

Content validation of the nursing diagnosis "deficient knowledge" in hemodialysis patients*

Validação de conteúdo do diagnóstico de enfermagem "Conhecimento deficiente" em pessoas submetidas à hemodiálise

How to cite this article:

Rebouças TLL, Lins SMSB, Sousa CN, Paula MCSM, Carlos KTG, Marta CB, et al. Content validation of the nursing diagnosis "deficient knowledge" in hemodialysis patients. Rev Rene. 2026;27:e97108. DOI: <https://doi.org/10.36517/2175-6783.20262797108>

 Tais Lobo Lisboa Rebouças¹
 Silvia Maria de Sá Basílio Lins¹
 Clemente Neves Sousa²
 Monique Coutinho da Silva Menezes de Paula¹
 Karina Telles Guimarães Carlos³
 Cristiano Bertolossi Marta³
 Ayla Christine Pereira dos Santos¹

*Extracted from the dissertation "Validação do diagnóstico de enfermagem conhecimento deficiente em pacientes renais crônicos submetidos à hemodiálise, Universidade Federal Fluminense, 2024.

¹Universidade Federal Fluminense.
Niterói, RJ, Brazil.

²Universidade do Porto. Porto, Portugal.

³Universidade do Estado do Rio de Janeiro.
Rio de Janeiro, RJ, Brazil.

Corresponding author:

Tais Lobo Lisboa Rebouças.
Travessa Santa Rosa do Viterbo, 24. Santa Rosa.
CEP: 24241939. Niterói, RJ, Brazil.
E-mail: taislobo@yahoo.com.br

Conflict of interest: the authors have declared that there is no conflict of interest.

EDITOR IN CHIEF: Ana Fatima Carvalho Fernandes 

ASSOCIATE EDITOR: Suellen Cristina Dias Emidio 

ABSTRACT

Objective: to validate the content of the nursing diagnosis "Deficient Knowledge" in chronic kidney patients under hemodialysis. **Methods:** content validation based on advanced diagnostic validation methods, developed in two stages: conceptual fitness of the diagnosis and content validation by specialists. The participants were 26 nurses with experience in nephrology and/or nursing diagnoses. They were selected using a snowball sampling technique. The experts evaluated the diagnostic components using a five-point Likert scale. Data was analyzed using the content validity index. **Results:** the diagnostic components reached an index of 0.80 or more, indicating appropriate fitness. The defining features with the highest level of agreement were "Imprecise statements about a topic" and "Inadequate behavior". **Conclusion:** the diagnosis showed sufficient content validity for people with chronic kidney disease under hemodialysis. **Contributions for practice:** further fine-tuning the diagnostic components can increase the precision of the diagnosis and support the planning of nursing interventions targeted at this population.

Descriptors: Standardized Nursing Terminology; Nursing Diagnosis; Validation Study; Renal Dialysis; Knowledge.

RESUMO

Objetivo: validar o conteúdo do diagnóstico de enfermagem "Conhecimento deficiente" em pessoas com doença renal crônica submetidas à hemodiálise. **Métodos:** validação de conteúdo fundamentada em métodos avançados de validação diagnóstica, desenvolvida em duas etapas: adequação conceitual do diagnóstico e validação de conteúdo por especialistas. Participaram 26 enfermeiros com experiência em nefrologia e/ou diagnósticos de enfermagem, selecionados por técnica de amostragem em bola de neve. Especialistas avaliaram os componentes diagnósticos por meio de escala Likert de cinco pontos. Os dados foram analisados pelo Índice de Validade de Conteúdo. **Resultados:** os componentes diagnósticos apresentaram índice superior a 0,80, indicando validade adequada. As maiores concordâncias ocorreram nas características definidoras "Afirmações imprecisas sobre um assunto" e "Comportamento inadequado". **Conclusão:** o diagnóstico apresentou validade de conteúdo adequada para pessoas com doença renal crônica submetidas à hemodiálise. **Contribuições para a prática:** o refinamento dos componentes diagnósticos pode aumentar a precisão diagnóstica e subsidiar o planejamento das intervenções de enfermagem direcionadas às necessidades dessa população. **Descritores:** Terminologia Padronizada em Enfermagem; Diagnóstico de Enfermagem; Estudos de Validação; Diálise Renal; Conhecimento.

Introduction

Chronic Kidney Disease (CKD) is an important public health issue worldwide, involving the progressive and irreversible loss of kidney function, in association with high rates of morbidity and mortality, with a significant impact on health systems⁽¹⁻³⁾. Estimates suggest that from 10% to 14% of the world's population has some level of renal impairment. This disease is closely related to the increased prevalence of chronic conditions — such as diabetes mellitus and arterial hypertension —, which has a significant impact on health systems. Epidemiological estimates indicate an expressive growth in the demand for renal replacement therapies in the next few decades, especially in low- and middle-income countries⁽²⁻³⁾.

In Brazil, the number of people on dialysis has been increasing, which represents an important challenge for the organization of health care⁽⁴⁻⁵⁾. Hemodialysis is the most commonly used renal replacement therapy (RRT) in the country, imposing significant changes in the daily life of people with CKD, including food and water intake restrictions, continuous medication use, the need to preserve vascular access, and rigorous adherence to treatment⁽¹⁻⁴⁾. In this context, the development of knowledge related to the disease and the treatment is essential to promote self-care and therapeutic adherence, and to prevent complications^(1,6).

Knowledge in health is essential for the management of chronic conditions, since it influences the ability of an individual to understand information, take part in decision-making for their treatment, and develop self-care behaviors. In people on hemodialysis, the understanding of orientations related to their therapeutic regimen, including food and water intake restrictions, medication use, and their care for vascular access, favors adherence to treatment and the prevention of complications. Therefore, the systematic evaluation of knowledge becomes relevant to identify educational needs and plan targeted nursing interventions⁽⁶⁻⁸⁾.

Among the instruments used for the systemati-

zation of care, the diagnoses in International Nursing Knowledge Association (INKA) help us find human responses and support interventions targeted at the needs of the patient⁽⁹⁾. The nursing diagnosis “Deficient Knowledge”, defined in the 12th edition of INKA as “lacking cognitive information or the acquisition of information regarding a specific topic”^(10:293), has potential clinical relevance in the context of hemodialysis. Nonetheless, current evidence points out gaps related to the validation of its diagnostic components in people with chronic kidney disease on hemodialysis, showing the need for investigation that can support their scientific frameworks and show their clinical applicability⁽⁷⁻⁸⁾.

Considering how complex hemodialysis treatment is and the need for continuously acquiring knowledge about the disease, the treatment, and self-care, it is relevant to have nursing diagnoses that are based on evidence and validated for this population. In this regard, this investigation is original in its proposal to validate the nursing diagnosis “Deficient Knowledge” in a specific population, that of people with chronic kidney disease on hemodialysis, which would help give support to its scientific framework and clinical applicability⁽⁷⁻⁸⁾.

The validation of nursing diagnoses helps improve clinical practice, increasing diagnostic precision and clinical reasoning and increasing the quality of nursing care^(9,11). Among the methodological references available, there are two advanced methods that structure diagnostic validation in three dimensions: theoretical-causal validity, content validity, and clinical validity⁽¹¹⁾.

Therefore, this study seeks to produce evidence that can help in the conceptual refinement and validation of the components of this nursing diagnosis, supporting its use in evidence-based clinical practice. We expect our results to support a more consistent identification of knowledge deficits, the planning of educational interventions, and the decision-making process in the care for people on hemodialysis. Furthermore, this study can contribute to teaching and

research, and push forward the knowledge about nursing diagnoses, encouraging the use of more precise conceptual and operational definitions in the evaluation of those with CKD on hemodialysis^(9,11).

It is worth highlighting that, in the latest edition of INKA (2024-2026), the diagnosis "Deficient Knowledge" was replaced with "Inadequate Health Knowledge"⁽⁹⁾. Nevertheless, we decided to use the 12th edition nomenclature (2021-2023), given that the study was designed and operated before the newest version of the taxonomy was published⁽¹⁰⁾. The changes in the term did not substantially affect the conceptual center of the clinical phenomenon under investigation, and the scientific and practical relevance of the findings presented was maintained. Furthermore, the defining characteristics of the previous ND that were considered in this study are still present in its current version.

Considering the above, this study aimed to validate the content of the nursing diagnosis "Deficient Knowledge" in chronic kidney patients under hemodialysis.

Methods

Type of study

Content validation study, based on diagnostic validation methods⁽¹¹⁾ and developed in two stages: conceptual fitness of the diagnosis and validation of the content by experts.

First stage: conceptual fitness

Theoretical study on the conceptual fitness of the nursing diagnosis "Deficient Knowledge" for people with chronic kidney disease on hemodialysis.

Literature review

A narrative, exploratory literature review was conducted in February 2023 on the databases Latin American and Caribbean Health Sciences Literature (LILACS), Nursing Database (*Base de Dados de Enfer-*

magem - BDENF), Medical Literature Analysis and Retrieval System Online (MEDLINE) via PubMed Central (PMC), and Scientific Electronic Library Online (SciELO). The following descriptors were used: "nursing diagnosis", "deficient knowledge", and "content validity". They were adapted depending on the specifics of each database. No restrictions were put in place regarding language or period of publication.

At first, 18 pieces were found that addressed, to some extent, the diagnosis "Deficient Knowledge". Nonetheless, the goal of this non-structured review was to understand the definitions attributed to the defining characteristics by the studies that validated the content of this diagnosis in any clinical context. After titles and abstracts were read and eligibility criteria were applied, seven publications were selected for an in-depth analysis.

Elaboration of conceptual and operational definitions

Two researchers were responsible for assessing the fitness of the diagnostic title "Deficient Knowledge" and the elaboration of the conceptual and operational definitions of its defining characteristics, in the context of people with CKD on hemodialysis. These researchers had experience in nephrology and nursing diagnostics, *stricto sensu* graduations, and clinical and academic practice in this field. Five meetings were conducted to discuss, compare, and refine diagnostic component concepts. The researchers reached a consensus regarding the clarity, clinical relevance, and conceptual representativeness of the elements elaborated.

Second stage: Content validation

This stage encompassed the content validation of the diagnostic components elaborated. This is a validation of the degree to which the diagnostic elements appropriately represent the clinical phenomenon investigated^(9,11-12). In this process, the employment of collective knowledge, based on the theory of

predictive diversity, helps produce more robust evaluations that are closer to clinical reality, given that gathering the opinions of multiple specialists tends to lead to results that are more reliable than isolated assessments. According to the methodological recommendations for diagnostic validation research⁽¹¹⁾, we selected nurses with clinical and/or academic experience in nephrology and/or in nursing diagnoses, seeking to address different levels of expertise and analytical diversity.

Sample

The sample was selected by convenience, using the snowball sampling technique, according to which each participant recommended another professional who fit the inclusion criteria. We included nurses with at least five years of practical experience in hemodialysis care. Since there is no consensus in literature regarding the time needed for one to be considered a specialist, this study adopted the cutoff point of 5 years of experience, believing that this length of time would ensure experience in health education, something essential in the day-to-day experience of hemodialysis rooms.

Sample size was calculated using the formula for the estimate of continuous parameters, often used in content validation studies: $n_0 = (Z_{1-\alpha/2} \cdot s)^2 / e$. According to this formula: $Z_{1-\alpha/2}$ corresponds to the confidence level; S represents the standard deviation; and e is the sampling error. We considered a significance level of 5%, a standard deviation of 0.17, and a sampling error of 6.5%. Based on these parameters, the minimum sample size estimated was 26 specialists.

Data collection

Data collection took place between May and August 2023. The participants received an invitation and a consent form via e-mail, as well as a link to access the electronic instrument elaborated in the Google Forms® platform.

The instrument had two sections. The first encompassed the sociodemographic and professional characterization of specialists. It included their sex, age, academic titles, field of work, professional experience, experience with nephrology and/or nursing diagnosis, scientific production, and their use of standardized language in clinical practice. The second section included the conceptual definition of the title of the diagnostic and the conceptual and operational definitions of its defining characteristics. These characteristics were: imprecise statements about a topic; imprecise performance in a test; imprecise following of instructions; and inadequate behavior⁽¹⁰⁾.

Specialists used a five-point Likert scale to evaluate the clarity and pertinence of the conceptual definition of the title of the nursing diagnosis, and of the conceptual and operational definition of each of its defining characteristics. This scale had the options: strongly disagree, partially disagree, indifferent, partially agree, and entirely agree. There was also a field for qualitative suggestions and additional comments.

Data analysis

Data was organized in Microsoft Excel® 2020 spreadsheets and analyzed according to the methodological procedures mentioned above.

Content validity was assessed using the Content Validity Index (CVI), which is broadly used in methodological studies to measure expert agreement⁽¹²⁾. The Individual (CVI-I) and the Global (CVI-G) CVIs were calculated. To calculate these indices, we considered the responses “partially agree” and “strongly agree” to be positive responses, finding their ratio with regard to the total number of specialists that participated.

The minimum content validity considered acceptable was $CVI \geq 0.80$ ⁽¹²⁾. Diagnostic components with values below the cutoff point would be submitted to a review or considered for exclusion.

The qualitative suggestions of the experts were grouped according to their thematic similarity and incorporated when pertinent for conceptual refinement,

clarity, and the operational precision of the diagnostic components.

Ethical aspects

This study was approved by the Research Ethics Committee of the Universidade Federal Fluminense, opinion No. 5.836.599/2022 and Certificate of Submission to Ethical Appraisal No. 64500022.2.0000.5243. All participants agreed to participate by signing an informed consent form.

The tool ChatGPT (OpenAI) was used exclusively to provide support in linguistic revision and improve the writing of the manuscript. The scientific content, data analysis, interpretation of results, and the final writing of the manuscript were the responsibility of the authors.

Results

The narrative literature review evaluated seven articles, which validated the nursing diagnosis “Deficient Knowledge”. They included one theoretical-causal validation, four content validations, and two clinical validations. The clinical contexts of these studies included heart failure, coronary artery disease with myocardial revascularization, and oral contraceptive use.

The five meetings in this regard, conducted by the nephrology researchers, analyzed the clinical pertinence, the conceptual clarity, and the representativity of the elements elaborated. The consensus achieved in this study corroborated the elaboration of the conceptual definition of the diagnostic title “Deficient Knowledge” and of the conceptual and operational definitions of its defining characteristics in the context of people with CKD on hemodialysis.

26 specialist nurses, experienced in hemodialysis, participated in the validation process. Most were female (88.5%), with a mean age of 43.0 ± 8.1 and a mean professional experience of 17.7 ± 8.3 years. Their mean experience in nephrology was 13.9 ± 7.9

years. Regarding their academic training, most participants had *lato sensu* specializations (28.5%), followed by Doctors (26.9%) and Masters (23.1%). Most participants stated that they do use standardized nursing language in their clinical practice (61.5%). Table 1 presents the characteristics of the experts who participated in this study.

Table 1 – Sociodemographic and professional characterization of the specialists who participated in the study. Niterói, RJ, Brazil, 2023

Variables	n (%)
Sex	
Female	23 (88.5)
Male	3 (11.5)
Age (years), mean ± standard deviation: 43.0 ± 8.1	
Titles	
Residency	3 (11.5)
Specialization	10 (38.5)
Master's Degree	6 (23.1)
PhD	7 (26.9)
Professional experience (years), mean ± standard deviation: 17.7 ± 8.3	
Professional experience in nephrology (years) mean ± standard deviation: 13.9 ± 7.9	
Studies in nephrology (previous or ongoing)	
No	12 (46.2)
Yes	14 (53.8)
Articles published in the field of nephrology	
No	15 (57.7)
Yes	11 (42.3)
Use of standardized nursing language/nursing diagnoses in clinical practice	
No	10 (38.5)
Yes	16 (61.5)

Table 2 shows the CVI values found for the diagnostic title and its defining characteristics. All components reached values above the cutoff point established (CVI ≥ 0.80), showing appropriate content validity.

Table 2 – Content Validity Index of the components of the nursing diagnosis “Deficient Knowledge”, from NANDA-I, in people on hemodialysis. Niterói, RJ, Brazil, 2023

Definitions	CVI-I	CVI-G
Title		
Conceptual definition: Absence of cognitive information or of the acquisition of information regarding chronic kidney disease, hemodialysis, and the care related to the treatment.	0.923	0.961
Defining characteristics		
Imprecise statements about a topic		
Conceptual definition: Mistaken statements about basic concepts related to chronic kidney disease and hemodialysis.	0.962	0.981
Operational Definition: The patient perceives or expresses mistaken, imprecise, or inexact knowledge about the basic concepts of chronic kidney disease and hemodialysis.	1.000	0.981
Imprecise performance in a test		
Conceptual definition: Medium performance in an assessment of knowledge about chronic kidney disease, hemodialysis, and the care pertaining to the treatment.	0.923	0.923
Operational definition: The patient reached a score below 50% in questions requiring their knowledge about chronic kidney disease, hemodialysis, and the care pertaining to the treatment.	0.923	0.923
Imprecise following of instructions		
Conceptual definition: The patient did not adequately follow the specific recommendations for water intake, diet, medication use, and hemodialysis.	0.923	0.923
Operational Definition: The patient stated that they did not follow the guidance of the health team regarding the therapies adopted: water intake, diet, medication use, and hemodialysis.	0.923	0.923
Inadequate behavior		
Conceptual Definition: Inadequate conduct regarding self-care, as it pertains to preserving the vascular access used for hemodialysis treatment.	0.923	0.943
Operational Definition: The patient assumes an inadequate conduct regarding self-care, as it pertains to preserving the vascular access used for hemodialysis treatment.	0.962	0.943

CVI-I: Individual Content Validity Index; CVI-G: Global Content Validity Index

Despite the high agreement between specialists, their qualitative contributions allowed us to refine elements associated with the clarity, precision, objectivity, and scope of the conceptual (CD) and operational (OD) definitions of the diagnostic concepts.

Combining the quantitative evaluation (the CVI) with the qualitative contributions enabled us to improve the consistency of the diagnosis in the context of people with chronic kidney disease on hemodialysis. Figure 1 shows expert suggestions and the changes that were included.

Component	Expert suggestions	Changes included
Title	Expand the concept to include different levels of knowledge	The expression “or disability” was added
Imprecise statements about a topic (CD and OD)	Include the pertinent care in the definitions.	The expression “and the care pertaining to the treatment” was added to the CD and OD.
Imprecise performance in a test (CD)	Use a more objective term to characterize the performance in the evaluation of knowledge	Replace “medium performance” with “performance below the expected or desired one”
Imprecise following of instructions (OD)	Consider observable behaviors in addition to the patient’s verbal reports	Replace “stated that they did not follow... precisely” with “stated or showed they did not follow...”
Inadequate behavior (CD and OD)	Use more specific terminology that is compatible with the goal of the nursing diagnosis	Replace “inadequate conduct regarding self-care” with “unfit self-care behavior”

Figure 1 – Expert suggestions and changes incorporated of the components of the nursing diagnosis “Deficient Knowledge”, from NANDA-I, in people on hemodialysis. Niterói, RJ, Brazil, 2023

Discussion

The content validation of the nursing diagnosis "Deficient Knowledge" enabled us to expand the understanding of the clinical phenomenon of knowledge deficit in people with CKD on hemodialysis. The high agreement levels among specialists show that the conceptual and operational components evaluated have good fitness, reiterating the clinical pertinence of the diagnosis for this population.

The validation of nursing diagnoses is an essential stage to improve evidence-based clinical practice, since it helps increase precision in the identification of human responses and reduces ambiguities in the interpretations involved in diagnostic reasoning. Conceptual and operational definitions that are clearly established increase uniformity in the diagnostic inferences of nurses and increase clinical safety in the health care decision-making process^(9,11).

In the context of people with CKD on hemodialysis, the knowledge related to the disease and to the treatment is very relevant for self-care and therapeutic adherence. People on hemodialysis need to understand complex guidance related to water intake restrictions, dietary control, correct medication use, vascular access maintenance, and regular visits to dialysis sessions^(1,13-15). Evidence has shown that low levels of health literacy are associated with worse self-care behaviors, lower adherence to therapy, and inferior clinical outcomes in people with CKD, reiterating the need for targeted and individualized educational interventions⁽¹⁵⁻¹⁶⁾.

In addition to the availability of information, the development of knowledge in health depends on health literacy, cognitive capacity, social support, and the socioeconomic conditions of the individual⁽¹⁵⁾. In people on hemodialysis, factors such as treatment-related tiredness, emotional overload, cognitive limitations, and social vulnerability can significantly interfere with the understanding and application of therapeutic guidance^(14,16). Thus, deficient knowledge must be seen as a multifactorial, dynamic phenomenon,

influenced by both individual characteristics and contextual and organizational aspects of care.

The ND "Deficient Knowledge" has often been found in people on hemodialysis. National and international investigations found that this diagnosis appears with expressive frequency, and that its defining characteristics are often repeated, such as patients who state they do not have sufficient knowledge, who do not follow instructions properly, in addition to those who do not adhere to the treatment and the dietary restrictions. The most common factors reported include a low educational level, cognitive limitations, difficulties understanding orientations, and insufficient exposure to information about the disease and its treatment^(15,17-18). These findings reiterate the consistency of the diagnosis, especially regarding self-care and insufficient knowledge about the disease and the hemodialysis treatment.

Consequently, the conceptual refinement proposed by the experts is particularly important to increase the precision and applicability of the diagnosis. Reformulating the CD of the title of the diagnostic by incorporating the expression "or disability" increased its sensitivity by recognizing different limitations related to the acquisition and understanding of the information needed for hemodialysis treatments. These changes bring the diagnosis closer to the multiple ways in which deficient knowledge can manifest in complex clinical conditions, such as CKD⁽⁹⁾.

Changes in the defining characteristics also increase the clinical coherence of the diagnosis. The expansion of the characteristic "Imprecise statements about a topic" to include the extract "care pertinent to the treatment" made the description more compatible with the therapeutic demands of hemodialysis, whose therapeutic success directly depends on the ability of the patient to understand and put into practice recommendations related to self-care^(1,9-10).

The defining characteristic "Imprecise performance in a test" was refined in an important way, replacing the term "medium performance" with the expression "performance below the expected or desired",

which reduced the potential of interpretative subjectivities and increased clinical objectivity. Nonetheless, it should be noted that the lack of specific standardized instruments for the evaluation of knowledge in those on hemodialysis is a relevant limit to clinical practice and the advance of research in the field. Current studies reiterate the need for instruments that are valid and culturally adapted and can measure knowledge related to renal replacement therapy^(10,15-16,19).

Another relevant aspect is related to the reformulation of the definitions of the CD “Inadequate Behavior”, replacing the expression “inadequate conduct regarding self-care” with “unfit self-care behavior”. This change improved the alignment of the diagnosis and the contemporaneous perspectives related to self-care and the management of one’s own health^(6,19). In people on hemodialysis, inadequate self-care behaviors, related to the preservation of vascular access, can lead to serious complications, rehospitalizations, and increased morbidity and mortality^(6,10,13,16).

The relevance of this association between knowledge and self-care, on one side, and therapeutic adherence on the other, is not restricted to the context of nephrology, which is demonstrated by the fact that the results found here converge with evidence produced in different clinical contexts. In individuals with heart failure, for example, a middle-range theory, followed by content analysis and diagnostic accuracy studies, found a relationship between the nursing diagnosis “Deficient Knowledge” and self-care limitations, inadequate understanding of the treatment, and insufficient adherence to therapeutic recommendations⁽²⁰⁻²²⁾.

Considering this relationship between knowledge and health behaviors, international publications have reiterated the relevance of educational interventions carried out by nurses in the improvement of knowledge and the self-care of people with chronic kidney disease^(15-16,20). Customized educational strategies in association with continuous follow-up and effective communication between professionals and

patients can lead to better clinical outcomes, increased therapeutic adherence, and a reduced number of complications related to hemodialysis treatment⁽¹⁵⁻¹⁶⁾.

However, although the results reiterate the relevance of the diagnosis, one must consider that content validity is only one stage of the process of diagnostic refinement. The high level of agreement between specialists does not ensure, in itself, appropriate accuracy in clinical practice^(9,11).

Study limitations

Although results have shown that the content validity of the nursing diagnosis “Deficient Knowledge” was appropriate, some limitations must be considered. The main limitation is related to the nonprobabilistic convenience sampling method used in the form of snowball sampling, which can limit the generalization of results into other health care contexts. Furthermore, the heterogeneity of the specialists who participated, especially regarding their experience in nephrology, scientific production, and use of standardized nursing language, may have influenced the results of our assessment, albeit this diversity is in line with the methodological precepts of collective knowledge.

It is also worth noting that this study focused exclusively on the diagnosis title and its defining characteristics. It did not evaluate its related factors, risk populations, or associated conditions, elements that could increase our understanding of the diagnostic phenomenon in the context of hemodialysis.

Contributions to practice

The outcomes of this study give support to increase the diagnostic precision of the clinical practice of nurses who care for people with chronic kidney disease on hemodialysis. The refinement of the conceptual and operational definitions of the diagnosis “Deficient Knowledge” may increase uniformity in diagnostic in-

ference, helping plan educational interventions that are better targeted at the needs of this population.

Furthermore, the use of validated diagnostic components can improve strategies used to promote self-care, therapeutic adherence, and health education, helping improve the quality of nursing care and develop safer, individualized, and patient-centered care.

Conclusion

The nursing diagnosis "Deficient Knowledge" shows good content validity for people with chronic kidney disease on hemodialysis, with an improvement in the conceptual and operational definitions of their diagnostic components.

Author contributions

Conception, design, analysis and interpretation of data; Writing of the manuscript or relevant critical review of the intellectual content; Final approval for the version to be published; Agreement to be responsible for all aspects of the manuscript related to the need to investigate the precision or integrity of any part and resolve issues appropriately: **Rebouças TLL, Lins SMSB, Sousa CN, Paula MCSM, Carlos KTG, Marta CB, Santos ACP.**

Data availability

The data that support the conclusions of this study are available upon reasonable request to the corresponding author. Due to ethical aspects related to the anonymity of patients, the data is not publicly available.

References

1. Gebrie MH, Asfaw HM, Bilchut WH, Lindgren H, Wettergren L. Health-related quality of life among patients with end-stage renal disease undergoing hemodialysis in Ethiopia: a cross-sectional survey. *Health Qual Life Outcomes*. 2023;21(1):36. doi: <http://doi.org/10.1186/s12955-023-02117-x>
2. GBD 2023 Chronic Kidney Disease Collaborators. Global, regional, and national burden of chronic kidney disease in adults, 1990–2023, and its attributable risk factors: a systematic analysis for the Global Burden of Disease Study 2023. *Lancet*. 2025;406(10518):2461–82. doi: [https://doi.org/10.1016/S0140-6736\(25\)01853-7](https://doi.org/10.1016/S0140-6736(25)01853-7)
3. Bikbov B, Purcell CA, Levey AS, Smith M, Abdoli A, Abebe M, et al. Global, regional, and national burden of chronic kidney disease, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet*. 2020;395(10225):709–33. doi: [https://dx.doi.org/10.1016/S0140-6736\(20\)30045-3](https://dx.doi.org/10.1016/S0140-6736(20)30045-3)
4. Sociedade Brasileira de Nefrologia (SBN). Censo de diálise 2025 [Internet]. 2025 [cited May 4, 2026]. Available from: <https://www.sbn.org.br/censo-de-dialise-2025>
5. Vanholder R, Annemans L, Braks M, Brown EA, Pais P, Purnell TS, et al. Inequities in kidney health and kidney care. *Nat Rev Nephrol*. 2023;19(11):694–708. doi: <https://doi.org/10.1038/s41581-023-00745-6>
6. Lira M, Sousa C, Wanderley M, Pessoa N, Lemos K, Manzini C, et al. Scale of Assessment of Self-Care Behaviors with Arteriovenous Fistula in Hemodialysis: a psychometric study in Brazil. *Clin Nurs Res*. 2021;30(6):875–82. doi: <https://dx.doi.org/10.1177/1054773821989800>
7. Sousa RS, Grande MEG, Medeiros TM, Lima LB, Tinôco JDS, Frazão CMFQ. Deficient knowledge in patients undergoing hemodialysis: integrative review. *Rev Enferm UFPE Online*. 2023;17:e254317. doi: <https://dx.doi.org/10.5205/1981-8963.2023.254317>
8. Rebouças TLL, Lins SMSB, Santana RF, Tavares JMAB, Pereira SK, Paula MCSM, et al. NANDA-I nursing diagnoses for chronic kidney patients on hemodialysis: scope review. *Rev Baiana Enferm*. 2024;38:e53348. doi: <https://doi.org/10.18471/rbe.v38.53348>
9. Herdman TH, Kamitsuru S, Lopes CT. NANDA International nursing diagnoses: definitions and classification, 2024–2026. Porto Alegre: Artmed; 2024.
10. Herdman TH, Kamitsuru S, Lopes CT. NANDA International nursing diagnoses: definitions and classification, 2021–2023. Porto Alegre: Artmed; 2021.

11. Lopes MVO, Silva VM. Métodos avançados de validação de diagnósticos de enfermagem. In: PRONANDA: Programa de Atualização em Diagnósticos de Enfermagem. Porto Alegre: Artmed; 2016.
12. Polit DF, Beck CT. Fundamentos de pesquisa em enfermagem: avaliação de evidências para a prática da enfermagem. Porto Alegre: Artmed; 2019.
13. Forcey D, Tran D, Connor J, Ayudhya PK, Ocampo C, Nelson C, et al. Improving assessment and escalation of threatened haemodialysis access: results of a nursing-led program. *BMC Nephrol.* 2023;24(1):268. doi: <https://dx.doi.org/10.1186/s12882-023-03321-z>
14. Botelho ML, Correia MDL, Ribeiro E, Ferreira RC, Duran ECM. Content analysis of the nursing diagnosis "Excess fluid volume (00026)" in renal patients. *Rev Bras Enferm.* 2022;75(4):e20210058. <https://doi.org/10.1590/0034-7167-2021-0058>
15. Billany RE, Thopte A, Adenwalla SF, March DS, Burton JO, Graham-Brown MPM. Associations of health literacy with self-management behaviours and health outcomes in chronic kidney disease: a systematic review. *J Nephrol.* 2023;36(5):1267-81. doi: <https://dx.doi.org/10.1007/s40620-022-01537-0>
16. Ouirdani M, Boutib A, Azizi A, Chergaoui S, Saad EM, Hilali A, et al. Impact of nutrition education on various health-related components of hemodialysis patients: a systematic review. *Healthcare.* 2024;12:1197. doi: <http://doi.org/10.3390/healthcare12121197>
17. Sousa EVD, Medina LAC, Martins MG, Teixeira CRS, Maniva SJCF, Caetano JA. Sleep quality in people with chronic pain undergoing hemodialysis. *Rev Rene.* 2023;24:e91962. doi: <https://doi.org/10.15253/2175-6783.20232491962>
18. Cuevas-Budhart MA, Sierra JRP, Cedillo-Flores R, Hernandez-Iglesias S, Crespo Cañizarez A, Renghea MA, et al. Nursing diagnoses and interventions in the field of action for patients undergoing renal replacement therapy: a scoping review. *Nurs Open.* 2025;12(8):e70280. doi: <https://doi.org/10.1002/nop2.70280>
19. Moreels T, Van de Velde D, Goethals J, Wyngaert KV, Baets S, Nagler E, et al. Self-management interventions for facilitating life participation for persons with kidney failure: a systematic review. *Clin J Am Soc Nephrol.* 2024;19(2):189-201. doi: <http://doi.org/10.2215/CJN.0000000000000347>
20. Silva CG, Araújo SS, Morais SCR, Frazão CMFQ. Impaired knowledge in individuals with heart failure: a middle-range nursing theory. *Rev Bras Enferm.* 2022;75(2):e20200855. doi: <https://doi.org/10.1590/0034-7167-2020-0855>
21. Silva CG, Araújo SS, Silva JI, Lira ALBC, Lopes MVO, Lopes CT, et al. Analysis of the content of the nursing diagnosis deficient knowledge in individuals with heart failure. *Int J Nurs Knowl.* 2023;34(2):116-25. doi: <http://doi.org/10.1111/2047-3095.12386>
22. Araújo SS, Silva CG, Manguiera SO, Lira ALBC, Lopes MVO, Lopes CT, et al. Deficient knowledge in patients with heart failure: a study of diagnostic accuracy and etiological relationships. *Int J Nurs Knowl.* 2024;35(2):186-94. doi: <https://doi.org/10.1111/2047-3095.12434>



This is an Open Access article distributed under the terms of the Creative Commons