

Nurse-Led Patient Education Interventions for Adults Undergoing Hemodialysis: A Scoping Review

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Abstract — Globally, Chronic Kidney Diseases (CKD) has gained an increasing concern and equates the growing needs for the nurse-led patient education intervention for adults undergoing hemodialysis. Despite the perceived benefits, review of the nurse-led interventions produced limited studies that will contribute to the delivery of quality nursing care to the adults undergoing hemodialysis. Hence, the aimed of this scoping review is to map the existing empirical evidence on nurse-led patient education interventions on adult undergoing hemodialysis to support the continuous improvement of nursing practice in hemodialysis settings. The JBI methodology was used in the conduct of the review and reported with Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR). Four studies met the inclusion criteria. Findings were grouped into categories: measurement approaches/strategies, type of nurse-led education intervention, outcomes and recommendations to enhance the said interventions in caring for patients undergoing hemodialysis. This review is essential to the nurses providing quality nursing care as well as the adults undergoing hemodialysis, however, there are scarcity of the evidence on this area particularly on the nurse-led patient education intervention. As the Chronic Kidney Disease increases, the need for nurse-led interventions becomes a vital part in providing quality and competent care among the dialysis nurses. The conduct of future researches that include-high quality empirical evidence by applying relevant theories, nurses competency validated tools, exploring more research designs and the appropriate statistical methods.

Keywords — Hemodialysis, Patient Education, Nursing, Self-Management, Scoping Review

I. Introduction

Globally, the alarming cases of Chronic kidney disease (CKD) has become a threat to everyone's health. Currently, the World Health Organization (2026) states that estimated 674 million people have chronic kidney disease worldwide; mostly living in the low- and middle-income countries. In addition, Lifestyle diseases such as diabetes, obesity and high blood pressure remain the top causes of CKD, alongside dietary risks and environmental factors (Institute for Health Metrics and Evaluation, 2025). Moreover, the most severe form of CKD is kidney failure, which requires dialysis or kidney transplantation to sustain life.

Among the available renal replacement therapies, hemodialysis remains the most widely used modality for adults with kidney failure. However, individuals undergoing maintenance hemodialysis experience complex treatment demands frequent healthcare encounters. These challenges require patients to develop effective self-management skills to optimize treatment adherence, preventing complications, and quality of life improvement.

Mark et al.(2025) suggest that a sufficient knowledge about the disease and programmes are vital for treatment that will improved patient outcomes. Thus, patient education is an

essential component of hemodialysis care because it supports patients' understanding of their condition, promotes active participation in decision-making, and enhances their ability to manage treatment-related responsibilities.

Nurses being the frontliner within hemodialysis settings because of their continuous interaction with patients throughout dialysis sessions and their expertise in facilitating health promotion and self-management. Nurse-led educational interventions may include individualized counseling, structured teaching sessions, demonstration of self-care techniques, written educational materials, digital health approaches, and reinforcement of health behaviors. Recent evidence indicates that nurse-delivered education can improve self-management outcomes among adults receiving hemodialysis, particularly in areas such as vascular access care, knowledge acquisition, and confidence in performing recommended health behaviors (Wong et al., 2025).

Despite the recognized importance of education in hemodialysis care, nurse-led patient education interventions remain diverse in terms of theoretical foundations, educational strategies, duration, delivery methods, and measured outcomes. Some interventions focus on uncertainty of illness (.Sajjadi, Ghafourifardand Khosroshahi (2025), fatigue and CKD symptoms (Sharma, et al (2025), on improving dietary and fluid management (Yangöz and Özer (2025) , medication adherence, vascular access protection, symptom recognition, or preparation for kidney transplantation, while others incorporate behavioral strategies and digital technologies. This variability creates challenges in identifying effective intervention components and determining how nurse-led education can be optimally implemented across different clinical contexts.

A scoping review is appropriate for examining the breadth and characteristics of available evidence regarding nurse-led patient education interventions for adults undergoing hemodialysis. By systematically exploring current evidence, this review may provide a holistic information of how the said interventions were designed, delivered, and evaluated among adult hemodialysis patients.

Therefore, this review aimed to map and synthesize empirical evidence on nurse-led patient education interventions for adults undergoing hemodialysis. Specifically, it seeks to identify the types of educational interventions implemented by nurses, describe their characteristics and delivery approaches, examine reported outcomes, and highlight gaps requiring further investigation. The findings may contribute to the development of evidence-based nursing education strategies that enhance patient empowerment, self-management, and quality of care among hemodialysis patients.

II. Methodology

The JBI methodology was used in the conduct of the review and reported with Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR).

Search Methodology

The PICO framework identified keywords and MESH terms which included a population of adults (≥ 18 years) undergoing maintenance hemodialysis, patient education interventions, hospital, dialysis centers and outpatient dialysis units

The search used two databases of PubMed and CINAHL from 2016 to 2026. Searches used the following keywords: Nurse, dialysis nurse, nurse-led patient education interventions, hospitals, dialysis centers and outpatient dialysis units.. This search used the following search strings : (nurse or nurses or nursing) and patient education intervention for dialysis patients and hospital setting, dialysis centers and outpatient dialysis and quality care

Participants

The empirical studies published focused nurse-led patient education interventions for adults undergoing hemodialysis was included in the review.

Criteria for the Selection of the Studies

The empirical studies published should conform with following criteria:

Inclusion criteria: studies should include (a) report on adult patient undergoing maintenance hemodialysis, (b) evaluate or describe nurse-led patient education intervention, (c) setting (hospitals, dialysis center, outpatient dialysis units) (d) primary studies (e) be written in English and with full text. Published within 2016-2026. There were no restrictions on study design, and geographical area.

Exclusion criteria: (a) studies on hemodialysis involving pediatric patients, (b) studies on hemodialysis involving nursing students, and faculty in the academe (c) focus exclusively on peritoneal dialysis or kidney transplantation (d) studies do not report on education interventions (e) editorial letter, conference abstracts, or opinion papers.

Search Results and Data Extraction

After a through screening of the studies, 35 studies were selected for full text review and 4 studies were chosen for this scoping review. (Fig. 1).

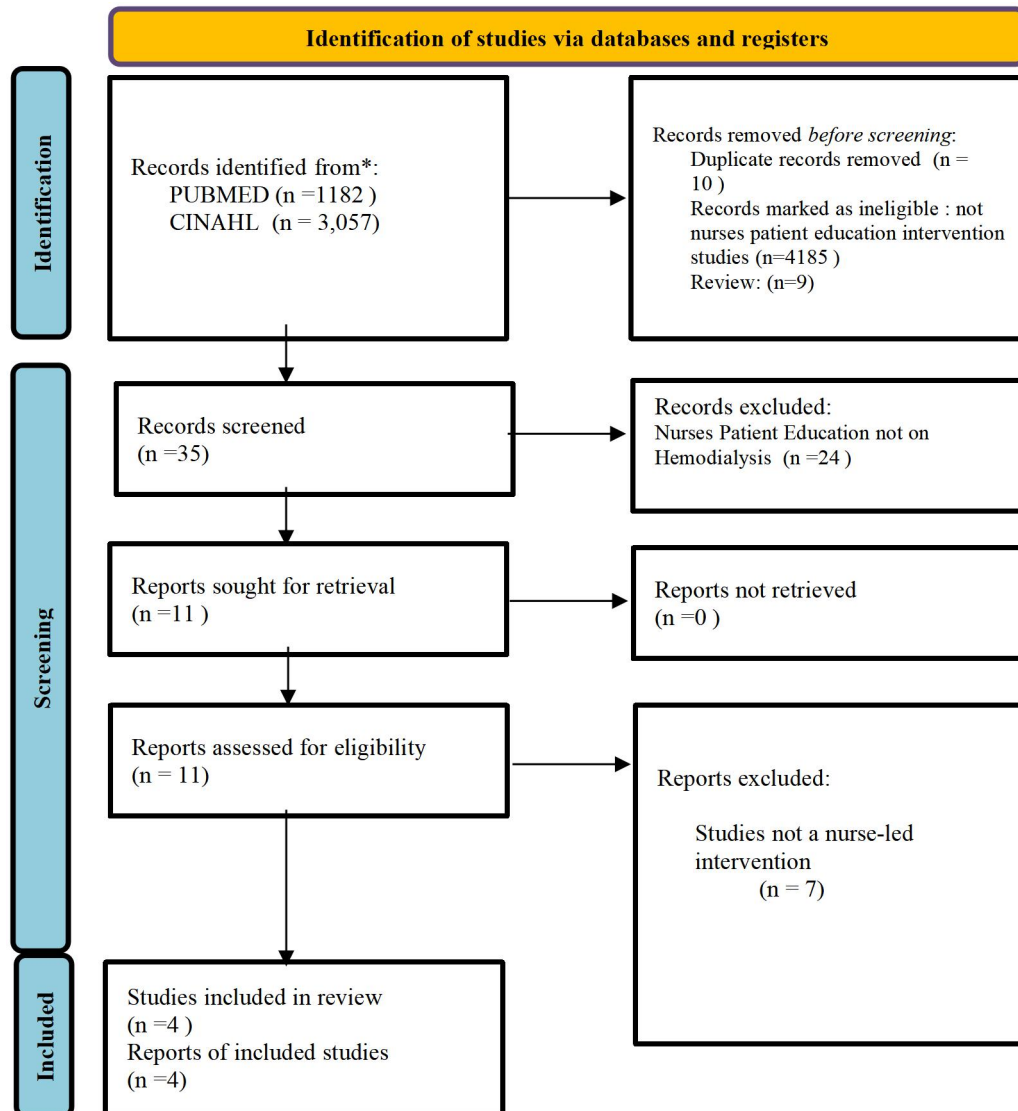
The researcher develop a data extraction instrument with 3- categories namely: core citation and study details, methods and appraisal and findings and relevance.

Data analysis and synthesis

The studies were analyzed and presented to tabular format to have a full grasp of the contents of the studies. (Appendix 1).

Furthermore, the researcher extracted data and used two tables such as Table 1 refers to

the characteristics of included studies (the author, year of study, study design, population of interest and participants).



Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

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III. Results and Discussion

General Characteristics of included studies

The scoping review identified four studies : 1 quasi-experimental and 3 – cross sectional. The studies were carried out in China (n =1), Iran (n =1) Nepal (n =1) and Turkey (n =1), The publication period range from 2022 – 2023. (Table 2).

Only four studies have been published since 2016 to 2026. A 10 year period was chosen to be updated of the nurse-led patient education interventions for adult undergoing hemodialysis.

The sample size of the included studies varied from 60 to 126 participants and mostly 18 years old and above.

Table 1
Characteristics of Included studies

Year	1 st Author	Country	Design	Population of Interest	Participants
2025	Sajjadi	Iran.	randomized controlled clinical trial	102 Hemodialysis Patients 51-intervention group (printed educational brochures) 51-control group (received routine education)	Nurses
2025	Sharma, et al	Nepal,	single-blinded two-arm parallel group study	126 participants receiving hemodialysis	Nurses
2025	Yangöz	Turkey	single-centre, single-blinded RCT	Hemodialysis Patients intervention 50 participants	Nurses
2022	Zuo, et al	China	randomized trial	118 hemodialysis 60 patients in the IG the 54 patients in the CG 4 dropped out	Nurses

Quality of studies

The researcher used the JBI methodology for scoping reviews, and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR).

Data Analysis

Due to limited studies, only four studies were included in this review. The analysis of the data focused on the measurement strategies/approaches, nurse-led patient education strategies outcomes and recommendations of the study.

Measurement Approaches /Strategies of the Cultural Competency Constructs

All studies (n=4) used different measurement approaches/ strategies to determine the effectiveness of the nurse-led patient education intervention for adults undergoing hemodialysis.

Sajjadi, Ghafourifard and Khosroshahi (2025) measured the uncertainty in illness through the scale-community form and patient activation measure (PAM) that will be completed in three time periods including before and 3 month after the intervention.

Sharma et al (2025) study measured two outcomes namely: primary and secondary outcomes. Measurements used Fatigue Symptom Inventory (fatigue) while palliative care outcome scale-renal (IPOS-renal) measured CKD symptoms, and Canadian Occupational Performance Measure (Occupational performance, performance and satisfaction).

Some of the scales used by Yangöz and Ozer (2025) in their study were: Diet and Fluid Non-Adherence Questionnaire non-adherence to fluid intake and diet); The Scale for Dietary Behaviours in Haemodialysis Patients (adherence to diet)and Laboratory Parameters form (assess laboratory parameters).

Zuo, et al (2022) nurse-led intervention on nonpharmacological integrated care interventions (NICIs) used measurement namely the vitality level of the SF-36 scale, score of the HADS , tPSQI ,score of PSSS (Perceived Social Support Scale) and the score of the Behavioral Self-Management Scale .

Nurse-Led Patient Education Strategies

Sajjadi, Ghafourifard & Khosroshahi (2025) implemented the IDEAL-HD project, a nurse-led patient education strategy comprising four components: (1) education on CKD; (2) lifestyle recommendations on diet; (3) medication education and (4) management of complications.

Sharma et al. (2025) evaluated the EVEREST program delivered alongside usual care over 12 weeks. Outcomes included fatigue, CKD symptoms, occupational performance, and health-related quality of life.

Yangöz and Ozer (2025) examined a nurse-led motivational interviewing and education program (MlaEP) based on Watson's Theory. The experimental group received four motivational interviewing sessions and an educational booklet, while the non-experimental group received routine care.

Zuo et al. (2022) implemented an integrative non-pharmacological care intervention based on the Theory of Unpleasant Symptoms (TOUS), combining walking, motivational interviewing, and self-management education delivered through simulations, audiovisual materials, brochures, and verbal instruction over six months. Participants were encouraged to achieve at least 6,000 daily steps and attended monthly 20-minute motivational interviewing sessions.

Recommendations of the study

The following are the recommendations of the study:

Sajjadi, Ghafourifardand Khosroshahi (2025), states that an individualized interventions that caters to the patient's needs and preferences and should start at the early stage of CKD prior to HD is an effective interventions and highly recommended for adults the undergo hemodialysis

Yangöz and Ozer (2025) highly recommended their study because of the effectiveness of the study and will develop customized effective interventions for hemodialysis patients.

Despite, the effect on physical activity, adherence and communication, relieving numerous symptoms and changing lifestyle as a whole, Zuo et al (2022) recommended a multicenter studies to clarify the findings.

Sharma, et al (2025) highly recommended the energy conservation education program because it was highly effective in reducing fatigue and improving overall health outcomes among et al .participants. In addition, it also improved CKD symptoms, which may have contributed to the improvement in health-related quality of life.

Table 2
Summary of Studies Results

Studies included in the review	Measurement Approaches/Strategies	Nurse Led- Patient Education Strategies	Outcomes	Recommendations
Sajjadi, Ghafourifardand Khosroshahi (2025)	-The Mishel Uncertainty in Illness -Patient activation measure (PAM)	- individualized education on uncertainty in illness and activation (IDEAL HD project) with four main components	two groups before the intervention ($P = 0.56$, $P = 0.46$). reduced illness uncertainty and increased patient activation ($P < 0.001$).	- consider each patient's needs and preferences and use individualized education at the early stage of chronic kidney disease (CKD).
Sharma, et al (2025)	primary outcome: (Fatigue Symptom Inventory) Secondary outcome: (palliative care outcome scale-renal (IPOS-renal): Canadian Occupational Performance Measure)	Energy conservation education intervention for people with end-stage kidney disease receiving hemodialysis (EVEREST)	significant improvement on fatigue and related outcomes compared with the control group. At week 8 (all $p < .001$). At week 12, (all $p < .001$).	highly effective in reducing fatigue and improving overall health outcomes among participants
Yangöz and Özer (2025)	<i>Diet and Fluid Non-Adherence Questionnaire</i> <i>Fluid Control in Haemodialysis Patients Scale:</i> <i>The Scale for Dietary Behaviours in Haemodialysis Patients:</i> <i>The modified Morisky Scale:</i> <i>Watson's Caritas Patient Score:</i> <i>Kidney Disease Quality of Life-36 Scale:</i> to assess HRQOL- Hays et al. (1994), <i>Laboratory Parameters form:</i>	motivational interviewing and an education programme (MIaEP) based on Watson's theory	The education program significantly improved patients' adherence to fluid restrictions, dietary recommendations, and medication regimens, and reduced the perceived burden of kidney disease, resulting in better health-related quality of life. However, no significant changes in laboratory parameters during the study period.	the study suggested to develop customized effective interventions for hemodialysis patients particularly on the measurement of laboratory parameters..
Zuo, et al (2022)	sociodemographic indicators, vitality level of the SF-36 scale score of the HADS , tPSQI ,score of PSSS (Perceived Social Support Scale) and the score of the Behavioral Self-Management Scale	-nonpharmacological integrated care interventions (NICIs)	fatigue (2.26 vs. 0.48), mental fatigue (1.41 vs. 0.54), muscular fatigue (2.13 vs. 0.75), and some biochemical indicators (e.g., serum urea) ($P < 0.05$), compared with the CG.	-The study suggested the further study should be done to clarify the effectiveness of the program.

DISCUSSION

This review aimed to map the existing evidence on nurse-led patient education interventions for adults undergoing hemodialysis.

Four studies were reviewed to provide evidence that can guide nurses, particularly those working in dialysis units, in delivering effective patient education and enhancing the quality of nursing care. Their findings consistently demonstrated positive patient outcomes. The IDEAL-HD project developed by Sajjadi, Ghafourifard, and Khosroshahi (2025) emphasized individualized education that addressed patients' needs and preferences. Sharma et al. (2025) reported that an energy conservation education program reduced fatigue and improved overall health outcomes. Yangöz and Özer (2025) found improvements in treatment adherence, health-related quality of life, and laboratory parameters through motivational interviewing combined with patient education. Likewise, Zuo et al. (2022) demonstrated that an integrative non-pharmacological intervention incorporating walking, motivational interviewing, and self-management education increased physical activity, reduced fatigue, and promoted positive lifestyle changes.

Overall, the reviewed studies support the effectiveness of nurse-led patient education interventions for adults undergoing hemodialysis. However, several factors and study limitations should be considered when translating these interventions into clinical practice to further enhance the quality of nursing care.

Limitations

Across the reviewed studies, several limitations were identified: most were conducted in a single country or within limited clinical settings, reducing the generalizability of the findings. Some studies banked on self-reported outcome measures, which may have introduced response bias. Because educational and nursing interventions cannot easily be blinded, there is also a risk of performance bias. Furthermore, some studies lacked quality control measures to monitor intervention implementation and outcomes. The relatively short follow-up periods limited the evaluation of long-term intervention effects. Finally, differences in healthcare systems, clinical practices, and patient populations may affect the applicability of the findings to other settings.

Suggestions for Future Research

As all studies included in this review employed experimental designs, future research should incorporate a wider range of quantitative methodologies and qualitative approaches to achieve a more clearer understanding of the experiences, perceptions, and emotional needs of adults undergoing hemodialysis.

In addition, because most of the reviewed studies were conducted in hospital settings, future investigations should be carried out in dialysis centers and outpatient dialysis units to determine the applicability and effectiveness of the said interventions in different clinical environments.

Finally, further studies on nurse-led patient education interventions for adults undergoing hemodialysis are recommended to serve as a basis for developing evidence-based policies, clinical guidelines, and educational programs. Such research may strengthen hemodialysis nurses' competencies, improve patient outcomes, and promote the delivery of high-quality, individualized nursing care.

IV. Conclusion

This review provides valuable insights into nurse-led patient education interventions for adults undergoing hemodialysis and highlights strategies that can enhance the quality of nursing care. Although only a limited number of studies met the inclusion criteria, the findings demonstrate the positive impact of nurse-led patient education on patient outcomes and emphasize its growing role in hemodialysis care.

With the increasing prevalence of CKD, nurse-led patient education has become an essential component of competent and high-quality dialysis care. Future research should generate stronger empirical evidence by applying relevant theoretical frameworks, using validated instruments to assess nursing competencies and patient outcomes, exploring diverse research designs, and employing appropriate statistical methods. These efforts will further strengthen the evidence base for nurse-led patient education and support the continuous improvement of nursing practice in hemodialysis settings.

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