



(REVIEW ARTICLE)



## A systematic review of patient education strategies for arteriovenous fistula care in hemodialysis patients

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### Abstract

Chronic kidney disease (CKD) poses a significant global health challenge, contributing to approximately 1.4 million deaths in 2019. As the prevalence of end-stage renal disease (ESRD) rises, effective management strategies, particularly hemodialysis and arteriovenous fistula (AVF) care, become paramount. This systematic review aims to evaluate various nurse-led patient education interventions focused on enhancing self-care practices and reducing complications associated with AVF. A comprehensive literature search across CINAHL Complete and PubMed yielded 344 articles, of which only six met the inclusion criteria, highlighting the selective nature of the review process. All included studies employed quantitative methods, encompassing diverse educational approaches such as brochures, multi-method techniques, and instructional modules, involving a total of 212,372 participants. The findings demonstrate that effective patient education significantly improves knowledge of AVF care, reduces anxiety, enhances the ability to identify infection symptoms, and positively influences vascular access outcomes. Thematic synthesis revealed common patterns and themes across the studies, emphasizing the importance of tailored educational strategies in improving self-care behaviors among hemodialysis patients. This review underscores the critical role of healthcare professionals, especially nurses, in implementing diverse educational interventions that cater to individual patient needs, ultimately improving clinical outcomes and quality of life for individuals with AVF undergoing hemodialysis. Future research should explore integrated education programs to further enhance the effectiveness of patient education in this population.

**Keywords:** End-Stage Renal Disease; Arteriovenous Fistula (AVF); Patient Education; Scoping review

### 1. Introduction

Chronic kidney disease (CKD) continues to be an emerging and evolving health problem both nationally and globally. In 2019, about 1.4 million deaths globally were attributed to CKD, representing a 20% increase compared to 2010 (IHME, 2020). In South Asia, the pooled prevalence of CKD among the general population was 14% (95% CI 11-18%) (Shrestha et al., 2021). In fourteen low- to middle-income countries, including the Philippines, the prevalence of CKD stage 3-5 was 11.2% (95% CI 9.3-13.2%).

For ESRD, hemodialysis is a primary treatment, requiring the creation of a permanent vascular access through an arteriovenous fistula (AVF). Proper care of the AVF is critical to the success of hemodialysis. Nurses play a key role in promoting accurate self-care of AVF access, which is essential for treatment maintenance. Understanding the most effective methods of nurse-led patient education for maintaining AVF access is critical.

This systematic review aims to compare different modes of nurse-led patient education in reducing AVF complications. Patient education remains a primary responsibility of nurses, and establishing clear intervention programs and

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guidelines can provide essential self-care strategies for patients with an AVF (Clemente N. Sousa et al., 2014). In addition to vascular access care, patient education programs positively influence patients' knowledge of hemodialysis, its complications, appropriate diet and fluid restrictions, medications, and activities, thereby improving patient adaptation to hemodialysis and CKD (Fadlalmola & Elkareem, 2020).

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## **2. Methods**

### **2.1. Search Strategy**

A comprehensive search of scientific databases was conducted, including CINAHL Complete and PubMed, using the following search terms: "arteriovenous fistula" OR AVF AND "Patient Education" OR "Health Education" AND Nursing AND "Chronic Kidney Disease" OR CKD. To ensure a comprehensive review, web-based searches were conducted if necessary. The search commenced after ethics board approval of the review.

### **2.2. Inclusion and Exclusion Criteria**

Articles were included if they were:

- Primary empirical studies,
- Focused on patient education on self-care in ckd patients regardless of stage, and
- Relevant to the review's objectives.

Articles were excluded if they:

- We're not published in English,
- Had no available full text, or
- We're not primary empirical articles, such as reviews or commentaries.

### **2.3. Study Selection**

Titles and abstracts from the search results were screened for relevance. Relevant titles were screened, and their abstracts evaluated to determine if they met the review's objectives. Full texts of eligible abstracts were then sought. All screenings were conducted solely by the author.

### **2.4. Data Abstraction**

This review adhered to PRISMA guidelines. Data extraction was performed using a data extraction table, and completeness and accuracy were reviewed after extraction. Homogeneity among the studies was also assessed.

### **2.5. Quality Appraisal**

Eligible articles were appraised using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists for Analytical Cross-Sectional Studies (Moola et al., 2015). The appraisal assessed biases, and inclusion of articles was based on a predetermined score. The author conducted the appraisal.

### **2.6. Data Synthesis**

A quantitative pooling of study results was planned if homogeneity was present. If heterogeneity was observed, a thematic synthesis was performed to classify, categorize, or identify patterns in the included studies.

### **2.7. Ethical Considerations**

This systematic review adhered to the ethical guidelines outlined in the National Ethical Guidelines for Health and Health-Related Research (Reyes et al., 2017) and related laws. The review followed the seven ethical principles: informed consent, social value, vulnerability, risk and safety, privacy, justice, and transparency. Informed consent was unnecessary since no direct human participation occurred, and data were derived from published empirical studies.

### 3. Results

In the systematic review process, a total of 344 articles were initially identified through searches in CINAHL Complete, PubMed, and additional web sources. This comprehensive search strategy aimed to capture all relevant literature concerning patient education related to arteriovenous fistula (AVF) care in patients undergoing hemodialysis (see figure 1).

Following the initial identification phase, the articles underwent a meticulous screening process. This involved a thorough evaluation of titles, abstracts, and full-text articles to ensure adherence to the established inclusion and exclusion criteria. After this rigorous process, only six (6) articles met the criteria for inclusion in the final review.

The reduction from 344 identified articles to just six included articles highlights the selective nature of the review process. This substantial attrition indicates that many of the initially identified studies may not have been sufficiently relevant, methodologically sound, or aligned with the specific focus of the review—patient education strategies in relation to the maintenance of AVF access.

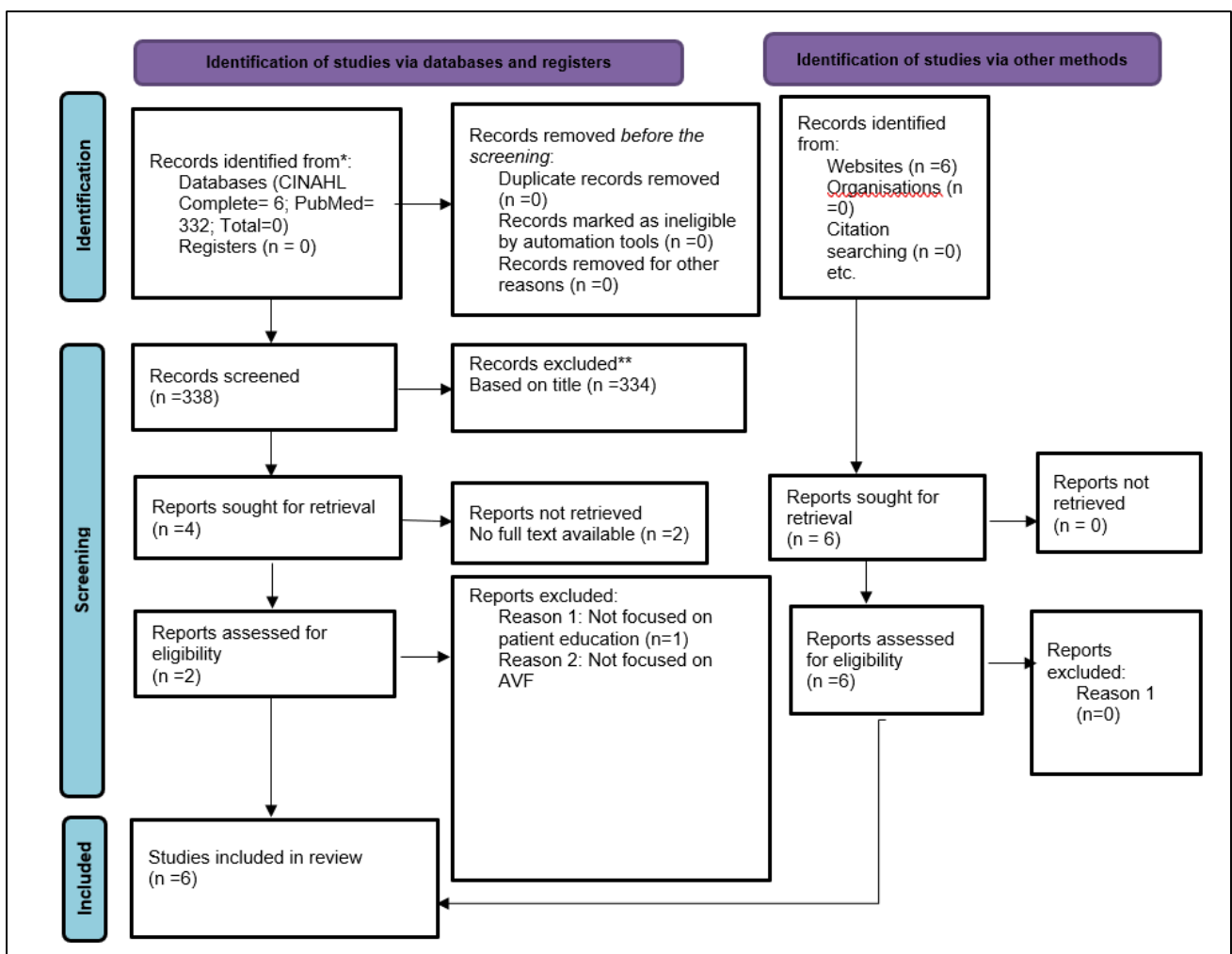


Figure 1 PRISMA flow diagram for the study

### 4. Discussion

This review showed that various patient education methods produce different outcomes in arteriovenous fistula (AVF) care, such as the reduction of anxiety, improvement of knowledge regarding AVF, identification of signs and symptoms of infections or complications, and overall improvement of incident vascular access outcomes. Patient education among individuals with AVF on hemodialysis remains a significant role for nurses.

Providing patient education is especially important since the AVF provides access to one of the primary long-term treatments for chronic kidney disease. In a descriptive, cross-sectional study aimed at identifying the knowledge, attitudes, and practices in self-care among patients receiving dialysis with AVF, it was found that 97.7% of patients had inadequate knowledge and self-care practices (Pessoa & Linhares, 2015). Poor AVF care was also identified in a descriptive, cross-sectional study assessing AV fistula care practices among patients undergoing hemodialysis, revealing that the majority of respondents (49%) exhibited poor AV fistula care practices, such as checking AV fistula thrill or pulse daily, while 40% of subjects practiced inadequate handwashing before and after touching the AVF site (Abraham et al., 2020).

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## 5. Conclusion

In summary, the results of this systematic review underline the importance of tailored patient education interventions in enhancing self-care behaviors and clinical outcomes for individuals with AVF undergoing hemodialysis. The findings highlight the necessity for healthcare professionals to implement diverse educational strategies to meet the varying needs of patients.

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