

Nursing diagnoses, patient outcomes, and nursing interventions for patients undergoing peritoneal dialysis

Diagnósticos, resultados e intervenções de enfermagem para pacientes em diálise peritoneal

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Keywords

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

Descritores

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Abstract

Objective: To identify the main nursing diagnoses, patient outcomes and nursing interventions, and to validate a proposed care plan for patients on peritoneal dialysis.

Methods: Cross-sectional study with 68 patients from a referral center for kidney disease, according to the steps: identification of nursing diagnoses, according to NANDA International; proposal of patient outcomes and nursing interventions according to *Nursing Outcomes Classification and Nursing Interventions Classification*; and, development of a care plan using expert validation.

Results: Six diagnoses with frequency higher than 50% were identified; 16 patient outcomes and 35 nursing interventions were proposed. Eight patient outcomes and 21 nursing interventions were selected using the validation process conducted with specialist nurses, with very good concordance index (≥ 0.8).

Conclusion: The study identified diagnoses, select patient outcomes, and nursing interventions for clinical practice, in order to support the process of care and the knowledge of nursing taxonomies.

Resumo

Objetivo: Identificar os principais diagnósticos, resultados e intervenções de enfermagem, e validar uma proposta de plano de cuidados para pacientes em diálise peritoneal.

Métodos: Estudo transversal com 68 pacientes em centro de referência para doenças renais, seguindo as etapas: elaboração dos Diagnósticos de Enfermagem a partir da NANDA-Internacional; proposta inicial de resultados e intervenções de enfermagem, conforme a *Nursing Outcomes Classification e Nursing Interventions Classification*; e elaboração de um plano de cuidados com validação por especialistas.

Resultados: Identificaram-se seis diagnósticos com frequência acima de 50% e foram propostos 16 resultados e 35 intervenções de enfermagem. No processo de validação realizado por enfermeiros especialistas, foram selecionados oito resultados e 21 intervenções com índice de concordância muito bom ($\geq 0,8$).

Conclusão: O estudo permitiu identificar diagnósticos e selecionar resultados e intervenções de enfermagem para aplicação na prática clínica, com vistas a subsidiar o processo de cuidado e o conhecimento das taxonomias de enfermagem.

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Introduction

About 12 million of people have some degree of renal insufficiency in Brazil, and approximately 95,000 patients with chronic renal failure depend on dialysis or a kidney transplant to survive. According to the Brazilian Society of Nephrology Dialysis Census, 100,397 Brazilians were on dialysis in 2013, and the number is increasing.⁽¹⁾

Chronic renal failure is related to a decrease in the glomerular filtration rate, associated to the loss of regulatory, endocrine and excretory functions of the kidney. Forms of peritoneal dialysis, hemodialysis and kidney transplantation are among options of treatment for chronic renal disease.^(2,3)

Continuous ambulatory peritoneal dialysis is a treatment option that can be performed at home, but it is a complex procedure that involves a series of important measures, which can lead to complications.⁽⁴⁾

A study investigating the process of care for people with chronic renal failure treated with home peritoneal dialysis showed caregiver burden and indicated the need for specialized family support to appropriately care for these patients.⁽⁵⁾

Patients also need support to cooperate with their treatment, and nurses working with patients on peritoneal dialysis must assess the motivation, manual skills and cognition level of these patients, conducting theoretical/practical training, according to the needs of each patient.⁽⁶⁾

Patients with chronic renal failure demand multidisciplinary care due to the complexity of the disease and treatment. Nurses can promote individualized, integral and humanized care using the nursing process, adjusting the nursing care, and facilitating the adaptation of the patient and his family to the disease and treatment.⁽⁷⁾

The nursing process is an instrument used by nurses to identify human needs due to health problems, to organize care and document practice grounded in clinical reasoning, which is broken down into five separate steps: assessment, diagnosis, planning, implementation and evaluation.⁽⁶⁾

Nursing diagnosis, patient outcomes and nursing interventions are part of the essential elements of nursing practice, which contribute to the patient's

therapeutic judgment about his/her real care needs.⁽⁷⁾ The identification of these elements is an important tool in the standardization of nursing care for individuals with chronic renal failure on peritoneal dialysis, which can contribute to improving the quality of care for this population.

Considering this context, a question emerges: what are the main needs of patients with chronic renal failure on peritoneal dialysis? This study aimed to identify the nursing diagnoses, patient outcomes and nursing interventions, and validate a proposed care plan for chronic renal patients on peritoneal dialysis.

Methods

This was a cross-sectional study with a quantitative approach, followed by expert content validation. The methodology had four steps: identification of nursing diagnoses according to NANDA International (NANDA-I); initial proposal of patient outcomes and nursing interventions according to the *Nursing Outcomes Classification* (NOC) and *Nursing Interventions Classification* (NIC);⁽⁸⁾ and development and validation of a care plan.

The population consisted of 82 patients undergoing peritoneal dialysis from a reference center for treatment of kidney disease, located in northeastern of Brazil, using expert Brazilian nurses.

The sample size calculation was performed using the formula for finite populations, considering a confidence level of 95% ($Z_{\infty} = 1.96$), sampling error of 5%, the population size, and the prevalence of chronic kidney disease in the population.⁽⁹⁾ Thus, the sample consisted of 68 patients, consecutively selected by convenience

The inclusion criteria for patient selection were: diagnosis of chronic renal failure; receiving peritoneal dialysis; and age greater than 18 years. Participants with comorbidities not related to renal involvement that could interfere with the profile of human responses in these patients were excluded from the study.

The sample of experts was selected, by assessment of the curriculum vitae made available through the CNPq Lattes Platform - National Council for Scientific and Technological Development (*Conselho*

Nacional de Desenvolvimento Científico e Tecnológico - CNPq). The inclusion criteria were: a professional nurse, *published or completed matriculation (specialization, master's or PhD) related to nursing diagnoses in patients with chronic renal failure or having academic advisement in the subject.* Nurses, who only had undergraduate research was excluded for the sample.

Considering the importance of clinical practice in the process of care plan content validation, and its practical applicability, , having at least five years of experience in nephrology services was added to the inclusion criteria.⁽¹⁰⁾ Thus, 14 nurses were selected, referred to as experts.

Data were collected in the patient's home from January to June of 2014, by means of an interview guide and physical examination, based on the Taxonomy II - NANDA-I.

The data collection instrument was adapted from studies on the profile of patients with kidney disease, standardization of nursing care and nursing diagnoses in the nephrology area, and was composed of open and closed questions on sociodemographic and clinical data, followed by data related to dialysis treatment and the physical examination.⁽¹¹⁻¹³⁾ Moreover, the tool addressed the defining characteristics (signs and symptoms), related/risk factors subdivided into 12 domains (health promotion, nutrition, elimination and exchange, activity/rest, perception/cognition, self-perception, role relationships, sexuality, coping/stress tolerance, safety/protection, life principles and comfort) presented in NANDA International's Taxonomy II. The domain of growth and development was excluded, as it was not related to the objective of this study.⁽⁸⁾

The instrument was administered as a pre-test to ten patients undergoing peritoneal dialysis. These responses were included in the study sample, as no need for changes was identified.

The authors simultaneously analyzed the nursing diagnoses, in order to identify the defining characteristics and related factors/risk according to NANDA-I.⁽⁸⁾ All patients were assessed by the authors of this study and the steps identified by Gordon were used to structure the selection of nursing diagnosis.⁽¹⁴⁾

After this stage, in order ensure consensual judgment and greater accuracy, the results were submitted

to a review process using a paired manner between two other authors, both with doctorates, more than five years of clinical nephrology practice, and experience in the development and implementation of the nursing process with this population, in the same center where the data were collected. Patient outcomes and nursing interventions were proposed only for the most frequent diagnoses, based on their clinical practice, and on the suggestions of the NOC and NIC classifications.⁽⁸⁾ The most common diagnoses were those found in more than 50% of study patients.

Content validation was performed after development of the final proposal for the care plan, by nurse specialists who agreed to participate in the study by signing the Terms of Free and Informed Consent form, respecting the ethical research precepts. The nurses' cooperation was requested in order to indicate whether, in the final draft of the instrument (care plan), the outcomes and nursing interventions were relevant for the diagnosis identified by the researchers, applicable to the field of nephrology, and useful for implementation in the care of patients with chronic renal failure on peritoneal dialysis. In case of disagreement with the statements, suggestions for their adaptation to the reality of nursing practice were requested.

Each item of the plan of care was rated by specialist nurses regarding the agreement or disagreement of on the proposed outcomes and interventions. In addition, suggestions could also be made to modify or incorporate the contents in the research. After adjustments, the care plan was sent to the nurse specialists for final analysis. The outcomes and nursing interventions were incorporated into the instrument with a concordance index ≥ 0.80 among specialist nurses, and were considered validated.

For data analysis, the instruments were numbered, and the variables were encoded and entered into the database, using *Microsoft Office Excel* 2009. Subsequently, the data were compiled and processed using the *IBM Statistical Package for the Social Sciences* (SPSS), version 20.0 for *Windows*, and the *Kappa* test was applied.

The study was registered in Brazil under the Platform Presentation of Certificate number for Ethics Assessment (CAAE) 15437013.9.0000.5537.

Results

Among the 68 study participants, most were female (66%), of mixed skin color (48%), married (59%), with incomplete elementary education (66%), income of one to two minimum wages (56%), and retirees (87%). The mean age was 45.6 years, with a minimum of 20 and maximum of 65 years. Table 1 describes the 22 identified nursing diagnoses, with their respective frequencies and percentages.

Considering the high number of diagnoses found, chart 1 presents the related factors and defining characteristics of the diagnoses with relative frequencies above 50%.

Outcomes and the main nursing interventions were identified for patients on peritoneal dialysis, based on the identified diagnoses. The authors selected these diagnoses separately, and those with consensus among the researchers were included in the care plan. Among the 16 patient outcomes proposed and sent to the experts, six achieved a concordance index ≥ 0.8 ; the hydration outcome was suggested for the diagnosis of constipation, and the resistance outcome for impaired walking, totaling eight outcomes or caring targets.

Among the 35 interventions sent for validation, 17 had a concordance index ≥ 0.8 and were maintained. The experts suggested the inclusion of some interventions: risk identification (6610) for the nursing diagnosis, risk for infection; electrolyte management (2080) for the diagnosis, excess fluid

volume; and two interventions for the nursing diagnosis of acute pain: teaching: individual (5606) and mutual goals setting (4410), totaling 21 interventions. After the suggestion of these new interventions and outcomes, additional analysis was performed to ensure agreement higher than 0.8.

Finally, the care plan was composed of six nursing diagnoses, eight patient outcomes, and 21 nursing interventions, with a concordance index ≥ 0.8 among specialist nurses, as shown in chart 2.

Table 1. Distribution of nursing diagnoses identified in patients with chronic renal disease on peritoneal dialysis

Nursing diagnoses	n(%)
Risk for infection (00004)	68 (100)
Fatigue (00093)	62 (91.1)
Constipation (00011)	50 (73.5)
Acute pain (00132)	41 (60.2)
Impaired walking (00088)	39 (57.3)
Excess fluid volume (00026)	38 (55.8)
Ineffective health management (00078)	22 (32.3)
Sexual dysfunction (00059)	20 (29.4)
Low situational self-esteem (00120)	20 (29.4)
Anxiety (00146)	18 (26.4)
Ineffective protection (00043)	15 (22.0)
Activity intolerance (00092)	13 (19.1)
Risk for falls (00155)	11 (16.1)
Disturbed sleep pattern (00198)	11 (16.1)
Disturbed sensory perception, visual (00122)	8 (11.7)
Disturbed sensory perception, auditory (00122)	6 (8.8)
Chronic sorrow (00137)	5 (7.3)
Deficient knowledge (00126)	5 (7.3)
Fear (00148)	4 (5.8)
Risk for powerlessness (00152)	3 (4.4)
Impaired dentition (00048)	3 (4.4)
Impaired skin integrity (00046)	2 (2.9)

Chart 1. Distribution of the most frequent nursing diagnoses, according to the respective domains, classes, related / risk factors and defining characteristics

Domain/class	Nursing diagnoses	Risk/related factors	Defining characteristics
Safety/protection/ infection	Risk for infection (00004)*	Invasive procedures, chronic disease	
Activity/rest	Fatigue (00093)*	Anemia	Insufficient energy Alteration in concentration Introspection Verbalization of constant insufficient energy
	Impaired walking (00088)*	Impaired ability to walk on decline Impaired ability to climb stairs	Insufficient muscle strength
Elimination and exchange /gastrointestinal function	Constipation (00011)*	Insufficient fluid intake Average daily physical activity is less than recommended for gender and age	Pain with defecation Hard, formed stool Change in bowel pattern
Comfort/physical comfort	Acute pain (00132)*	Physical agents	Expressive behavior: irritability Sleep disturbance Facial expression of pain
Nutrition/ Hydration	Excess fluid volume (00026)*	Compromised regulatory mechanism	Azotemia Intake exceeds output Weight gain over short period of time Electrolyte imbalance

*Numeric codes

Chart 2. Proposed care plan for chronic renal failure patients on peritoneal dialysis

Diagnosis (NANDA-I)	Outcomes (NOC)	Interventions (NIC)
1. Risk for infection (00004)*	Immune status (0702)*	Health screening (6520)* Immunization/vaccination management (6530)* Health education (5510)* Risk identification (6610)*
2. Fatigue (00093)*	Activity tolerance (0005)*	Self-care assistance (1800)* Exercise promotion: stretching (0202)* Risk identification (6610)*
3. Constipation (00011)*	Bowel elimination (0501)* Hydration (0602)*	Fluid management (4120)* Fluid/electrolyte management (2080)* Constipation/impaction management (0450)*
4. Acute pain (00132)*	Pain control (1605)*	Pain management (1400)* Teaching: individual (5606)* Mutual goals setting (4410)* Sleep enhancement (1850)* Environmental management: comfort (6482)* Coping enhancement (5230)*
5. Impaired walking (00088)*	Coordinated movement (0212)* Endurance (0001)*	Body mechanics promotion (0140)* Energy management (0180)*
6. Excess fluid volume (00026)*	Fluid balance (0601)*	Fluid management (4120)* Fluid/electrolyte management (2080)* Fluid monitoring (4130)*

*Numeric codes

Discussion

The identification of nursing diagnoses, patient outcomes and nursing interventions contribute to the establishment of different clinical nursing actions. In this sense, this study has strengths that should be highlighted, such as the strategy to establish a care plan proposal according to the needs of a patient on peritoneal dialysis. This is an important tool in supporting clinical nursing practice, as it directs the view of this professional to essential aspects to be evaluated, such as in patients receiving peritoneal dialysis or with other very specific clinical situations.

In this study, the intervention of peritoneal dialysis therapy was not indicated by experts in the plan care. This may be due to the fact that undergoing this type of procedure was a criterion for inclusion.

In this sense, the proposed plan of care can contribute to an assessment directed toward the main problems of patients on peritoneal dialysis, facilitating the identification of outcomes and the establishment of nursing interventions. The care plan, however, does not exclude the individualized assessment and even the identification of other problems that may be identified. When planning assistance, the nurse identifies the patient's needs, indicates the nursing interventions, supervises the performance of the nursing staff, and evaluates the results and the quality of care.

In this study, the nursing diagnosis, risk for infection (00004), was identified in all patients, which can be explained by the fact that they were exposed to invasive procedures which, with a chronic disease, constitutes a risk factor for infections.⁽⁴⁾ This diagnosis is in the safety and protection domain of NANDA-I, regarded as the imminent state of harboring some biological injury, such as viruses, bacteria and fungi, which may be caused by invasive procedures, thus affecting the immune system.

For the diagnosis, risk for infection (00004), the target is to maintain an adequate immune status (0702), or natural and acquired resistance,⁽¹⁵⁾ through the following measures: health screening (6520), risk identification (6610) and the immunization/vaccination management (6530). Another nursing action includes health education (5510), through which the patient should be guided regarding cleaning the area close to the catheter insertion site at bath time and after bathing. Prevention and control of infection require technical and behavioral measures, such as rigorous hand hygiene, before and after procedures, and the use of sterile gloves during dressing changes, which influence the quality of health and the consequent efforts aimed at reduction of infection, its problems, complications and costs.⁽¹⁶⁾

The second most frequent diagnosis found in this study was fatigue (00093), which is found within the activity and rest domain of NANDA-I, and is regarded as an unpleasant physical sensation,

with cognitive and emotional symptoms described as tiredness, that are not relieved by use of the usual energy restoration strategies. Chronic renal failure can lead to a progressive loss of muscle structure, since the level of protein in the extracellular fluid is unsatisfactory and, to compensate for this deficiency, the liver cells try to meet the demand. In addition, people with chronic renal disease are anemic, resulting from an erythropoietin deficiency. Thus, oxygen diffusion becomes impaired, leading the cells to produce a large amount of lactic acid, saturating the muscle fibers, and fatigue episodes with possibility of falls.^(16,17)

Patients are more likely to be confined to bed due to Fatigue (00093), and with impaired walking, the venous network does not work properly, increasing the risk of pressure ulcers, pulmonary embolism and deep vein thrombosis. Fatigue (00093) directly affects the daily living activities (DLA), reducing the patient's functionality. Therefore, one of the care plan goals is to maintain the activity tolerance (0005), characterized by responses to body movements involved in daily activities that spend energy. In this sense, the nursing interventions include risk identification (6610) and exercise promotion: stretching (0202). Another intervention is self-care assistance (1800), by means of guidance on maintaining a rhythm for activities, sleep and supplementation with foods rich in folate (folic acid) and cyanocobalamin (vitamin B12) that contribute to red blood cells maturation.^(17,18)

Another nursing diagnosis frequent in patients on peritoneal dialysis was impaired walking (00088), included in the activity/rest domain (NANDA-I), and conceptualized as the state in which the individual experiences a limitation in independent physical movements. The target for this diagnosis is to achieve coordinated movement (0212) and endurance (0001). Thus, the nursing interventions should be focused on the promoting body mechanics (0140), stimulating the practice of active and passive exercises, and energy management (0180) due to loss and consumption.^(17,19)

Within the elimination/exchange domain of NANDA-I, the diagnosis of constipation (00011) was identified in the study, stated as decrease in normal frequency of defecation accompanied by difficult or

incomplete passage of stool and/or passage of excessively hard, dry stool. The cause may be multifactorial in patients with nephropathy, such as the loss of electrolytes, advanced age, physical inactivity, the use of phosphorus binders, deficient fluid intake (may be due to treatment), all of which are associated with this physiological state in which the patient has hard stools and changes in the intestinal rhythm, reaffirmed by the defining characteristics and related factors.⁽¹⁶⁻²⁰⁾

Constipation (00011) in patients with kidney diseases is related to the low fluid intake and decreased excitability of the peripheral nervous system in the enteric tract, decreasing peristalsis and impacting the fecal mass.⁽¹⁶⁾ The care plan targets include hydration (0602), stated as the amount of fluid in the body's intracellular and extracellular compartments, and bowel elimination (0501), which is the ability of the gastrointestinal tract to form and evacuate the stool effectively. The interventions are: fluid/electrolyte management (2080), fluid management (4120), and constipation/impaction management (0450). The guidelines on fluid management, consumption of soluble fibers such as pectins, gums, mucilages and some hemicelluloses, are critical to the normalization of intestinal transit.^(15-17,21)

The nursing diagnosis of acute pain (00132) was also identified in the participants, located in the comfort domain (NANDA-I), and defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Pain is a complex phenomenon resulting from activation of nociceptive receptors, resulting in the release of algogenic substances that sensitize free nerve endings, which in turn send pain information to the brain. The plan's goal is pain management (1605), and the nurse should intervene to improve coping enhancement (5230), environmental management: comfort (6482), mutual goal establishment (4410), and sleep enhancement (1850). The causal factors of pain must be identified, to propose actions that provide comfort and relief, as well as the promotion of self-care, using the intervention of teaching: individual (5606) on pain management methods and the use of complementary therapies for pain relief.^(16,17,21)

The nursing staff can act on pain control (1605) using non-pharmacological interventions, such as

comfort massage, relaxation techniques, and application of physical methods such as heat or cold. All these strategies stimulate the proprioceptive system, promote muscle relaxation, improve local blood circulation, and release endorphins, which contribute to pain modulation.^(17,21)

The last nursing diagnosis identified in more than 50% of patients on peritoneal dialysis was excess fluid volume (00026), which is part of the nutrition domain (NANDA-I), and is defined as the increased isotonic fluid retention in the tissue spaces. The fluid excess in patients on peritoneal dialysis results from decompensation of regulatory mechanisms between colloidal osmotic and hydrostatic pressures, existing in the peritoneal compartment.^(22,23) So, for fluid balance (0601), defined as the balance between the intra- and extracellular fluids, the nurse should be aware of the possible fluid imbalance signals, and must provide interventions such as fluid management (4120), electrolyte management (2080) and fluid monitoring (4130) by means of fluid restriction, assessment of edema, and the fluid balance.⁽¹⁵⁾

Conclusion

The most frequent nursing diagnoses for patients with chronic renal failure on peritoneal dialysis were: risk for infection, fatigue, impaired walking, constipation, acute pain, and excess fluid volume. These diagnoses enabled the development and validation of a care plan with eight outcomes and 21 interventions. As implications for practice, the use of this plan could represent an important tool in the process of standardization of nursing care in the peritoneal dialysis service, providing improvement in the quality of care to this population. Also, the use of a specific nursing language ensures clear, precise and objective communication among all the nursing staff. Finally, among the limitations of the study was the small number of patients assessed, and the use of an instrument that had not been validated.

Collaborations

Silva RAR and Bezerra MX contributed to the study design, analysis, data interpretation, article writing,

relevant critical review of the intellectual content, and final approval of the version to be published. Salvetti MG, Mendonça AEO and Neto VLS contributed to the analysis, data interpretation, article writing, relevant critical review of the intellectual content, and final approval of the version to be published.

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