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Excessive fluid volume risk middle-range theory

Teoria de médio alcance do risco de volume de líquidos excessivo

Teoría de rango medio del riesgo de un volumen de líquido excesivo

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ABSTRACT

Objective: to construct a middle range theory for developing the excessive fluid volume risk diagnostic proposition in patients undergoing hemodialysis. **Method:** this is a methodological study, developed for the theoretical-causal validity of a nursing diagnosis. The study was carried out in four stages: study selection, identification of the main concepts of the theory, pictogram construction and proposition elaboration. These steps were operationalized through an integrative literature review, with a sample of 82 articles selected from the Web of Science, PubMed, CINAHL, Scopus and Science Direct databases. **Results:** the data extracted from the sample articles enabled identifying five essential terms to define excessive fluid volume risk. Furthermore, 31 etiological factors of excessive fluid volume risk were identified, in addition to a pictogram and 12 propositions. **Conclusion and implications for practice:** the construction of a middle-range theory focused on excessive fluid volume risk in patients undergoing hemodialysis refines terminology and expands the understanding of nursing phenomena. Thus, the data from this research will provide clear and robust knowledge for the conduct of nurses' actions in clinical practice.

Keywords: Adult; Renal Dialysis; Nursing; Body Fluids; Nursing Theory.

RESUMO

Objetivo: construir uma teoria de médio alcance para o desenvolvimento da proposição diagnóstica risco de volume de líquidos excessivo em pacientes em hemodiálise. **Método:** trata-se de um estudo metodológico, desenvolvido para a validade teórico-causal de um diagnóstico de enfermagem. O estudo foi realizado em quatro etapas: seleção dos estudos, identificação dos conceitos principais da teoria, construção do pictograma e elaboração das proposições. Essas etapas foram operacionalizadas por meio de uma revisão integrativa da literatura, com uma amostra de 82 artigos selecionados nas bases de dados *Web of Science*, PubMed, CINAHL, Scopus e *Science Direct*. **Resultados:** os dados extraídos dos artigos da amostra possibilitaram a identificação de cinco termos essenciais para a definição do risco de volume de líquidos excessivo. Além disso, foram identificados 31 fatores etiológicos do risco de volume de líquidos excessivo, além de construídos um pictograma e 12 proposições. **Conclusão e implicações para a prática:** a construção de uma teoria de médio alcance voltada para o risco de volume de líquidos excessivo em pacientes em hemodiálise refina as terminologias e amplia a compreensão dos fenômenos da enfermagem. Assim, os dados desta pesquisa fornecerão conhecimentos claros e robustos para a condução das ações do enfermeiro na prática clínica.

Palavras-chave: Adulto; Diálise Renal; Enfermagem; Líquidos Corporais; Teoria de Enfermagem.

RESUMEN

Objetivo: construir una teoría de rango medio para el desarrollo de la propuesta diagnóstica del riesgo de volumen excesivo de líquidos en pacientes en hemodiálisis. **Método:** se trata de un estudio metodológico, desarrollado para la validez teórico-causal de un diagnóstico de enfermería. El estudio se realizó en cuatro etapas: selección de estudios, identificación de los principales conceptos de la teoría, construcción del pictograma y elaboración de proposiciones. Estos pasos se pusieron en práctica a través de una revisión integradora de la literatura, con una muestra de 82 artículos seleccionados de las bases de datos Web of Science, PubMed, CINAHL, Scopus y Science Direct. **Resultados:** los datos extraídos de los artículos permitieron identificar cinco términos esenciales para definir el riesgo de exceso de volumen de líquido. Además, se identificaron 31 factores etiológicos de riesgo de exceso de volumen de líquidos, además de un pictograma y 12 proposiciones. **Conclusión e implicaciones para la práctica:** la construcción de una teoría de rango medio centrada en el riesgo de volumen excesivo de líquido en pacientes en hemodiálisis afina la terminología y amplía la comprensión de los fenómenos de enfermería. Así, los datos de esta investigación proporcionarán un conocimiento claro y robusto para la conducción de las acciones del enfermero en la práctica clínica.

Palabras clave: Adulto; Diálisis Renal; Enfermería; Líquidos Corporales; Teoria de Enfermería.

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INTRODUCTION

The review and construction of new nursing diagnoses are encouraged by Nanda International, with the aim of strengthening and developing the taxonomy by researchers from different countries.[1,2] For the development of nursing diagnoses, research is needed to scientifically support it.[3]

Therefore, the literature suggests the construction of nursing diagnoses based on middle-range theories (MRT), aiming at subsidizing causal relationships between the diagnostic components, to ensure a better understanding of the terminology by nurses, enabling accurate clinical reasoning and judgment and supporting the applicability of diagnosis in clinical practice.[4]

In this regard, MRT provide greater applicability of nursing phenomena in clinical practice, as they present clearer theoretical statements that can be tested empirically.[5,6] When created for developing nursing diagnoses, they assist in identifying etiological agents and/or signs and symptoms of a nursing diagnosis, clearly establishing the relationships between the components of a diagnosis, scientifically supporting nursing practice with robust data and improving nursing classification systems.[2,4,7]

In this perspective, research on the review and/or development of new nursing diagnoses from the MRT construction is being carried out by nursing researchers, in order to consolidate and improve nursing diagnoses in nursing taxonomies.[8-10] However, among the studies developed and published, no MRT was found on excessive fluid volume risk. This risk situation requires the attention of nurses, especially when referring to chronic kidney patients undergoing hemodialysis.

Fluid overload is often present in patients undergoing hemodialysis.[11,12] In these patients, excessive fluid volume is associated with an increase in the hospitalization rate and high morbidity and mortality.[13-16] Moreover, its occurrence causes serious health problems in this clientele, such as worsening and increased prevalence of cardiovascular diseases,[17,18] in addition to restrictive and obstructive respiratory abnormalities, such as acute pulmonary edema.[19,20] Therefore, it is verified that excessive fluid volume is an important nursing problem in the progression of adverse clinical outcomes in patients undergoing hemodialysis.[16]

Thus, based on the lack of knowledge about a MRT focused on excessive fluid volume risk, the objective is to construct a MRT for developing the diagnostic proposition excessive fluid volume risk in patients undergoing hemodialysis. This study is fundamental for the theoretical advancement of nursing and clarification of the concept.

METHODOLOGY

This is a methodological study, developed for the theoretical-causal validity of a nursing diagnosis. This method aims to construct a MRT focused on identifying etiological factors and/or defining characteristics of a nursing diagnosis and verifying causal relationships that clearly establish the occurrence of this human response.[4] Thus, for the construction of MRT focused on excessive fluid volume risk, this study used the methodological path based on the steps: study selection; study classification; identification of main concepts; pictogram construction; and proposition preparation.[4,6]

The study was operationalized by the integrative literature review, from five stages, namely: review questioning identification; literature search; assessment of the data of included studies; interpretation of findings; and synthesis of the knowledge found in assessed articles.[21]

To formulate the review questions, the mnemonic PICo (P – Population; I - Interest; Co - Context) was followed, with adults with chronic kidney disease being established as Population; Interest, the main concepts of excessive fluid volume risk; and Context, hemodialysis. Thus, as guiding questions, the following were listed: what are the essential terms for defining excessive fluid volume risk in patients undergoing hemodialysis? And what are the etiological factors of excessive fluid volume risk in patients undergoing hemodialysis?

All searches were carried out in the following databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus, National Library of Medicine and National Institutes of Health (PubMed), Web of Science and Science Direct. In the search, the keywords indexed in the Medical Subject Headings (MeSH) were used: Risk Factors and Hemodialysis. Fluid retention and fluid overload were also used. These terms were separated by the Boolean operator "AND". The crosses used were: Fluid retention AND Risk Factors AND Hemodialysis (01); Fluid overload AND Risk Factors AND Hemodialysis (02); Fluid retention AND Hemodialysis (03); and Fluid overload AND Hemodialysis (04).

Full articles available in selected databases, articles available in Portuguese, English or Spanish, studies that addressed the topic, patients with chronic kidney disease undergoing hemodialysis, and adult individuals were included. In turn, editorials, letters to the editor, abstracts and integrative literature reviews were excluded. There was no time frame for article selection, because it is a broad search for concepts related to the excessive fluid volume risk phenomenon.

The search was performed simultaneously and manually by three previously trained nurses, to avoid biases in article selection. An initial sample of 6,958 articles was identified in the five databases, and 82 articles were selected to compose the sample. In the CINAHL database, 687 articles were identified, six of which were excluded because they were duplicates, and 666 because they did not meet the eligibility criteria, and 15 articles were selected for the sample. In the Scopus database, 294 articles were identified, six of which were excluded because they were duplicated and 274 because they did not fit the criteria, considering 14 articles for the sample. In the PuBMed database, 1,026 articles were identified, of which 35 were excluded because they were duplicated, and 965 because they did not fit the criteria, considering 26 articles for the sample. In the Web of Science database, 678 articles were identified, 62 being excluded because they were duplicated, and 603, because they did not fit the eligibility criteria, with 13 articles being selected. In the Science Direct database, 4,273 were identified, 30 were excluded

because they were duplicated, and 4,229, because they did not meet the criteria, and 14 articles were selected.

To identify the main concepts of MRT, the concepts - etiological factors of excessive liquid volume risk and essential terms for defining excessive liquid volume risk were extracted from the integrative review articles.[4,6] The search for these main concepts was determined according to the components necessary for constructing a risk nursing diagnosis (definition of the diagnostic title and its risk factors), which are based on the structure recommended by NANDA International.[1] As it is a risk diagnosis, there was no need to identify the defining characteristics of the phenomenon.

Thus, the articles selected in the review were read in full, and the etiological factors of excessive fluid volume risk and the terms that would help in defining the diagnostic label were extracted and compiled in a synoptic table. As it is a risk diagnosis, these essential terms selected to compose the label definition were mainly related to the etiological agents of excessive fluid volume risk most cited in articles.

From the extracted concepts, a pictogram and a theoretical propositions were constructed, to represent the interrelationships between the concepts.[6] To construct the pictogram of the theory, an analogy was made between tidal cycles - which consist of cyclic changes in sea water level - a phenomenon influenced by the rotation of the Earth and the gravitational forces of the moon. Similarly, the body volume of patient undergoing hemodialysis increases between dialysis sessions and decreases during hemodialysis. This oscillation of patients' water status is influenced by a series of etiological factors, remembering the tidal cycles, which also change according to lunar influences. The analogy about these phenomena was created from the author's creative insight, and a graphic design was designed by a professional designer.

It is noteworthy that, for the MRT elaboration, Roy's[22] adaptation model was used as a theoretical framework. This model was chosen considering the characteristics presented by the clientele undergoing hemodialysis - patients who experience a series of transformations, restrictions in their daily lives and complications resulting from their disease and treatment; therefore, they may present a series of maladaptive behaviors that need to be investigated from the perspective of this model.

Thus, to support the MRT construction in this study, the etiological factors found in literature were subdivided into focal, contextual and residual stimuli. These stimuli are responsible for affecting the adaptive modes of individuals and, consequently, generating ineffective behavior, such as excessive water retention in patients undergoing hemodialysis. The focal stimulus consists of one who immediately confronts a person, therefore, they are the ones that most impact individuals. Contextual stimuli are those that indirectly influence ineffective behavior production. Residual stimuli produce non-central effects, and a person is generally unaware of the existence of these stimuli.[22] The terms used in Roy's model were also expressed in a pictogram and propositions.

RESULTS

The construction of an excessive fluid volume risk MRT was based on studies identified in literature. Medicine was the subject with the largest publication on the topic. Europe was the continent that most publicized the topic, and the English language predominated. The most frequent type of study was descriptive.

In the following topics, the main identified concepts, the constructed pictogram, the MRT propositions regarding excessive fluid volume risk and the diagnostic proposition developed will be exposed.

Key concepts of excess liquid volume risk

The main concepts of MRT were the essential terms to define the diagnostic label and the etiological factors of excessive fluid volume risk, which are presented in Tables 1 and 2.

Table 1 shows five essential terms, of which three presented higher prevalence, such as interdialytic weight gain above 3.5% of dry weight, excessive hydration and excessive fluid retention. These terms helped constructing the definition of the diagnostic proposition title.

The etiological factors were categorized according to Roy's adaptation model into focal, contextual and residual stimuli, as shown in Table 2. The literature review identified 31 factors for

Table 1. Essential concepts for defining excessive fluid volume risk in patients undergoing hemodialysis.

Essential concepts of excessive liquid volume risk	n (%)
Interdialytic weight gain above 3.5% of dry weight	14 (17.07)
Excessive hydration	14 (17.07)
Excessive fluid retention	13 (15.8)
Isotonic liquid accumulation process	04 (4.8)
Lack of body volume control	01 (1.2)
Definition: vulnerability to excessive fluid retention that occurs when interdialytic weight gain is greater than 3.5% of dry weight, due to excessive hydration, able to lose control of body volume and compromise health.	

Source: prepared by the authors.

excessive fluid volume risk in patients undergoing hemodialysis. The etiological factors highlighted were inadequate fluid removal during hemodialysis, increased dialysate sodium concentration, dietary abuse, excessive fluid intake, comorbidities, conventional intermittent hemodialysis, low self-efficacy for fluid intake, altered Body Mass Index and excessive sodium intake.

Table 2. Etiological factors of excessive fluid volume risk in patients undergoing hemodialysis.

Etiological factors	n (%)
Focal stimuli	
Inadequate removal of fluids during hemodialysis	10 (12.1)
Increased dialysate sodium concentration	05 (6.1)
Diet abuse	04 (4.8)
Excessive fluid intake	04 (4.8)
Decline in renal function	02 (2.4)
Decreased ultrafiltration volume	02 (2.4)
Diuresis failure	02 (2.4)
Absence in hemodialysis session	01 (1.2)
Decreased body fat	01 (1.2)
Vascular access failure	01 (1.2)
Low Kt/V index	01 (1.2)
Contextual stimuli	
Comorbidities	10 (12.1)
Conventional intermittent hemodialysis	08 (9.7)
Low self-efficacy for fluid intake	05 (6.1)
Altered Body Mass Index	05 (6.1)
Excessive sodium intake	05 (6.1)
Increased experience in dialysis treatment	04 (4.8)
Thirst	03 (3.6)
Dry mouth	03 (3.6)
Low serum albumin level	02 (2.4)
Elevated serum phosphorus level	02 (2.4)
Insufficient water assessment	01 (1.2)
Poor knowledge	01 (1.2)
Inflammatory state	01 (1.2)
Daily stress	01 (1.2)
Hospitalization	01 (1.2)
Use of antihypertensive drugs	01 (1.2)
Decreased serum lymphocyte level	01 (1.2)
Residual stimuli	
Young adults	04 (4.8)
Older adults	02 (2.4)
African-American	02 (2.4)

Source: prepared by the authors.

Excessive liquid volume risk pictogram

In Figure 1, the pictogram with the main interrelated concepts of excessive liquid volume risk MRT will be presented.

The pictogram (Figure 1) expresses the Earth, which represents the individual with chronic kidney disease undergoing hemodialysis. This individual, like Earth, is made up of water. Both are influenced by various factors that can increase or decrease this amount of fluid. The Earth has a tidal cycle. In the phases of the full moon or new moon, gravitational forces influence the increase in tidal volume. Moreover, in the period of the waning or crescent moon, gravitational forces stimulate the tides little or almost nothing.

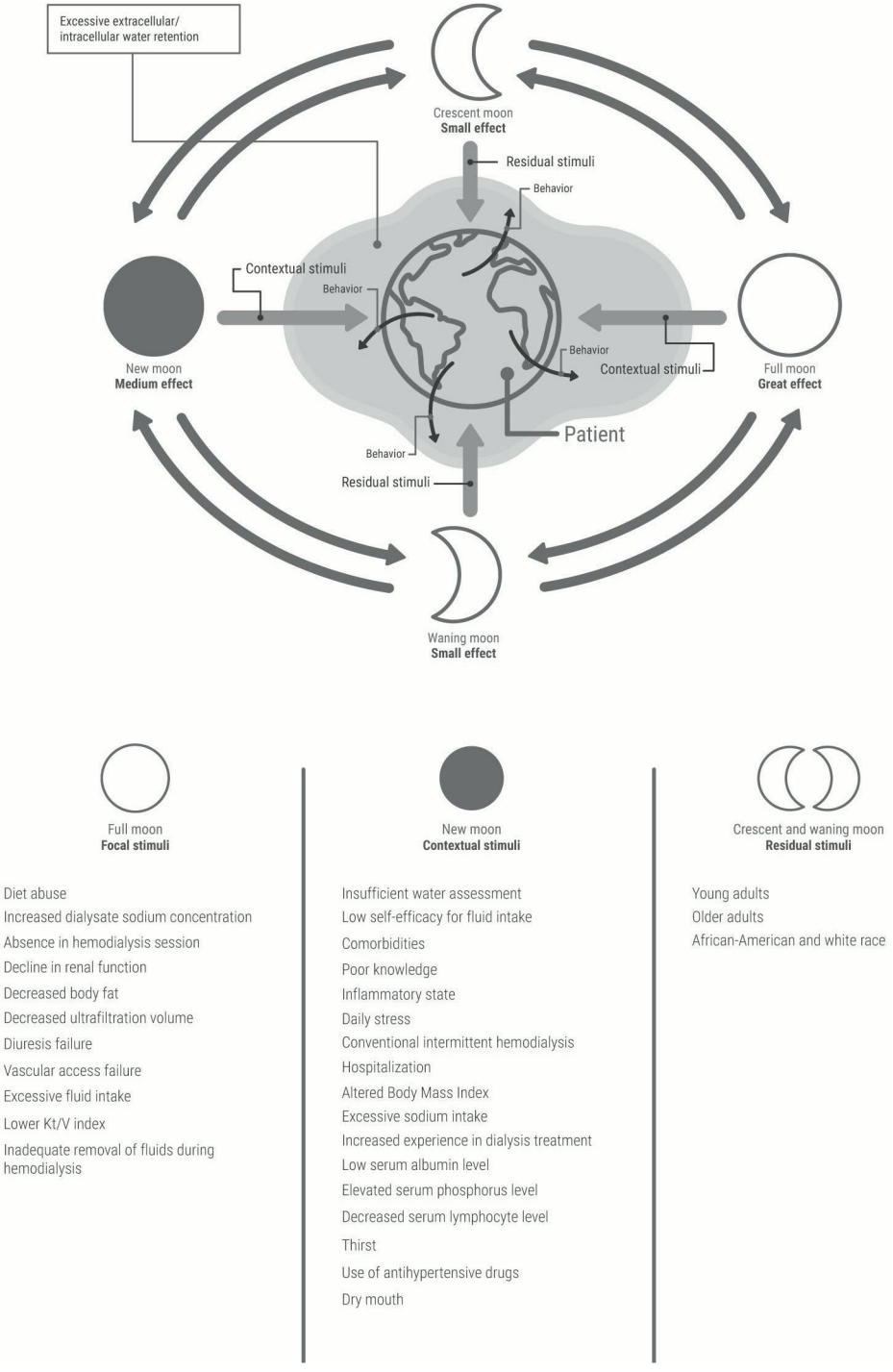

Figure 1. Pictogram with the main interrelated concepts of middle-range theory excessive fluid volume risk.
Source: prepared by the authors.

Thus, it was considered that patients undergoing hemodialysis (the Earth) are influenced by various stimuli (moon phases) that can cause the occurrence of ineffective behaviors, such as excessive water retention.

Propositions of interrelated main concepts

In addition to the pictogram, 12 propositions were created for excessive liquid volume risk MRT, which are exposed in Chart 1 below:

In these propositions, the relationships between two or more concepts of MRT were highlighted, such as etiological factors and the occurrence of excessive fluid volume in patients undergoing hemodialysis.

Excessive fluid volume risk diagnostic proposition

Considering the construction of MRT, it was possible to develop the diagnostic proposition excessive fluid volume risk with the elements required by NANDA International, as shown in Chart 2.

Chart 1. Middle-range theory propositions for excessive fluid volume risk in patients undergoing hemodialysis.

1. The state of body water balance in patients undergoing hemodialysis is related to fluid intake and excretion. Ingestion occurs through beverage and food consumption, and excretion occurs through the elimination of feces, breathing, sweat and, mainly, through urine, which is regulated by the kidneys. In these patients, renal function is impaired; therefore, ingested food and liquids are not sufficiently eliminated, a problem that triggers the ineffective behavior of excessive intracellular/extracellular water retention.
2. Focal, contextual and residual stimuli affect the physical-physiological mode of individuals undergoing hemodialysis and reach the basic need for fluids, increasing the vulnerability of chronic kidney patients undergoing hemodialysis to the occurrence of ineffective behavior of excessive water retention.
3. Depending on the type of stimulus applied to patients undergoing hemodialysis, the behavior of excessive intracellular/extracellular water retention may vary to a greater or lesser extent.
4. The fluid balance of patient undergoing hemodialysis is affected by stimuli from the patients themselves (biological-genetic, psychosocial and sociodemographic) and influenced by the actions of health professionals who work in hemodialysis.
5. Focal stimuli such as dietary abuse, absence from hemodialysis session, decline in renal function, decrease in body fat, excessive fluid intake and failure to urinate are originated from the choices made by patients undergoing hemodialysis or their own biological processes, and directly reflect the increase in vulnerability to the development of excessive water retention behaviors.
6. Focal stimuli such as increased dialysate sodium concentration, decreased ultrafiltration volume, failed vascular access, lower Kt/V and inadequate fluid removal during hemodialysis involve the actions performed by health professionals directly involved in the care of patients undergoing hemodialysis and directly reflect on the increased vulnerability to water retention behavior.
7. Contextual stimuli such as comorbidities, inflammatory status, daily stress, hospitalization, altered body mass index, excessive sodium intake, increased experience in dialysis treatment, decreased serum albumin and lymphocyte level, elevated serum phosphorus, thirst and dry mouth arise from choices made by patients undergoing hemodialysis or are caused by biological processes and can influence/potentiate the development of excessive water retention behavior.
8. Plasma sodium plays a central role in fluid balance in patients undergoing hemodialysis. The change in plasma sodium level is responsible for affecting liquid volume.
9. Low self-efficacy for fluid intake is a behavior that originates in the self-concept identity mode, but acts as a contextual stimulus that affects the physical-physiological mode of patients undergoing hemodialysis, and may influence/potentiate the development of excessive water retention behavior.
10. Contextual stimuli such as insufficient water assessment and use of antihypertensive drugs are factors resulting from the behavior of health professionals who work in hemodialysis and can influence/potentiate the development of excessive water retention behavior.
11. The occurrence of contextual stimuli such as deficient knowledge and conventional intermittent hemodialysis derive jointly from the conduct of health professionals that act in hemodialysis and the attitudes of patients undergoing hemodialysis and can influence the development of excessive water retention behavior.
12. Sociodemographic factors such as being older adult, being a young adult, and/or being African-American are residual stimuli that can influence the development of excessive water-retaining behavior in some way.

Source: prepared by the authors.

Chart 2. Diagnostic proposition of excessive fluid volume risk.

Excessive liquid volume risk	
Domain 2. Nutrition	
Class 5 Hydration	
Definition: vulnerability to excessive fluid retention that occurs when interdialytic weight gain is greater than 3.5% of dry weight, due to excessive hydration, able to lose control of body volume and compromise health.	
Risk factors	
• Diet abuse	• Altered Body Mass Index
• Absence in hemodialysis session	• Excessive fluid intake
• Insufficient water assessment	• Excessive sodium intake
• Low self-efficacy for fluid intake	• Increased experience in dialysis treatment
• Poor knowledge	• Lower Kt/V index
• Decreased body fat	• Inadequate removal of fluids during hemodialysis
• Daily stress	• Thirst
• Vascular access failure	• Dry mouth
Populations at risk	
• Young adults	
• Older adults	
• African-American or white race	
Associated conditions	
• Increased dialysate sodium concentration	
• Comorbidities	
• Decline in renal function	
• Decreased ultrafiltration volume	
• Inflammatory state	
• Diuresis failure	
• Hospitalization	
• Conventional intermittent hemodialysis	
• Low serum albumin level	
• Elevated serum phosphorus level	
• Decreased serum lymphocyte level	
• Use of antihypertensive drugs	

Source: prepared by the authors.

As a diagnostic proposal, a definition for the diagnostic label was constructed, and 31 etiological factors were presented, of which three are classified as populations at risk, and 12 as associated conditions. It is suggested that this proposition be inserted in domain 2 (nutrition) and class 5 (hydration) of Nanda International.

DISCUSSION

The excessive fluid volume risk MRT in patients undergoing hemodialysis exposes the essential terms involved in the definition of this nursing phenomenon, in addition to pointing out the etiological factors highlighted in the literature responsible for causing the occurrence of water overload in the studied clientele. Considering the main concepts expressed in the MRT constructed, the causal relationships between the concepts identified most frequently in the studies will be woven below.

Regarding the main defining terms of the diagnostic label of the investigated phenomenon, excessive fluid retention, interdialytic weight gain and excessive hydration stand out. Excessive fluid retention is frequent in patients undergoing hemodialysis and is

characterized by the sum of weight gain between dialysis and residual volume overload after dialysis. Incomplete fluid withdrawal in hemodialysis determines the residual volume, so that it directly interferes with dry weight at the end of hemodialysis.[13,16]

Although similar, water retention and interdialytic weight gain are not synonymous. Water retention is a consequence of excessive weight gain between dialyses.[23,24] Interdialytic weight gain is characterized by the difference between pre-dialysis weight and the weight at the end of the previous hemodialysis session.[25,26] Patients' body volume increases between dialysis sessions and decreases during hemodialysis, reaching a final post-hemodialysis value, usually lower.[25]

Weight gain between sessions does not necessarily indicate that patients are overloaded. However, if this gain is higher than the recommended standard (above 3.5% of dry weight), water retention will be present.[27,28] When interdialytic weight gain is ≥ 5.7% of dry weight, there is a higher risk of mortality.[29]

Excessive hydration is one of the factors responsible for weight gain in these patients, with consequent water retention. Therefore, it appears as a possible generic risk factor, as it can be caused by several other factors, such as thirst, dry mouth, hyperglycemia and low self-efficacy for fluid restriction.[30,31]

Thus, some etiological factors stand out in the literature for contributing to excessive hydration and increasing vulnerability to excessive fluid volume in patients undergoing hemodialysis, such as inadequate fluid removal during hemodialysis, increased dialysate sodium concentration, dietary abuse, excessive fluid intake, comorbidities, conventional intermittent hemodialysis, poor self-efficacy for fluid intake, altered Body Mass Index, and excessive sodium intake.

Inadequate fluid withdrawal in hemodialysis consists of the removal of fluids during hemodialysis less than recommended. Its occurrence may be related to medical prescription (incorrect estimate of dry weight), hemodialysis machine operator (error when operating the machine) and vascular access failures (interruption of normal vascular access operation).[32]

Increased dialysate sodium concentration was also another factor highlighted. Excess fluid may occur when dialysis sodium is adjusted in the haemodialysis machine to a value above the recommended standard. When this occurs, less fluid is transferred from the patient to the machine.[26,33]

In addition to this, conventional intermittent hemodialysis increases the chances of fluid overload.[13] On the other hand, when hemodialysis is performed daily, it is more similar to the purification of blood obtained by healthy kidneys. Thus, patients on daily hemodialysis experience a significant decrease in interdialytic weight gain, fewer blood pressure problems, and a decrease in episodes of shortness of breath.[34]

Dietary abuse can also promote fluid retention in these patients. There is a need for an extremely restrictive diet; thus, patients have difficulty following dietary guidelines and, therefore, tend to develop an excessive volume of fluids.[35] It is noteworthy that diet abuse is a modifying factor of Body Mass Index. Individuals undergoing hemodialysis with higher body mass index tend to accumulate more volume.[36]

In addition to food restriction, there is also the need for water restriction. However, it seems that excessive fluid intake is a prevalent causal factor of excess fluid in this clientele. Among the main factors responsible for excessive fluid intake, low compliance with water restriction, dry mouth and excessive sodium intake stand out.[37]

Low self-efficacy for fluid intake may influence decreased compliance with fluid restriction in patients undergoing hemodialysis.[37] In this sense, patients who do not comply with fluid restriction may develop fluid overload.[38] Also, a sodium-rich diet, physiologically, leads to increased thirst and, consequently, increases fluid intake.[34,37,39]

Regarding comorbidities, the literature highlights that diabetes mellitus is a potential risk factor for excess fluids. Diabetic patients undergoing hemodialysis and with constant hyperglycemia have a greater tendency to increase serum osmolarity, with consequent increase in fluid intake and increase in interdialytic weight gain.[40]

CONCLUSION AND IMPLICATIONS FOR PRACTICE

The study identified five essential terms to support the construction and definition of the diagnostic proposition excessive fluid volume risk, and 31 etiological factors, with emphasis on those with higher prevalence, such as inadequate fluid removal during hemodialysis, increased dialysate sodium concentration, diet abuse, excessive fluid intake, comorbidities, conventional intermittent hemodialysis, low self-efficacy for fluid intake, altered Body Mass Index and excessive sodium intake.

From the construction of excessive fluid volume risk MRT, main concepts and propositions were identified, providing better clarification for this nursing phenomenon. Thus, the data of this study will provide clear and robust knowledge to conduct nurses' actions in clinical practice. However, it is suggested that future research be conducted to test the relationships between these concepts in clinical practice.

As limitations of this study, it is noteworthy that the constructed MRT was aimed at patients undergoing hemodialysis, thus, the generalization of these results to another clientele should be used with caution.

AUTHOR'S CONTRIBUTIONS

Study design. Maria Isabel da Conceição Dias Fernandes. Juliane Rangel Dantas. Maynara Caroline Gomes Gabriel. Karolayne Cabral Matias. Marcos Venícios de Oliveira Lopes. Ana Luisa Brandão Carvalho Lira.

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Interpretation of results. Maria Isabel da Conceição Dias Fernandes. Juliane Rangel Dantas. Maynara Caroline Gomes Gabriel. Karolayne Cabral Matias. Marcos Venícios de Oliveira Lopes. Ana Luisa Brandão Carvalho Lira.

Article writing and critical review. Maria Isabel da Conceição Dias Fernandes. Juliane Rangel Dantas. Maynara Caroline Gomes Gabriel. Karolayne Cabral Matias. Marcos Venícios de Oliveira Lopes. Ana Luisa Brandão Carvalho Lira.

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