



# **Nursing Health Education on Self-Health Management of patients with Chronic Kidney Disease**

**A literature Review**

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**Nursing Health Education on Self-Health Management of patients with Chronic Kidney Disease**

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**Abstract**

Chronic kidney disease (CKD) is a public health challenge of major global concern, defined by the progressive deterioration of kidney function and related complications. The consequences of chronic kidney disease are already one of the causes of global mortality, such as cardiovascular diseases caused by diabetes and hypertension. Research has found that increased patient self-management can improve chronic kidney disease outcomes. Nurses' health education to patients is one of the main ways to affect their condition.

The research goal and purpose of this article is to explore what health education channels nurses use to influence patients to implement effective self-management.

A systematic literature review of the reputable CINAHL Ultimate (Ebsco) and Pub Med databases was conducted, resulting in six peer-reviewed articles.

In conclusion, this article reveals several important findings that different nursing health education not only enhances patient engagement in treatment but also improves self-management of patients with chronic kidney disease, such as compliance with dietary restrictions, medication management, and monitoring of vital signs. In addition, it is equally important to pay attention to the mental health of patients with chronic kidney disease. However, in modern and developing intelligent society, integrating technology and tele-medicine into online platforms to implement real-time nursing education programs for patients is expected to improve patients' participation and long-term persistence in self-care practices.

**Keywords/tags (subjects)**

Chronic Kidney Disease, CKD, Chronic kidney disease patients, Education

**Miscellaneous (Confidential information)**

For example, the confidentiality marking of the thesis appendix, see Project Reporting Instructions, section 4.1.2

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# 1 Introduction

Chronic kidney disease abbreviated as CKD is a global epidemic, but many people lack basic health knowledge about the disease, this also increases the prevalence of CKD. The disease is defined as long-term and slowly developing renal dysfunction, typically lasting more than three months (Schiffrin et al., 2007). As the prevalence of CKD continues to rise, the need to empower patients with the knowledge and ability to independently manage their own health becomes increasingly apparent. (GBD Disease and Injury Incidence and Prevalence Collaborators 2017, 2018).

Chronic kidney disease is a common disease plaguing global health and has become a major and worrisome public health problem. The Global Burden of Disease Study is a broad, holistic survey that highlights the impact and increase in mortality caused by chronic kidney disease (GBD Disease and Injury Incidence and Prevalence Collaborators 2017, 2018). In addition, the study by Mills et al. (2016) highlighted the key role of CKD as a precursor to cardiovascular problems and the impact of renal dysfunction on cardiovascular diseases, such as pericarditis, coronary heart disease, etc. On the other hand, global differences in hypertension and control have also been elucidated (Mills et al., 2016).

Nursing health education has become an indispensable part in addressing the multifaceted needs of CKD patients. The study by Latter (2022) emphasizes the pivotal role of nurses in the comprehensive management of patients, providing insights into the diverse responsibilities nurses shoulder in patient care (Latter, 2022). Furthermore, the work of Devins et al.(2003) on predialysis psychoeducational interventions highlights the impact of psychological support on patient outcomes, further underlining the holistic nature of CKD management (Devins et al., 2003).

In this context, Tentori et al. (2008) became indispensable in the study of mortality risk in dialysis patients, revealing the clinical significance of serum calcium, phosphorus, and parathyroid hormone levels in CKD patients. To comprehensively address CKD, attention must be paid to lifestyle changes. Therefore, Plantinga et al. (2011) study explored physical activity patterns in CKD patients, which is important for understanding the role of lifestyle changes in disease management.

This article aims to understand the relationship between nursing health education and self-health management of CKD patients, and provide a corresponding knowledge base, combining insights from different studies, and emphasizing the importance of nursing health education for self-management of CKD patients.

## **2 Chronic Kidney Disease**

### **2.1 Understanding the impact of Chronic Kidney Disease**

Chronic kidney disease affects approximately 700 million people worldwide, with a prevalence increase of 29.3% since 1990 (Cockwell & Fisher, 2020). The prevalence of CKD is mainly caused by hypertension, obesity, diabetes and the increase in the aging of the social population (Ayodele & Alebiosu, 2005). CKD is associated with cardiovascular complications and the incidence of end-stage renal disease and has a significant impact on mortality in populations worldwide (Eknoyan et al., 2004). In countries with lower levels of socioeconomic development and limited access to quality healthcare, the burden of chronic kidney disease is higher as the population increases, often due to low health awareness and poorer social well-being, as people are unclear about how to manage it. health issues (Jha and Modi, 2018). Torres-Toledano et al. (2017) found that global CKD-related mortality increased by 108% between 1990 and 2015, and these values will continue to increase in the future. The prevalence and overall burden of CKD was estimated to be high in 2010, but varied between regions and populations. For example, unhealthy diet and lifestyle can lead to the exacerbation and escalation of various underlying diseases, with diabetes being a major factor in Mexico. (Torres-Toledano et al., 2017; Mills et al., 2015) Factors contributing to regional disparities in CKD include race, ethnicity, genetic susceptibility, and increased prevalence of type 2 diabetes. People with CKD lack knowledge about their disease management, resulting in increased prevalence and risk of disease progression. (Ayodele & Alebiosu, 2010).

## **2.2 Underlying disease associated with chronic kidney disease**

### **2.2.1 Interconnection of CKD and Hypertension**

Chronic kidney disease (CKD) and hypertension are intricately linked medical conditions, with a complex interplay between the two. It has been observed that despite the utilization of various drug treatment regimens, individuals affected by CKD face significant difficulties in effectively controlling the progression of disease. Elevated blood pressure can cause damage to the small blood vessels in the kidneys, impairing their ability to effectively filter blood and leading to kidney dysfunction. Furthermore, hypertension is the most common cause of secondary hypertension, which is often associated with kidney related disease such as renal artery stenosis. CKD lead to a vicious cycle of hypertension and vice versa, increasing cardiovascular events and risk of further kidney damage (Tsirpanlis, 2008; Wright et al, 2015). This apparent challenge underscores the pressing need to optimize the existing treatment regimes for CKD patients. The field of pharmacogenomics has emerged as a promising avenue to explore in the quest for better understanding and management of hypertension in the context of CKD (Eadon et al., 2022). Therefore, the management of disease is also important and directly affects the progression of CKD, such as the control of hypertension. According to studies including VanDeVoorde and Mitsnefes (2011), hypertension is a prevalent problem among over half of children afflicted with chronic kidney disease. Furthermore, the development of CKD is associated with cardiovascular irregularities, further exacerbating health problems in this population. In the realm of pediatric patients, the impact and benefits of active therapeutic intervention are expected to be more pronounced than in adult patients. Resistant hypertension, defined as blood pressure above target levels despite optimal medical treatment, is a challenge in managing hypertension (Thomas & Rahman, 2021).

### **2.2.2 Interconnection of CKD and Diabetes**

Diabetic patients are one of the high-risk groups for developing CKD and often suffer from glucose intolerance and impaired insulin secretion. During this process, high blood sugar damages the small blood vessels of the kidneys, thus easily leading to diabetic nephropathy. Inability to effectively control blood sugar or insulin resistance are major risk factors for CKD, leading to disease progression and increased cardiovascular risk. Therefore, patients with CKD often develop

abnormalities in glucose metabolism, leading to impaired glucose tolerance and diabetes (Bonacina et al., 2019). As cardiovascular disease increases, it becomes the leading cause of death in this population. Glycemic control is crucial for the treatment of CKD, but HbA1c treatment options remain controversial internationally. Antidiabetic drug therapy in patients with chronic kidney disease requires careful adjustment due to altered drug metabolism and risk of hypoglycemia (Alicic et al., 2022). The study by Kalmykova et al. (2019) showed a significant correlation between CKD and age, diabetes, hypertension, and serum creatinine. Urea is a uremic metabolite that directly impairs pancreatic beta-cell function and insulin secretion, making CKD patients more susceptible to diabetes (Allison, 2016). Early recognition of CKD is critical to delaying disease progression, reducing the economic burden on individuals, families, and communities, and developing interventions to maintain insulin secretion in patients with CKD.

### **2.3 Clinical Insights into Mortality Risks**

The global burden and mortality risk are closely related, and a wealth of clinical insights underline the importance of this relationship. Among them, epidemiological studies have consistently demonstrated that because patients with CKD often suffer from complications such as cardiovascular disease, they are at a higher risk of premature death. Through the comprehensive meta-analysis by Matsushita et al. (2010), the link between CKD progression and mortality was revealed, emphasizing the seriousness of CKD as an adverse event alone affecting overall health (Matsushita et al., 2010). Furthermore, the study of Tonelli et al. (2006) highlighted modifiable risk factors such as hypertension and diabetes that further amplify the risk of mortality in patients with CKD. These findings are reinforced by Matsushita et al. (2010) consortium that conducted a global analysis confirming a consistent association between reduced estimated glomerular filtration rate and increased mortality across different populations. This is a complication of high blood pressure and diabetes. Therefore, it is more necessary to provide health education and implement effective intervention measures for CKD patients. Most underlying diseases are caused by bad living habits and irregular eating habits. Various body functions are damaged, leading to the worsening of underlying diseases. Taken together, these clinical insights highlight the need for targeted interventions and increased awareness to reduce the global burden of CKD related mortality (Matsushita et al., 2010).

## **2.4 Nursing Health Education**

Nursing health education is defined as nurses sharing knowledge about health promotion, prevention, recovery, and rehabilitation to patients, families, or caregivers through systematic or non-systematic educational methods (Ferreira et al., 2022). Simultaneously, nursing health education, as an important part of basic nursing, aims to promote a healthy lifestyle. It includes the skills needed to provide health education to nursing students in professional practice. Nursing education is an intervention in patient health supported by nursing practice summary and provides reasonable health promotion based on patient information (Li et al., 2022). The basic content of health education usually involves disease knowledge, sign management, medication management and life health conditions, such as pain management through medication knowledge, improving patients living habits, improving health literacy, etc. Nurses achieve this measure. For instant, various educational models and methods, usually demonstration conversations, motivational interviews, technical feedback, lectures and workshops. Education is a powerful tool in preventing disease and reducing its impact. Nurses conduct initial patient assessments about risk factors, explain early warning symptoms or signs, and then educate patients on preventive measures to enable them to adopt healthy behaviors and reduce the risk of chronic disease. Nurses, on the other hand, empower patients to take an active role in managing their own health by providing them with knowledge and resources. Educated patients are better able to comply with and choose treatment options that suit their condition, live a healthy lifestyle and promote their own healthcare needs. But in most cases, it is not ideal to expect that one-time or less frequent educational sessions will lead to changes in patient health behaviors (Drake & Williams, 2017; Kim & Oh, 2020). It is important to address health education at different stages of life, and health education programs have a positive impact on global health attitudes and behaviors. Especially during a global epidemic, health education plays a positive role in preventing disease and drug abuse. Digitizing and broadening the scope of health education can improve interventions and programs (Rizvi, 2022).

## **2.5 Chronic Kidney Disease Management**

Self-management refers to patients' responses to their disease through self-awareness, including lifestyle changes, symptom monitoring, medical visits, and medication intake. It is also an important aspect of care for patients with chronic kidney disease (CKD). There are currently many

studies exploring the factors that influence the self-management behavior of CKD patients. Self-management measures have also been shown to improve blood pressure, blood sugar, and disease progression in patients with CKD. Despite suffering from CKD, active participation in treatment and care plans can effectively improve the quality of life and reduce the impact of CKD on life (Bağriaçık and Dikmen, 2023; Zimbudzi et al., 2018). Self-management of CKD helps patients take control of their lives and health, and effective self-monitoring can reduce complications and hospitalizations. Furthermore, knowledge and education have been identified as key influencing factors for self-management in CKD patients undergoing hemodialysis. These interventions have the potential to improve patients' self-management skills and health outcomes. In summary, healthcare providers should focus on enhancing social support, perceived benefits, self-efficacy, knowledge, and education to promote self-management behaviors and improve outcomes for patients with CKD (Cancarevic and Malik, 2020). However, it is currently unclear which interventions and specific elements are more effective in treating the disease. Interventions that leverage research reminders for patient education and goal setting are associated with improved outcomes. Early and correct screening, identification, and management of diabetes, hypertension, and hyperlipidemia are important for chronic kidney disease, focusing on the control of blood sugar and blood pressure and the resolution of related conditions (Qu and Shen, 2023). Evidence from more high-quality research is still needed to support future self-management programs and their effectiveness.

### **3 Aim, purpose and research question**

The aim of this literature review is to find and summarize existing research on health education interventions in the care of patients with chronic kidney disease. The study informs about the current evidence base in this field to improve nursing health education interventions and patient care in CKD. The study identifies topics, practices, and directions for improvement in health education programs for CKD patient care. The research question is: What kind of nursing health education improves self-management in CKD patients?

## 4 Methodology

### 4.1 Literature review

This article is based on a literature review and the article research summarizes a number of selected articles. Literature review includes analyzing and summarizing the existing basic theoretical and practical data, searching for background, discovering problems, analyzing the data, drawing conclusions, and finally summarizing. Literature reviews can also help researchers identify topics and analyze initial questions (Libório et al., 2023). Academic research requires the rational use of scientific methods to conduct literature reviews, which is a necessary condition to ensure the quality of the literature and provide a basis for practice (Winchester & Salji, 2016; Denney & Tewksbury, 2013). The inclusion and exclusion criteria of articles are mainly based on articles with abstracts, full-text articles, peer review, English articles, published between 2013-2023, accessible to JAMK students, and research-related articles. The exclusion criteria are articles before 2013, conference abstracts, books, social discussions, and articles other than English papers as shown in Table 1

Table 1. Inclusion & Exclusion criteria

Inclusion criteria	exclusion criteria
● Peer review	◆ articles before 2013
● English articles	◆ conference abstracts, books, social discussions
● Articles with abstracts	◆ articles other than English papers
● Published between 2013-2023	
● Accessible to JAMK students	

● Articles relevant to study question	
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## 4.2 Data search

The studies for this literature review were primarily extracted from two databases: Pubmed and CINAHL Ultimate (Ebsco). These reliable sources ensured that the researches collected and obtained an authoritative set of articles, identified correct data and summarized answers to the article question "What kind of nursing health education improves self-management in CKD patients?". The selected articles will be from a nursing perspective and implemented in the self-management of kidney disease patients. The author used Boolean operators "AND" and "OR" to search using the keywords "chronic kidney disease" or "chronic renal failure" or "ckd" and "health education" or "health promotion" or "patient education" and "nursing interventions" or "nursing care" or "nursing support", when perform data search in PubMed. These keywords were also used when conducting a data search in CINAHL. Following the research method of PICOs format, the target population of this document meets the inclusion criteria and, including the content and learning design in the interest direction of this population, author used and conducted the preliminary search as shown below Table 2

Table 2. PICOS illustration

<b>P</b> (population)	Patient with Chronic Kidney Disease
<b>I</b> (Interest )	Nursing Education
<b>CO</b> (Context)	Nursing intervention

### 4.3 Studies selection process

Articles data searches were conducted in CINAHL and PUBMED and excluding duplicate articles, initially 311 studies were identified, including 22 from CINAHL and 289 from PUBMED. The screening process started by reviewing the article titles, followed by generating 92 articles, further screened the articles by reading abstracts, as shown in the flowchart in PRISMA (Figure 1). After secondary review, 56 articles were excluded at this stage or were not relevant to nurse health education content. In order to further select articles, the remaining 36 articles will go through two screening criteria stated by reading the full-text content of the articles to see whether they were consistent with the research and whether the articles met the inclusion criteria, 6 articles were finally generated, which conform to all requirements and inclusion criteria, as shown in Table 1. A summary of the screened articles is provided in Appendix 1.

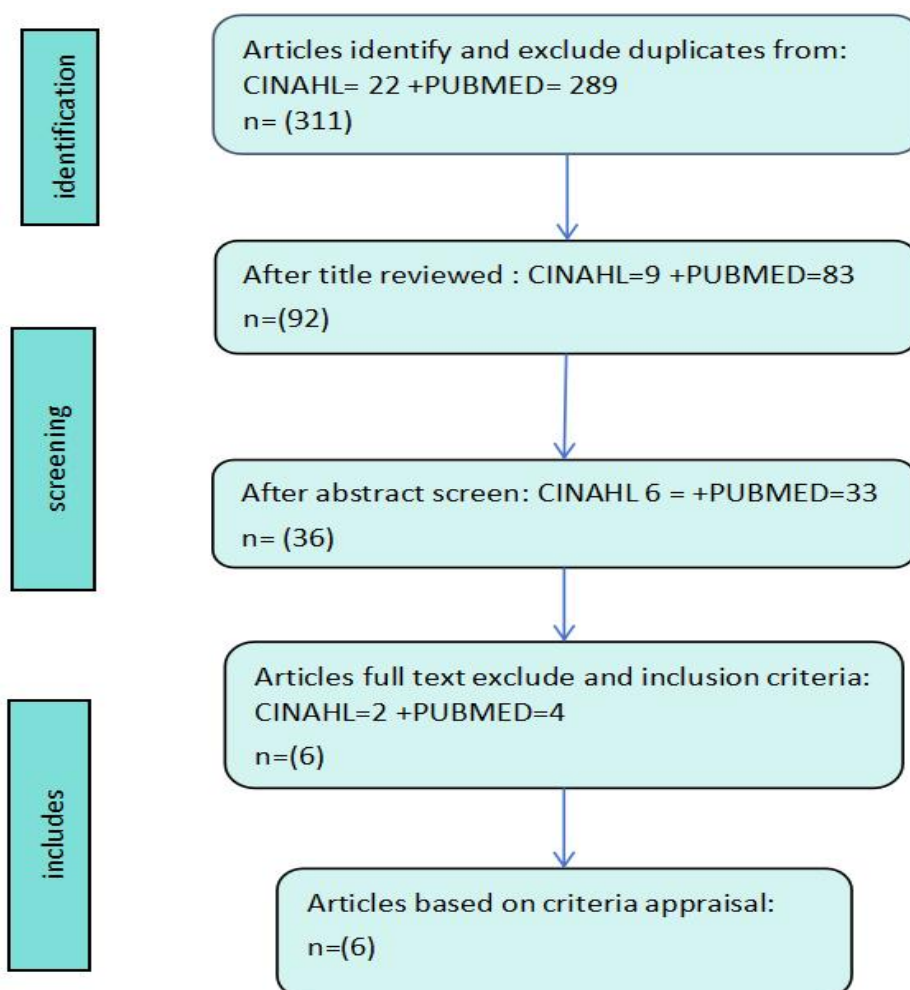


Figure 1. PRISMA flow chart of studies selection process

#### 4.4 Data analysis

Data analysis is an important part of research projects and studies, and researchers who use traditional content analysis are able to derive answers and insights from data. The study by Raskind et al. (2018) demonstrated the use of coding methods for reporting data in health education articles. There are generally two methods for indexing or decomposing tags on data, which can also be used in combination. The first one is to create a code list based on the research question and the arguments or opinions of the literature after searching, such as descriptive, open-ended, and structured arguments within the article. The second is to generate initial codes by paraphrasing the article arguments based on the article arguments, such as data paraphrase, model paraphrase, conclusion paraphrase, etc. Diverse coding was refined and summarized by repeatedly reading articles carefully, using key arguments within them to create descriptive codes, identifying these argument codes, and creating subcodes (Raskind et al., 2018).

Labeling this argument data helps establish logic, describe the topic, and demonstrate reasons. Data analysis can use different techniques and tools. In order to ensure the detail and credibility of the data, the original data were extracted in the form of sentences for analysis and summary. The results of the data analysis provide the basis for the conclusions. On the other hand, code design methods, data categories, definitions, and inductive summaries also help researchers identify and understand the study. (Raskind et al., 2018; O'Brien et al., 2014). Table 3 below shows the analysis of the data. Label and classify representations of data from a research perspective. Informational data were obtained from six filtered articles.

Table 3. Data analysis process

Origin expression	Subcategories	Main categories

<p>Nurse-led health education significantly improves patient treatment compliance</p> <p>Identifies educational needs of young renal transplant recipients.</p>	<p>Health education in care plan</p> <p>Health education in transplant</p> <p>health education needs</p>	<p>Health education type</p>
<p>Office-based educational intervention showed short-term success; NP-delivered intervention most successful.</p> <p>Careful planning and interdisciplinary cooperation can enhance patient's quality of life.</p>	<p>health education goals</p> <p>Professional Education</p> <p>Extend education</p>	<p>Health education scope</p>
<p>Self-management model improved patient-centered outcomes in chronic kidney disease.</p> <p>Improve patients' health literacy levels so they can better understand medical staff</p>	<p>Impact of education outcomes</p> <p>self-management changes</p>	<p>Health education effect</p>

## 5 Result

### 5.1 Health education type

Most people diagnosed with chronic kidney disease (CKD) require a comprehensive disease management plan. Patients' perceptions of their disease influence their management of themselves, thereby affecting their motivation and self-management to implement a treatment or management plan. Aard et al. (2021) emphasized the importance of a multidisciplinary educational approach to patients with chronic kidney disease, including comprehensive nursing knowledge, evidence-based practice, professional guidance, and interdisciplinary communication. At the same time, the prevention of CKD related complications is crucial, and relevant interventions use health education to guide patients to comply with the treatment plan. For example, educational interventions often include imparting knowledge about lifestyle changes, medication management, and self-management strategies, according to Goovaerts et al. (2015) Disease education should be modified strictly according to the progression of the disease, and some patients should also receive special education, such as dialysis education, transplantation education, etc. The purpose of different health education is to improve the health level of patients and meet different needs, and most achieve this goal by improving patients' self-management. Therefore, corresponding nursing health education is crucial for patients. The report also mentioned that a higher proportion of CKD patients also suffer from coronary heart disease, and understanding how to maintain kidney function can help improve self-efficacy. The quality of life of CKD patients is improved through the improvement of self-efficacy, and the activation of self-efficacy comes from health education. In addition, the demand for CKD disease knowledge is also related to gender, age, and education level. The longer you receive health education, the better the effect of improving disease aggravation. (Jacobson et al., 2015)

With the rapid development of technology and the Internet, today's health education communication methods have been changed. As Arad et al (2021) highlight, video calls have become an essential tool for delivering health education to remote patients. Participation provides an effective medium. According to a survey by Goovaerts et al. (2015) Providing education and regular follow-up can increase patient motivation and compliance with treatment and treatment regimens, including medication management and implementation of dietary regimens. Real-time

monitoring is conducted online and patients are taught to adopt healthy lifestyles, including dietary modification, regular exercise and smoking cessation. This approach helps CKD patients at all stages reduce symptoms of the disease and delay disease progression. Ultimately, this comprehensive disease health education effort can guide CKD patients to better understand their condition, allowing them to proactively manage their health and adhere to prescribed treatment regimens, potentially improving symptoms and slowing disease progression. (Jacobson et al., 2021; Arad et al., 2021)

## **5.2 Health education scope**

Health education work usually meets the self-management needs of patients with chronic diseases at different stages, helping them establish healthy habits and prevent high-risk behaviors in the early stages of chronic kidney disease. Wellness plans address nutrition, daily activities, medication management, sexual health, mental health and more. As stated by Goovaerts et al. (2015), while targeting young people, the focus of nursing health education is to establish healthy habits and reduce high-risk behaviors as early as possible, promote and help CKD patients focus on healthy lifestyles, prevent chronic diseases, and Encourage regular health checkups to prevent the progression of CKD. Covering aspects such as nutrition, daily activities, medication management, sexual health and mental health, these programs are designed to promote a healthy lifestyle and encourage regular health check-ups.

As CKD progresses, infection prevention education is also critical to reduce the risk of peritonitis, especially in the later stages when dialysis is required. As highlighted by Goovaerts et al (2015), patients receive education on how to manage dialysis independently or with assistance, as well as important infection prevention measures to reduce risk. The study by Walker et al (2013) showed that daily dialysis education for CKD patients includes sterility awareness, catheter site care, infection recognition, and compliance with fluid restrictions. Dialysis education influences patient self-management while emphasizing the importance of rigorous self-monitoring and medication compliance in disease management.

Furthermore, as Corr et al (2023) pointed out, it is crucial to address the psychological aspects of CKD, with CKD patients often facing psychological stress and emotional distress, not only those requiring dialysis treatment. Young transplant recipients, in particular, can express concerns about

their body image after transplantation and even develop symptoms of trauma and stress such as impatience and anxiety. This illustrates how mental health is a vital part of the disease management plan. By managing these psychological stressors and expanding disease management knowledge, health education interventions not only help adhere to treatment plans but also help improve patients' self-management abilities and maintain their mental health. Overall, health education interventions are important tools to support people with CKD at all stages, meeting their changing needs while promoting overall health and well-being.

### **5.3 Health education effect**

As highlighted by Boyer et al (2021), the impact of health education on chronic kidney disease (CKD) patient self-management before dialysis appears to vary among individuals. This difference emphasizes the importance of early assessment of health literacy to effectively develop self-management plans. Particularly for home dialysis patients, understanding their health literacy status is significantly helpful in improving patient participation and the effectiveness of program implementation. Health education interventions change patients' lifestyles and can have a positive impact on biomedical outcomes, including markers such as albumin to creatinine ratio (ACR), cardiovascular risk factors, blood pressure, serum cholesterol levels, and glycemic control. As demonstrated by Walker et al. (2013). Enhanced self-management outcomes, including improved medication and condition knowledge, medication adherence, and healthy lifestyles, are further indicators of intervention effectiveness.

Furthermore, Corr et al. (2023) findings highlight the urgent need for post-transplant health management knowledge among young kidney transplant recipients, especially those with lower socioeconomic status and limited self-care abilities. Psychological education has become an important part of improving patients' life satisfaction and health pursuits. In addition, as Goovaerts et al. (2015) emphasized continuous education for CKD patients to help patients choose and improve renal treatment options, especially the choice of renal replacement therapy. It also extends to helping patients select and optimize renal treatment options, including renal replacement therapy (RRT). Multi-level educational interventions enable patients to actively participate in the medical decision-making process, influencing choices related to RRT options such as dialysis and kidney transplantation, with family members playing a key role in the decision-

making process. Health education strategies that effectively influence physical and psychological aspects play a crucial role in optimizing patient outcomes and improving CKD outcomes. Health education interventions play a critical role in enhancing self-management among people with CKD, as evidenced by improvements in health literacy, biomedical outcomes, and treatment decision-making.

## 6 Discussion

These 6 studies highlight the importance of a multidisciplinary health education approach involving nurses for patients with CKD. Arad et al. (2021) and Boyer et al. (2021) both emphasize the involvement of healthcare professionals, including nurse interventions in the treatment and management of the disease process, indicating the need for patient education about CKD and its management. The study by Walker et al. (2013) demonstrated the significant impact of health education on biomedical outcomes and lifestyle behaviors. Improved health literacy and self-management skills lead to better control of biomedical markers such as albumin to creatinine ratio, blood pressure and glycemic control, as well as compliance with medication regimens and healthy lifestyles. It is worth mentioning that as CKD progresses, tailored education is necessary. As highlighted by Boyer et al. (2021), patients with renal disease at different stages, whether in pre-dialysis, hemodialysis, or undergoing self-management at home dialysis, indicate that patients have different educational needs. Similarly, Corr et al. (2023) noted the importance of adapting education to meet the unique needs of adolescent and young adult kidney transplant recipients. Educational methods can be implemented in a variety of ways. Arad et al. (2021) believe that the comprehensive use of modern technology, especially video calls and network platforms, has become a tool for close communication and can effectively provide health education to CKD patients. This finding highlights the potential for telephone health education interventions to overcome long geographic distances and longitude time differences to improve patient engagement and compliance with treatment plans. This approach ensures patients receive treatment appropriate to their needs and enhances their understanding of the disease, thereby improving self-management outcomes. The study by Goovaerts et al. (2015) emphasize the critical role of health education in promoting informed decision-making regarding renal replacement therapy (RRT) selection. Multi-level education enables patients to actively participate in medical

decisions, including the choice between dialysis and kidney transplantation, ensuring that treatment decisions are consistent with the patient's disease profile and needs.

## **7 Ethical considerations**

According to the article by Newman et al. (2021), the ethical guidelines that need to be followed when conducting literature review research are proposed, emphasizing the importance of rigor, transparency, and systematic search methods in literature review writing. This literature review follows high ethical standards. For writing, the analysis of the papers in the article conforms to the systematic search method; the screening restrictions, the sources of the article, the data analysis and the methods are all fair, rigorous and transparent. The article is mainly derived from two databases, CINAHL and PubMed. The authors of the selected published articles stated that they had obtained informed consent from the management of the research institution and participants, and respected the consent, privacy, security and confidentiality of all parties. All data citations within this article comply with the ethical guidelines published by JAMK University of Applied Sciences, and author citations and source references are made for relevant articles. (JAMK, 2018)

The assessment tool described by Hawker et al. (2002) is widely recognized for its effectiveness in assessing the methodological quality of research articles. In this literature review, the authors used this tool to carefully assess the relevance and reliability of selected articles. Carefully apply the criteria outlined in Appendix 2 to ensure transparency and credibility in the assessment process. Each essay is reviewed on nine different items, with scores ranging from 1 to 4, for a final possible total score of 36 points. This systematic approach helps identify articles that meet the strict criteria specified by the review objectives. After a rigorous screening process, the six articles selected were directly related to the aspects and questions of the study, and the accurate information confirmed the reliability of the article. This rigorous selection process not only maintains the integrity of the review but also ensures the validity of the findings investigated.

## 8 Conclusion

Six screened articles provided compelling evidence that health education is an important way to influence self-management among patients with chronic kidney disease. Nursing health education should develop different intervention measures according to the patient condition stage and needs, which has a significant impact on the care and management of CKD patients. As Boyer et al. (2021) emphasized that appropriate health education interventions can promote patients' participation in the disease and effectively help long-term persistence in self-management. Nurses planning educational programs for patients should understand and assess the patient's health literacy level, disease progression, and individual needs. As long as health education meets the individual needs and actual situation of patients, it can influence patients to implement effective self-management. Additionally, health education interventions have significant effects on both biomedical outcomes and lifestyle behaviors. As demonstrated by Walker et al. (2013) and Boyer et al. (2021) Health education affects the implementation of self-management by changing patients' health literacy, medication management, and lifestyle, thereby improving disease outcomes. This nursing intervention promotes biomedical health outcomes in patients with CKD by highlighting the self-management approach influenced by health education. As highlighted by Corr et al. (2023) Mental health is also part of patient needs, influencing outcomes in treatment and management through health education interventions, particularly for post-transplant patients. Addressing psychological issues and improving patient satisfaction are critical to improving patient self-management in the future.

Furthermore, as Goovaerts et al. (2015) emphasized that health education plays a vital role in promoting informed decision-making about treatment options. Promote active patient participation in treatment plans and improve patient self-management. In the future, nurses use technology and telemedicine solutions to integrate health education. As suggested by Arad et al. (2021), telemedicine education will increase CKD patients' engagement in treatment and thereby adhere to long-term effective self-management. Continued research and innovation in health education strategies are critical to optimize patient engagement and self-management, as well as to advance future kidney disease care. Taken together, the findings from these articles highlight the potential of health education to improve CKD management. By addressing the multifaceted

needs of patients, nursing health education initiatives empower individuals to proactively manage their own health, thereby improving chronic kidney disease outcomes and enhancing quality of life.

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## Appendices

### Appendix 1. Summary of selected articles

Author and Title	Purpose and Aims	Research methods	Participants or Samples	Key Findings and Results	Country/Origin of study and clinical context
Rachael Walker, Mark R Marshall & Nick Polaschek. (2013)  Improving self-management in chronic kidney disease: a pilot study	Implement a collaborative, community-based intervention for chronic kidney disease patients.  Target individuals at risk of developing end-stage kidney disease.	Community-based CKD pilot study with specialist nephrology nursing support.  Self-management model of care with a Self-Management booklet provided.	52 patients from primary care practices in socio-economically deprived areas.	improved self-management outcomes in CKD patients were observed.  Significant changes in various self-management domains were reported during the study.  Ongoing funding from primary and secondary care is crucial.	New Zealand
Corr M, McKeaveney C, Wurm F, Courtney AE, Noble H. (2023)  The Educational Needs of Adolescent and Young Adult Renal Transplant Recipients-A Scoping Review.	To understand the educational needs of adolescent and young adult renal transplant recipients. To provide knowledge synthesis and mapping of existing research in the field.	Methodological recommendations and steps by Colquhoun et al., Levac et al., and Arksey were adhered to	The scoping review included a total of 29 studies. The study participants were young renal transplant recipients.	A total of 29 studies were included in the scoping review.  Three themes were identified for young people struggling with self-management.  There is a lack of research on protective factors for successful health management.	Switzerland
Jacobson Vann, J. C., Hawley, J., Wegner, S., Falk, R. J., Harward, D. H., & Kshirsagar, A. V. (2015)	To improve knowledge and self-management in individuals with CKD Stages 3b and 4.	Validity testing with algorithms combining hospital and physician claims data.	participants' demographic characteristics included age,	Mixed results in identifying CKD patients, successful educational intervention.	New Zealand

<p>Nursing Intervention Aimed at Improving Self-Management for Persons with Chronic Kidney Disease in North Carolina Medicaid: A Pilot Project.</p>	<p>Implement a nurse-led education intervention pilot study for individuals with CKD.</p>	<p>Educational intervention with CKD nurse educator using standardized curriculum.</p>	<p>gender, ethnicity, and race.</p>	<p>Population-based approach minimally successful, office-based approach not accessible.</p>	
<p>Boyer, A., Begin, Y., Dupont, J., Rousseau-Gagnon, M., Fernandez, N., Demian, M., Simonyan, D., Agharazii, M., &amp; Mac-Way, F. (2021).</p> <p>Health literacy level in a various nephrology population from Québec: predialysis clinic, in-centre hemodialysis and home dialysis; a transversal monocentric observational study</p>	<p>Define health literacy levels in nephrology patients across different treatments.</p> <p>Compare health literacy scores using BHLS and HLQ tools.</p> <p>Analyze health literacy in predialysis clinic, in-center dialysis, and home dialysis.</p>	<p>Compare health literacy scores using BHLS and HLQ tools.</p>	<p>Univariate generalized linear regression model to analyze health literacy screen results.</p>	<p>Patients on PD had higher BHLS score than ICHD patients.</p> <p>Patients on HDD and PD felt more understood by healthcare providers.</p> <p>Patients on HDD had sufficient information to manage health.</p> <p>Predialysis clinic patients reported high abilities for health information appraisal.</p>	<p>Canada</p>
<p>Arad, M., Goli, R., Parizad, N., Vahabzadeh, D., &amp; Baghaei, R. (2021).</p> <p>Do the patient education program and nurse-led telephone follow-up improve treatment adherence in hemodialysis</p>	<p>Determine effects of patient education and nurse-led follow-up on treatment adherence.</p> <p>Enhance adherence to hemodialysis in HD patients through educational interventions.</p>	<p>Randomized controlled trial with 66 patients recruited using convenience sampling.</p>	<p>HD patients in the hospital dialysis ward. Minimum sample size: 66 patients (n=33 per group).</p>	<p>Significant improvement in HD attendance, medication use, fluid restrictions, and diet.</p> <p>Higher treatment adherence in the intervention group compared to the control.</p> <p>Significant difference in mean scores</p>	<p>Iran</p>

patients? A randomized controlled trial				of laboratory values post-intervention.	
<p>Goovaerts, T., Bagnis Isnard, C., Crepaldi, C., Dean, J., Melander, S., Mooney, A., Prieto-Velasco, M., Trujillo, C., Zambon, R., &amp; Nilsson, E. L. (2015).</p> <p>Continuing education: preparing patients to choose a renal replacement therapy.</p>	<p>Provide guidance for nurses on renal replacement therapy education.</p> <p>Tailor guidance to nurses for individualized patient education.</p> <p>Offer advice on navigating resources and materials effectively.</p>	<p>Consensus conference with nurses, nephrologists, and a psychologist.</p> <p>Brainstorming and discussing quality standards for RRTOE.</p>	<p>Four nurses, 5 nephrologists, and 1 clinical psychologist participated.</p>	<p>Recommendations for nurses on running renal replacement therapy option education.</p> <p>Quality standards for the education team, processes, content, and quality measurements.</p> <p>Implementation of an education program to help patients choose suitable therapy.</p>	<p>European Renal Care Association</p>

## Appendix 2. Critical Appraisal of the articles

Author	Abstract and title	Introduction and aims	Method and data	Sampling:	Data analysis	Ethics and bias	Results:	Transferability or generalizability	Implications and usefulness	Total
Rachael Walker, Mark R Marshall & Nick Polaschek. (2013)	3	3	3	4	4	3	4	4	4	32
Corr M, McKeaveney C, Wurm F, Courtney AE, Noble H. (2023)	4	4	4	4	4	4	4	4	4	36
Jacobson Vann, J. C., Hawley, J., Wegner, S., Falk, R. J., Harward, D. H., & Kshirsagar, A. V. (2015)	2	4	4	2	4	4	4	4	3	31

Boyer, A., Begin, Y., Dupont, J., Rousseau-Gagnon, M., Fernandez, N., Demian, M., Simonyan, D., Agharazii, M., & Mac-Way, F. (2021).	3	4	4	4	4	3	4	4	4	34
Arad, M., Goli, R., Parizad, N., Vahabzadeh, D., & Baghaei, R. (2021).	4	4	4	4	4	4	4	4	4	36
Goovaerts, T., Bagnis Isnard, C., Crepaldi, C., Dean, J., Melander, S., Mooney, A., Prieto-Velasco,	4	4	4	2	2	4	4	4	4	34



### Appendix 3. Data analysis process

Simplified raw entries	subcategories	Main categories
Exercise education improves patients' health	Health education in care plan	Health education type
Dietary advice and personal hygiene are essential education	Health education in care plan	Health education type
Multidisciplinary care promotes patient self-care efficacy	Health education needs	Health education type
Chronic kidney disease patients need predialysis education	Health education in needs	Health education type
Mental health of patients after kidney transplant is crucial	Health education in transplant	Health education type
Health interventions improve dialysis patients self-care	Health education in care plan	Health education type
Patient self-management is related to their own health literacy	Health education needs	Health education type
Health education guides patients' self-management awareness	Health education needs	Health education type

Good living habits are crucial for patients with chronic kidney disease	health education goals	Health education scope
Teaching patients to follow their medication schedule is an important part of education	health education goals	Health education scope
Remote technology combined with health education	Extend education	Health education scope
Educate patients in real time to monitor their condition on a daily basis	Extend education	Health education scope
Dialysis education is needed in the later stages of chronic kidney disease	Professional Education	Health education scope
Patients with diabetes and hypertension need corresponding education, guidance and self-monitoring	Professional Education	Health education scope
Implement complete health education to improve patient self-management	self-management changes	Health education effect
Nurse health intervention resulted in improvements some self-management outcomes	self-management changes	Health education effect
Patients who have been influenced by health education have good psychology	Impact of education outcomes	Health education effect
Health education influences patient self-management to improve biomedical	Impact of education outcomes	Health education effect

outcomes		
Health education improves patients' health literacy and changes self-management	self-management changes	Health education effect
<b>19 Simplified raw entries</b>	<b>8 subcategories</b>	<b>3 Main categories</b>