number of publications from 2020 to 2023.

Although the number of publications decreased in 2025 (4.35%), this may be interpreted as a transition phase toward exploring more specific aspects of post-PCI complication management.

The Overlay Visualization diagram reinforces this finding by showing that newer terms such as *protocol*, *efficacy*, and *treatment* have begun to attract attention in the most recent period, indicating a research direction increasingly oriented toward evaluating more effective and evidence-based interventions.

Density Visualization

The Density Visualization in VOSviewer illustrates the density of terms within a research field based on their frequency of occurrence in the analyzed literature. Yellow indicates terms that appear frequently and have strong relationships with various other concepts, while green and blue represent terms with lower frequencies and weaker connections within the research network. Through this analysis, key trends in the management of radial access complications following Percutaneous Coronary Intervention (PCI) can be identified, particularly in the context of evidence-based nursing.

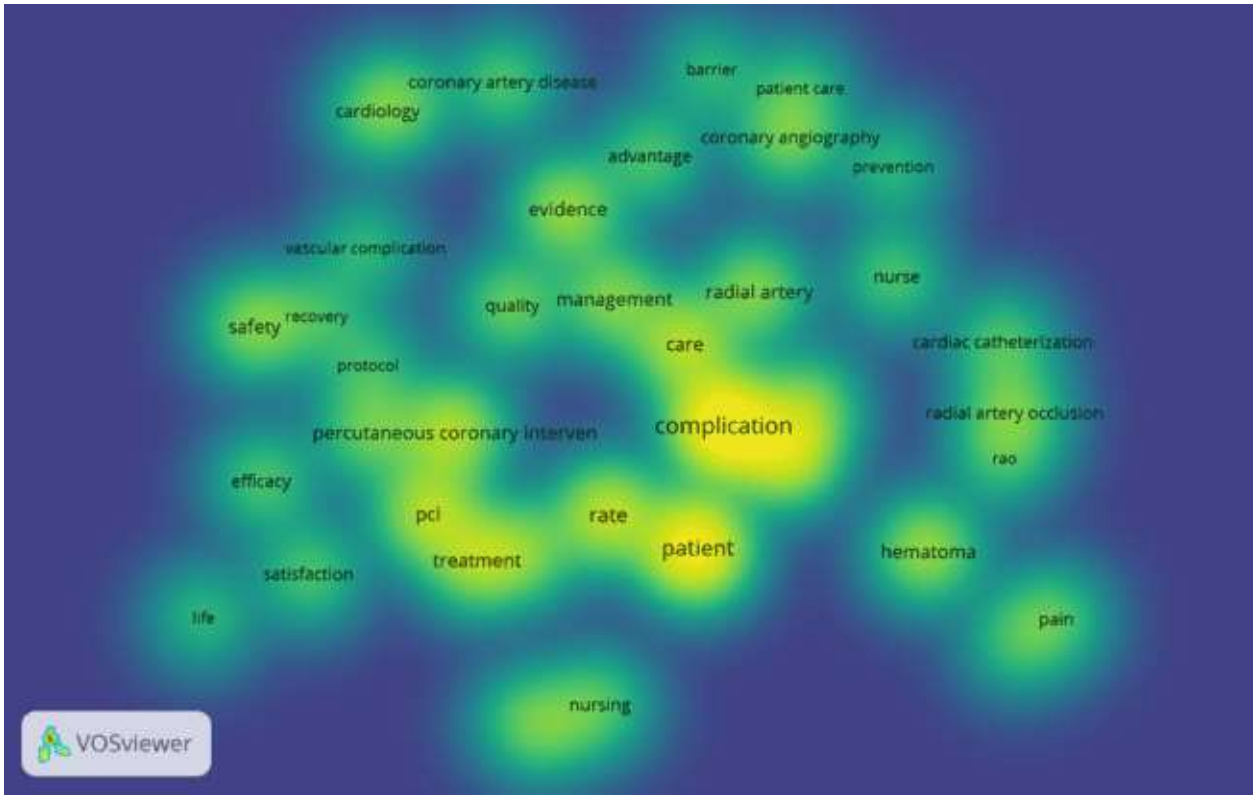

Figure 3. Network Visualization

In this visualization, the terms *complication*, *patient*, and *percutaneous coronary intervention* appear with strong yellow intensity, indicating that complications and their impact on patients are the main focus of research. This aligns with the abundance of studies addressing the side effects of radial access in PCI, such as radial artery occlusion and hematoma. Terms such as *treatment*, *safety*, and *management* also appear in bright yellow-green hues, suggesting that recent research increasingly emphasizes patient safety and management strategies in this procedure.

Meanwhile, terms such as *cardiac catheterization*, *nurse*, and *prevention* appear in green areas, indicating that aspects of nursing and complication prevention remain part of the research, though not as intensively focused as patient complications and care. Terms in the blue spectrum, such as *pain*, *barrier*, and *life*, show that research on psychosocial aspects and barriers in post-PCI patient care remains limited compared to clinical aspects. Thus, this

visualization suggests that the field is evolving toward improving intervention effectiveness and enhancing complication management, with nursing playing an increasingly recognized role in evidence-based approaches.

Based on the analysis of 23 studies related to the management of radial access complications post-PCI, there is a clear trend toward optimizing evidence-based nursing practice. The majority of studies (Xia et al., 2024; Rodrigues et al., 2024; Song et al., 2023) emphasize the importance of hemostasis techniques and prevention of Radial Artery Occlusion (RAO) as key focuses. The implementation of compression protocols (such as the use of prophylactic ulnar compression) and the reduction of catheter sheath size has proven effective in decreasing RAO incidence, with compliance rates reaching up to 100% on certain audit criteria (Xia et al., 2024). These studies also highlight the need for standardized equipment and nursing documentation to ensure the sustainability of best practices.

Scientific attention to radial access complications is global, with research contributions from various regions such as China (Liu et al., 2022; Wang et al., 2021), the United States (Levin et al., 2022; Beaver et al., 2021), and Europe (Didagelos et al., 2024; Schahab et al., 2020). However, clear methodological variations and recommendations are evident. For example, a study in Pakistan (Cheema et al., 2024) reported lower in-hospital mortality with radial access compared to femoral, while research in Greece (Didagelos et al., 2024) identified RAO risk factors such as female gender and anticoagulant use. This highlights the need for local adaptation of global guidelines.

Aspects that remain underexplored include patient education and long-term monitoring. Only a few studies (e.g., Williams et al., 2020) have evaluated the effectiveness of nurse-led ultrasound monitoring to detect RAO, despite its proven feasibility and ability to reduce complications. In addition, psychosocial interventions, such as managing patient anxiety post-PCI, have yet to be widely investigated, although Yang et al. (2020) demonstrated that advanced nursing care improved patients' quality of life and satisfaction.

Hemostasis techniques emerged as a dominant theme, with four main methods identified: manual compression, bandages, compression devices, and hemostatic patches (Rodrigues et al., 2024). However, the absence of standardized protocols for some methods (e.g., patches) indicates a gap in clinical practice. The study by Song et al. (2023) introduced innovations such as a combination of active care and hydrogel dressings that reduced puncture site complications, but their implementation remains limited to research settings. Traditional monitoring (e.g., vital sign frequency) has also been questioned. Clark et al. (2024) found that heart rate and blood pressure monitoring did not directly correlate with vascular complication detection, instead recommending a focus on access site physical assessment and patient education. These findings align with the SCAI consensus by Naidu et al. (2021), which emphasizes the importance of holistic clinical assessment by nurses.

Several studies reveal implementation challenges, such as a lack of specialized compression devices (Xia et al., 2024) or resistance to the radial technique learning curve (Beaver et al., 2021). Team-based training programs (coaching interventions) have proven effective in increasing radial access adoption but require institutional support and sufficient resources. Based on this synthesis, evidence-based policy recommendations include: (1) standardizing hemostasis protocols with a priority on calibrated compression devices, (2) integrating ultrasound training and clinical assessment into nursing curricula, (3) developing electronic documentation systems to monitor protocol compliance, and (4) enhancing multidisciplinary collaboration in the development of local guidelines.

Studies such as those by Roy et al. (2022), Brunet et al. (2020), and Ying et al. (2024) also underline the importance of vigilance regarding rare complications such as severe ischemia, which require rapid response and systematic reporting.

Conclusion

The Evidence-Based Nursing approach in managing radial access complications post-PCI demonstrates that evidence-based nursing practice plays a crucial role in enhancing patient safety and reducing the risk of complications. The analysis of research trends reveals that the main focus in the literature is the prevention of Radial Artery Occlusion (RAO), optimization of hemostasis techniques, and the use of monitoring technology to support early complication detection. Recent studies highlight the effectiveness of strategies such as prophylactic ulnar compression and reduction in catheter sheath size in decreasing the incidence of vascular complications. Additionally, the findings of this study indicate that nurse involvement in patient education and post-procedural monitoring significantly contributes to improved clinical outcomes and patient satisfaction.

Although the evidence-based approach has shown a positive impact in clinical practice, this study has several limitations. The data analyzed mainly comes from studies published in recent years, which may not fully reflect the long-term dynamics in the management of radial access complications. Furthermore, the research is still limited to literature using quantitative approaches, while psychosocial aspects and patient experiences have not been deeply explored. Another factor to consider is the heterogeneity in nursing standards across healthcare facilities, which may affect the applicability of the research findings in various clinical contexts. Therefore, further research using longitudinal methods and qualitative approaches is needed to obtain a more comprehensive understanding.

The implications of this study include strengthening evidence-based nursing standards in PCI procedures, enhancing nurse training in early complication detection, and developing more systematic protocols for the prevention and management of vascular complications. Healthcare institutions are expected to adopt best practices proven effective in this study to improve patient safety and optimize post-procedural recovery. Moreover, these findings emphasize the importance of policies that support access to monitoring technologies and safer interventional tools to reduce complication rates. Thus, strengthening the synergy between research, policy, and clinical practice becomes a strategic step toward improving the quality of evidence-based nursing services in the field of interventional cardiology.

References

Bartolini, M., Bottani, E., & Grosse, E. H. (2019). Green warehousing: Systematic literature review and bibliometric analysis. *Journal of Cleaner Production, 226*, 242–258. https://doi.org/10.1016/j.jclepro.2019.04.055

Batra, M. K., Rai, L., Khan, N. U., Mengal, M. N., Khowaja, S., Rizvi, S. N. H., ... & Karim, M. (2020). Radial or femoral access in primary percutaneous coronary intervention (PCI): Does the choice matter? *Indian Heart Journal, 72*(3), 166–171. https://doi.org/10.1016/j.ihj.2020.05.004

Beaver, K., Naranjo, D., Doll, J., Maynard, C., Taylor, L., Plomondon, M., Waldo, S., Helfrich, C. D., & Rao, S. V. (2021). Design and baseline results of a coaching intervention for implementation of trans-radial access in percutaneous coronary intervention. *Contemporary Clinical Trials, 111*, 106606. https://doi.org/10.1016/j.cct.2021.106606

Brunet, M.-C., Chen, S. H., & Peterson, E. C. (2020). Transradial access for neurointerventions: Management of access challenges and complications. *Journal of Neurointerventional Surgery, 12*(1), 82–86. https://doi.org/10.1136/neurintsurg-2019-015145

Cheema, A. A., Abbas, S., Shahid, M., Ahmed, M. S., Usmani, S., & Ali, S. M. N. (2024). The impact of radial vs femoral access on vascular complications and patient outcomes in

complex PCI. *Journal of Health and Rehabilitation Research, 4*(2), 466–470. https://doi.org/10.61919/jhrr.v4i2.876

Clark, J. B., & Hyrkas, K. (2024). Early identification of vascular access site complications and frequent heart rate and blood pressure monitoring after cardiac catheterization: A scoping review. *Journal of Vascular Nursing*. https://doi.org/10.1016/j.jvn.2024.08.001

Cullen, L., Hanrahan, K., Farrington, M., Tucker, S., & Edmonds, S. (2022). *Evidence-based practice in action: Comprehensive strategies, tools, and tips from University of Iowa Cao, Y., Qi, F., Cui, H., & Yuan, M. (2023). Knowledge domain and emerging trends of carbon footprint in the field of climate change and energy use: a bibliometric analysis. Environmental Science and Pollution Research, 30(13), 35853-35870. Hospitals & Clinics*. Sigma Theta Tau.

Didagelos, M., Pagiantza, A., Papazoglou, A. S., Moysidis, D. V., Petroglou, D., Daios, S., Anastasiou, V., Theodoropoulos, K. C., Kouparanis, A., & Zegkos, T. (2024). Incidence and prognostic factors of radial artery occlusion in transradial coronary catheterization. *Journal of Clinical Medicine, 13*(11), 3276. https://doi.org/10.3390/jcm13113276

Holmberg, C. (2025). Identifying trends in the most cited nursing articles: Research topics, author gender representation and characteristics correlated with citation counts. *Journal of advanced nursing*, *81*(6), 2874-2884. https://doi.org/10.1111/jan.16562

Huang, C., Yang, C., Wang, S., Wu, W., Su, J., & Liang, C. (2020). Evolution of topics in education research: A systematic review using bibliometric analysis. *Educational Review, 72*(3), 281–297. https://doi.org/10.1080/00131911.2019.1566212

Imbrìaco, G., Monesi, A., & Spencer, T. R. (2022). Preventing radial arterial catheter failure in critical care—Factoring updated clinical strategies and techniques. *Anaesthesia Critical Care & Pain Medicine, 41*(4), 101096. https://doi.org/10.1016/j.accpm.2022.101096

Khan, K., Amir, E., Akano, O., Borucki, J., Al Thaher, A., Stather, P., & Ali, T. (2025). Challenging the controversy surrounding percutaneous brachial artery access related complications: A systematic review and meta-analysis. *Vascular and Endovascular Surgery, 59*(1), 47–63. https://doi.org/10.1177/15385744241278048

Levin, S. R., Carlson, S. J., Farber, A., Kalish, J. A., King, E. G., Martin, M. C., McPhee, J. T., Patel, V. I., Rybin, D., & Siracuse, J. J. (2022). Percutaneous radial artery access for peripheral vascular interventions is a safe alternative for upper extremity access. *Journal of Vascular Surgery, 76*(1), 174–179. https://doi.org/10.1016/j.jvs.2021.11.076

Li, B., Du, K., Qu, G., & Tang, N. (2024). Big data research in nursing: A bibliometric exploration of themes and publications. *Journal of Nursing Scholarship*, *56*(3), 466-477. https://doi.org/10.1111/jnu.12954

Liang, H., Yuan, P., Xu, T., Jin, C., & Ji, C. (2025). The impact of functional training based on clinical nursing pathways informed by evidence-based theory on functional recovery in patients with cerebral hemorrhage. *Frontiers in Neurology*, *16*, 1558908. https://doi.org/10.3389/fneur.2025.1558908

Liu, L.-Y., Ren, F., Xing, Y.-L., Liu, Q.-R., Wu, Q.-Y., Ren, G., Liao, Q.-W., Wang, L., & Gan, F. (2024). Evaluation of the safety and efficacy of coronary intervention through the brachial artery compared to the radial artery in elderly patients with different

extubation times. *The Heart Surgery Forum, 27*(4), E374–E380. https://doi.org/10.3389/fphar.2025.1582661

McArthur, C., Bai, Y., Hewston, P., Giangregorio, L., Straus, S., & Papaioannou, A. (2021). Barriers and facilitators to implementing evidence-based guidelines in long-term care: a qualitative evidence synthesis. *Implementation Science*, *16*, 1-25. https://doi.org/10.1186/s13012-021-01140-0

Naidu, S. S., Abbott, J. D., Bagai, J., Blankenship, J., Garcia, S., Iqbal, S. N., Kaul, P., Khuddus, M. A., Kirkwood, L., & Manoukian, S. V. (2021). SCAI expert consensus update on best practices in the cardiac catheterization laboratory. *Catheterization and Cardiovascular Interventions, 98*(2), 255–276. https://doi.org/10.1002/ccd.29760

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Ren, X., Hu, X., Chen, X., Zhang, M., Zhang, J., & Xiao, Q. (2025). Summary of the best evidence for perioperative prevention of deep vein thrombosis in adult patients with hip fracture. *Journal of Nursing Management, 2025*(1), 8819579. https://doi.org/10.1111/jonm.8819579

Rodrigues, D. J. T., Teixeira, C., Parola, V., & Marques, P. (2024). Radial artery haemostasis after coronary angiography: A scoping review. *The Journal of Vascular Access*, 11297298241290568. https://doi.org/10.1177/11297298241290567

Roy, S., Kabach, M., Patel, D. B., Guzman, L. A., & Jovin, I. S. (2022). Radial artery access complications: Prevention, diagnosis and management. *Cardiovascular Revascularization Medicine, 40*, 163–171. https://doi.org/10.1016/j.carrev.2021.12.007

Ruiz, M. J. S., Moll, N. V., Gálvez, M. M., Jiménez, M. G., & Muñoz, L. A. (2024). Compression therapy in patients with venous leg ulcers: a best practice implementation project. *JBI Evidence Implementation*, 10-1097. https://doi.org/10.1097/xeb.0000000000000433

Schahab, N., Kavsur, R., Mahn, T., Schaefer, C., Kania, A., Fimmers, R., Nickenig, G., & Zimmer, S. (2020). Endovascular management of femoral access-site and access-related vascular complications following percutaneous coronary interventions (PCI). *PLOS ONE, 15*(3), e0230535. https://doi.org/10.1371/journal.pone.0230535

Sharma, H., Padhi, B., Sharif, A., & Bashir, M. F. (2025). Striving towards green total factor productivity: A bibliometric and systematic literature review for future research agenda. *Journal of Environmental Management*, *377*, 124639. https://doi.org/10.1016/j.jenvman.2025.124639

Song, B., Zhang, M., Fan, L., Chen, R., & Weng, L. (2023). Prospective active care combined with hydrogel dressing for the prevention of puncture site complications after transradial coronary intervention: A randomized controlled study. *Materials Express, 13*(8), 1414–1421.

Wang, Z., Wang, Y., & Song, X. (2021). Comprehensive nursing care after coronary intervention operation. *Food Science and Technology, 41*, 556–563.

Williams, T., Condon, J., Davies, A., Brown, J., Matheson, L., Warner, T., Savage, L., Boyle, A., Collins, N., & Inder, K. (2020). Nursing-led ultrasound to aid in trans-radial access in cardiac catheterisation: A feasibility study. *Journal of Research in Nursing, 25*(2), 159–172.

Xia, B., Song, P., McArthur, A., & Bai, J. (2024). Prevention of radial artery occlusion after transradial angiography and intervention: A best practice implementation project. *JBI Evidence Implementation*. https://doi.org/10.1097/XEB.0000000000000424

Yang, C., Wei, Y., Su, Q., Zhang, J., & Wang, G. (2020). Effects of advanced nursing on temporary pacemaker installation during PCI treatment for acute myocardial infarction. *International Journal of Clinical and Experimental Medicine, 13*(8), 5858–5866.

Ying, Y., Lin, X., Chen, M., Cao, Y., Yao, Y., & Group, E. I. C. A. (EICA). (2024). Severe ischemia after radial artery catheterization: A literature review of published cases. *The Journal of Vascular Access, 25*(3), 767–773. https://doi.org/10.1177/11297298221101784

Zhu, R., Liu, M., Su, Y., Meng, X., Han, S., & Duan, Z. (2021). A bibliometric analysis of publication of funded studies in nursing research from Web of Science, 2008–2018. *Journal of Advanced Nursing*, *77*(1), 176-188. https://doi.org/10.1111/jan.14578