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ORIGINAL ARTICLE

PHYSIOLOGICAL ADAPTATION OF ELDERLY INHEMODIALYSIS TREATMENT: AN ANALYSIS IN THE LIGHT OF THE ROY MODEL

ADAPTAÇÃO FISIOLÓGICA DE IDOSOS EM TRATAMENTO HEMODIALÍTICO: UMA ANÁLISE À LUZ DO MODELO DE ROY

LA ADAPTACIÓN FISIOLÓGICA DE ANCIANOS SOMETIDOS A TRATAMIENTO DE HEMODIÁLISIS: UN ANÁLISIS A LA LUZ DEL MODELO DE ROY

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ABSTRACT

Objective: analyzing, in the light of the Model of Roy, the physiological adaptation of the elderly on hemodialysis. ***Method:*** a qualitative study involving fifteen elderly patients with chronic kidney disease treated at a hospital. As a tool for data production, it was used a semi-structured interview script; then, the technique of content analysis, specifically the thematic analysis and guideline corresponded to the components of the physiological Mode of Roy. The research project was approved by the Ethics Committee in Research of the Center of Health Sciences, Federal University of Paraíba, under Protocol n° 381/11. ***Results:*** ineffective responses related to the categories were identified: oxygenation, nutrition, elimination, fluids, electrolytes, endocrine function, activity and rest, protection and senses. ***Conclusion:*** The results of the study allowed inferring that the elderly on hemodialysis have difficulties to adapt to the disease and treatment. ***Descriptors:*** Elderly; Renal Dialysis; Nursing Theory.

RESUMO

***Objetivo*:** analisar, à luz do Modelo de Roy, a adaptação fisiológica de idosos em tratamento hemodialítico. ***Método*:** estudo qualitativo, que envolveu quinze idosos com doença renal crônica, atendidos em uma instituição hospitalar. Como instrumento para a produção dos dados, utilizou-se um roteiro de entrevista semiestruturado, em seguida, a técnica de análise de conteúdo, especificamente a análise temática e o eixo norteador corresponderam aos componentes do modo fisiológico de Roy. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa do Centro de Ciências da Saúde, da Universidade Federal da Paraíba, sob Protocolo n° 381/11. ***Resultados*:** foram identificadas respostas ineficazes relacionadas às categorias: oxigenação, nutrição, eliminação, fluidos, eletrólitos, função endócrina, atividade e repouso, proteção e sentidos. ***Conclusão*:** os resultados do estudo permitiram inferir que os idosos em tratamento hemodialítico apresentam dificuldades para se adaptar à doença e ao tratamento. ***Descritores*:**Idoso; Diálise Renal; Teoria de Enfermagem.

RESUMEN

Objetivo: analizar, a la luz del Modelo de Roy, la adaptación fisiológica de los ancianos en hemodiálisis. ***Método:*** un estudio cualitativo, que implica quince pacientes ancianos con enfermedad renal crónica tratados en un hospital. Como una herramienta para la producción de los datos, se utilizó un guión de entrevista semi-estructurada, a continuación, la técnica de análisis de contenido, específicamente el análisis temático y la directriz correspondido a los componentes del modo fisiológico de Roy. El proyecto de investigación fue aprobado por el Comité de Ética en Investigación del Centro de Ciencias de la Salud de la Universidad Federal de Paraíba, en virtud del protocolo n° 381/11. ***Resultados:*** respuestas ineficaces relacionadas con las categorías se identificaron: la oxigenación, nutrición, eliminación, fluidos, electrolitos, función endocrina, actividad y descanso, la protección y los sentidos. ***Conclusión:*** Los resultados del estudio permiten inferir que los ancianos en hemodiálisis tienen dificultades para adaptarse a la enfermedad y el tratamiento. ***Descriptores:*** Ancianos; Diálisis Renal; Teoría de Enfermería.

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INTRODUCTION

Aging is defined as a dynamic, continuous and progressive process itself to all members of a species, which involves a number of factors such as social, cultural, economic and physical conditions. In this phase of life, there are functional, morphological, biochemical and psychological changes that promote the loss of individual's adaptation to the environment and causes more susceptible to the onset of pathological processes.[1-2]Currently, the proportion of people over age 60 is growing faster as compared to any other age group. This growth is happening quickly and in proportional terms it is also accompanied by changes in the demographic and epidemiological profile of the population.[3]

The epidemiological transition is focused on the complex changes in patterns of health and illness and the interactions between these patterns and their geographic, economic and social determinants leading to a set of long-term changes in patterns of morbidity, disability and death, featuring a population specific and generally occurs in conjunction with other processing.[4]

In Brazil, the epidemiological transition has generated significant changes in the context of morbidity and mortality caused the infectious diseases, which accounted for 40% of recorded deaths, currently reached less than 10%. Cardiovascular diseases in 1950 were responsible for 12% of deaths; now represent more than 40%. In this way, the country has gone from a typical mortality profile of a young population for a drawing of more advanced age itself. As individuals age, the NCD become major causes of morbidity, disability and mortality in all regions of the world.[4]

Facing this reality, the changes in the profile of morbidity and mortality of the world population during the last decades, showed an increase in chronic diseases and designed the Chronic Renal Failure (CRF) on the world stage as a major public health challenges of this century, with all its economic and social implications.[5]

IRC is a public health problem because it is considered a disease with high morbidity and mortality. Its incidence and prevalence when terminally ill have progressively increased throughout the world and has become an epidemic. It is a pathological condition in which the kidneys cannot remove the metabolic waste from the body or performing regulatory functions. Substances that would be eliminated in the urine accumulate in body fluids, which lead to a disruption in the endocrine and metabolic functions and hydroelectrolyte disturbances.[6]

In the elderly, the number of functional nephrons is reduced by one third. The glomerular filtration rate decreases linearly with age, because of decreased renal mass, which predisposes the elderly to kidney failure and increases the need for renal replacement therapy some to survive: dialysis (hemodialysis or peritoneal dialysis) or a kidney transplant.[7]

Hemodialysis is the most common treatment today; it is a process of filtering and purification of the blood that brings physical consequences to the individual who experiences and change your daily life, causes the patient to experience stress, social isolation, loss of employment, dependence of people, medicines, limited mobility due to general medical condition, which leads to losses in personal and social life, as it requires a long process of adaptation to this new condition and drastically alter its lifestyle, due to various duties imposed by treatment.[8-9]

Nursing has an important role against the elderly on hemodialysis, thus, seeks to understand its nature, the interaction with the environment and the impact of this interaction on health, so you can direct the nursing interventions in order to attain health and well-being, focusing on the improvement of nursing care based on the Nursing Theories.[10]

The present study was based on the theoretical foundation of the Roy Adaptation Model, which was based on systems theory, this being defined as a set of interconnected parts to function as a whole. Thus, the person is seen as a holistic system as an adaptable with ability to adapt to the environment and make changes on it.[11]

The Roy Adaptation Model describes three classes of stimuli in which the person may be exposed: the focal stimulus with respect to changes or situations that immediately affect the person; contextual stimuli includes all other stimuli present in the situation that influence the response to Focal stimulation, whereas the residual stimulus is internal and external factors, whose current effects are not clear, and the person may be unaware of these factors.[12]

Responses to stimuli are produced and expressed through physiological and/or psychosocial modes. In that study, it was delimited so that the physiological theory which include the basic needs of physiological integrity described by Roy covering: oxygenation, nutrition, elimination, fluids and electrolytes, endocrine function, activity and

rest, protection and senses, allowing understanding of behavioral responses expressed by elderly on hemodialysistreatment.[12]

Thus, the study aims to examine, in the light of the Model of Roy, the physiological adaptation of the elderly on hemodialysis. The answer to this objective favors the construction of guidelines for nurses working in hemodialysis units and can help them to assess the physical condition of the elderly in care environment so that these people to individualized interventions are implemented.

METHOD

This is a descriptive study with a qualitative approach, carried out in specialized clinics for chronic renal patients in a charity hospital reference in dialysis and renal transplantation, in the city of João Pessoa/Paraíba. The subjects were 15 individuals, of both genders, who were selected randomly and who met the following inclusion criteria: a) aged 60 years old, b) belonging to hemodialysis program of the hospital, c) who were able to understand and respond to the questions posed in the interview guide.

As a tool for data production, there were used a semi-structured interview script, which had the purpose of recording data characterizing the elderly respondents, and questions, referring to the physiological adaptation. Regarding the ethical principles adopted in this study, the project was evaluated and approved by the Ethics Committee in Research of the Center of Health Sciences, Federal University of Paraíba, under Protocol n° 381/11, and its development followed the precepts of Resolution 196/96 of the National Health Council, which regulates the ethical aspects of research involving human beings, individually or collective.[13]in obedience to these Resolutions, were provided to all study participants or responsible for them clarify the objectives and importance of the research, through information available in the Terms of Consent . Participants were interviewed from January to April 2012, through interviews tape-recorded and transcribed in full by the researcher.

For data analysis, there was used the technique of content analysis, specifically the thematic analysis proposed by Laurence Bardin, which defines it as a set of techniques for analysis of communications in order to obtain systematic and objective procedures to describe the content of the messages that allow the inference of knowledge concerning the conditions of production/reception of these messages.[14]

For implementation of this technique for data analysis, obeyed the following phases: selection of material or corpus consisting of fifteen interviews, which were transcribed and typed in full, with the speeches of the participants identified by the vowel E, plus the corresponding number the order of the interviews, in order to preserve confidentiality and anonymity assured the participants in the research.

After establishing contact with the documents, it proceeded to the initial reading of the material, in order to better understand the text. After this phase the choice of units of analysis in which the raw data of the text were systematically turned into cutouts or units of analysis, corresponding to small segments of content or topics in which older people expressed their physiological process of adaptation was made towards treatment hemodialysis.

In the last phase was established categorization, noting that in this investigation, the thematic categories were predetermined and correspond to the components of physiological adaptation of Roy.

RESULTS AND DISCUSSION

Through the analysis of the data was obtained six categories that emerged from the analysis of the corpus of the interviews: oxygenation, nutrition, elimination/fluid/electrolytes/endocrine function, activity and rest, protection, senses.

The physiological aspect is the physical response of the individual to environmental stimuli. This response involved the subcategories:

♦Oxygenation

The oxygenation category, the physiological aspect of the Theory of Roy, is classified as one of the basic needs of the person, as it refers to the processes by which the supply of oxygen is maintained in the cell body. The principal mechanisms responsible for cell oxygenation are ventilation, alveolar gas exchange and capillary transport of gases and tissues. The ventilatory deficit, associated with other lung tissue compromises, compromises the function of this system, contributing to decreased lung capacity.[15]

Behaviors or empirical indicators evidenced by the elderly included in this category were dyspnea and anemia, which reaffirmed their diagnosis of ineffective breathing pattern nursing, defined as "inspiration and/or

expiration that does not provide adequate ventilation."[16:294]This condition is exemplified in the following lines:

> *I'm filling in the body and when I drink a little more water, I feel tired and weakening legs. (E5)*
>
> *The belly gets too full of liquid; my boobs are out of breath, I become very tired. (E13)*
>
> *I cough, tiredness, get swollen, I cannot sweep a house or wash a bathroom because I'm tired. (E9)*
>
> *[...] I became pale, weak and won over this catheter [...]. (E14)*

Elderly patients with chronic kidney disease on hemodialysis faced with breathing difficulties resulting from fluid overload and anemia caused by kidney damage, which decreases the production of erythropoietin and consequently the production of red blood cells. Chronic kidney disease has a deficit of this hormone, which makes its replacement necessary for most patients, a fact that makes it difficult to adapt to the new lifestyle.[7]It is clear, too, that although the elderly manifest ineffective behaviors on display oxygenation as evidenced in speeches cited herein, they are knowledgeable of the stimuli that influence such a response, and often try to adapt to the situation:

> *The body gets full of water, just come fatigue and is why I do not take water, so I have to go in my day if not get worse and die. (E9)*
>
> *I try to do [hemodialysis] always in my days when I spend the weekend without the body is changed, miss. I feel different; the body becomes heavy, get tired fast. (E14)*

♦Nutrition

Regarding nutrition category, which is associated with the ingestion and assimilation of food to keep the body functioning, behavior/responses were observed mainly in elderly restriction of fluids and food, weight loss, nausea and vomiting, which are by as nursing diagnosis impaired nutrition: less than body requirements which "refers to insufficient intake of nutrients to meet the metabolic needs".[16:233]Faced with this problem, the elderly were urged to strictly control their diet and their water intake, as demonstrated in these statements:

> *[...] Many things have changed in my life. Liked to drink lots of water, eat lots of fruit and now I cannot. This greatly moved me. (E13)*
>
> *[...] We pass through a lot of suffering. Just not being able to drink water in this heat! If you take water, the doctor is complaining that you cannot ingest too much liquid. The food! Saltkeeps right away. (E4)*

The changes of dietary habits and water, molded for life, are necessary for the elderly maintain balance, even relative to their physiological functions, however, are a limiting their quality of life and their friendship factor by imposing multiple social deprivations. The statements below confirm this assertion:

> *This treatment is prohibited ninety percent of the things you enjoy most. You cannot drink water or soft drinks [...] Sometimes, I eat out, but I know that the food will not be appropriate for me; I fear there, it is clear that the restaurant will not make a meal for me. So I am restricted to live at home. (E14)*

Another factor highlighted by respondents, the nutrition component was the weight loss that is associated with inadequate intake of protein, energy deficit, the concomitant chronic diseases, the catabolic stimulus of dialysis procedure, which leads to loss of nutrients, and disturbance endocrine.[17]

> *I lost ten kilograms; I was pale, weak and won over this catheter! (E14)*
>
> *Slimming twenty-five kilograms, so here my [arm muscles] was very fat, now it's ugly. (E2)*
>
> *I was very strong today and I'm too skinny, did not know that this disease ended with us suddenly. (E3)*

♦Elimination/fluids/electrolytes/endocrine function

On the elimination category/fluids and electrolytes/endocrine function, its components are essential for homeostasis of the individual. The elimination of metabolic waste products occurs through the gastrointestinal tract, lungs, skin and kidneys.[18]As the elderly renal function decreases, end products of metabolism accumulate in the blood and cause ineffective responses, as edema in the lower limbs, cramp and pressure levels high. These responses are exacerbated when combined with hydro-electrolytic imbalance, which contributes to the evidence of nursing diagnosis impaired urinary elimination and volume of excess liquid. The first corresponds to "dysfunction in the elimination of urine" [16:250], and the second relates to "increased isotonic fluid retention".[16:244]In this study, we observed that some seniors had ineffective behavior related to these components as the following addresses:

> *I'm heavy, the legs are swollen, pain in the body, everything is different, now feel the need to go to the machine. (E10)*
>
> *[...] I did not know that this disease ended with us suddenly. I was almost unable to walk; my legs went weak and very swollen. (E3)*

[...] My kidneys do not work, do not pee like you. I cannot take too much water, because I become all swollen. (E13)

These statements reveal that older people know the major complications of kidney failure and what it takes to replace its function through hemodialysis. It should be noted that in the elderly, chronic loss of kidney function because typical manifestations, including, hypertension, fluid overload and edema, particularly in the lower limbs, which are directly associated with excess water and salt in the body. This framework, in many cases, can be generalized or involve, besides the lower limbs, face and abdomen, and trigger complications of circulatory and pulmonary order.[7]Moreover, the decrease in blood filtration and accumulation of fluid and electrolytes in body, especially sodium and potassium, help to raise blood pressure and muscle cramps arise, show the elderly:

Today, I complain of headaches daily;the high pressure that bothers me. (E13)

[...] I feel weakness. The pressure is too high; you have to be very careful. (E1)

I have cramps, darkening of view, want to vomit, agony [...]. (E8)

With regard to endocrine function in the context of chronic kidney disease, this activity is altered, in particular, the failure of this function by the kidneys, which can affect the function of other organ systems of the body.[7]It is worth noting that when the elderly with chronic kidney disease have other comorbidities endocrine nature, eg, diabetes mellitus, it shows more difficulties in their adaptation process to the disease and treatment:

[...] I've always sick, have uncontrolled diabetes. [...] I cannot walk because of the leg that I have now with the kidney problem more difficult my life. (E15)

♦Activity and rest

The category of activity and rest, the Roy Adaptation Model, englobes the processes of bodily movement, promoting normal growth and development of the person, which is compensated by sleep/rest when the energy expended through activities, are renewed.[12]in this category, the following were incorporated adaptive problems: weakness, lack of energy, increased physical complaints, inability to maintain usual activity levels and dissatisfaction with sleep, which contributed to the evidence of the diagnostic standard nursing sleep disturbance, fatigue and activity intolerance.

As a result of the aging process and due to the dynamic and progressive process of both morphological, and functional, biochemical and psychological, the elderly have difficulty balancing evidence in activity and rest. This imbalance tends to worsen with the presence of renal failure associated with hemodialysis, as these conditions cause significant discomfort in those who experience them, as shown by these statements:

I become very tired, fatigued. When I do hemodialysis, I get my whole body broken to spend much time in those chairs. (E7)

[...] My arms becameslim. I'm a damned leg weakness. So do not even feel wish on walking. (E5)

[...] I do not do any activity; I cannot do anything with this problem. (E8)

Human response Fatigue is defined by as an "oppressive and sustained sense of exhaustion and decreased capacity for physical and mental work at usual level".[16:287]This response is closely related to the nursing diagnosis activity intolerance , also observed among the elderly, which is defined as "physiological or psychological energy to endure insufficient or complete required or desired daily activities".[16:292]

Some problems observed in chronic kidney disease, especially those on hemodialysis therapy are physical complaints and fatigue that, in most cases, are accompanied by malaise, drowsiness, decreased motivation, in dire need of rest and malaise. These factors induce the elderly and sedentary lifestyle increases the risk of cardiovascular diseases and injury to the functional capacity and quality of life, which hinders its adaptive process.[19]

Furthermore, considering the category activity and rest, was also observed among elderly nursing diagnosis of disturbed sleep pattern. These are the "disruption of the quantity and quality of sleep, time-bound, due to external factors".[16:275]Changes in sleep patterns and the rest of the elderly who are on hemodialysis alter homeostasis and reverberate in the function psychological, immune system and the behavioral response conditions that hinder adaptation. In this study, subjects presented tiredness, fatigue and dissatisfaction with sleep due to physical discomfort, concern and fear related to the possibility of losing vascular access, according to endorse these statements:

[...] The person suffers too much, I cannot sleep on the side of the catheter, I can only sleep on the other hand, suffer a lot, this really bothers catheter, nobody sleeps concerned [...]. (E14)

I do not have health, I have dizziness, weakness, leg pain, trouble sleeping, I'm always sick. (E13)

It is noteworthy that, to perform hemodialysis, the elderly need a proper access, which may be temporary or permanent vascular. The temporary access is made by a double-lumen catheter, which is most widely used among patients who require urgent dialysis and in general cause more discomfort. The insertion of this catheter occurs in places such as the subclavian, internal jugular and femoral. Permanent vascular access relates to the arteriovenous fistula, considered more appropriate due to the fact cause less limitation. However, in the elderly, the presence of cardiovascular disease, diabetes and vascular exploration for making such access increases the likelihood of complications and lead to a more serious morbidity.[7]

♦Protection

Still considering the vascular access for hemodialysis in the elderly, there is an association of them with protection category, which involved nursing diagnoses impaired skin integrity, risk of infection, risk of vascular trauma and bleeding risk. These diagnoses are related, in particular, the continuous punches (three times per week) required for the completion of hemodialysis, which produce these physiological, pain and discomfort responses, as reflected in these statements:

> *[...] It's a lot of suffering, bored me too! Made a hole in my neck, my belly, my groin [...] my arms are torn. The needles are very thick, like a matchstick, very hurt. (E8)*
>
> *We have to be very careful with the catheter when going to bathe, because if you cannot complicate. The doctor said that if not careful infects. (E6)*

The skin is considered a major component to protect the body. Along with the hair, the nails and the immune system, the skin has the primary role of protecting the person from internal and external stimuli that threaten adaptation.[12]Thus, impaired skin integrity predisposes the elderly to the risk of infection: "the possibility of invasion by pathogenic organisms "16:485, generating them additional difficulties:

> *[...] Bath not take as wish not to wet the catheter has to be carefully not to have infection. (E14)*
>
> *[...] Sometimes I have a fever, especially when the catheter ignites. (E11)*

Chronic renal patient is immunodepressed due to a reduction of circulating red blood cells and red blood cells and therefore has an increased susceptibility to infections. Invasive procedures related to venous access, especially those affected by means of catheters, favoring the emergence of bacteremia, manifested mainly by hyperthermia and chills. It is noteworthy that the presence of the catheter may also determine other complications such as pneumothorax, bleeding and bruising which, combined with the anticoagulant heparin, a substance used to each hemodialysis session that has an aim to prevent clotting of the extracorporeal circuit, conditions that hinder the process adaptive in the elderly.[20]

♦ Senses

In the category sense, it can be stated that this component plays an important role in the adaptive system, as it serves as a channel through which the person receives and exchange with the environment the information necessary for the activities of life.[12]

The sensory system is considered as one of the complex networks through which neurologic function is developed. It is noteworthy that most of the activities of the nervous systembegin with sensory experience, especially pain, which may cause an immediate reaction or be stored in memory. The primary senses-sight, touch and hearing - are channels through which the person receives and exchange information necessary to perform the activities of life.[18]

Within this research, the component senses, the elderly expressed ineffective adaptive responses, represented by chronic painful processes of physical nature, resulting from venous punctures, and emotional, raised in particular by grief related to prolonged suffering caused by hemodialysis. This condition experienced by elderly guard line with the different elements present in the definition of chronic pain "unpleasant sensory and emotional experience arising from actual or potential tissue damage or described in terms of such damage; intense sudden onset or slow, light intensity, constant and recurring without anticipated or predictable end and a duration of more than six months".[16:549]the statements that follow confirm the experience as experienced by the elderly:

> *The needle prick on us. There are days when my arms hurt a lot. (E8)*
>
> *[...] We suffer too, when will put this catheter we suffer too much, even too much, it hurts a lot. (E2)*
>
> *[...] When you have the will to leak and the machine takes two bored, bored a well and another well, [demonstrates] three times a week is a lot of pain, no joke something like that! (E1)*

CONCLUSION

The study allowed identifying that the use of the Roy Adaptation Model made an important theoretical framework for understanding the situation experienced by the elderly on hemodialysis. The choice for the qualitative analysis of empirical data approach provided effective interpretation of the physiological adaptation of the elderly on hemodialysis, unveiling their behaviors/responses and favored the elucidation of nursing diagnoses representative of physiological adaptation. Regarding the findings, it was found that the elderly had ineffective behaviors related to the physiological mode of Roy, related to components oxygenation, nutrition, elimination, fluids, electrolytes, endocrine function, activity, sleep/rest, protection and senses.

From the foregoing, it is noteworthy that the aspects related to physiological adaptation of the elderly on hemodialysis, elucidated in the context of this research may provide support for the health care team, in particular, to nursing, to encourage the elderly in coping with the disease, encouraging them to seek a redefinition of the condition of life from a perception that envisions a better quality of life. Finally, it is expected that this work will inspire the creation of new research that furthers the subject.

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