TEXTO & CONTEXTO ENFERMAGEM
TEXT & CONTEXT NURSING TEXTO & CONTEXTO ENFERMERÍA

KNOWLEDGE AND CARE PRACTICE OF NURSES OF INTENSIVE CARE UNITS REGARDING ACUTE KIDNEY INJURY

Geórgia Alcântara Alencar Melo[1]
Renan Alves Silva[2]
Nelson Miguel Galindo Neto[3]
Maria Alzete de Lima[4]
Maria de Fátima Antero Sousa Machado[5]
Joselany Áfio Caetano[1]

[1]Universidade Federal do Ceará, Departamento de Enfermagem. Fortaleza, Ceará, Brasil.
[2]Universidade Federal do Espírito Santo, Centro Universitário do Norte do Espírito Santo. São Mateus, Espírito Santo, Brasil.
[3]Instituto Federal de Educação, Ciência e Tecnologia de Pernambuco. Pesqueira, Pernambuco, Brasil.
[4]Universidade Federal do Rio Grande do Norte. Natal, Rio Grande do Norte, Brasil.
[5]Fundação Oswaldo Cruz, Programa de Pós-Graduação em Saúde da Família. Fortaleza, Ceará, Brasil.

ABSTRACT

Objective: to evaluate the knowledge and care practice of nurses in the care of patients with acute kidney injury in an intensive care unit.

Method: cross-sectional study with 136 nurses from seven large public hospitals. Knowledge was measured by a questionnaire with 25 objective questions; and care practice, by a checklist with 15 questions. The instrument was created for this research and evaluated by judges regarding reliability, criterion and construct. Correlation tests, bivariate and multivariate analyses were used for data analysis.

Results: the percentage of nurses' knowledge about acute kidney injury was 44.96%. The questions with the highest rates of correct answers dealt with nursing care. The percentage of execution of the practice was 47.54%. The most complete care was: applies protocol if the patient becomes hypotensive (89.7%); and checks skin condition, respiratory pattern and peripheral perfusion in complications (88.2%). Regarding professional data, it was observed that having a specialization in intensive care (p=0.034) and attending nephrology in specialization (p=0.030) were determining factors for greater knowledge, while specialization in intensive care (p=0.019) was a determining factor for practice.

Conclusion: nurses obtained inadequate knowledge and care practice. It was observed that professionals with specialization in intensive care who attended a discipline or training in the area of nephrology showed better knowledge and care practices, when compared to those who did not. These data contribute to the construction of institutional policies that prioritize permanent education strategies in intensive care units.

DESCRIPTORS: Knowledge. Professional practice. Acute kidney injury. Nursing care. Intensive care units. Hemodialysis hospital units.

CONHECIMENTO E PRÁTICA ASSISTENCIAL DE ENFERMEIROS DE UNIDADES DE TERAPIA INTENSIVA SOBRE INJÚRIA RENAL AGUDA

RESUMO

Objetivo: avaliar conhecimento e a prática assistencial dos enfermeiros no cuidado do paciente com injúria renal aguda em unidade de terapia intensiva.
Método: estudo transversal, com 136 enfermeiros de sete hospitais públicos de grande porte. O conhecimento foi mensurado por questionário, com 25 questões objetivas; e a prática assistencial, por *checklist,* com 15 questões. O instrumento foi criado para esta pesquisa e avaliado por juízes, quanto à confiabilidade, critério e constructo. Utilizaram-se de testes de correlação, análises bivariadas e multivariadas para análise de dados.
Resultados: o percentual de conhecimento dos enfermeiros sobre injúria renal aguda foi 44,96%. As questões com maiores índices de acertos trataram dos cuidados de enfermagem. A porcentagem de execução da prática foi 47,54%. Os cuidados mais adimplidos foram: institui protocolo, se o paciente ficar hipotenso (89,7%); e checa condição de pele, padrão respiratório e perfusão periférica em intercorrência (88,2%). No que tange aos dados profissionais, observou-se que possuir especialização em terapia intensiva (p=0,034) e cursar disciplina Nefrologia na especialização (p=0,030) foram fatores determinantes para maior conhecimento, enquanto especialização em terapia intensiva (p=0,019) foi para prática.
Conclusão: os enfermeiros obtiveram conhecimento e prática assistencial inadequados. Observou-se que os profissionais com especialização em terapia intensiva que cursaram disciplina ou capacitação em Nefrologia demonstraram melhor conhecimento e maior execução dos cuidados, quando comparados aos que não o tinham. Esses dados contribuem para construção de políticas institucionais que priorizem estratégias de educação permanente em unidades de terapia intensiva.

DESCRITORES: Conhecimento. Prática profissional. Lesão renal aguda. Cuidados de enfermagem. Unidades de terapia intensiva. Unidades hospitalares de hemodiálise.

CONOCIMIENTO Y PRÁCTICA ASISTENCIAL DE ENFERMERAS DE UNIDADES DE CUIDADOS INTENSIVOS SOBRE LESIÓN RENAL AGUDA

RESUMEN

Objetivo: evaluar el conocimiento y la práctica asistencial del enfermero en la atención de pacientes con insuficiencia renal aguda en una unidad de cuidados intensivos.
Método: estudio transversal con 136 enfermeras de siete grandes hospitales públicos. El conocimiento se midió mediante un cuestionario, con 25 preguntas objetivas; y práctica de asistencia, por lista de verificación, con 15 preguntas. El instrumento fue creado para esta investigación y evaluado por jueces, en cuanto a confiabilidad, criterio y constructo. Para el análisis de los datos se utilizaron pruebas de correlación, análisis bivariados y multivariados.
Resultados: el porcentaje de conocimiento de las enfermeros sobre la lesión renal aguda fue del 44.96%. Las preguntas con mayores tasas de éxito se refieren a los cuidados de enfermería. El porcentaje de ejecución de la práctica fue del 47.54%. Los cuidados más cumplidos fueron: se instituye el protocolo, si el paciente se pone hipotenso (89.7%); y condición cutánea comprobada, patrón respiratorio y perfusión periférica intercurrente (88.2%). En cuanto a los datos profesionales, se observó que tener especialización en cuidados intensivos (p = 0.034) y cursar la disciplina Nefrología en especialización (p = 0,030) fueron factores determinantes para un mayor conocimiento, mientras que la especialización en cuidados intensivos (p = 0.019) fue para practicar.
Conclusión: los enfermeros obtuvieron conocimientos y prácticas de cuidados inadecuados. Se observó que los profesionales con especialización en cuidados intensivos que cursaron disciplina o formación en Nefrología mostraron mejor conocimiento y mayor ejecución del cuidado, en comparación con los que no lo tenían. Estos datos contribuyen a la construcción de políticas institucionales que prioricen estrategias de educación permanente en unidades de cuidados intensivos.

DESCRIPTORES: Conocimiento. Práctica profesional. Lesión renal aguda. Cuidado de enfermería. Unidades de cuidados intensivos. Unidades hospitalarias de hemodiálisis.

INTRODUCTION

In recent decades, there has been an increasing incidence of Acute Kidney Injury (AKI) in critically ill patients admitted to Intensive Care Units (ICU); often, of a multifactorial nature, due to hypovolemia, sepsis, hemodynamic diseases and medications,[1–2] which implies the need for hemodialysis, increased hospitalization time, and may even progress to Chronic Kidney Disease and death.[3–5]

The incidence of AKI in patients admitted to hospitals is alarming, both in the pediatric and adult audiences, followed by an increasing overall mortality rate of AKI, which reach a percentage of 46%.[6]

It is known that, despite the great advances in treatment, the complications of AKI contribute significantly to the increase in morbidity and mortality of critically ill patients. The mortality rate ranges from 30 to 90% in patients who are in the ICU due to AKI, associated with these underlying disease: sepsis, respiratory failure and severe trauma.[7] Regarding the national literature, an incidence of 44.7% of AKI in ICU patients was found.[8]

In this sense, this clinical condition should be treated with clinical measures and, if refractory to treatment, with dialysis therapy. One study[9] shows that hemodialysis is prescribed for six to 13% of patients who are hospitalized in the ICU and has a high mortality rate (50 - 80%) resulting from the treatment.

When considering the data presented, nurses urgently need to seek knowledge for this specific demand of nephrology and improve practices, in order to ensure that the care provided is effective and safe to patients with kidney dysfunction, in order to identify the problems and complications early, as well as how to institute effective interventions in order to reduce this clinical condition.[10–11]

A gap is noted in the national and international literature regarding the assessment of how nurses care for, learn and sustain knowledge and skills for safe practice in patients undergoing hemodialysis.[12]

In a study conducted in two Brazilian states on prevention, diagnosis and treatment of AKI, in which the knowledge of 216 nurses working in the ICU was analyzed, it was found that most did not identify the clinical manifestations of AKI (57.2%); its incidence (54.6%) and its index (87.0%); the impact of serum creatinine on mortality (67.1%); and measures to prevent AKI (66.8%) were unknown.[13]

Due to the problems presented and the research gap in nephrological nursing, the question arose: what is the knowledge and care practice of intensive care nurses regarding patients with acute kidney injury in intensive care units?

The possibility of evaluating knowledge and practice to patients with AKI may contribute to the choice of strategies that favor better quality of care and safety, supporting proposals to modify the reality, in order to also benefit the assisted clientele, since during the training process, there are few experiences and practices directed to the care of patients in renal replacement therapy , a reason that hinders the nursing approach to patients with AKI.

Therefore, it is essential to evaluate knowledge and nursing care practice, so that educational interventions are planned based on a situational diagnosis. Thus, the study aimed to evaluate the knowledge and care practice of nurses in the care of patients with acute kidney injury in an intensive care unit.

METHOD

This cross-sectional study was carried out in seven public hospitals in the state network of Ceará which provides hemodialysis as a therapeutic modality in the ICU.[14] The Health Department of the State of Ceará (SESA) has 11 hospitals, eight in the capital and three outside the capital. Among these, four hospitals were excluded. Three that attended the specialties: pediatrics, gynecology-obstetrics and psychiatry; as well as one which was inaugurated after the data collection period. Inclusion criteria were defined for intensive care units: adult patients with general, neurological and cardiovascular clinical conditions, because they present a clinical profile and a similar amount of dialysis.

It is emphasized that the seven hospitals have a homogeneous clinical profile of patients. It was underestimated that there would be dialysis homogeneity since the amount in each intensive care unit was similar, with a minimum of 378 and a maximum of 417 dialysis sessions per month.

The formula for finite population was adopted to calculate the sample size, considering the total of 210 nurses, distributed in the seven hospitals, 5% confidence coefficient and 50% proportion of the outcome to maximize the sample, using epi info 3.5 for respective calculation. Thus, 136 nurses were obtained, who were recruited proportionally to the total of those who worked in intensive care units of each hospital, who were selected by non-probabilistic sampling, for convenience.

The inclusion criterion was: having at least one year of experience in adult ICU. The exclusion criterion was to be absent, for any reason, during the data collection period (maternity leave, vacation or illness); and to be a nephrologist nurse, in order to reduce bias regarding knowledge.

The data collection instrument was composed of two parts and developed using an integrative review and focus group. In the integrative review, the six phases were completed.[15] The main question of the study was: what knowledge and care practice do intensive care nurses need to care for patients with acute kidney injury in the intensive care environment?

The survey occurred in the databases: LILACS, CINAHL, Scopus and PubMed, using the crossing of the descriptors Injúria Renal Aguda/*Acute Kidney Injury* OR Insuficiência Renal/*Renal Insuficiency* AND Unidades de Terapia Intensiva/*Intensive Care Units* OR Cuidados críticos/*critical care* AND Cuidados de Enfermagem/*Nursing Care* OR Enfermagem/*Nursing* in the VHL (Virtual Health Library) in the last ten years.

119 studies were found in total in electronic databases, 54 from PubMed, 23 from CINAHL and 42 from Scopus. Among these, 66 were analyzed in full and 57 were excluded for not answering the research question. Nine studies were selected. Regarding results, 12 nursing interventions were identified, included and recognized by the nursing interventions classification,[16] and three that were not. Thus, it was decided to include in the checklist. Regarding knowledge, the importance of knowledge was verified in the following aspects: nursing care, dialysis complications and machine management, clinical manifestations, diagnostic markers, causes, definition and method of kidney function assessment.

For the development of the focus group, the institutions that work in the care of acute kidney injury patients in Ceará were sought (eight services: five private clinics and three large public hospitals); and contacts were established with these health services, in order to contact the professionals (13 nurses), through invitations sent by e-mail.

The sample consisted of ten nephrology nurses. The focus group occurred in two meetings. Data collection started from the following direction: talk about their perception of the knowledge intensive nurses need who cares for people with acute kidney injury. List the nursing care practice necessary for safe care practice. The audios were recorded, fully transcribed and submitted to content analysis. Three empirical categories emerged: pathophysiological knowledge of the disease; nursing care before, during and after dialysis; management and monitoring of equipment during dialysis therapy.

Regarding knowledge evaluation, the instrument consisted of 25 multiple choice questions about definition, causes of AKI, kidney function assessment methods, diagnostic markers, laboratory tests, clinical manifestations, dialysis complications and nursing care. It is emphasized that the questions had as answer options the items 'a', 'b', 'c', 'd' and 'e', being a single correct item.

The contents addressed the following themes: (1) definition of AKI; (2) specific markers of AKI to establish diagnosis; (3) reference values for creatinine; (4) identification of the patient diagnosed with AKI according to some parameters; (5) nurses' actions in relation to the risks of hyperkalemia; (6) most common hydroelectrolytic disorders; (7) identification of hydroelectrolytic complications in dialysis therapy; (8) pathophysiology of AKI; (9) index that best represents the mortality rate of patients who develop AKI in the intensive care environment; (10) main signs and symptoms of the patient with AKI; (11) main cause of AKI; (12) causes of prerenal AKI; (13) causes of postrenal AKI; (14) causes of intrarenal AKI; (15) maintenance of hemodialysis access; (16) more frequent complication in AKI; (17) complications related to the extracorporeal blood circuit; (18) nurses' actions in the face of hydroelectrolytic complications in dialysis therapy; (19) electrolyte monitoring; (20) how to proceed when an accidental air infusion occurs in the system; (21) roles of nurses at the time of hemodialysis, addressing everything that concerns dialysis therapy; (22) diet control; (23) identification and control of eating disorders; (24) complications related to vascular venous access; and (25) nursing and maintenance care with hemodialysis venous access device.

In relation to care practice, a checklist was constructed from the nursing intervention proposed by the Nursing Interventions Classification (NIC) Hemodialysis Therapy (2100): (1) Review blood biochemistry before treatment (Urea, Creatinine, Sodium, Potassium and Bicarbonate); (2) Check and record vital signs (pressure, pulse, breathing, temperature) before treatment; (3) Check all equipment and solutions, including the extracorporeal circuit, in order to ensure that there are no bends and the connections are securely secured; (4) Wear gloves, eye protection, mask and protective clothing; (5) Check system monitors (flow rate, temperature, pH level, pressure, conductivity, clots, air pressure, negative pressure for ultrafiltration and blood sensor) to ensure patient safety; (6) Monitor pressure, pulse, breathing, temperature and patient response during dialysis and at the end to compare with predialysis values; (7) Monitor coagulation times and adjust heparin administration according to the patient's clinical condition; (8) Adjust the filtration pressures to remove the appropriate amount of liquids; (9) Establish a protocol if the patient becomes hypotensive; (10) Provide care to the catheter or fistula (dressing); (11) Make diet adjustments, impose limitations regarding liquid and medication intake that regulate water and electrolyte exchanges; (12) Check for skin conditions, respiratory pattern and peripheral perfusion in cases of complications.[16]

Three precautions were added that were not contained in the NIC, but which were deemed necessary to analyze: (13) To note the losses in the water balance at the end of dialysis; (14) Use the catheter for some purpose other than dialysis therapy; (15) Remain by the patient's side for the first five minutes of dialysis therapy. The checklist is dichotomous and has yes and no answer options which are to be filled out by nurses, according to the performance or absence of care.

The instrument was submitted to validation regarding clarity, construct, redundancy, relevance, types of conduct and failures regarding question structuring, by ten nephrologist nurses and PhD professors, with expertise in the theme of instrument construction and validation. In the validation process, the knowledge instrument obtained a Content Validity Index (CVI) of 92.5%; with percentage from 80% to 100%, minimum and maximum between items. Regarding the checklist, there was a general CVI of 96%; with a percentage of 90% to 100%, minimum and maximum, respectively.[17]

It is also noteworthy that this instrument presented Cronbach's alpha of 91.5% for the knowledge data collection instrument; as well as 84% for the checklist of care practice. Thus, it is observed that the instruments presented good reliability measures.

Data collection was performed in two moments: during a previous visit to the sector, explaining the study objective and invitation to participate, with completion of the free and informed consent form. At this time, the next appointment for the researcher's new return was scheduled. At the time, the knowledge and care practice instrument was filled out by the nurse, in the presence of the researcher. The two instruments were filled in at the same time and, at the end, they delivered them to the researcher, since in order to reduce the study's bias, their delivery at a later time was not allowed.

The statistical treatment of the data was carried out using the Statistical Package for the Social Science (SPSS) program, version 21.0. Descriptive statistics of the data, data normality verification tests, homogeneity test of variances and homoscedasticity of the variables were performed. After, the Student t-test, ANOVA and Pearson's correlation test were used to compare the averages of knowledge and care practice with training characteristics and professionals (gender, age, work shift, training institution, time of service, employment relationship, titration, specialization in ICU, having studied nephrology discipline, previously, or having done some training in the nephrology area). The Tukey test was performed to complement the analysis of variance.

The scores were assigned, using a previously used model,[18] according to the number of questions proposed in this study. Thus, the knowledge was considered adequate, when the nurse correctly answered 17 or more questions, in order to obtain a score greater than or equal to seven points; regular, when the nurse obtained between 12 and 16, obtaining scores between five and six; and inadequate with less than 12, with a score below five. Care practice was considered adequate when at least 10 of the 15 actions was performed, considering a score equal to or higher than seven points; regular, when they performed between six and nine; and inadequate, when they performed less than six nursing care actions.

The subjects were informed about the objectives of the study, signed the Free and Informed Consent Form and confidentiality and the possibility of withdrawal of consent at any time during the research was guaranteed.

RESULTS

Among the 136 nurses interviewed, the majority were female (n=106; 77.94%); aged between 23 and 68 years (mean of 37 years); had between one year and 35 years of experience (mean of 2.3 years). More than half of the nurses were outsourced employees, through a cooperative (n=72; 52.94%); they worked under labor law contracts (n=26; 27.94%).

As for the maximum titration, n=40; 29.41% of the participants only had an undergraduate degree; n=85; 62.5% were specialists; seven masters (5.14%) and four had PhDs (2.94%). Six nurses had participated in training or updating in the nephrology area, throughout the professional trajectory, and none were trained by the hospital.

The number of questions answered correctly by the participating nurses about AKI varied according to the percentage of correct answers, by content and questions presented in Table 1.

Table 1 – Knowledge of intensive care unit nurses regarding
acute kidney injury. Fortaleza, CE, Brazil, 2016. (n=136)

Content addressed in the questions	Questions	Knowledge n (%)	Classification
Nursing care	Acid-base and electrolyte control	116 (85.3)	Adequate
	Access Maintenance for dialysis	114 (83.8)	Adequate
	Hydroelectrolytic control	113 (83.1)	Adequate
	Device maintenance for venous access	85 (62.5)	Regular
	Hemodialysis therapy	83 (61.0)	Regular
	Control of eating disorders	56 (41.2)	Inadequate
	Electrolyte monitoring	46 (33.8)	Inadequate
	Nutrition Control	34 (25.0)	Inadequate
Dialysis complications and machine management	Complications related to vascular venous access	72 (52.9)	Inadequate
	Air infusion in the system	66 (48.5)	Inadequate
	Identification of hydroelectrolytic complications in dialysis therapy	56 (41.2)	Inadequate
	Risks of hyperkalemia	55 (40.4)	Inadequate
	Complications related to extracorporeal blood circuit	53 (39.0)	Inadequate
	Mortality of Acute Kidney Injury in the Intensive Care Unit	15 (11.0)	Inadequate
Clinical manifestations	Signs and Symptoms of Acute Kidney Injury	87 (64.0)	Regular
Diagnostic markers	Specific Markers of Acute Kidney Injury	85 (62.5)	Regular
	Reference values for creatinine	35 (25.7)	Inadequate
	Most common electrolyte disorders	20 (14.7)	Inadequate
Causes	Cause of Acute Kidney Injury	77 (56.6)	Regular
	Intrarenal Causes of Acute Kidney Injury	65 (47.8)	Inadequate
	Postrenal causes of Acute Kidney Injury	34 (25.0)	Inadequate
	Prerenal Causes of Acute Kidney Injury	18 (13.2)	Inadequate
Definition	Pathophysiology of Acute Kidney Injury	68 (50.0)	Regular
	Definition of Acute Kidney Injury	58 (42.6)	Inadequate
Kidney function assessment method	Diagnosis of Acute Kidney Injury	18 (13.2)	Inadequate
Average percentage of hit		61.16 (44.96%)	Inadequate

The average percentage of correct knowledge among the participating nurses working in the ICU, based on the questionnaire, was 44.96%, considered inadequate. The questions with the highest rates of correctly address nursing care: acid-basic and electrolyte control (85.3%), maintenance of access to dialysis (83.8%) and hydroelectrolytic control (83.1%). Those with the lowest rates were regarding dialysis complications and machine management, in addition to the causes and methods of kidney evaluation: mortality due to AKI in the ICU (11%) and pre-renal causes and the diagnosis of AKI with 13.2%.

The nursing care performed by the participating nurses during hemodialysis is presented in Table 2.

Table 2 – Care practice of intensive care unit nurses during hemodialysis. Fortaleza, CE, Brazil, 2016. (n=136)

Care performed by nurses in the ICU during hemodialysis	Performs care n (%)	Classification
Reviews blood biochemistry before treatment	42 (30.9)	Inadequate
Monitors clotting times and adjusts heparin administration according to the patient's clinical condition	32 (23.5)	Inappropriate
Adjusts filter pressures to remove the proper amount of liquids	83 (61.0)	Regular
Checks all equipment and solutions as well as checks the extracorporeal circuit in order to ensure that there are no bends and the connections are securely secured	16 (11.8)	Inadequate
Checks and records vital signs before treatment	93 (68.4)	Regular
Wears gloves, eye shield, mask and protective clothing	75 (55.1)	Regular
Performs diet adjustments, with limitations of liquids and medications that regulate water and electrolyte exchanges	12 (8.8)	Inadequate
Establishes protocol, if the patient becomes hypotensive	122 (89.7)	Adequate
Stays by the patient's side for the first five minutes	51 (37.5)	Adequate
Uses the catheter for purposes other than dialysis therapy	54 (39.7)	Regular
Monitors the patient's pressure, pulse, breathing, temperature and response during dialysis and, at the end	45 (33.1)	Inadequate
Check system monitors to ensure patient safety	15 (11.0)	Inadequate
Check skin conditions, respiratory pattern and peripheral perfusion in cases of complications	120 (88.2)	Adequate
Provides care for the catheter or fistula (dressing)	108 (79.4)	Adequate
Notes the losses in the water balance chart at the end of the session	102 (75.0)	Adequate
Average care performed	57.46 (47.5%)	Inadequate

The amount of care performed by ICU nurses was 47.54%. The most performed care was: institutes protocol, if the patient becomes hypotensive 122 (89.7%); checks skin condition, respiratory pattern and peripheral perfusion, in cases of complications 120 (88.2%); and provides care to the catheter or fistula (dressing) 108 (79.4%). The types of care actions that presented the greatest fragility were: performs diet adjustments, with limitations regarding liquids and medications that regulate water and electrolytic exchanges 12 (8.8%); checks all equipment and solutions, as well as checks the extracorporeal circuit, in order to ensure that there are no folds and the connections are well fixed 16(11.8%); and checks the system monitor to ensure patient safety 15 (11.0%).

When comparing the means of knowledge with training and professional characteristics, it was found that the variables that presented statistically significant differences were: original training, ICU specialization and attending discipline in the nephrology area.

It was found that 27.94% received nursing degrees from a state educational institution, with an average of 11.42 for knowledge among the assertive ones, with statistically significant differences (p=0.042). When calculating the Tukey test, it was proved that graduating from a state university was decisive for better nursing knowledge (Table 3).

Regarding specialization in the ICU, it is reported that 63.23% of nurses who had specialization in this area had an average knowledge of 12.51 (p = 0.034). Regarding the nurses who attended the nephrology discipline, in the specialization in ICU, 19.11% had an average of 11.34, when compared to those who did not attend the discipline, 10.327 (p = 0.030) (Table 3).

Table 3 – Statistical difference of the average knowledge of intensive care unit nurses regarding acute kidney injury. Fortaleza, CE, Brazil, 2016. (n=136)

Sociodemographic variables	N	Average	Deviation Default	T	GI	p	Tukey Test
Work shift							
Daytime	88	10.70	±2.71	1.06	134	0.271	
Night	48	10.18	±2.39				
Sex							
Female	107	10.68	±2.52	1.381	134	0.170	
Male	29	9.93	±2.87				
Training institution							
Federal	28	10.25	±2.74	3.256*	133	0.042*	0.039
State	38	11.42	±2.43				
Private	70	10.14	±2.56				
Employment type							
CLT employee	38	10.65	2.82	0.100	133	0.905*	
Civil servant	26	10.57	2.56				
Cooperative statutory scheme	72	10.43	2.53				
Titration							
Graduation	40	10.17	2.48	1.672	131	0.160*	
Specialization	83	10.48	2.67				
Residence	2	10.00	2.82				
Masters	7	12.85	1.57				
Doctorate	4	11.00	2.70				
Specialization in intensive care							
Yes	86	12.51	2.60	3.745	134	0.034	
No	50	10.54	2.64				
Attended the Nephrology discipline							
Yes	26	11.34	2.84	3.867	134	0.030	
No	110	10.32	2.52				
Nephrology Training							
Yes	6	11.66	1.86	1.101	134	0.273	
No	130	10.46	2.63				

Sociodemographic variables	Pearson Correlation Coefficient		p	95% Confidence Interval	
Age	- 0.126		0.143	-0.297	0.043
Working time	-0.107		0.215	-0.303	0.078

*ANOVA

Regarding nursing care in an intensive care unit, it was found that the variable that presented statistical difference was having ICU specialization (p=0.019) (Table 4). It is pointed out that 63.23% of the nurses investigated had this specialization and that they had an average of 6.74 in nursing care practice.

Table 4 – Statistical difference in the average of nursing care practice in an intensive care unit during hemodialysis. Fortaleza, CE, Brazil, 2016. (n=136)

	N	Average	Standard Deviation	T	Gl	p
Work shift						
Daytime	88	661	2.91	1.642	134	0.103
Night	48	5.83	2.07			
Sex						
Female	107	6.19	2.70	1.195	134	0.234
Male	29	6.86	2.47			
Training institution						
Federal	28	6.00	3.07	0.503	133	0.606*
State	38	6.65	2.54			
Private	70	6.30	2.56			
Employment type						
CLT employee	38	6.15	2.92	0.268	133	0.785*
Civil servant	26	6.65	2.85			
Cooperative statutory scheme	72	6.31	2.47			
Titration						
Graduation	40	6.45	2.20	0.590	131	0.600*
Specialization	83	6.40	2.89			
Residence	2	5.50	0.70			
Masters	7	6.28	1.60			
Doctorate	4	4.25	3.94			
Specialization in intensive care						
Yes	86	6.74	2.67	2.404	134	0.019
No	50	5.64	2.52			
Attended the nephrology discipline						
Yes	26	6.00	2.78	0.695	134	0.491
No	110	6.41	2.64			
Nephrology Training						
Yes	6	6.16	1.47	0.161	134	0.873
No	130	6.34	2.71			

Variables	Pearson Correlation Coefficient		P	95% Confidence Interval	
Age	0.067		0.441	-0.139	0.274
Working time	-0.041		0.635	-0.239	0.188

*ANOVA

DISCUSSION

Nursing care for patients with AKI is challenging to clinical practice, as it requires quick and effective clinical reasoning, judgment and decision-making. These discussions should encourage nurses to design better health care with a view to early detection and treatment of AKI.[19]

The nursing knowledge regarding hemodynamics, electrolyte and acid-basic balance as well as dressing care is evident since the percentage of the correct answers exceeded 80%. However, they present difficulties in relation to the kidney function assessment method, obtaining 13.2% of correct answers.

The competence and ability to evaluate dialysis complications are essential for ICU nurses in order to perform early identification and improve the clinical evolution of patients.[20] The dialysis complications and the management of the machines were below 50%: infusion of air in the system, identification of hydroelectrolytic complications in dialysis therapy, risks of hyperkalemia, complications related to the extracorporeal blood circuit and mortality due to acute kidney injury in the Intensive Care Unit.

The quantitative number of correct answers was obtained in relation to the diagnostic markers. Understanding the reference values for AKI, in addition to electrolyte disorders, are equally important for kidney function assessment, such as urea and creatinine levels.[5] The need for nurses to have knowledge about these questions lies in the early identification and staging of AKI,[21] in addition to the correct therapy indication.

Another important care action concerns nutritional therapy. It is necessary that nurses have knowledge about metabolic alterations in patients with AKI, so that they can act in a qualified manner, providing actions and means for patients to receive the necessary caloric needs.[22]

Therefore, it is verified that nurses should improve the care of patients on hemodialysis, through the promotion of clinical evaluation processes, in order to ensure adequate monitoring of renal function, by monitoring the volume of diuresis, as well as other clinical-laboratory indicators of renal failure.[12]

A study conducted in Canada, during nursing care for hemodialysis patients, reported concerns about education, competencies, preventive actions and the management of adverse events, such as filter coagulation or extracorporeal system and hemorrhages.[23] In the United Kingdom, the role of ICU nurses in the care and management of Renal Replacement Therapy (RRT) is related to the choice, installation, monitoring, evaluation and therapy interruption; in addition to providing 24-hour bedside observation, caring for and supporting the patient during dialysis therapy.[12]

It is noted that, although there is no consensus on the competencies of nurses in RRT, this protocol is recommended: operation of the machine; troubleshooting in dialysis complications; skills in checking and programming dialysis treatment parameters, as well as administration of medicines and solutions; management of vascular access; flow rate adjustment; appropriate time for discontinuation of the procedure. They also recommend that ICU nurses work in a transdisciplinary manner, with the inclusion of nephrologist nurses, aiming at comprehensive care in RRT.[23]

It is known that hemodialysis is an extracorporeal process, carrying risks and complications. In this study, a low level of knowledge related to diagnostic markers was observed, which compromises preventive care. Therefore, recognizing the prevention of complications is an important part of nursing management and patient care. It is essential for nurses to check the circuit lines before the start of therapy, in order to avoid bleeding or coagulation in the system; as well as to stay by the patient's side at the beginning of dialysis therapy in order to deal with alarms quickly and avoid complications such as gas embolisms or elevated venous pressure.[12]

The role of nurses in maintaining and caring for the catheter is to avoid infections. In this regard, it was identified that the nurses in this study did not know these aspects, considering them essential for performing RRT. Thus, access should be dedicated for single purpose (hemodialysis) and used in other cases, only when there is a risk to life. Any type of manipulation must be carried out using aseptic techniques and principles. The dressing must be sterile, transparent and semi-permeable, with periodic dressing changes performed every seven days or earlier, if it is no longer intact.[24]

The majority (69.1%) of the nurses did not perform laboratory tests before starting dialysis therapy in order to perform electrolyte replacement. However, nursing interventions essential to patients with AKI are electrolyte balance and prevention of complications, resulting from abnormal or unwanted levels of serum electrolytes.

It is essential that during the work process, managers encourage nurses working in the ICU to seek improvement in this respective area of knowledge. Furthermore, regarding this improvement, that AKI should be highlighted considering the epidemiological data. This study observed that professionals who have undergone specialization in ICU, attended nephrology discipline or received nephrology training have a better level of knowledge and nursing care practice in patients with AKI undergoing hemodialysis.

Thus, it is suggested that professional training use, among others, pedagogical strategies workshops and trainings and consider the following aspects: monitoring of abnormal serum levels and manifestations of electrolyte imbalance; maintenance of peripheral venous access; fluid and liquid administration; accurate recording of ingestion and elimination; maintenance of intravenous electrolyte solution with constant flow rate; administration of supplementary electrolytes; and obtaining serial samples for laboratory analysis of electrolyte levels.[25]

Furthermore, measures should be instituted to control excessive electrolyte loss, through intestinal control, change in the type of diuretic or administration of antipyretic; provide adequate diet in relation to the patient's electrolyte imbalance; enable a safe environment for the patient with neurological and/or neuromuscular manifestations of electrolyte imbalance; monitor the patient's reaction to prescribed electrolyte therapy, side effects of prescribed supplemental electrolytes, serum potassium levels using digitalis and diuretics; as well as cardiac monitoring.[25]

The study restricted geographic region is a limitation of this study. In addition to this, the evaluation of care practice, which could not be anchored from observational research. Therefore, it is necessary to conduct new research with the same theme, in order to identify the reality and specific need, so that it is possible to compare reality in different places and institutions.

CONCLUSION

The nurses in this study had inadequate knowledge and care practice. Those who specialized in ICU, attended discipline and/or nephrology training, demonstrated better knowledge and care practice when compared to those who did not.

Thus, the identification of knowledge deficit and aspects of inadequate care practice contributes to the construction of institutional policies that prioritize strategies of permanent education in the clinical practice of intensive care units. It is essential to include courses and training in hospitals, aimed at nurses from intensive care units, since it is these professionals who have direct care for these patients.

Planning joint actions with specific interventions can contribute to the early identification of risk factors for the development of kidney injury, in addition to cost reduction and protocol creation. In addition, directing nurses to training/continuing education courses support future interventions, according to contexts.

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NOTES

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Study design: Melo GAA, Caetano JÁ.
Data collect: Melo GAA.
Data analysis and interpretation: Melo GAA, Silva RA.
Discussion of the results: Melo GAA, Galindo Neto NM.
Writing and/or critical review of the content: Melo GAA, Caetano JÁ, Lima MA, Machado MFAS.
Review and final approval of the final version: Melo GAA, Silva RA, Galindo Neto RA, Caetano JÁ, Lima MA, Machado MFAS.

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CORRESPONDING AUTHOR
Geórgia Alcântara Alencar Melo
georgiaenf@hotmail.com