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Clinical Indicators of Nutrition in Hemodialysis Clients

ORIGINAL

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Abstract

Background: Nutritional aspects are relevant to reduce the morbidity and mortality of the hemodialysis clientele. Thus, the identification of clinical indicators of nutritionis fundamental to guide a qualified care. This study aimed to verify the occurrence of clinical nutritional indicators in patients undergoing hemodialysis. Cross-sectional study.

Methods and Findings: The study was carried out with 50 patients in a hospital in northeastern Brazil selected by convenience. Collection took place through an interview form and physical examination from December 2013 to May 2014. Results were analyzed using descriptive statistics. Thirty three clinical indicators of nutrition were identified, and rates exceeded 50%. Among these, Altered blood pressure was present in 100% of the sample. Six indicators showed rates above 90%, namely: Anxiety, Azotemia, Thirst, Decreased hemoglobin, Regular nutrition and Lack of information. The limitation of the study relates to the fact that this was developed in a single center.

Conclusion: Clinical indicators of nutrition are common among hemodialysis customers and relate to electrolyte and nutritional disorders. The identification of these indicators allows the appreciation of nutritional nursing phenomena and consequent effective interventions and positive responses regarding nutrition safety of hemodialysis patients.

Keywords
Nursing; Nutritional Processes; Kidney Dialysis; Hemodialysis; Chronic Renal Disease.

Introduction

Hemodialysis (HD) is performed to replace the renal function that is compromised [1]. According to international guidelines of the *Kidney Disease Improving Global Outcomes,* Chronic Renal Disease Terminal

requires this type of treatment when glomerular filtration rate has a value below 15 mL/min./1.73m [2].

Chronic renal disease terminal is characterized as a public health problem and a major cause of death and disability, with an estimated prevalence between 8% and 16% worldwide [2,3]. Morbidity and mortality among these patients are high [4], with a mortality rate of 48% [5].

High mortality rate present in these clients shows relation with the adequacy of dialysis and with the nutritional status of the patient [6, 7]. In this respect, during HD, toxic substances are removed from the plasma, in addition to essential components such as peptides, vitamins and glucose [1, 6]. Furthermore, there is a catabolic effect induced by the treatment, the state of uremia and metabolic acidosis that permeate kidney disease and exponentially affect the nutritional status [1, 6].

Thus, the prevalence of malnourished patients in the final stages of the disease ranges from 40% to 70% and is linked to loss of appetite, dysgeusia, impaired digestion and absorption, metabolic acidosis and emotional stress [7]. Given this reality, it is critical to clinically assess the nutritional aspects of the patient by the health team, especially by nurses. Therefore, nursing diagnoses expressed through clinical indicators are important, as they are capable of translating phenomena of interest for nursing in face of a human response to professional practice [8].

Nursing taxonomies favor the classification of phenomena, guiding the diagnostic identification of nurses. In this context, the Nutrition domain in NANDA International stands out. This includes clinical indicators that represent nutritional human responses. Thus, understanding the nutritional aspects of hemodialysis patients provides early identification of nursing problems developed by such patients favoring rapid interventions and targeted to the real needs of clients.

In this perspective, the following questions emerged: What are the clinical indicators of nutrition presented by patients undergoing hemodialysis? The objective is, therefore, to determine the prevalence of clinical indicators of nutrition in patients undergoing hemodialysis.

Method

Cross-sectional study carried out in a dialysis unit of a university referral hospital for hemodialysis. The population consisted of 210 patients treated during the period from January 2012 to January 2013.

The sample was calculated based on the formula for finite populations, considering the level of confidence of 95% for the study (Z_{∞} = 1.96); sampling error of 12%; and a population of 210 patients. As for the prevalence of the studied event, as no study indicating that prevalence was identified, the conservative value of 50% was taken into account. Thus, by applying these values, a sample of 50 individuals was found. The sampling procedure was carried out by convenience and was consecutive.

The inclusion criteria for the study were: being hospitalized, undergoing hemodialysis in that hospital, aged at or older than 18 year, and conscious and oriented. Exclusion criteria were: patients undergoing hemodialysis in that hospital with external service, pregnant women and patients under plasmapheresis treatment.

The instrument used was composed of an interview script and physical examination adapted to electronic format. The software developed in *Microsoft Excel 2010* offered the function *touch screen* to select the options for answers and space for typing in order to minimize errors and facilitate the flow of information to the generation of databases. Clinical indicators present in the field of Nutrition of the International NANDA were shown. Operational definitions were developed for each indicator to be measured.

The instrument was submitted to validation of content and appearance by two PhD professors specialists in nursing, nephrology and nursing diagnoses. Suggestions made were included in the ins-

trument. They made reference to the organization of questions, as well as accessibility of the language.

The instrument was applied in form of pre-test in the dialysis unit to five patients with renal impairment and undergoing hemodialysis at the time. There was no need for change and the participants of the pre-test were included in the study sample.

Data collection took place from December 2013 to May 2014, from the beginning to end of the hemodialysis session. Data were collected by the researcher and four undergraduate Scientific Initiation Fellows and undergraduate nursing students. The students were trained in two phases: dialogued expository lecture addressing the theme under study; and training on propaedeutic techniques for physical examination from operational definitions created for each nutritional clinical indicator. Finally, the fellows were trained to operate the instrument in the digital model.

After collection, data from the instrument were gathered in order to support clinical reasoning about the presence or absence of clinical indicators. Based on this, data were compiled and processed in the program *IBM SPSS version 20.0 for Windows Statistic*, and analysis of absolute and relative frequency of clinical indicators of nutrition [nominal variables] took place. Numeric variables [demographic data] received statistical treatment of central tendency and dispersion measures. In order to verify the normal distribution of numerical variables, the Kolmogorov-Smirnov test was used, with $p < 0.05$.

As for the ethical principles of research involving human beings, the study received favorable Opinion of the Ethics Committee of the institution responsible for research under the number 392,535 and certificate of presentation for ethical appraisal number 18710613.4.00005537. It is noteworthy that patients received the necessary explanations about the purpose and method used in this study with subsequent signing of the Informed Consent.

Results

The clientele in the study was characterized as mostly females (62%), brown-skinned (68%), religiously active (80%), 54% had a partner and 62% were retired or beneficiaries. The average age of the sample was 47.5 years (± 14.61), with median of 5.0 years of study and 1.5 minimum wages as family income.

In order to present the results clearly and accurately, the present study highlights the nutritional indicators that presented frequency above 50% in the study population. Thirty-three clinical indicators of the Nutrition area were identified with frequency above 50% among patients undergoing hemodialysis, which are presented in **Table 1**.

Among the 33 clinical indicators found, Altered blood pressure as nutritional indicator stands out by its hegemonic presence among the clientele studied. Still, six indicators with prevalence below 90% stood out. They are: Anxiety; Azotemia; Thirst; Decreased hemoglobin; Regular nutrition and Lack of information.

Table 1. Frequency of clinical nutritional indicators in patients undergoing hemodialysis.

Clinical indicators of nutrition	n	%
Altered blood pressure	50	100
Anxiety	48	96
Azotemia	48	96
Thirst	47	94
Decreased hemoglobin	46	92
Regular nutrition	45	90
Lack of information	45	90
Swallowing piece by piece	44	88
Decreased hematocrit	44	88
Awakening during sleep	42	84
Expressed desire to increase the fluid balance	40	80
Sedentary Lifestyle	39	78
Altered electrolytes	39	78
Edema	39	78
Incorrect information	39	78
Ingestion exceeding the output	39	78

Clinical indicators of nutrition	n	%
Expressed desire to improve nutrition	38	76
Wrong ideas	38	76
Hydrated mucous membranes	38	76
Without excessive thirst	35	70
Pulmonary congestion	31	62
Adventitious chest noise	31	62
Change in breathing pattern	30	60
Increased pulse rate	29	58
Adequate food consumption	29	58
Expressed knowledge about healthy food choices	29	58
Increased body temperature	27	54
Dysfunctional nutritional pattern	27	54
Attitude towards food consistent with health goals	26	52
Heartburn	26	52
Good tissue turgor	26	52
Expressed knowledge about healthy drink choices	25	50
Adherence to an appropriate nutrition pattern	25	50

Discussion

The identification of clinical indicators that reveal the occurrence of nursing phenomena is relevant to give direction to the professional practice. Thus, determining the most prevalent indicators related to nutritional aspects in hemodialysis patients favors the promotion and prevention in nursing. Also, it favors the early identification of these indicators so that morbidity and mortality risks in can be reduced this clientele, favoring the qualified attention based on scientific evidence and with focus on the promotion of patient safety.

Regarding the clinical indicators identified in this study, the relationship of these with electrolyte and nutritional disorders triggered by kidney disease and hemodialysis is evidenced by the hegemonic presence of the indicator Altered blood pressure. Study on factors related to weight gain in hemodialysis patients indicates that this aspect adversely affects blood pressure levels [9]. Moreover, the removal of fluids during HD also has a direct influence on blood pressure, causing symptoms that may persist after the end of the hemodialysis [1]. This variation in pressure during hemodialysis is commonly associated with hypotension. Research about interdialytic complications presents hypotension as the main complication of this treatment, happening in more than 50% of dialyses [10].

The clinical indicators of nutrition Azotemia and Altered electrolytes also showed relation with the evolution of kidney disease and its treatment. Azotemia corresponds to the condition of accumulation of urea and creatinine in the blood, typical of decreased renal function and consequent accumulation of electrolytes [7]. Cross-sectional study with hemodialysis patients revealed incidence of azotemia in 100% of the sample and 88% in the case of Altered electrolytes [11].

Decreased hemoglobin and hematocrit were expressed in high levels among the clientele and this reflects the state of anemia, a common complication in renal patients that implies negative outcomes. Anemia in these patients may be exacerbated by iron deficiency, gastrointestinal bleeding, malnutrition, surgical procedures, losses in collections for exams and losses in dialysis [12]. A research conducted in northeastern Brazil also detected decreased hemoglobin in 73% of the sample and decreased hematocrit in 96% [9].

Pulmonary congestion, Adventitious chest noise, and Change in breathing pattern were common respiratory complications in cases of nutritional changes. These signs and symptoms suggestive of excess fluid are interrelated and characterize uremic syndrome, as well as indicate excessive intake of fluids responsible for high mortality rates [1,13].

Loss of the ability to excrete water and sodium causes fluid retention and subsequent development of hypertension and edema, including pulmonary congestion, as evidenced in the sample. Moreover, intracellular edema and hyponatremia can occur [13]. Edema was present in 78% of patients sur-

veyed, as well as Ingestion exceeding the output, confirming the influence of this indicator on the onset of edema, which is characterized as a positive water balance in the body [7].

Anxiety strongly reflected on renal dysfunction and was present in 96% of patients. This characteristic results from indirect electrolytic changes and is related to the occurrence of pulmonary congestion, which is an indication of pulmonary edema, implying inefficient gas exchange related to hypoxia and resulting from changes in ventilation and perfusion. The advance of this condition causes injury in spontaneous ventilation, which makes the patient increasingly apprehensive [14].

Thirst was reported by most of participants and this is associated with the strict water restrictions imposed by the treatment. It is also believed that sodium intake can be the most important contributor, because it stimulates the thirst mechanisms [7]. These indicators favor the intake of fluids of hemodialysis patients, which is linked to the most serious problems highlighted by these patients with high morbidity and mortality rates. Thus, giving attention to the occurrence of the nutritional clinical indicator Thirst favors early nursing intervention of health education through the adoption of palliative measures like the application of wet compress on the lips of patients.

Increased pulse rate and Increased body temperature were mentioned by the clientele and they are related to the loss of liquid volume during HD, which causes changes in blood pressure, such as hypotension, followed by an increase in the pulse rate [15]. Similarly, changes in body temperature are also related to hemodynamic changes, mainly due to heat flow between the extracorporeal system and the patient. In the case of temperature reduction during dialysis, peripheral vasoconstriction may occur, causing an increase in body temperature by reducing heat loss from the surface. The reverse mechanism is true, as vasodilation and subsequent hypotension may occur. Therefore, the choice of the appropriate temperature for the dialysis client is critical for hemodynamic stability and prevention of hypotension [15].

Expressed desire to increase the fluid balance, Hydrated mucous membranes and the account of the absence of excessive thirst also stood out in this study. These expressions mean that the patient adheres to the nutritional regimen instituted, probably due to the condition of being hospitalized, and because they are, therefore, followed by a health team through rehabilitation strategies. This reflects in improvements in nutritional and hydric state contributing to the reduction of morbidity and mortality [16]. The Good tissue turgor, present in 52% of the sample, can also be understood as a positive reflection of this monitoring.

Regular nutrition, Adequate food consumption, Attitude towards food consistent with health goals and Adherence to an appropriate nutrition pattern are clinical indicators that have significant frequencies and also indicate good adherence to nutritional therapy. It is known that a proper diet to the patient's health condition is offered, besides the support of the team, and this encourages nutritional improvement and consequent coping with the disease [17].

The clinical indicators of nutrition: Expressed desire to improve nutrition; Expressed knowledge about healthy food choices and Expressed knowledge about healthy drink choices corroborate the reflection on the hospital context in which these patients are inserted, bearing in mind the stimulus received by the patient through the constant presence of the health team and the whole technological and scientific apparatus [16]. Thus, a multidisciplinary performance for favoring positive clinical indicators of nutrition in hemodialysis clientele, favoring the safety of facing negative events, stands out as fundamental.

However, despite the fact that these patients expressed having knowledge about nutrition and liquids, Lack of information was identified, as well

as Wrong ideas and also Incorrect information, all with relevant frequencies. This reality may reflect the unfavorable socio-demographic context in which individuals of the present study are inserted, highlighting the low level of education and low income. In addition, attention must be given to flows in education programs on kidney health. It is important to note that, for these patients, mortality rates are linked to the nutritional level [7,17].

Sedentary lifestyle and Dysfunctional nutritional pattern are practices that influence mortality among the renal clientele, and they were predominantly present in the clientele studied. Literature suggests that excessive body weight is a protective factor for cardiovascular mortality in patients undergoing HD and that the Body Mass Index has an inverse relationship with mortality rates due to these diseases. However, this is true only when considering the negative effect of malnutrition in these patients. Thus, weight control and adequate nutritional support bring benefits to hemodialysis patients [17].

Finally, the clinical indicator Swallowing piece by piece, Awakening during sleep and Heartburn are evidence of impaired swallowing according to NANDA International, which is defined as abnormal functioning of the swallowing mechanism associated with deficits in the oral, pharyngeal or oesophageal structure or function [8]. Therefore, these are not directly related to renal dysfunction, but affect the nutritional status of these patients and have a close relationship with the critical condition of the hospitalized patient, typical of the clientele studied.

Conclusion

Thus, based on the above, the identification of clinical indicators of nutrition among hemodialysis clientele indicates the striking frequency of changes present in these patients in the field Nutrition, which shows the nursing phenomena related to the nutritional status of these clients. Thus, nursing interventions should be planned to this reality, with a view to obtaining accurate and effective positive results for nutritional safety of customers and consequent reduction of morbidity and mortality of these people.

The study leads to the conclusions that renal patients undergoing hemodialysis present clinical indicators of nutrition with significant frequency. Thirty-three clinical indicators in the Nutrition field related to human responses to renal dysfunction of hemodialysis patients, were identified. Among these, the following stand out: Altered blood pressure, Azotemia, Anxiety, Thirst, Decreased hemoglobin, Regular nutrition and Lack of information, all with high prevalence.

The clinical indicators identified in this study are subsidies for clinical judgment and diagnostic reasoning to identify the nursing diagnoses in order to translate nutritional phenomena of hemodialysis clientele that will drive the development of care plans that will meet the real needs of these patients. Therefore, as unique agents in the care provided to hemodialysis patient, nurses have the duty to investigate these signs and symptoms to lead to the systematization of effective assistance, achieving real changes in the clinical situation of hemodialysis patients. This will reflect in an improvement in the quality of life and will contribute to advancing the practice of care and the possible influence on morbidity and mortality indices.

The limitations found in the present study were related to its development in a single center, which minimizes the coverage of the results. However, the characteristics highlighted in this study are in line with other national and international contexts, which gives opportunity to more robustness to the evidence found. The development of new multicenter studies is suggested in order to enable the comparison of results, as well as new study designs that may promote the development of nursing interventions to complement the results of the present study.

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