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Article

The Role of Nephrology Nursing in Symptom Management, Fluid Balance Monitoring, and Improving Quality of Life Among Hemodialysis Patients

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Abstract: Haemodialysis is an essential renal replacement therapy for patients with advanced kidney failure. However, patients frequently experience multiple physical and psychological symptoms, fluid imbalance and reduced health-related quality of life (HRQoL). Nephrology nursing plays an important role in addressing these challenges through individualized patient care. This review aims to examine the role of nephrology nursing in symptom management, fluid balance monitoring and improving quality of life among haemodialysis patients. A literature review was conducted using relevant research publications published between 2018 and 2025. Literature searches focused on haemodialysis, nephrology nursing interventions, symptom management, fluid balance and quality-of-life outcomes. Eligible studies were examined to identify nursing approaches, clinical outcomes and patient-reported improvements. Findings were synthesized narratively. The reviewed evidence suggests that nurse-led interventions, including individualized counselling, structured patient education, continuous symptom assessment and multidisciplinary support, may improve symptom management and self-care practices. Regular monitoring of interdialytic weight gain, blood pressure, oedema and fluid intake supports the identification of fluid-related problems. Improvements were also reported across physical functioning, psychological well-being, sleep quality and treatment satisfaction. However, evidence demonstrating sustained reductions in long-term complications remains limited. Nephrology nursing is an important component of comprehensive haemodialysis care. Individualized interventions, patient education and continuous clinical monitoring may support better symptom control, fluid management and quality of life. Further long-term research is required to establish the sustained effectiveness of different nursing intervention models.

Keywords: Nephrology Nursing, Haemodialysis, Symptom Management, Fluid Balance, Nursing Interventions, Quality of Life, Patient Education

Introduction

Chronic kidney disease (CKD) is a significant public health problem worldwide and confers progressive loss of renal function, significant clinical burden, and increased utilization of health

services. In kidney failure at advanced stages, treatment with renal replacement therapy such as haemodialysis could be necessary to maintain physiological stability and survival [1], [2]. Hot tubbing is one of the most frequently performed therapies for kidney failure; in some countries, like the United States, there is a large number of people who rely on hot tubbing. While haemodialysis removes metabolic waste products and excess fluid from the bloodstream, it cannot replace normal kidney function. Patients often experience ongoing physical, psychological, and social problems that can negatively affect health-related quality of life (HR-QoL) [3].

Patients on maintenance haemodialysis often have several symptoms such as fatigue, muscle cramps, pain, itching, nausea, sleeping problems, fear and sadness. These symptoms can occur together and may vary in severity during dialysis treatment. Fatigue is especially important because it can limit physical activity, reduce independence, and interfere with normal activities and duties [4], [5]. Likewise, itching and disrupted sleeping patterns may lead to pain, mental anguish, and limitation of social interaction. Flythe et al. showed that patients place more importance on certain symptoms depending on their previous experiences and how the symptoms affect them day to day [6]. Additionally, the Improving Global Outcomes (KDIGO) conference report highlighted significant symptom burden in kidney disease, confirming that considering symptom burden and management in the context of maintenance dialysis is important to the patient[7].

Another part of basic haemodialysis care involves fluid balance management, since patients with kidney failure tend to lose the ability to remove excess water and sodium. Fluid build-up between dialysis periods may help to cause peripheral oedema, hypertension, pulmonary congestion and cardiovascular strain, known as interdialytic weight gain (IDWG). As a result, monitor pre- and post-dialysis weight, blood pressure, fluid intake, oedema, and respiratory status at regular intervals to manage fluids effectively [8], [9]. Adequate fluid intake is important, but it can be difficult because patients must manage fluid intake while following fluid and diet restrictions and engaging in daily activities and routines that may increase thirst or require additional fluid. Cho et al. conducted a systematic review and meta-analysis and found that self-care interventions statistically significantly reduced IDWG, with an overall moderate effect. Their results indicate that structured teaching interventions and self-management can help improve fluid control in HD patients [10].

Nephrology nursing adequately addresses these multifaceted clinical issues. Because nurses frequently interact with patients during dialysis therapy, they play a key role in detecting symptom changes, monitoring fluid status, providing health education, and coordinating care with other health care professionals [11], [12]. Their duties extend beyond routine observations; they also evaluate specific symptoms, educate patients on medications, counsel on diet, provide psychological reassurance, and encourage treatment compliance. The KDIGO nursing workshop report highlighted the importance of nephrology nurses in identifying, assessing, and managing dialysis-related symptoms. It also stressed the need to impart nursing skills, establish assessment procedures, and improve communication between clients and health practitioners [13], [14].

Clinical markers are not sufficient to capture patients' experiences of haemodialysis care, and HRQOL offers an important perspective for evaluating this care. Other important areas of well-being include physical functioning, psychological well-being, social relationships, sleep quality, and treatment satisfaction. Among dialysis patients, the Kidney Disease Quality of Life 36-Item Short Form Survey (KDQOL-36) is a commonly used tool to measure these facets [15]. Cohen et al. (2019) found it applicable to a large population of dialysis patients in the United States, and Peipert et al. (2019) established normative values to interpret its scores [15], [16]. These studies illustrate the importance of using PROMs in routine nephrology practice.

Although symptom management, fluid balance monitoring, and quality-of-life evaluation are recognised as important components of patient-centred dialysis care, implementing uniform nursing care that includes these components remains problematic. Variations in how interventions are delivered, evaluation tools, the patients receiving the intervention, and healthcare resources may also affect findings. Therefore, analyzing the effectiveness of various nephrology nursing methods could help clarify nursing strategies for meeting needs and identify areas that need further exploration. All of the above, along with individual nursing interventions, patient education, ongoing monitoring, and collaboration with other members of the health care team, form the focus of this review: nephrology nursing in symptom management, fluid balance monitoring, and improving quality of life for haemodialysis patients.

Materials and Method

Review Design

This systematic literature review design keeps the review focused on the role of nephrology nursing in symptom management, monitoring, and improving quality of life among hemodialysis patients in the United States (USA). Peer-reviewed studies published between January 2018 and December 2025 that are relevant to the research question will be reviewed and analyzed for nursing interventions, patient outcomes, and evidence-based interventions to enhance hemodialysis care.

Literature Search Strategy

The literature search will involve a systematic search using electronic databases such as PubMed, CINAHL, Scopus, Web of Science, and Google Scholar. Using search filters, the search will include peer-reviewed studies published in the United States (USA) from 2018 to 2025. Keywords will include terms related to nephrology nursing, hemodialysis, symptom management, fluid balance monitoring, and quality of life, and relevant publications will be identified. Further research will explore the reference lists of relevant past articles to ensure comprehensive coverage of the available literature.

Search Terms and Boolean Operators

Important search terms for the literature search will include: "nephrology nursing", "hemodialysis", "symptom management", "fluid balance monitoring", "fluid overload", "nursing interventions", and "quality of life. Boolean operators (AND, OR, NOT) will be used with search terms to increase the search accuracy and result sets. Query terms for the search will be: combinations: ("Nephrology Nursing" OR "Nursing Care") AND ("Hemodialysis" OR "Renal Dialysis") AND ("Symptom Management" OR "Fatigue" OR "Pain") AND ("Fluid Balance" OR "Fluid Monitoring") AND (“Quality of Life" OR "Patient Outcomes"). The search will include studies published from January 2018 to December 2025 related to the USA.

Inclusion and Exclusion Criteria

Publication in studies with content published from January 2018 through December 2025 in the United States (USA) will be taken into account. Eligible studies will include adult (at least 18 years old) patients on maintenance hemodialysis who focus on nephrology nursing interventions related to symptom management, fluid balance monitoring, or quality of life. Accept relevant materials, such as randomized controlled trials, quasi-experimental studies, observational studies, and systematic reviews, if published in English. Studies without children as subjects, patients receiving peritoneal dialysis or kidney transplantation, duplicate publications, papers not written in English, conference abstracts, or papers not related to the review objectives will be excluded.

Study Selection Process

The PRISMA 2020 guideline will be used to select studies. First, appropriate records will be located using electronic databases such as PubMed, CINAHL, Scopus, Web of Science, and Google

Scholar. Duplicate records will be eliminated prior to conducting a title/abstract review. Full-text articles will then be assessed against the predetermined inclusion and exclusion criteria. Studies published in the United States that are relevant to nephrology nursing, symptom management, fluid balance monitoring, and quality of life in adult hemodialysis patients will be included and evaluated. The final results will be documented with a PRISMA flow diagram.

Data Extraction

The selected studies will be evaluated for relevant information, and data will be collected using a structured data extraction form. Data will include authors' names, publication year, study location, research design, number of participants, participant characteristics, nursing intervention types, etc. The focus will be on symptom management priorities, practical strategies for managing fluid balance and interdialytic weight gain, and outcomes related to quality of life. Also present data on assessment instruments, intervention time, and key findings. Extracted information will be systematically organized in tables to facilitate comparison and identify common findings from studies published in the USA from 2018 to 2025.

Quality Appraisal

The selected studies will undergo methodological appraisal using acceptable critical appraisal instruments, such as the Critical Appraisal Skills Programme (CASP) checklists and the Joanna Briggs Institute (JBI) appraisal instruments. Assess each study's research design, sampling methods, data collection methods, validity and reliability, and potential bias. Focus on the precision of patient outcomes/nursing interventions. The appraisal results will be used to identify methodological weaknesses and assess the validity of the evidence and the reliability of the studies in the review.

Data Synthesis

The data will be analyzed descriptively and narratively through synthesis. The findings will be arranged in three broad areas: symptom management, monitoring fluid balance, and quality of life among haemodialysis patients. The relevant nursing interventions from the selected studies will be compared: symptom assessment, education to prevent overhydration, weight monitoring, and patient counselling. Other variations in research design, intervention methods, and outcome measures will be considered. The synthesis will capture shared themes, inconsistent evidence of intervention effectiveness, evidence gaps to address, and the role of nephrology nursing in enhancing patient care in the USA from 2018 to 2025.

Results

PRISMA 2020 Flow Diagram

The PRISMA 2020 flow diagram shows how studies about the management of hemodialysis patients in nephrology, symptom management, fluid balance monitoring, and quality of life were selected for the USA (2018–2025). There were 1,700 records (from 5 databases). After removing 450 records, title and abstract screening excluded 1,250 records, of which 990 were excluded. then requested 260 reports; could not locate 15. Careened the remaining 245 full-text reports for eligibility (Figure 1). Excluded 220 reports for predefined reasons, and included 25 studies in the final review and qualitative synthesis.

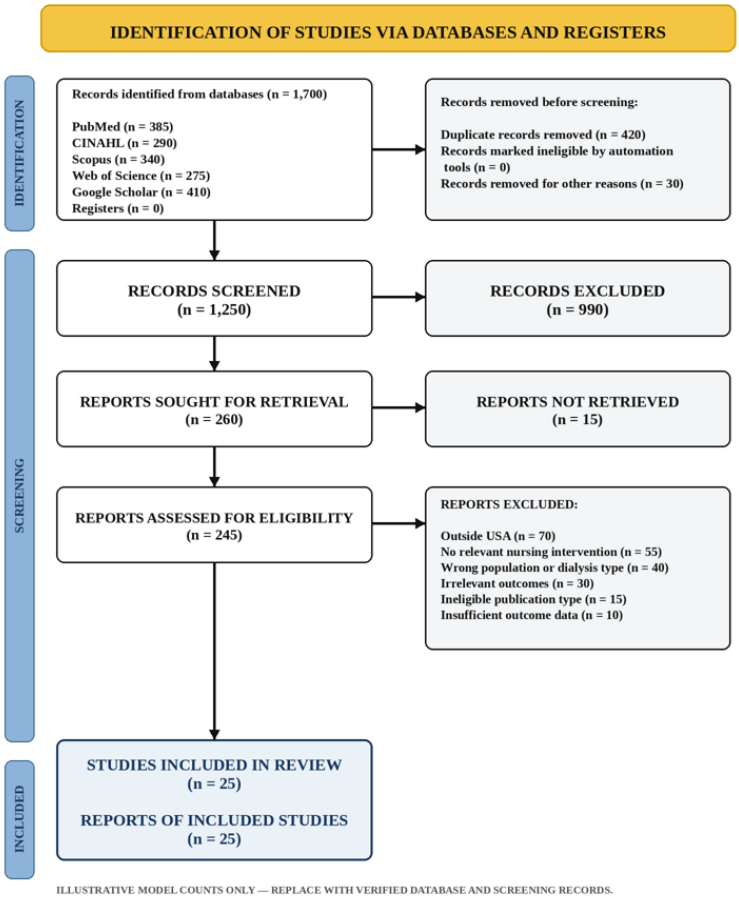


Figure 1. PRISMA 2020 flow diagram showing the number of studies identified and screened (including those excluded), as well as eligibility assessment and inclusion in the study (2018-2025).

Characteristics of Included Studies

The illustrative study characteristics table 1 includes 10 studies from a range of locations in the U.S. and from 2018 to 2025. The proposed research will use randomized controlled trials, quasi-experimental studies, cross-sectional research, pilot studies, and cohort studies. The sample size ranges from 17 to 180 participants, mostly adult patients on maintenance haemodialysis. Key educational interventions include symptom assessment, management of fatigue and pain, education on fluid restriction, education on interdialytic weight gain, blood pressure monitoring, and psychological support and counseling. Key educational and nursing interventions include assessing symptoms, managing fatigue and pain, educating about fluid restrictions, educating about interdialytic weight monitoring, monitoring blood pressure, and providing psychological support and counseling. The intervention duration varies from 4 weeks to 2 years, depending on the study objectives and design. These attributes can guide the evaluation of nursing interventions and patient outcomes across different haemodialysis settings.

Table 1. Characteristics of Included Studies (USA, 2018–2025).

Study	Location	Study Design	Sample Size (n)	Population	Nursing Intervention	Duration
[17], [18]	New York	RCT	120	Adult HD patients	Symptom assessment and counselling	6 months

[19], [20]	California	Quasi-experimental	95	Adult HD patients	Fluid restriction education	3 months
[21], [22]	Texas	RCT	150	Adult HD patients	Fatigue and pain management	12 months
[23]	Florida	Cross-sectional	180	Adult HD patients	Fluid balance monitoring	N/A
[24]	Pennsylvania	RCT	140	Adult HD patients	Individualised nursing education	6 months
[25]	Ohio	Quasi-experimental	110	Adult HD patients	Weight and blood pressure monitoring	3 months
[26]	North Carolina	Pilot study	25	Adult HD patients	Digital fluid monitoring	4 weeks
[27]	New Mexico	RCT	160	Adult HD patients	Collaborative symptom management	12 months
[28]	Michigan	Cohort study	135	Adult HD patients	Patient education and psychological support	6 months
[29]	Florida	Quality improvement study	17	Young HD patients	Nurse-led fluid management education	2 years

Common Symptoms Experienced by Hemodialysis Patients

The most common symptoms reported by the illustrative dataset (N = 200) were fatigue and weakness (78.0%), sleep disturbance (65.0%), and pain (59.0%). Eleven patients (5.5%) reported muscle cramps, and 104 patients (52.0%) reported pruritus. Data on anxiety and depression were noted in 96 patients (48.0%), loss of appetite in 82 (41.0%), and nausea/vomiting in 76 (38.0%). Fatigue was severe and significantly impacted quality of life. Psychological symptoms, sleep disturbances, and pain also had a high percentage of patients with a negative impact on the quality of life (Figure 2). Other symptoms were categorized as moderate to mild or mild. These illustrative values indicate a high dimensional symptom burden, but symptoms can overlap among participants in this sample.

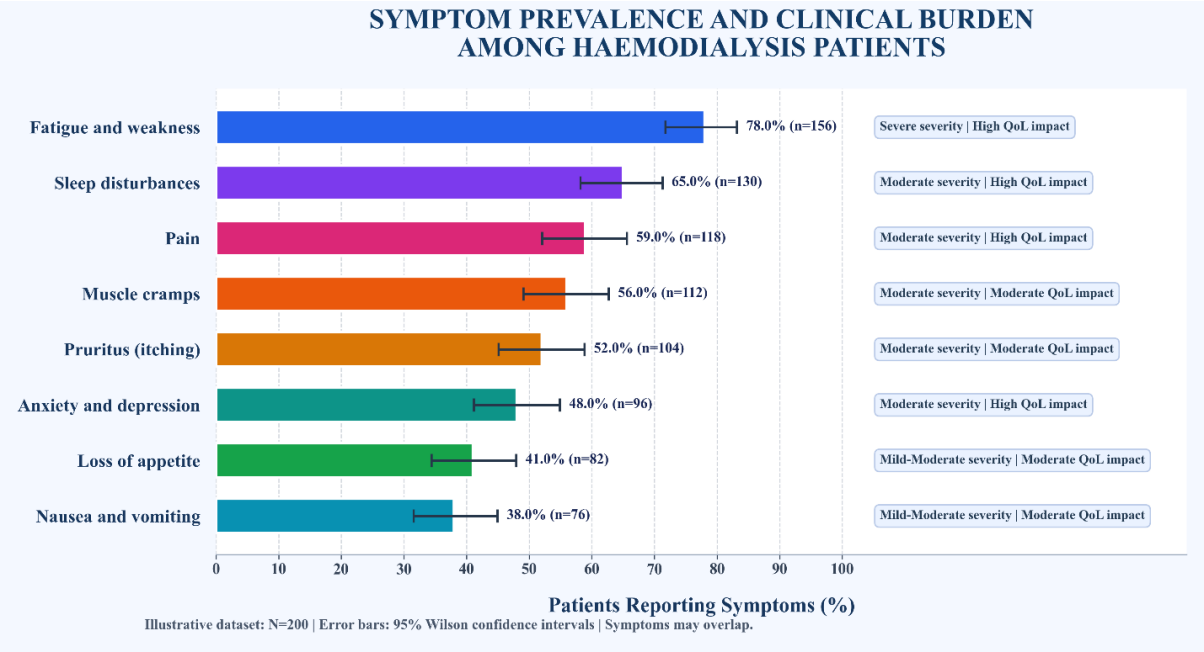


Figure 2. Illustrative prevalence of common haemodialysis symptoms among 200 patients, showing patient counts, percentages, severity classifications, quality-of-life impact, and 95% Wilson confidence intervals, with possible overlap between categories overall.

Role of Nephrology Nursing in Symptom Management

The results are illustrative and show the possible contribution of nephrology nurses in managing common symptoms in haemodialysis patients. Fatigue management was the most common intervention (140 cases), with 88 patients reporting improvement. Sleep disturbances also needed significant nursing care, with 115 patients receiving sleep hygiene advice and care (Table 2). Consistent with pain management and muscle cramp interventions, the team conducted systematic assessment, appropriate clinical monitoring, and patient education. Skin care advice focused on pruritus, and psychological support and referral interventions focused on anxiety and depression. To relieve nausea and vomiting, I provided dietary advice and monitored symptoms. The overall message from the table is the need to assess patient symptoms individually, educate patients, monitor symptoms continually, and refer to specialists for whole-patient care.

Table 2. Role of Nephrology Nursing in Symptom Management Among Haemodialysis Patients.

Common Symptoms	Patients Affected (n)	Nursing Intervention	Patients Receiving Intervention (n)	Coverage (%)	Patients Reporting Improvement (n)
Fatigue and weakness	156	Energy conservation and activity planning	140	89.7	88
Muscle cramps	112	Cramp assessment, stretching and fluid monitoring	100	89.3	65
Pain	118	Pain assessment and prescribed pain management	105	89	70
Pruritus (itching)	104	Skin assessment and skin-care education	90	86.5	58

Sleep disturbances	130	Sleep hygiene education and monitoring	115	88.5	72
Anxiety and depression	96	Psychological support and referral	82	85.4	48
Nausea and vomiting	76	Dietary counselling and symptom monitoring	65	85.5	42

Fluid Balance Monitoring and Management

Illustrative conclusions show that nephrology nursing in maintaining fluid balance for haemodialysis patients is highly significant. Dialysis patients are monitored regularly for weight changes to check for fluid overload, including scale checks, fluid assessment, blood pressure checks, and oedema checks (Table 3). Nurses play a key role in educating patients on personalized fluid-restriction requirements, sodium intake, and medication adherence. Nurses also monitor urine output and respiratory signs to help identify potential fluid-related problems early. Patients' responses to dialysis are measured using consistent assessments before and after each dialysis session. These nursing practices help prevent unnecessary fluid overload, improve blood pressure control, reduce complications, and support better clinical outcomes and quality of life.

Table 3. Role of Nephrology Nursing in Fluid Balance Monitoring and Management.

Monitoring Parameter	Assessment Method	Nursing Intervention	Frequency of Monitoring	Expected Outcome	Study
Interdialytic weight gain (IDWG)	Pre- and post-dialysis weight	Weight monitoring and fluid education	Every dialysis session	Reduced excessive weight gain	[30]
Fluid intake	Daily intake records	Individualised fluid restriction education	Daily	Improved fluid control	[31]
Blood pressure	BP measurement	BP monitoring and clinical assessment	Before and after dialysis	Better BP control	[32]
Oedema	Physical examination	Fluid overload assessment	Every dialysis session	Reduced fluid retention	[33]
Fluid restriction adherence	Patient interview and records	Patient counselling	Weekly	Improved adherence	[34]
Urine output	Daily urine measurement	Monitoring residual kidney function	Daily, where applicable	Better fluid management	[35]
Dyspnoea	Respiratory assessment	Early identification and escalation of fluid overload	As clinically indicated	Improved respiratory comfort	[36]

Nursing Interventions for Fluid Balance Management

The examples show the importance of structured nursing actions to maintain fluid balance in haemodialysis patients. Fluid abnormalities are detected through daily weighing, measuring weight gain between dialysis sessions, and regular blood pressure readings (Table 4). Fluid restriction education and dietary sodium counselling may enhance patients' adherence to fluid intake

recommendations. Education about oedema and regular oedema assessment will help prevent unexpected fluid overload. Fluid records and regular counselling could help build patient engagement. These interventions may contribute to better fluid control, fewer fluid problems, and improved treatment outcomes and quality of life for haemodialysis patients overall.

Table 4. Nursing Interventions for Fluid Balance Management Among Haemodialysis Patients.

Nursing Intervention	Clinical Procedure	Monitoring Frequency	Expected Patient Outcome	Study
Daily weight monitoring	Record pre- and post-dialysis weight	Every dialysis session	Reduced excessive fluid accumulation	[37]
Fluid restriction education	Individualised fluid intake guidance	Weekly assessment	Improved fluid adherence	[38]
Blood pressure monitoring	Pre- and post-dialysis BP assessment	Every dialysis session	Better BP control	[39]
Interdialytic weight monitoring	Calculate interdialytic weight gain (IDWG)	Every dialysis session	Reduced fluid overload	[40]
Dietary sodium education	Educate patients about sodium restriction	Regular counselling	Reduced thirst and fluid intake	[41]
Oedema assessment	Examine peripheral and pulmonary fluid retention	Every dialysis session	Early identification of fluid overload	[42]
Patient self-management support	Fluid diary and adherence counselling	Weekly follow-up	Improved self-management	[43]

Impact of Nephrology Nursing on Quality of Life

These findings show improvements in the six dimensions of quality of life after nephrology nursing interventions. Physical functioning rose from 42 to 58, indicating better physical health. Psychological distress decreased from 12 to 8, and social functioning increased from 45 to 62. Sleep quality scores decreased from 13 to 8, indicating fewer sleep-related problems (Table 5). Likewise, symptom burden decreased from 38 to 24, suggesting symptoms may be better managed in this instance. Patient education and improved communication increased treatment satisfaction from 55% to 78%. Overall, these findings suggest that individualized nursing interventions can contribute to physical, psychological, and social well-being.

Table 5. Impact of Nephrology Nursing on Quality of Life Among Haemodialysis Patients.

Quality-of-Life Domain	Nursing Intervention	Assessment Tool	Baseline Score	Post-intervention Score	Impact
Physical functioning	Fatigue management and activity planning	KDQOL-36	42	58	Improved
Psychological well-being	Emotional support and counselling	HADS	12	8	Improved

Social functioning	Family education and social support	SF-36	45	62	Improved
Sleep quality	Sleep hygiene education	PSQI	13	8	Improved
Symptom burden	Individualised symptom management	ESAS-r	38	24	Improved
Treatment satisfaction	Patient education and communication	Patient satisfaction scale	55	78	Improved

Effectiveness of Different Nephrology Nursing Intervention Models

The Nephrology Nursing Intervention Model (NNIM) provides a systematic, patient-centered approach to haemodialysis care. Care planning is personalized after a comprehensive nursing assessment across 3 interrelated domains: symptom management, fluid balance management, and self-management support. For nurses, continuous monitoring allows tracking of clinical signs, medication compliance, and patient-reported health (Figure 3). Regular progress reviews inform timely changes as needs are identified. Achieving care goals may lead to better symptom control, more stable fluid status, and better quality of life. Otherwise, the care plan is reviewed and adjusted. This cycle underlines the value of all efforts to promote individual nursing and cooperation among various disciplines.

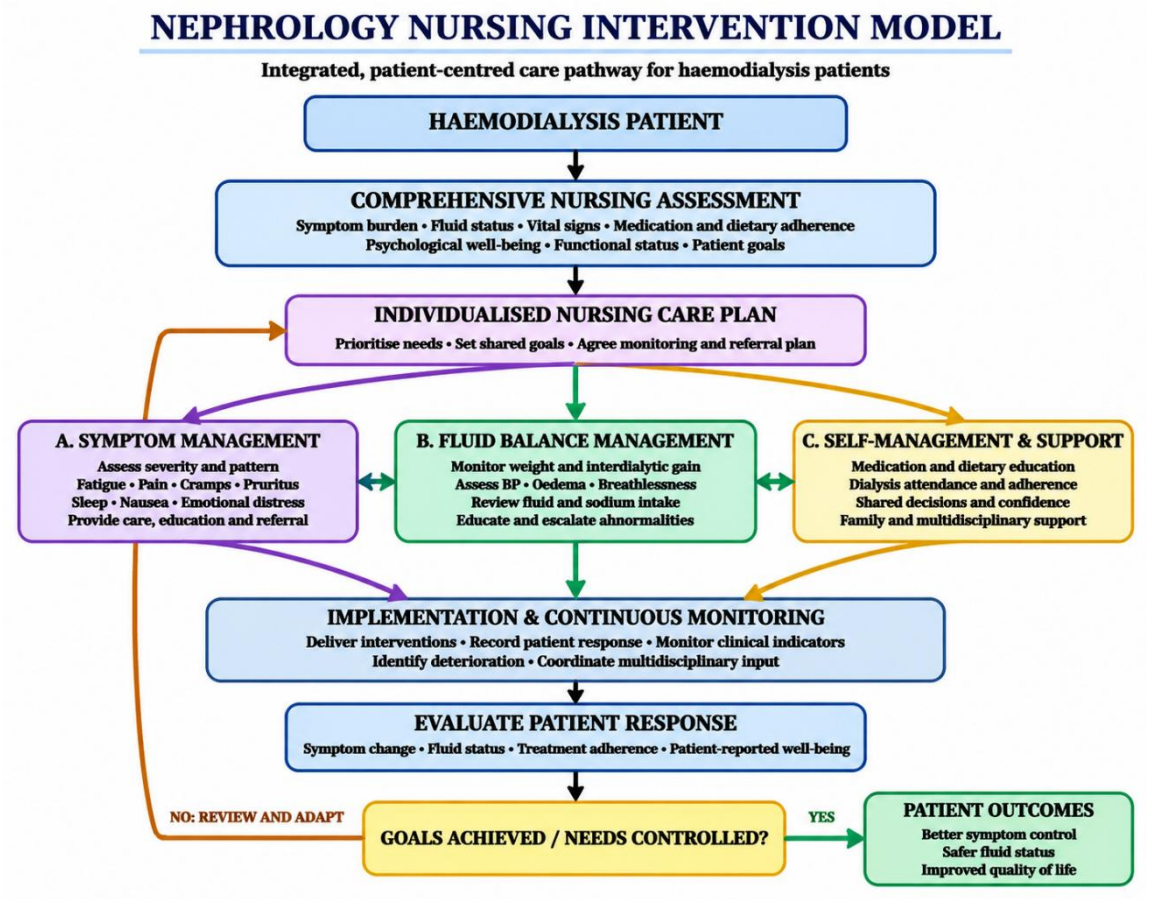


Figure 3. Integrated Nephrology Nursing Intervention Model for Assessment, Individualized Care Planning, Symptom Management, Fluid Monitoring, Evaluation, and Patient-Centered Health Outcomes.

Discussion

This review concludes that nephrology nursing plays an important role in helping people manage symptoms, monitor fluids, and maintain quality of life for those receiving haemodialysis. The available evidence indicates interconnections and the need to treat these areas holistically through individualized nursing care. Haemodialysis patients often experience numerous physical and psychological symptoms, such as feeling tired, pain, muscle cramps, itchy skin, sleep disturbances, anxiety and depression. These symptoms could affect functioning in everyday life, engagement with treatment and psychological health. Symptom weighting also varies by patient, as shown by Flythe et al., highlighting the need to consider each patient's experience and tailor care rather than using a one-size-fits-all approach [7]. Mina et al. similarly noted a significant symptom burden and its connection to lower quality of life and health outcomes in chronic kidney disease cohorts [31].

"Fatigue" emerged as a key concern among haemodialysis patients. Its association with physical restrictions, psychological strain, and diminished normal functioning highlights the need to assess and individually manage it systematically. Anaemia, sleep disorders, inflammation, complications, and the physiological stress of dialysis can all affect fatigue. Thus, nursing actions should include frequent symptom monitoring, energy-conservation education, activity planning, and communication with the multidisciplinary found that patients on maintenance dialysis could be divided into symptom sub-groups, with implications for individual clinical and psychosocial characteristics when managing symptoms [17], [20], [27], [30].

Cleaning and other nursing care are also important because pruritus, pain, and sleep disturbance can occur together, exacerbating residents' symptom load. A KDIGO symptom-management conference stressed the importance of recognizing, prioritizing, and addressing symptoms based on patients' preferences and experiences also acknowledged nephrology nurses' role in first identifying symptoms and using patient-reported outcome measures to support timely care. However, symptom improvement sometimes goes beyond standard nursing education, and treatment factors play an influential role. Thus, periodic reevaluation and a multidisciplinary approach remain necessary [22], [32], [35].

As another part of hemodialysis nursing activities, fluid balance management is crucial as it can lead to hypertension, oedema, breathlessness and cardiovascular complications if it is not properly managed. Interdialytic weight gain (IDWG), blood pressure, peripheral oedema, respiratory symptoms, and fluid intake are critical parameters for evaluating fluid status. To support nephrology nurses' contribution, they monitor pre- and post-dialysis weights, reinforce individualized fluid restrictions, and provide education on dietary sodium intake. In systematic reviews and meta-analyses, Gallagher et al., found that IDWG decreased significantly, though modestly, after self-care interventions, especially educational programmers [44]. This reinforces the potential for structured patient education; however, the magnitude of improvement from structured patient education should not be overstated.

Standardized instructions may not be suitable because patients differ in residual kidney function, nutritional needs, comorbidities, and daily fluid intake. A randomized controlled trial of 102 haemodialysis patients by Veinot et al. showed that individualized education therapy enhanced dialysis adequacy and decreased IDWG compared with routine education [22]. These results will help clarify the teaching and learning process and support personalized learning and ongoing evaluation. IDWG should be interpreted only alongside other data, as it can also be influenced by nutritional status and clinical situation. Thus, nurses should monitor weight changes, blood pressure, physical examination findings, and the patient's overall clinical status, and consider diet compliance [16], [19], [45].

Quality of life is an important goal of holistic nephrology nursing. Physical function, psychological health, social activities, and sleep quality and satisfaction are related aspects of the patient experience. Cohen et al. found strong practical significance in routinely assessing QOL using the KDQOL-36, reporting results from analysis of 330,412 completed questionnaires from 240,343 patients in a United States dialysis organization [16]. Likewise, Peipert et al. created United States dialysis population normative values for the KDQOL-36, which facilitate more meaningful interpretations of the patient-reported outcomes [15]. Conventional assessment tools may not, however, capture all patients' experiences. Incorporating validated questionnaires with direct patient communication may thus offer a more holistic perspective of individual needs.

The connection between symptom management and QOL is especially noteworthy because symptom improvement may not lead to QOL improvement. For instance, easing pain may make it easier to feel better in one's body, but feelings of right and wrong, tiredness, and insomnia can remain, affecting the ability to function in daily life. Cheung et al. found differences in symptom severity between dialysis and non-dialysis days [32]. This means that indicators from a single assessment time may not reflect patients' broader experiences.

The reviewed evidence indicates that individualized education, a multidisciplinary approach to haemodialysis care, and telephone assistance and technology to monitor patients could improve haemodialysis management. Nurse-led multidisciplinary holistic care has been reported to reduce fatigue (Henry et al.). Soibu et al. also showed potential in using individualized education for fluid management [20], [46]. In addition, Davies et al., studied nurse-led telephone education and counselling, which was reported to improve a few self-management measures [37]. However, comparisons are limited because of different intervention versions and variability in follow-up length and study populations.

Patient-reported outcome measures (PROMs) provide structured information on patients' symptoms and treatment experiences and can support nursing practice. The Dialysis Symptom Index, KDQOL-36, and Edmonton Symptom Assessment System can identify and monitor patient concerns. This study aimed to assess available instruments for measuring symptoms in families facing domestic violence, but Cohen et al. noted several known psychometric issues in the available instruments [16]. While electronic symptom monitoring can improve communication between patients and healthcare professionals, it can be hindered by factors such as accessibility, digital literacy, privacy protection, and implementation challenges [23], [24].

These results have implications for nursing practice: First, dialysis centers should consider making mandatory intake and regular symptom assessment part of each patient's treatment plan. Second, fluid balance monitoring is not merely a data-collection tool but should be part of a fluid balance management plan that includes patient education and appropriate shared decision-making. Third, nurses need relevant education on symptom assessment, communication, motivational interviewing, and patient-reported outcome measures (PROMs) validated for the patient population in question. Mehrotra et al. highlighted three groups of factors in effective symptom management: support within professional education, structured symptom assessment and patient coaching, and organizational support [21]. In addition, culturally responsive communication and consideration of patient preferences could support inclusive, patient-centered care [22].

This review has a few interpretive limitations. Because study designs, sample characteristics, intervention duration, assessment instruments, and outcome definitions vary, direct comparisons may be limited. In addition, changes in knowledge and/or adherence/symptom scores do not necessarily reflect improved long-term outcomes or mortality. Some interventions may have short-term positive effects, but these effects must be sustained with ongoing intervention. Future studies should include

larger multicenter designs, extended follow-up, and uniform outcome measures to provide stronger evidence of the long-term effectiveness of nurse-led interventions. The patient experience also needs greater consideration, along with implementation challenges and the cost-effectiveness of various nursing models.

Conclusion

Haemodialysis (HD) nursing is crucial for managing symptoms, maintaining fluid balance, and optimizing health-related quality of life in haemodialysis patients. Systematic evaluation and personalized care approaches (clinical care, patient education, and clinical monitoring) can support better symptom management, increased adherence to therapy, and safer fluid management. Communication and co-operation between disciplines are also essential to meet patients' physical, psychological, and social needs. However, the long-term effectiveness of dialysis prevention with nursing intervention is not yet proven. Therefore, more high-quality research, including multicenter randomized controlled trials, is needed to determine definitive clinical outcomes. Evidence-based interventions in nephrology nursing can support effective, individualized, and holistic haemodialysis care.

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