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Nursing diagnoses and adaptation problems among chronic renal patients

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Objective. To identify similarities between NANDA International nursing diagnoses and Roy's adaptation model among chronic renal patients undergoing hemodialysis. **Methodology.** Cross-sectional and descriptive study with 178 individuals selected, through consecutive convenience sampling, in a dialysis center located in the Northeast of Brazil. The study was conducted between October 2011 and February 2012. Data collection instruments included an interview form and a physical assessment. **Results.** Similarity was found between 20 nursing diagnoses and 22 adaptation problems. Roy's adaptation modes that presented these relationships were: physiological, self-conception and role function. **Conclusion.** There are similarities between the two typologies. Furthermore, the use of the nursing process from the perspective of a theory inherent to the field supports care delivery and strengthens scientific knowledge in the profession.

Key words: nursing; nursing care; nursing diagnosis; nursing theory; renal dialysis.

Diagnósticos de enfermería y problemas adaptativos en pacientes renales crónicos

Objetivo. Identificar las semejanzas entre los diagnósticos de enfermería de NANDA Internacional y los problemas de adaptación de Roy en pacientes renales crónicos con hemodiálisis. **Metodología.** Estudio transversal de tipo descriptivo en una muestra por conveniencia de 178 individuos de un centro de diálisis localizado en el nordeste de Brasil. El estudio se realizó entre los meses de octubre de 2011 a febrero de 2012. El instrumento de recolección de la información incluyó datos de la entrevista y del examen físico. **Resultados.** Hubo semejanza entre los 20 diagnósticos de enfermería y los 22 problemas adaptativos detectados. Los modos adaptativos de Roy que presentaron esas relaciones fueron: fisiológico, autoconcepto y el desempeño de roles. **Conclusión.** Hay similitudes entre las dos tipologías

estudiadas. Además, el uso del proceso de enfermería en el contexto de una teoría propia enriquece el cuidado y fortalece el conocimiento científico de la profesión.

Palabras clave: enfermería; atención de enfermería; diagnóstico de enfermería; teoría de enfermería; diálisis renal.

Diagnósticos de enfermagem e problemas adaptativos em renais crônicos

Objetivo. Identificar as semelhanças entre os diagnósticos de enfermagem da NANDA Internacional e os problemas de adaptação de Roy em pacientes renais crônicos em hemodiálise. **Metodologia.** Estudo transversal e descritivo com amostra de 178 indivíduos, selecionados por amostragem de conveniência consecutiva, em um centro de diálise localizado no nordeste do Brasil. O estudo foi realizado nos meses de outubro/2011 a fevereiro/2012. Os instrumentos de coleta de dados foram formulários de entrevista e exame físico. **Resultados.** Houve semelhança entre 20 diagnósticos de enfermagem e 22 problemas adaptativos. E os modos adaptativos de Roy que apresentaram essas relações foram: fisiológico, autoconceito e desempenho de papéis. **Conclusão.** Há semelhança entre as duas tipologias estudadas. Outrossim, o uso do processo de enfermagem, sob o contexto de uma teoria própria da área subsidia a assistência e fortalece o conhecimento científico da profissão.

Palavras chave: enfermagem; cuidados de enfermagem; diagnóstico de enfermagem; teoria de enfermagem; diálise renal

Introduction

Chronic kidney disease (CKD) has progressively increased in frequency every year in epidemic proportions, constituting a public health problem both in Brazil and in the world. In 2010, the estimated number of individuals with CKD undergoing dialysis in Brazil was approximately 92,091.¹ CKD is characterized by kidney damage (structural or functional abnormalities), may or may not be associated with reduced rates of glomerular filtration (GFR) $<60\text{ml}/\text{min}/1.73\text{m}^2$, for three months or more.² End-stage kidney disease is when the kidneys lose homeostasis control, GFR is below $15\text{ ml}/\text{min}/1.73\text{m}^2$ and the individual experiences intense uremic symptoms such as anemia, high blood pressure, edema, weakness, malaise, and digestive symptoms.³ Renal replacement therapy, such as peritoneal dialysis, hemodialysis (HD) or kidney transplantation, is required for the survival of these individuals.

Among the options of dialysis, HD stands out in quantitative terms in Brazil; approximately 90%

of the individuals undergoing renal replacement therapy undergo this modality of treatment¹. Hemodialysis is characterized by the extracorporeal circulation of blood so that toxic nitrogenous substances and excess fluid accumulated in the tissues are removed. Blood is obtained via vascular access and is pumped to an extracorporeal circuit where there is a dialyzer through which blood is filtered and then returns to the individual's circulation.⁴ This treatment is generally performed three times a week in sessions of approximately four hours. Nurses play a key role in this context in terms of monitoring, supporting, assessing, providing education and identifying the individual needs of patients with a view to provide services that facilitate patient adaptation to the treatment. Hence, the implementation of the nursing process (NP), in accordance with a theoretical framework inherent to the profession, is essential in this sector.

The NP is an instrument that nurses use to organize care delivery, differentiating their practice

from other healthcare workers. This methodology influences the quality of care because when it is systematically and deliberately implemented, it defines the needs of patients, guides care and records the results obtained from the intervention.⁵ For that, nurses need to be familiar with the NP phases and the classification systems of elements in nursing practice, in order to promote better quality care and standardization of professional language. Among the classification systems of nursing diagnoses (NDx), International NANDA is one of the most widely disseminated and implemented worldwide.⁵ To support classification systems, theories have contributed to the development of nursing knowledge and the strengthening of nursing practice. Among them, the theoretical model of adaptation developed by Sister Callista Roy stands out. It considers the person as an holistic adaptation system that emits adaptive or inefficient responses that may be observed in four modes: physiological, self-conception, role function, and interdependence.⁶

Therefore, deepening knowledge of theoretical frameworks that guide the nursing care provided to chronic renal patients and that facilitates their adaptation to their treatment is necessary, because these patients experience many changes in their lifestyles caused by fluid and diet restrictions, a continuous medication scheme, and dependency on treatment that ensures their survival. In this context, we believe that Roy's adaptation model can guide nursing care provided to individuals undergoing hemodialysis, seeking to enable these people to adapt to their treatment and feel integrated in the process. We also note that the use of nursing theories, such as the one chosen for this study, means there is an effort to validate nursing theories, to organize nurses' practices, produce knowledge and use the language inherent to the profession. Additionally, associating a theory with a taxonomy of nursing diagnoses implies a critical analysis seeking to develop actions that address an organized and coherent set of concepts and assumptions concerning nursing phenomena. Given the previous discussion, this study's aim was to identify similarities between International NANDA nursing diagnoses and Roy's adaptation model among chronic patients undergoing HD.

Methodology

This cross-sectional and descriptive study was conducted in a dialysis center located in the northeast of Brazil. Cross-sectional studies are studies in which variables are identified at a single point in time and relationships among them are established. Descriptive studies enable researchers to identify and make a detailed description of the characteristics of a group.⁷ The population was composed of 330 individuals, regularly monitored and receiving hemodialysis in the clinic. The study sample was composed of 178 individuals, which was based on a formula for finite populations⁸ that took into account a confidence level of 95% ($Z=1.96$), sample error (5%), size of the population (330), and prevalence Roy adaptation problems. Because no studies were found that estimated the prevalence of Roy adaptation problems among people with CKD, we conservatively considered a prevalence of 50%. We employed a consecutively recruited convenience sample. This sampling is not probabilistic, i.e., the researcher selects the individuals to whom there is easy access, assuming they represent the entire population.⁹

The inclusion criteria were: having a medical diagnosis of chronic kidney disease; being enrolled in and under hemodialysis in the study's outpatient clinic; aged between 20 and 65 years old; and being in a physical and mental condition to participate in the study at the time of data collection. Exclusion criteria were: chronic renal patients with other diseases that could alter the profile of human response of these individuals and that are not related to the renal condition. Data were collected from October 2011 to February 2012 through an interview form and physical assessment, both based on NANDA International and Roy adaptation models. First, a pre-test was performed with 10% of the sample to check the instrument's applicability and verify the need for changes. There was no need to adapt the instrument, so the individuals who participated in the pretest were included in the study sample.

In the data analysis, we employed an individual process of critical judgment of the individuals' answers based on NANDA International and Roy adaptation problems, which were verified in two phases: analysis (categorization of data and identification of gaps) and synthesis (grouping, comparison, identification and list of etiological factors).¹⁰ The clinical judgment process concerning the diagnoses and adaptation problems was performed by the researchers and resulted in double entry of the diagnostic labels, defining characteristics, related or risk factors, adaptation problems, stimuli, and behaviors. Afterwards, the results were organized in tables and each pair was reviewed by the authors to ensure a consensus in order to achieve greater accuracy. At this point, similarity was established according to the definition provided by theory for the adaptation problems and the definition of the diagnoses contained in NANDA International Taxonomy.

Then data were compiled and analyzed using the Statistical Package for the Social Sciences (SPSS), version 2.0 for Windows, generating descriptive statistics and p-values from the Kolmogorov-Smirnov normality test in order to verify whether data distribution was normal or not. In compliance with ethical aspects, this study was approved by the Institutional Review Board (Protocol No. 115/11) and received certification for ethical examination (No. 0139.0.051.000-111) and the participants signed free and informed consent forms in accordance with Resolution 466/2012, regulating research involving human subjects. Note the study received financial support from CNPq - National Council for Scientific and Technological Development (MCT/CNPq 14/2010), Process 483285/2010-2.

Results

The results revealed that 52.2% of the individuals were men, aged 46.6 years old on average (± 12.3). In regard to marital status, 62.9% had a partner and in regard to religion, 69.1% practiced Catholic religion, family income ranged from one

to 30 times the minimum wage; most (92.1%) reported 1 times the minimum wage (R\$ 622.00 at the time of data collection). The participants had 8.5 years of schooling on average (± 4.8). In terms of data concerning hemodialysis, time since the patients started this therapy ranged from 4 to 252 months, 72.7 months (± 62.4) on average, i.e., 6 years. The main vascular access was an arteriovenous fistula (93.8%).

The average number of nursing diagnoses was 6.6 ± 2.3 per individual, with a median of 7, a minimum of 3 and a maximum of 15. The valued obtained with the Kolmogorov-Smirnov test showed an asymmetric distribution ($p < 0.001$). The total number of diagnoses was 24, namely: Risk of infection (100%); Excessive fluid volume (99.4%); Hypothermia (61.8%); Fatigue (47.2%); Ineffective health management (42.7%); Impaired dentition (38.2%); Risk of falls (37.1%); Impaired physical mobility (35.4%); Sexual dysfunction (28.7%); Disturbed sensory perception: visual (28.1%); Insomnia (25.3%); Lack of knowledge (18.5%); Chronic pain (15.7%); Disturbed sensory perception: auditory (15.2%); Ineffective protection (12.9%); Situational low self-esteem (12.4%); Acute pain (11.2%); Self-care deficit: dressing (11.2%); Impaired skin integrity (6.7%); Constipation (5.6%); Risk of injury (2.8%); Disturbed sensory perception: tactile (2.8%); Imbalanced nutrition: less than body requirements (1.1%); and Diarrhea (1.1%).

The average number of adaptation problems per individual was $6.4 (\pm 2.3)$, with a median of 6, a minimum of 2 and a maximum of 13. The valued provided by the Kolmogorov-Smirnov test showed an asymmetric distribution ($p < 0.001$) and a total of 22 adaptation problems: Intracellular fluid retention (99.4%); Hyperkalemia (64.6%); Hypothermia (61.8%); Edema (53.9%); Activity intolerance (47.2%); Failure in the role (42.7%); Potential for injury (37.1%); Mobility: walk and/or restricted coordination (35.4%); Hypokalemia (34.8%); Sexual dysfunction (28.7%); Impairment of a primary sense: vision (28.1%); Sleep deprivation (25.3%); Chronic pain (15.7%); Impairment of a primary sense: hearing (15.2%);

Low self-esteem (12.4%); Acute pain (11.2%); Loss of ability to self-care (11.2%); Impaired skin integrity (6.7%); Constipation (5.6%); Impairment of a primary sense: touch (2.8%); Nutrition less than the body's needs (1.1%); and diarrhea (1.1%).

In regard to the relationship between NANDA International taxonomy II and the theoretical model of adaptation, similarity was found between 20

nursing diagnoses and 22 adaptation problems. Only four nursing diagnoses (Risk of infection; Impaired dentition; Lack of knowledge; and Inefficient protection) were not related to Roy's adaptation problems.

Table 1 presents the list of similarities of NANDA International nursing diagnoses with Roy adaptation problems observed in the sample.

Table 1. List of similarities between International NANDA nursing diagnoses and Roy adaptation problems among individuals undergoing hemodialysis. Natal, RN, Brazil. 2012

NANDA International Domains	NANDA International Nursing Diagnoses	Roy adaptation model	Roy adaptation modes
Nutrition	Excessive fluid volume	Edema	Physiological
		Intracellular fluid retention	Physiological
		Hypocalcaemia	Physiological
		Hyperkalemia	Physiological
Safety/ Protection	Imbalanced nutrition: less than body requirements	Altered nutrition less than body requirements	Physiological
		Hypothermia	Physiological
		Impaired skin integrity	Physiological
		Risk of falls	Physiological
Perception/ Cognition	Disturbed sensory perception: auditory	Potential for injury	Physiological
		Risk of injury	Physiological
		Deficiency of a primary sense: auditory	Physiological
		Deficiency of a primary sense: visual	Physiological
Activity/ Rest	Disturbed sensory perception: tactile	Deficiency of a primary sense: tactile	Physiological
		Fatigue	Physiological
		Insomnia	Physiological
		Impaired physical mobility	Physiological
Comfort	Self-care deficit: dressing	Loss of ability to self-care	Physiological
		Chronic pain	Physiological
		Acute pain	Physiological
Elimination and change	Constipation	Constipation	Physiological
		Diarrhea	Physiological
Self-perception	Situational low self-esteem	Low self-esteem	Self-conception
Sexuality	Sexual dysfunction	Sexual dysfunction	Self-conception
Health promotion	Ineffective health management	Failure in the role	Role function

Table 1 shows that the NDx were present in nine domains of the Taxonomy II NANDA International. The most frequent domains included: Safety/Protection and Activity/Rest. Roy adaptation problems that presented similarities with NANDA International NDx belonged to the physiological, self-conception and role function modes.

Discussion

This section presents data concerning sociodemographic characterization and the list of similarities of nursing diagnoses greater than the relative frequency of 50% with adaptation problems proposed by Roy. The sample was mainly composed of men aged between 21 and 65 years old. National data provided by the Brazilian Society of Nephrology reveal that the percentage of male individuals undergoing dialysis was 57%, 1.6% were aged 18 years old or younger, while 30.7% were 65 years old or older.¹ Another study¹¹ reports that 62.6% were men aged 51.1 years old on average, which corroborates data from this study.

Most people in the sample completed middle school. It is known that a low level of education may hinder understanding concerning the cognitive aspects of the disease and treatment, potentially impeding treatment adherence.¹² In terms of family income, most individuals reported one times the minimum wage. Low income tends to be associated with other public problems, such as difficult access to the following: the health services; appropriate diet; transportation; pharmacological treatment. These, in turn, hinder one's adaptation to the new lifestyle imposed by the disease.¹² Most of the participants had a partner and were religious. One study¹² describing the quality of life of people undergoing hemodialysis reports that 51.5% were married and 84.8% had a religion. Having a partner was an advantage for people with renal disease and undergoing hemodialysis, because these individuals need help performing activities of daily life and need assistance in the event of complications and interurrences. Another

positive aspect for these individuals is participating in religious groups. Participating in a religious group may improve one's psychosocial life from the possibility of interacting and staying less lonely, potentially reducing anxiety and tension.¹³

In regard to nursing diagnoses, those with a frequency above 50% were: Risk of Infection (100%); Excessive fluid volume (99.4%) and Hypothermia (61.8). Some studies¹⁴⁻¹⁶ conducted in the Brazilian context identified NANDA International NDx in the hemodialysis field and the main ones were: Risk of infection; Inefficient tissue perfusion; Renal; Activity intolerance; Disturbed sleep pattern; Excessive fluid volume; Situational low self-esteem; Ineffective protection; Disobedience; Acute pain; Disturbed sensory perception; Insomnia; Chronic sorrow; Lack of knowledge; Fear; Impaired physical mobility; Risk of powerlessness; and Ineffective health maintenance. It is worth noting that few of these studies are grounded in nursing theory and none of them used the theoretical model proposed by Roy.

The Risk of infection NDx, which was present in all the individuals, did not establish a relationship of similarity with the Infection adaptation problem. This diagnosis is defined in International NANDA taxonomy as an increased risk of being affected by pathogenic organisms. Risk factors that infer the risk of infection diagnosis included invasive procedures, which in this case was hemodialysis, and the presence of chronic disease.¹⁷ The second most frequent diagnosis was excessive fluid volume, with a percentage of 99.4%. One study¹⁸ conducted with the objective to identify the profile of nursing diagnoses among people undergoing hemodialysis highlighted that about 70% of the sample presented the excessive fluid volume NDx, predominating over the defining characteristics weight gain in the short term and change of blood pressure and regulating mechanisms related factor. Controlling the intake of fluid among people undergoing hemodialysis is an important predictor of results; however, it is a difficult restriction to attain. Hence, encouraging better adherence of these individuals to treatment recommendations is an essential role of the nursing staff.¹⁹

A relationship was established between the Excessive fluid volume NDx, present in domain two (nutrition), class five (hydration) of NANDA International, with the Roy adaptation problems: intracellular fluid retention, hyperkalemia, edema and hypokalemia of the complex process of fluids and electrolytes.^{6,17} There is a divergence in the position of the terms since the adaptation model is in a complex process different from the NDx domain of NANDA International. Note, however, that the NANDA International Taxonomy II does not contain the fluids and electrolytes domain. The domains contained in this classification include: health promotion, nutrition, elimination and change; activity and rest, perception and cognition, self-perception, roles and relationships, sexuality, coping/tolerance to stress, life principles; safety/protection, comfort and growth/development.¹⁷ On the other hand, the organization of the adaptation problems in Roy's theoretical model is divided into four modes: physiological, self-conception, role function, and interdependence. The physiological mode corresponds to the environmental stimuli of the human body and involves five basic needs of physiological integrity (oxygenation, nutrition, elimination, activity and rest, and protection) and four complex processes (senses, fluid-electrolytes, neurological function, and endocrine function).

Self-conception encompasses the person's psychological and spiritual aspects and has two components: the physical self and the personal self. The role function mode identifies the person's patterns of social interaction in regard to others, reflected by primary, secondary and tertiary roles. Finally, the interdependence mode involves interaction with other people, focusing on intimate relationships and on one's position within society.⁶ The adaptation problem hypothermia, which is included in the physiological mode in the protection basic need proposed by Roy, was related with the NDx hypothermia from NANDA International, which is included in domain eleven (safety/protection), the definition of which is body temperature below normal levels.^{6,17} The relationship between this diagnosis and the adaptation problem hypothermia is remarkable due to the similarity in the grouping of the domain

with the basic need and its terminologies. One study²⁰ performed with 65 medical files analyzed the complications experienced by individuals undergoing hemodialysis and reports that hypothermia was the second most prevalent intercurrent in this population. Hypothermia is related to the cooling of blood due to extracorporeal circulation because blood and/or dialysate solution are exposed to room temperature causing heat loss by convection.²¹ The relationship between the NANDA International taxonomy of diagnoses and the four adaptation modes proposed by Roy was addressed in a study²² in which the authors report the existence of various divergences between the two typologies, since Roy presents a smaller number of diagnoses. The study highlights that there is a strong relationship when the two typologies are compared, which may be a consequence of the fact the theorist Sister Callista Roy was a member of NANDA International from the time of her first work. Hence, the relationship between the denominations of NDx of NANDA International and the adaptation problems of Roy's theoretical model is clear among individuals submitted to hemodialysis.

Conclusion

A total of 20 relationships of similarities were established between NANDA International NDx and Roy's adaptation problems, namely: Excessive fluid volume and Edema/Intracellular fluid retention/Hypokalemia/Hyperkalemia; Imbalanced nutrition: less than body needs and Nutrition less than body needs; Hypothermia and Hyperthermia; Impaired skin integrity; Risk of falls/Potential for injury and Risk of injury; Disturbed sensory perception: auditory, visual and tactile and Deficiency of primary sense: auditory, visual and tactile; Fatigue and Activity intolerance; Insomnia and Sleep deprivation; Impaired physical mobility and Mobility: restricted walking and/or coordination; Self-care deficit: dressing and Loss of self-care; Chronic pain and Chronic pain; Acute pain and Acute pain; Constipation and Constipation; Diarrhea and Diarrhea; Situational low self-esteem and Low self-esteem; Sexual

dysfunction and Sexual dysfunction; Inefficient health management and failure in role.

Therefore, there is similarity between NDx established by NANDA International and the Roy adaptation problems among individuals undergoing hemodialysis. The configuration of these similarities demanded a critical analysis of the theoretical model used, since it presents different ways to establish nursing diagnoses. Hence, we note that the theoretical model of Roy's adaptation problems perceives the individual from a psychosocial perspective and seeks to transform the patient's adaptation problems in positive indicators while NANDA International classifies nursing problems in plausible NDx of interventions focused on promoting the health of individuals, family and community. Furthermore, the use of the nursing process, under the context of a theory and a system of classification inherent to the field, supports care delivery and contributes to the scientific strengthening of nursing. It is worth noting that one of this study's limitations is the fact that it considers only the stages of investigation of the nursing process (assessment of behavior and stimuli) and diagnosis. Hence, we suggest further studies addressing all the stages of the nursing process considering specific interventions and the attainment of expected results, seeking improved quality of life of chronic renal patients undergoing hemodialysis.

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