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CARDIORESPIRATORY ARREST: A DIALYSIS UNIT NURSING STAFF'S KNOWLEDGE

PARADA CARDIORRESPIRATÓRIA: CONHECIMENTO DA EQUIPE DE ENFERMAGEM DE UMA UNIDADE DE DIÁLISE

PARADA CARDIORRESPIRATORIA: CONOCIMIENTO DEL EQUIPO DE ENFERMERÍA DE UNA UNIDAD DE DIÁLISIS

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RESUMO

A mortalidade devido às complicações relacionadas a eventos cardiovasculares, dentre elas, a Parada Cardiorrespiratória (PCR), configura-se como uma das principais causas de óbito em portadores de Doença Renal Crônica em terapia renal substitutiva: a hemodiálise. Desta maneira, é de suma importância uma atuação efetiva da equipe de Enfermagem diante de uma PCR. Este estudo teve como objetivo avaliar o conhecimento dos profissionais de Enfermagem de uma unidade de diálise a respeito da PCR. Trata-se de um estudo transversal, descritivo, de abordagem quantitativa, realizado em uma unidade de diálise de um hospital de alta complexidade de Pernambuco, com 46 profissionais de Enfermagem, por meio de um instrumento contendo questões sobre PCR. A coleta de dados ocorreu de julho a agosto de 2019, sendo considerado, como conhecimento satisfatório, um escore >80%. Os dados foram analisados pelo *Statistical Package for the Social Sciences* (SPSS), versão 18. Ao verificar o nível de conhecimento percentual geral dos profissionais avaliados, verifica-se que eles possuem uma mediana de 44,4 do total de conhecimentos acerca da PCR, um conhecimento insatisfatório. Este estudado evidenciou um conhecimento insatisfatório dos profissionais de Enfermagem de uma unidade de diálise sobre PCR. Sugere-se uma capacitação imediata com todos os profissionais da unidade pesquisada para que estes possam melhorar os atendimentos à vítima de PCR.
Palavras-chave: Diálise Renal. Parada Cardíaca. Enfermagem.

ABSTRACT

Mortality due to complications related to cardiovascular events, among them, cardiorespiratory arrest (CRA), is one of the main causes of death in patients with Chronic Renal Disease in renal replacement therapy: hemodialysis. Thus, it is of utmost importance that the Nursing team acts effectively in the face of a CRA. This study aimed to evaluate the knowledge of nursing professionals in a dialysis unit regarding CRA. This is a cross-sectional, descriptive, quantitative approach study, performed in a dialysis unit of a high complexity hospital in Pernambuco, with 46 nursing professionals, by means of an instrument containing questions about CRA. Data collection took place from July to August 2019, with a score of >80% being considered satisfactory knowledge. The data were analyzed by the Statistical Package for the Social Sciences (SPSS), version 18. When checking the level of general percentage knowledge of the professionals evaluated, it is verified that they have a median of 44.4 of the total knowledge about CRA, an unsatisfactory knowledge. This study showed an unsatisfactory knowledge of the nursing professionals of a dialysis unit on CRA. It is suggested an immediate training with all professionals of the researched unit so that they can improve the care to the CRA victim.
Keywords: Renal Dialysis. Cardiac arrest. Nursing.

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RESUMEN
Este estudio tuvo como objetivo evaluar el conocimiento de los profesionales de Enfermería de una unidad de diálisis sobre la PCR. Se trata de un estudio descriptivo, transversal, con abordaje cuantitativo, realizado en una unidad de diálisis de un hospital de alta complejidad en Pernambuco, con 46 profesionales de Enfermería, utilizando un instrumento que contiene preguntas sobre PCR. La recogida de datos se llevó a cabo de julio a agosto de 2019, considerándose como conocimiento satisfactorio una puntuación> 80%. Los datos fueron analizados por el *Statistical Package for the Social Sciences* (SPSS), versión 18. Al verificar el nivel de conocimiento porcentual general de los profesionales evaluados, se verifica que tienen una mediana de 44,4 del conocimiento total sobre PCR, un conocimiento insatisfactorio. Este estudio mostró un conocimiento insatisfactorio de los profesionales de Enfermería en una unidad de diálisis sobre PCR. Se sugiere una formación inmediata a todos los profesionales de la unidad investigada para que puedan mejorar la atención a la víctima de CPA.
Palabras-clave: Diálisis Renal. Paro Cardiaco. Enfermería.

INTRODUCTION

Chronic Kidney Disease (CKD) patients are susceptible to several cardiovascular events, which are the leading cause of death in dialysis patients[1]. The pathophysiology of cardiac arrhythmias in chronic renal disease patients is complex and is directly related to changes in cardiac structure caused by CKD, associated with several events, such as: hydro-electrolytic and hormonal disorders, use of arrhythmogenic drugs and those related to the dialysis procedure[2].

CKD is currently characterized as a public health problem. According to the Ministry of Health, this pathology affects millions of people around the world, considerably increasing public health costs and raising morbidity and mortality rates[3]. Annually, the number of patients in Replacement Renal Treatment increases considerably, including in Brazil, which, according to a report surveyed annually by the Brazilian Society of Nephrology (BSN), from 2004 to 2015, showed a real increase in prevalence, from 59,153 patients on dialysis programs to 91,314.[3]

In the US, for example, about 13% of the population has some degree of renal impairment and the prevalence rate has increased by about 3% per year from 2008 to 2013. In Japan, the mortality rate of patients on hemodialysis reaches 9%.[4] In Brazil, the estimated annual incidence of chronic renal patients in Replacement Renal Therapy (RRT) is 8% and approximately 90% of these patients enter the HD program, 85% of them in units associated with the Unified Health System[2] (UHS). In comparison, the number of new patients in the United States in 2017 was 123,688, more than three times the Brazilian number. But the American incidence has been stable for many years, while in Brazil it is growing.[5]

From this perspective, cardiorespiratory arrest (CRA) represents a great challenge for the professionals who witness it. CRA is understood to be the cessation of activities of the heart, circulation and breathing, recognized by the absence of pulse or signs of circulation, the patient being unconscious. It is the final event in a series of clinical pictures that can result in irreversible brain damage if the necessary measures such as resuscitation maneuvers are not taken.[6]

Measures and attitudes adopted during a CRA situation should be shown to be effective and initiated in the shortest time possible. Thus, when faced with a CRA, time is the main determinant of success, since every minute lost reduces the chance of survival by 10%.

A North American study has shown that the risk of CRA in the dialysis period is higher among patients with coronary disease, heart failure, low dialysate potassium levels, high serum calcium, hypoalbuminemia, low weight, low hemoglobin. Complications of the cardiovascular system represent some of the main factors that can cause death in dialysis patients. It is safe to say, therefore, that this is the greatest clinical emergency that threatens an individual's life, and being able to detect it and correct it in time makes all the difference in patient care.[7] The high rates of complications of patients in dialysis treatment, among them, CRA, have emerged due to the interest in the subject, since it is necessary that Nursing professionals are able to act in an emergency situation such as CRA.

This work aims to evaluate the knowledge of nursing professionals in a dialysis unit regarding CRA.

METHOD

This is a cross-sectional, descriptive, quantitative approach study carried out in the hemodialysis sector of a university hospital in Recife-PE. The study population consisted of all nurses and Nursing technicians who act directly in the care and execution of daily tasks and care of patients undergoing dialysis treatment. The sample was census, totaling 35 professionals and, of these, 26 participated in the survey. Data collection occurred after the approval of the work by the Ethics Committee of the Clinical Hospital under the Consubstantiated Opinion No. 3,570,796.

For data collection, a specific instrument (questionnaire) was created, divided into two steps. The first stage of this instrument is composed of seven questions related to the socio-demographic data (age, gender, education level) and questions related to the work scale, function, training time and working time in the sector, which represent the independent variables. The second stage of the

instrument is made up of objective questions related to knowledge about CRA and composed of ten questions.

For the data analysis, a database was built in Epi Info, version 3.5.4, where the validation of the data was performed (double typing for later comparison and correction of the divergences). After validation, the bank was exported to SPSS software, version 18, where the analysis was performed. In order to characterize the personal and professional profiles of the staff of the evaluated service, the percentage frequencies were calculated and the respective frequency distributions of the evaluated factors were constructed. In addition, frequency distributions of questions related to professionals' knowledge about CRA have been constructed.

For the measurement of knowledge, a score from zero to 100 points was assigned to professionals according to the number of hits achieved in responses to knowledge evaluation items. To assess the normality of the knowledge score, the Shapiro-Wilk test was applied. Once the normality of the score was indicated, the comparison of the level of knowledge of the professionals between the different categories of personal and professional profiles was performed by applying the Mann-Whitney and Kruskal-Wallis test. All the conclusions were made considering the significance level of 5%.

RESULTS

In Table 1, presents the socio-demographic profile of the participating.

The proportion comparison test was significant in all factors evaluated, except for age (p-value = 0.152) and work scale (p-value = 0.076), indicating that the number of professionals is similar between age groups and work scale.

Table 1. Distribution of the socio-demographic profile of the participating professionals. Recife (PE), Brazil, 2019.

Variable	n	%	p-value[1]
Sex			
Female	24	92.3	<0.001
Male	2	7.7	
Age			
25 to 34 years	8	30.8	
35 to 44 years	13	50.0	0.152
45 to 54 years	5	19.2	
Education			
Highschool	4	15.4	
Technical	4	15.4	0.001
Higher education	18	69.2	
Work schedule			
On call 12X36	14	53.8	0.076

On call 12X60	5	19.2	
Daily shift	7	27.0	
Training time			
1 to 4 years	4	15.4	
5 to 8 years	3	11.5	0.025
9 to 12 years	6	23.1	
+ 12 years	13	50.0	
Role			
Nursing Assistant	2	7.7	
Nursing technician	14	53.8	0.013
Nurse	10	38.5	
Time working in the sector			
1 to 4 years	13	50.0	
5 to 8 years	8	30.8	0.006
9 to 12 years	1	3.8	
+ 12 years	4	15.4	

[1] p-value of Chi-square test for proportion comparison.

Table 2 shows the distribution of professionals' responses to questions related to knowledge in CRA.

Table 2. Distribution of factors related to the knowledge of the professionals evaluated. Recife (PE), Brazil, 2019.

Evaluated factor	n	%	p-value[1]
Q8- Do you know about the American Heart Association (AHA) 2015 guidelines changing from CRA?			
Yes	17	65.4	0.117
No	9	34.6	
Q9-What is the frequency of chest compressions in an adult according to the American Heart Association (AHA) 2015 guidelines?			
110-120/min	2	7.7	
105-110/min	1	3.8	
100-120/min	15	57.7	<0.001
Don’t know	8	30.8	
Q10- How deep are the chest compressions in the adult individual according to the American Heart Association (AHA) 2015 guidelines?			
5 to 6 cm	13	50.0	
5 to 8 cm	1	3.8	0.006
4 to 6 cm	4	15.4	
Don’t know	8	30.8	
Q11- In relation to victim care in in-hospital CRA, the order of the "chain of care" is?			
Recognition and activation of emergency medical service, immediate and high quality CPR, rapid defibrillation, advanced life support and post-CRA care, surveillance and prevention	5	19.2	0.009

Surveillance and prevention, recognition and activation of emergency medical service, immediate and high quality CPR, rapid defibrillation, advanced life support and post-CRA care	13	50.0	
Immediate and high quality CPR, emergency medical service recognition and activation, rapid defibrillation, advanced life support and post-CRA care, surveillance and prevention	7	26.9	
Don't know	1	3.8	
Q12-What drugs should be used in CRA, according to the American Heart Association (AHA) guidelines 2015?			
Epinephrine and Vasopressin	12	46.2	0.011
Amiodarona and Epinephrine	9	34.6	
Lidocaine and Vasopressin	1	3.8	
Don't know	4	15.4	
Q13- What drug was taken from the person's care in CRA?			
Vasopressin	9	34.6	0.085
Epinephrine	1	3.8	
Amiodarona	9	34.6	
Don't know	7	26.9	
Q14- What are the CRA rates that can be identified?			
Pulse-less ventricular tachycardia, pulseless electrical activity, asystole and ventricular fibrillation	15	57.7	0.024
Sinus arrhythmia, pulseless ventricular tachycardia, pulseless electrical activity and asystole	4	15.4	
Don't know	7	26.9	
Q15- Which CRA rhythms are shockable, i.e. in which the defibrillator can be used?			
Pulse-less ventricular tachycardia and ventricular fibrillation	13	50.0	0.191
Asystole and ventricular fibrillation	7	26.9	
Don't know	6	23.1	
Q16- For the patient with advanced airway, what is the frequency of ventilation?			
1 ventilation every six seconds	14	53.8	0.003
2 ventilations every eight seconds	3	11.5	
1 ventilation every eight seconds	2	7.7	
Don't know	7	26.9	
Q17- Performing the laboratory evaluation, Coronariography (CAT) and body temperature control are one of the main cares that should be performed post-CRA.			
True	14	53.8	0.054
False	8	30.8	
Don't know	4	15.4	

[1] p-value of Chi-square test for proportion comparison.

In table 3, there is the average and interquartile range of the percentage of knowledge of the professionals evaluated.

When checking the general percentage knowledge level of the professionals evaluated, it is verified that they have a median of 44.4 of the total knowledge about CRA.

Table 3. Median and interquartile range of the percentage of knowledge of the professionals evaluated. Recife (PE), Brazil, 2019.

Evaluated factor	Median	Interquartile range	p-value[1]
Sex			
Female	44.4	56.0	0.332[1]
Male	27.8	-	
Age			
25 to 34 years	66.7	69.0	
35 to 44 years	44.4	61.0	0.140[2]
45 to 54 years	11.1	56.0	
Education			
Highschool	27.8	28.0	
Technical	33.3	92.0	0.292[2]
Higher education	55.6	53.0	
Work schedule			
On call 12X36	44.4	64.0	
On call 12X60	11.1	61.0	0.251[2]
Daily shift	55.6	44.0	
Training time			
1 to 4 years	44.4	83.0	
5 to 8 years	55.6	-	0.469[2]
9 to 12 years	66.7	75.0	
+ 12 years	33.3	50.0	
Role			
Nursing Assistant	22.2	-	
Nursing technician	27.8	56.0	0.014[2]
Nurse	77.8	50.0	
Time working in the sector			
1 to 4 years	55.6	67.0	
5 to 8 years	38.9	72.0	0.321[2]
9 to 12 years	22.2	47.0	
TOTAL	44.4	58.0	-

[1] p-value of the Mann-Whitney test. [2] p-value of the Kruskal-Wallis test.

DISCUSSION

Regarding the sociodemographic data, a significant amount of females was observed in the dialysis unit studied (92.3%), which corroborates several similar studies, which performed a research in a post-graduation course of Nursing in Cardiology, which showed a prevalence of 92% of females. A study performed by nurses of Basic Care identified a prevalence of 88.6% of females.[7]

In this perspective, the predominance of the feminization of the Nursing team in Brazil can still be affirmed, and it can be observed in all levels of formation of the Nursing team, both superior and technical and auxiliary.

"Nursing in the health sector represents the largest contingent of workers, being marked by selectivity based on sex qualities. "[8]

A survey conducted in Spain also identified a high percentage of women (93.5%) among nursing professionals.[8]

In relation to age, there was a prevalence between the age group of 35 to 44 years old (66.7%), which demonstrates that the work force of Nursing is composed, in its majority, of relatively young professionals, corroborating Report of the Federal Council of Nursing that demonstrated that the majority of the age group of Nursing in Brazil, in the year 2010, was between 26 and 35 years old, representing 35.98% and with international study that demonstrated the age group between 25 and 35 years old.[9]

When observed the function it occupies in the sector of the researched professionals, the majority is composed by Nursing technicians (53%). Regarding the level of education of the population studied, 69.2% claim to have a higher education, reinforcing several researches in this follow-up, such as the studies that highlighted that 30% of technicians and assistants in Nursing do some higher education; the majority, in turn, in the area of Nursing itself. This phenomenon can be explained by the "over qualification" that the market demands nowadays and also by the possibility of socioeconomic ascension.[10]

Regarding the time of training, there was a predominance of professionals with more than 12 years of training (50.0%). There were no significant variances in relation to the time of training with the level of knowledge about CRA, which highlights the importance of constant training of these professionals.[11]

These findings reinforce several studies in this follow-up, which identified significant gaps in the knowledge of the profile of the professionals studied in this survey on CRA, such as a study conducted with 73 nurses from the State of São Paulo that highlighted the difficulty of these professionals on how to detect CRA; the sequence of basic life support and the ventilation/compression ratio (>60%); not knowing the immediate conducts after detection (>70%) and the rhythm patterns present in cardiac arrest (>80%) and that partially identified (100%) the drugs used in cardiopulmonary resuscitation.[11-12]

Regarding the professional category, when analyzed in isolation, nurses presented satisfactory knowledge on CRA, and a higher median was found in the group of professionals with the described profile (77.8 points). The distribution comparison test was significant only in the function factor (p-value = 0.014), indicating that nurses have significantly more knowledge than the other professionals evaluated.[13]

Nursing professionals have a significant deficit in providing care to victims of CRA, which may be due to a superficial and limited training during the graduation period or to a lack of interest in the professionals who have not trained and have updated themselves.[13]

Regarding the findings of the study on knowledge of nursing professionals, it was possible to identify insufficient knowledge of the team regarding CRA (44%), corroborating other similar studies, which identified that nursing professionals do not know the signs and symptoms that characterize CRA.[14] CRA is a clinical emergency, and recognition of the manifestations of this emergency is a priority procedure for every health professional, regardless of their specialty.[15] Thus, it is a priority that the Nursing team be able to recognize when a patient is in CRA or about to develop one.[14]

The technical-scientific knowledge of professionals who assist victims in CRA is among the most important determinants of success rates in CPR.[16] In a study of 147 participants on CRA, 89.80% of them failed in their knowledge and only 10.20% of the sample was approved. When associated with the standard of approval with the professional categories, it was observed that only 4.41% of nurses were approved.[16-17]

In a quantitative, quasi-experimental study conducted in three hospitals in Botswana with 154 nurses, a pre-test, intervention, post-test and a retest were performed after six months to determine the knowledge and skills in CPR. This study showed a markedly deficient knowledge and skills in CPR among the nurses registered in the three hospitals evaluated. The average score of pre-test knowledge (48%) corroborated this research and, after the intervention, there was an increase of 26.4% in relation to the knowledge of CRA among nursing professionals, determining that the success of CPR depends on frequent training and capabilities.[16]

In the daily performance of the health team, it is possible to identify circumstances that reinforce the importance of knowing the main situations that

involve the care of CRA. Many times, it is the nursing professionals who identify the CRA signals, triggering the emergency call. However, they do not initiate CPR maneuvers, limiting themselves to the organization of the CRA environment and waiting for the arrival of the medical team. Improving the quality of CPR is essential to reduce the mortality of individuals assisted in CRA.[17]

It is crucial that nursing professionals keep their knowledge and skills up to date for their attitudes towards resuscitation to be effective. In 2010, the International Liaison Committee on Resuscitation (ILCOR) reported that basic and advanced life support knowledge and skills were likely to deteriorate for a short period, approximately three to six months.[15]

CRA is one of the most important emergencies and its success is directly linked to the agility in the delivery of health services. Early identification, recognition of Basic and Advanced Life Support actions by professionals working in the hemodialysis sector and proper management of these cardiovascular events during hemodialysis are essential to save lives. Numerous studies have highlighted the importance of continuing education as a fundamental tool in the training of nursing professionals in order to enable teams to provide fast, safe and effective care, within what is recommended by American Heart Assossiation.[4,18]

CONCLUSION

It was observed that the nursing professionals of the hemodialysis unit presented an unsatisfactory knowledge about CRA, with a low median, however, when analyzed separately by professional category, the nurses presented satisfactory knowledge about CRA.

It is suggested an immediate training with all the professionals of the researched unit so that they can improve the care to the CRA victim. This study can serve to foster the importance of health team upgrades and training. As a limitation of the study, the scarcity of data on CRA in dialysis units can be described.

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