Original Article

Patients undergoing peritoneal dialysis: association between nursing diagnoses and their components

Pacientes em diálise peritoneal: associação entre diagnósticos de enfermagem e seus componentes

Pacientes en diálisis peritoneal: relación entre diagnósticos de enfermería y sus componentes

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Renal insufficiency, chronic; Peritoneal dialysis; Nursing care; Nursing diagnosis; Nursing process

Descritores
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Descriptores
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Abstract

Objective: To analyze the association between nursing diagnoses and their defining characteristics, related or risk factors for patients on peritoneal dialysis.
Methods: Content validation study with six nephrologist nurses, who participated in the study as experts. The focus group technique was used. Logistic regression was used for data analysis.
Results: For the four nursing diagnoses studied, was identified an association with its components as follows. Fatigue: anemia, insufficient energy and verbalization of a sustained exhaustion; Impaired walking: impaired ability to navigate curbs, impaired ability to climb stairs and insufficient muscle strength; Constipation: insufficient fluid intake, insufficient physical activity, pain with defecation, hard and formed stools; Excess fluid volume: compromised regulatory mechanisms, azotemia, intake exceeds output, weight gain over short period of time, and electrolyte imbalance.
Conclusion: The analyzed diagnoses integrate the following domains: activity/rest, elimination and exchange and nutrition, and are associated with its components for patients undergoing peritoneal dialysis.

Resumo

Objetivo: Analisar a associação entre os diagnósticos de enfermagem e suas características definidoras, fatores relacionados ou de risco para pacientes em diálise peritoneal.
Métodos: Estudo de validação de conteúdo realizado com seis enfermeiros nefrologistas, os quais participaram no presente estudo como peritos. Utilizou-se a técnica de grupo focal. Para análise dos dados foi utilizada a regressão logística.
Resultados: Para os quatro diagnósticos de enfermagem estudados foram identificados associação com seus componentes como segue. Fadiga: anemia, falta de energia e verbalização de uma constante falta de energia; Deambulação prejudicada: capacidade prejudicada de subir e descer calçadas, capacidade prejudicada de subir escadas e força muscular insuficiente; Constipação: ingestão insuficiente de líquidos, atividade física insuficiente, dor à evacuação, fezes duras e formadas; Volume de líquidos excessivo: mecanismos reguladores comprometidos, azotemia, ingestão maior que o débito, ganho de peso em curto período e eletrólitos alterados.
Conclusão: Os diagnósticos analisados integram os domínios: atividade/repouso, eliminação e troca e nutrição e representam associação com seus componentes para os pacientes em diálise peritoneal.

Resumen

Objetivo: Analizar la relación entre los diagnósticos de enfermería y sus características definitorias, factores relacionados o de riesgo en pacientes en diálisis peritoneal.
Métodos: Estudio de validación de contenido realizado con seis enfermeros nefrólogos, que participaron en este estudio como peritos. Se utilizó la técnica de grupo focal. Para analizar los datos se utilizó la regresión logística.
Resultados: Se identificaron relaciones en los cuatro diagnósticos de enfermería estudiados con sus componentes de la siguiente forma. Fatiga: anemia, falta de energía y verbalización de una constante falta de energía; Deterioro de la deambulación: deterioro de la capacidad de subir y bajar escaleras, deterioro de la capacidad de subir escaleras y fuerza muscular insuficiente; Constipación: ingesta insuficiente de líquidos, actividad física insuficiente, dolor al evacuar, heces oscuras y formadas; Volumen excesivo de líquidos: mecanismos reguladores comprometidos, azotemia, ingesta mayor que las pérdidas, aumento de peso en corto período y electrolitos alterados.
Conclusión: Los diagnósticos analizados integran los dominios: actividad/reposo, eliminación y cambio y nutrición y representan relación con sus componentes en pacientes en diálisis peritoneal.

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Introduction

Chronic Kidney Disease (CKD) is the slow, progressive and irreversible loss of renal function due to decreased glomerular filtration rate (GFR) and loss of excretory, regulatory and endocrine functions.[1] In Brazil, it affects more than 90 thousand people, and the incidence occurs in the age group between 19 and 64 years.[2,3] These data tend to grow because of the increase of chronic diseases such as diabetes mellitus (DM) and systemic arterial hypertension (SAH).[4]

Various types of Renal Replacement Therapy (RRT) are indicated for patients with advanced CKD, namely: hemodialysis (HD), peritoneal dialysis (PD) and renal transplantation.[5,6] Among these, PD has the best cost-benefit ratio and the potential advantage of being performed at home.[5,7] However, it demands that patients adopt a differentiated lifestyle in relation to food, hygiene, medicines and health care.

In this context, nurses are an important facilitator of the care of patients in PD treatment, either by performing nursing procedures or by evaluating and providing guidance on their health status, exams, medications, diet, among others. Moreover, in the process of caring for this clientele, the accurate interpretation of human responses is essential for the selection of appropriate interventions and evaluation of the outcome achieved.

Therefore, nurses must develop the Nursing Process (NP) based on critical thinking and clinical judgment, as this is essential for safe and effective care. The NP is composed of five phases: history, nursing diagnoses (ND), interventions, implementation and evaluation of nursing actions. The identification of ND is a vital step, because it allows the judgment of human responses that require nursing interventions.

The identification of ND is a relevant instrument in the operationalization of care in patients undergoing PD treatment and may contribute to improve their quality of life and nurses' knowledge in the field of care, teaching and research.

An integrative review seeking for scientific productions on the subject in question was performed to support and justify the development of the study. The following databases of the Virtual Health Library (VHL) were used: Latin American and Caribbean Literature (LILACS) and International Literature in Health and Biomedical Sciences (Medline); SCOPUS and Cumulative Index to Nursing and Allied Health Literature (CINAHL) with the following crossings: Peritoneal dialysis; Nursing diagnosis; Nursing process.

A shortage of studies related to ND in patients undergoing PD treatment, especially current research on the association between diagnoses and their components, justified the performance of the present study.

The objective of this study was to analyze the association between nursing diagnoses and their defining characteristics, and the related or risk factors for patients undergoing peritoneal dialysis.

Methods

This article is the content validation part of a macro study. In that study, was performed the validation of the nursing diagnoses identified after nursing consultations with 82 registered patients undergoing peritoneal dialysis and under regular follow-up at a referral center for the treatment of renal diseases located in the Northeast of Brazil. These participants were included in the previous stage of the larger project in the period between March and September 2017.

The population that was the focus of the present study included 16 nurses working in the referred center. The following inclusion criteria were adopted for the sample: being a specialist in Nephrology, having experience in ND and acting in the institution as an internship preceptor. Professionals on medical leave or vacation were excluded. After applying the criteria, was reached a final sample of six expert nurses.

For the identification of Nursing Diagnoses, were used an interview script and a physical examination containing sociodemographic and clinical data, defining characteristics (signs and symptoms), and risk/related factors subdivided into the 12 domains present in NANDA International Taxonomy II. In addition, were used specific questions for people with kidney disease, such as: time of diagnosis and treatment, presence of comorbidities, knowledge about the disease, medications used and information about laboratory tests performed. The instrument that originated this part of the article refers to content validation and was constructed before the nursing consultation with the 82 patients.

This step was performed by two authors of the present study, both with a PhD degree, seeking to identify the defining characteristics and related/risk factors according to NANDA-I, version 2015-2017. For the identification of the Nursing Diagnoses, was adopted the clinical judgment model of Gordon. Then, were built 82 Microsoft Office Excel spreadsheets (each referring to a user) that formed the list of diagnoses with an average of 30 ND in each spreadsheet.

Subsequently, the six expert nurses received 82 spreadsheets, which contained sociodemographic and clinical data, the list of defining characteristics and risk/related factors marked according to their presence or absence for each ND investigated for each user, so they could direct the diagnostic inference.

Then, each expert analyzed and judged if the ND, according to NANDA-I, version 2015-2017,[8] was present or absent in each of the worksheets. The NDs underwent a process of consensus validation among the six experts through a focus group that resulted in 22 validated diagnoses. In the focus group, through the analysis of worksheets, the experts discussed the relationship between the data collected and their clinical support for reaching the diagnoses. They also assessed the agreement between the defining characteristics, related or risk factors and ND, thereby reaching priority diagnostics.

For the treatment of data, instruments were numbered, and their variables were coded and inserted into a Microsoft Office Excel 2009 database. Subsequently, data were compiled and processed by the IBM Statistical Package for the Social Science (SPSS), version 20.0 for Windows.

Inferential statistics was performed using the Pearson's chi-square test, the Fisher's exact test and logistic regression through the stepwise method. The aim was to identify the components of ND that influenced the process of establishing human responses in renal patients undergoing PD treatment. A significance level of 10% was considered.

The study met the national and international standards of ethics in research and was approved by the Research Ethics Committee under number 330.508.

Results

Most expert nurses were females (88.5%), aged between 35 and 45 years (34.1%), residents of the Northeast region of Brazil (100%), and had more than 15 years of professional training (83.9%). Regarding occupation, the majority (80.5%) worked as teachers in educational institutions, had a PhD degree (56%), taught ND (84.8%) and assisted people with Chronic Kidney Disease (80.7%). Table 1 describes the 22 priority diagnoses validated by the six expert nurses.

Table 2 shows the NDs that had a statistically significant association with their respective defining characteristics and related/risk factors through the Pearson's chi-square test and Fisher's exact test. The statistical tests could not be performed with the nursing diagnosis Risk for infection, because it was present in 100% of study participants.

The last stage of the study was the logistic regression for NDs that had a statistically significant association in the chi-square test with their respective defining characteristics and related/risk factors, such as: Fatigue, Impaired walking, Constipation, Excess fluid volume. Table 3 shows the association between the Defining characteristics/Related factors and the nursing diagnoses identified in patients undergoing PD.

Table 1. Distribution of the Nursing Diagnoses identified in chronic renal patients on peritoneal dialysis (n=82)

Nursing Diagnoses	(%)
1. Risk for infection	(100)
2. Excess fluid volume	(91.1)
3. Fatigue	(73.5)
4. Constipation	(60.2)
5. Impaired walking	(57.3)
6. Acute pain	(55.8)
7. Ineffective health management	(32.3)
8. Sexual dysfunction	(29.4)
9. Situational low self-esteem	(29.4)
10. Anxiety	(26.4)
11. Ineffective protection	(22.0)
12. Intolerance to physical activity	(19.1)
13. Risk for fall	(16.1)
14. Disturbed sleep pattern	(16.1)
15. Disturbed sensory perception: visual	(11.7)
16. Disturbed sensory perception: auditory	(8.8)
17. Chronic sadness	(7.3)
18. Deficient knowledge	(7.3)
19. Fear	(5.8)
20. Risk for powerlessness	(4.4)
21. Impaired dentition	(4.4)
22. Impaired skin integrity	(2.9)

Table 2. Distribution of Nursing Diagnoses according to the respective related/risk factors and defining characteristics that were statistically significant ($p<0.05$)

Nursing Diagnosis	Related/risk factors	*p-value*	Defining characteristics	*p-value*
Risk for infection	Invasive procedure, chronic disease	—	—	—
Fatigue	Anemia	0.024	Insufficient energy	0.001
			Verbalization of a sustained exhaustion	0.016
Impaired walking	Impaired ability to navigate curbs	0.036	Insufficient muscle strength	0.021
	Impaired ability to climb stairs	0.001		
Constipation	Insufficient fluid intake	0.029	Pain with defecation	0.018
	Insufficient physical activity	0.038	Hard, formed stool	0.042
Excess fluid volume	Compromised regulatory mechanism	0.012	Azotemia	0.001
			Intake exceeds output	0.022
			Weight gain over short period of time	0.001
			Electrolyte imbalance	0.037

An association was identified between the ND Fatigue and the Related factor Anemia, and with the Defining characteristics Insufficient energy and Verbalization of a sustained exhaustion. For the ND Impaired Walking, there was

Table 3. Association between defining characteristics/related factors and nursing diagnoses identified in patients undergoing peritoneal dialysis

Defining characteristics/ Related factors	Nursing Diagnosis		*p-value*	Cox & Snell R^2	Nagelkerke R^2
	Present (%)	Absent (%)			
Anemia	Fatigue				
Present	80.5	3.5	0.013	0.627	1.000
Absent	0.0	16.0			
Verbalization of a sustained exhaustion					
Present	80.5	5.5	0.032		
Absent	0.0	14.0			
Insufficient energy					
Present	80.5	5.5	0.002		
Absent	0.0	14.0			
Insufficient muscle strength	Impaired walking				
Present	44.2	21.3	0.001	0.705	1.000
Absent	25.3	9.2			
Impaired ability to navigate curbs					
Present	61.9	4.4	0.005		
Absent	7.0	26.7			
Impaired ability to climb stairs					
Present	64.6	0.0	0.027		
Absent	4.4	31.0			
Insufficient fluid intake	Constipation				
Present	31.8	26.7	0.001	0.649	1.000
Absent	21.9	19.6			
Insufficient physical activity					
Present	53.9	2.6	0.026		
Absent	0	43.5			
Pain with evacuation					
Present	52.2	8.8	0.015		
Absent	1.8	37.2			
Hard, formed stool					
Present	51.3	7.9	0.038		
Absent	2.6	38.2			
Azotemia	Excess fluid volume				
Present	43.4	10.6	0.001	0.727	1.000
Absent	10.6	35.4			
Intake exceeds output					
Present	43.4	10.6	0.018		
Absent	10.6	35.4			
Weight gain over short period of time					
Present	43.4	10.6	0.036		
Absent	10.6	35.4			
Electrolyte imbalance					
Present	43.4	10.6	0.001		
Absent	10.6	35.4			
Compromised regulatory mechanism					
Present	43.4	10.6	0.001		
Absent	10.6	35.4			

an association with the Related factor Impaired ability to navigate curbs, Impaired ability to climb stairs and the Defining Characteristic Insufficient muscle strength. For the ND Constipation, there was an association between the Related factors Insufficient fluid intake, Insufficient physical activity and the Defining characteristics Pain on evacuation, Hard and formed stools. For the ND Excess fluid volume, was identified an association between the Related factor Compromised regulatory mechanisms, and with the Defining characteristics Azotemia, Intake exceeds output, Weight gain in short period and Electrolyte imbalance.

Discussion

One of the nursing diagnoses found in all patients on peritoneal dialysis was Risk for infection. After cardiovascular causes, infectious diseases are among those that most kill patients undergoing dialysis. International research has identified sepsis as the second leading cause of death in patients on peritoneal dialysis, thereby demonstrating an increased risk in patients with more than one episode during treatment.[9]

In a study developed in Brazil with a sample of 90 patients, almost half (42.2%) had peritonitis, of which 15.5% had two or more episodes.[10] This is the main complication of peritoneal dialysis, whether in manual (MPD) or automated (APD).[11]

Therefore, professionals should advise patients about measures that minimize this risk and lead to a tunnel infection or an infection in the peritoneal catheter exit site, which are possible risk factors associated with the development of peritonitis. In addition, the constant evaluation of laboratory tests, dressing changes and observation of patients' body manifestations, signs and symptoms of infection (edema, hyperemia, heat, flushing, hyperthermia), hand hygiene with alcohol gel before and after each procedure, and using an aseptic technique for invasive procedures promote patient safety and protection.[12-14]

Although the ND Risk for Infection has been determined for 100% of patients and validated by experts, the identification of this diagnosis must be done with cautious by avoiding its indiscriminate use. According to studies discussed previously, there is evidence that less than 50% of people undergoing peritoneal dialysis have peritonitis.

Hence the importance of studies on the accuracy of nursing diagnoses for an adequate diagnostic inference. Knowledge about the clinical indicators with better predictive capacity for a given diagnosis offers nurses a greater precision in the choice and direction of interventions in clinical practice and favors the achievement of results.

Sociodemographic and nutritional factors, climatic conditions, diabetes mellitus, and the PD modality are the possible risk factors associated with the development of peritonitis.[13,14]

It is important that patients and/or caregivers are trained and supervised by nurses regarding the conditions of housing, supplies and procedures for PD for the prevention of infectious complications, such as catheter exit orifice infection and peritonitis.

Approximately 18% of mortality related to peritoneal dialysis infection is due to peritonitis. However, only 4% of episodes of peritonitis result in death. The severe and prolonged damage caused to the peritoneal membrane leads to peritoneal failure, which makes peritonitis the main cause for transferring peritoneal dialysis patients to hemodialysis. Therefore, its prevention is critical for a successful program.[13]

Nurses must evaluate the PD procedure performed by patients, family members or caregivers permanently, because patients may become vulnerable during treatment and neglect care, such as the adequate hygiene of hands and skin close to the site of catheter insertion, which constitutes a risk factor for infection.

Fatigue was also a nursing diagnosis present among patients. Chronic Renal Insufficiency can lead to progressive loss of muscular structure because of the unsatisfactory protein quantity in the extracellular fluid.[15] In addition, renal patients have anemia because of erythropoietin deficiency.

As a result, oxygen diffusion becomes impaired and leads cells to produce a large amount of lactic acid that causes muscle fiber saturation and consequent fatigue.[16]

Designing a care plan is a greatly important task in nursing so that patients maintain their autonomy and self-care in the performance of activities of daily living. The following stand out within this plan: explain the causes of fatigue to patients and their caregivers, determine each patient's physical limitations, identify activities in which help is needed and define the forms of resolution together with the patient, and encourage the verbalization of feelings about the limitations.[2,3]

In addition, it is important to provide guidelines on the importance of sleep and nutritional supplementation rich in folic acid and vitamin B12, as these contribute to the maturation of red blood cells and consequent reduction of these patients' anemia typical of their clinical condition itself. A study showed that resistance exercises improved strength, fatigue and physical performance of patients. These findings suggest beneficial effects of aerobic and resistance training on muscle mass in pre-dialysis and dialysis patients.[4]

Impaired walking was also identified in the present study. The loss of muscle mass in CKD is an important complicator, contributes to a sedentary lifestyle and compromises cardiovascular health due to the increase in morbidity and mortality. Patients on dialysis also have a reduced level of physical activity, which can induce the loss of muscle proteins and muscular atrophy through a complex mechanism that includes physical inactivity and lack of conditioning.[3]

Aiming at a coordinated movement and greater resistance of these patients, nurses can implement actions for promoting body mechanics by stimulating the practice of active and passive exercises, and the control of energy loss and consumption. The team must have double care with the physical mobility of these patients in order to minimize the risk for falls and their complications.[13]

Constipation is also present within this group of patients. The origin of intestinal constipation in dialysis patients is multifactorial and mainly a consequence of the low water intake and use of drugs such as calcium carbonate, the most used phosphorus chelator in the prevention and treatment of hyperphosphatemia. Attention should also be paid to the physical activity profile of patients on dialysis, since they have low exercise capacity compared to healthy individuals, and sedentarism is an important factor for the presence of constipation.[16]

Although water intake is related to a higher number of gastrocolic reflexes and contributes to intestinal lubrication, individuals with CKD should have a reduced water intake. Low fluid intake has been associated with intestinal constipation by observing its relation to slow intestinal transit and decreased fecal exoneration.[17]

Thus, the following nursing interventions can be performed: hydroelectrolytic control, water control and control of constipation/impaction. The guidelines on controlled water intake, consumption of soluble fibers such as pectins, gums, mucilages and some hemicelluloses are fundamental for the normalization of intestinal transit.[15] Early treatment of factors that may impair physical capacity, such as anemia and malnutrition, is essential for preventing chronic constipation in these patients.[4]

Finally, the diagnosis of Excess fluid volume was also identified. Chronic renal patients are unable to filter nitrogenous excreta, electrolytes and liquids, but the treatment does not completely replace renal function, and these substances accumulate. Excess fluid affects the health of these patients, which can lead to pulmonary edema, congestive heart failure and hypertension, that if untreated, can lead to death.[18]

For reaching the water balance expected results, nurses must be attentive to the possible signs of water imbalance and perform the necessary interventions such as water control, hydroelectrolytic control and water monitoring through the restriction of liquids, evaluation of the presence of edema and maintenance of fluid balance.[15]

As a limitation, the non-probabilistic sampling type does not guarantee the representativeness of the sample. The small number of studies addressing nursing diagnoses in people undergoing peritoneal dialysis treatment and using inferential statistics led to some difficulties in comparing the findings of the present study. Hence the suggestion of developing other studies with a view to provide stronger support for nurses' practice with people undergoing peritoneal dialysis, especially regarding nursing diagnoses and their predictors.

Conclusion

The study allowed to identify an association between the four nursing diagnoses and their components as follows: Fatigue: anemia, insufficient energy and verbalization of a sustained exhaustion; Impaired walking: impaired ability to navigate curbs, impaired ability to climb stairs and insufficient muscle strength; Constipation: insufficient fluid intake, insufficient physical activity, pain on defecation, hard and formed stools; Excess fluid volume: compromised regulatory mechanisms, azotemia, intake greater than output, weight gain over short period of time, and electrolyte imbalance. This study contributes to the advancement of nursing care, because the analysis of associations between the diagnoses and their components provides greater clinical power for nurses and allows the knowledge of aspects related to human responses of people, as well as the multicausal dimension and interconnection of these factors. This identification establishes useful nursing interventions for these people's needs and their health context, reduces complications of the treatment and the experience with the disease, and provides a basis for teaching nursing diagnoses.

Collaborations

Campos MXB, Dutra EJO, Silva CJA, Menezes HF, Santos RSC and Silva RAR collaborated in the project design, data collection, analysis and interpretation of data, article writing, critical review of the intellectual content and approval of the final version to be published.

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