RESEARCH | PESQUISA

Knowledge of primary health care nurses about risk factors of acute kidney injury

Conhecimento dos enfermeiros da atenção primária à saúde sobre fatores de risco para Lesão Renal Aguda

Conocimiento de las enfermeras de atención primaria de salud sobre los factores de riesgo de lesión renal aguda

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ABSTRACT

Objective: To describe nurses' knowledge about the identification, prevention and self-care measures directed to Acute Kidney Injury (AKI) in hypertensive and / or diabetic patients in Primary Health Care (PHC). **Method:** Cross-sectional and quantitative study. Sample consisting of 57 nurses working in primary health care (PHC). The semi-structured questionnaire was adopted for data collection. A descriptive and inferential analysis was performed. The result with p≤0.05 was considered significant. **Results:** The nurses' profile was young (age 42 ± 9 years old) and professional practice time being 9 ± 6 years. Knowledge about general aspects related to AKI was identified as below average (48±19 points), however, although the concept was correctly described by a majority 41 (71.9%). Risk factors recognized as determinant for AKI were mostly drug exposure 56 (98.2%) and diabetes mellitus 49 (86%). The length of practice in PHC was associated with reduced knowledge about the need for referral to the nephrologist based on serum creatinine value (p=0.004). **Conclusion and implications for the practice:** Nurses' knowledge was insufficient for recognition of risk factors, prevention and self-care activities of kidney disease. Thus, there is a need for permanent training of nurses in PHC to optimize the early identification of AKI, avoiding progression, and chronification and complications of this disease.

Keywords: Acute Kidney Injury; Nursing Care; Knowledge; Primary Health Care.

RESUMO

Objetivo: Descrever o conhecimento dos enfermeiros sobre a identificação, medidas de prevenção e de autocuidado direcionadas à lesão renal aguda (LRA) em hipertensos e/ou diabéticos na atenção primária à saúde (APS). **Método:** Estudo transversal e quantitativo. Amostra constituída de 57 enfermeiros atuantes na APS. Adotou-se questionário semiestruturado para coleta de dados. Realizou-se análise descritiva e inferencial. Considerou-se significativo resultado com p≤0,05. **Resultados:** O perfil dos enfermeiros era jovem (idade 42± 9 anos) e tempo de exercício profissional de 9±6 anos. O conhecimento sobre aspectos gerais relacionados a LRA mostrou-se abaixo da média (48±19 pontos), embora, uma maioria, tenha descrito o conceito corretamente 41 (71,9%). Os fatores de risco relacionados à LRA foram majoritariamente: exposição às drogas 56 (98,2%) e diabetes mellitus 49 (86%). O tempo de atuação na APS aliado ao conhecimento insuficiente sobre alteração do valor da creatinina sérica implicou na decisão sobre a necessidade de encaminhamento ao nefrologista (p=0,004). **Conclusões e implicações para a prática:** O conhecimento dos enfermeiros mostrou-se insuficiente para reconhecimento dos fatores de risco, prevenção e autocuidado da doença renal. Evidencia-se, portanto, a necessidade de capacitação dos enfermeiros da APS para otimizar a identificação precoce da LRA, evitando progressão e cronificação dessa doença.

Palavras-chave: Lesão Renal Aguda; Cuidados de Enfermagem; Conhecimento; Atenção Primária à Saúde.

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RESUMEN

Objetivo: Describir el conocimiento de las enfermeras en materia de medidas de identificación, prevención y autocuidado, dirigidas a la lesión renal aguda (LRA) en pacientes hipertensos y / o diabéticos en atención primaria de salud (APS). **Método:** estudio transversal y cuantitativo. Muestra compuesta por 57 enfermeras que trabajan en atención primaria de salud (APS). Se adoptó un cuestionario semiestructurado para la recopilación de datos. Se realizó un análisis descriptivo e inferencial. El resultado con p≤0.05 se consideró significativo. **Resultados:** El perfil de las enfermeras se circunscribió a personas jóvenes (edad 42 ± 9 años) con tiempo de práctica profesional de 9 ± 6 años. Sin embargo, el conocimiento sobre los aspectos generales vinculados con la LRA se consideró por debajo del promedio (48±19 puntos), aunque el concepto se describió de manera adecuada por la mayoría (41, equivalente a 71.9%). Los factores de riesgo reconocidos como determinantes para la LRA fueron principalmente la exposición a medicamentos (56, equivalente a 98.2%) y la diabetes mellitus 49 (86%). La duración de la práctica en APS se asoció con un conocimiento reducido sobre la necesidad de derivación al nefrólogo basado en el valor de creatinina sérica (p=0,004). **Conclusiones e implicaciones para la práctica:** El conocimiento de las enfermeras era insuficiente para el reconocimiento de los factores de riesgo, prevención y autocuidado de la enfermedad renal. Por lo tanto, se advierte la necesidad de capacitación permanente de enfermeras en APS para optimizar la identificación temprana de LRA, y evitar la progresión, la cronificación y las complicaciones de la enfermedad.

Palabras clave: Lesión Renal Aguda; Atención de Enfermería; Conocimiento; Atención Primaria de Salud.

INTRODUCTION

Acute Kidney Injury (AKI) is an increasingly common clinical problem in the intra and out-of-hospital setting and is associated with both short and long term adverse outcomes, and chronic kidney disease (CKD) is increasingly recognized as one of the its main outcomes.[1]

Impaired renal function may be due to factors such as obesity, family history of kidney disease, glomerulopathies, autoimmune diseases, recurrent urinary tract infection, cardiovascular disease, high blood pressure, diabetes mellitus, and neoplasms.[2]

From this perspective, it is up to health professionals, including nurses, to acquire skills that support the identification of risk factors, as well as the establishment of preventive strategies.[3,4]

It is crucial to consider the AKI as an acute insult has been consistently associated with prolonged hospitalization and sometimes the need for dialysis, CKD progression and death.[5] Reduction in Estimated Glomerular Filtration Rate (eGFR) and albuminuria should be underestimated as indicators of suspected renal dysfunction.[6]

Admittedly, the triple "disease burden" in Brazil today is represented by the persistence of infectious diseases, the growth of external causes and chronic diseases. Among the main chronic diseases are diabetes mellitus (DM), systemic arterial hypertension (SAH), renal dysfunction and cardiovascular diseases. This triple burden, besides being a challenge for the health system, seems to predispose to high morbidity and mortality rates, especially due to the low resolution rate in the primary health care (PHC) level,[7] which in turn, acts as an interface in the implementation of health actions such as promotion, prevention, protection, diagnosis and treatment, mediated by the integrated care exercised by the multiprofessional team. The main strategy adopted in Brazil to meet the primary care model is the Family Health Strategy (FHS), in force at the Brazilian Public Health System (*Sistema Único de Saúde*, SUS).[8]

The FHS is the attention model to the health that aims to act with the population, considering its social, economic, political and epidemiological aspects, in order to support the identification of risk factors for illness and avoid the aggravation of a disease. Therefore, the competencies of the nursing professional must be integrated with the needs of the population, and in this context, health education is one of them.[9]

In primary care, the nurse acts to prevent and postpone the progression of noncommunicable chronic diseases (NCDs) through a comprehensive and interdisciplinary approach. These acute NCDs represent risky situations and nursing care, a differential in reducing the impacts and complications related to loss of renal function or reduced disease progression.[10]

Given the above, nursing care gains relevance when directed to prevention and health promotion, as measures such as these result in control and early detection of the disease, which minimizes complications and[11] establish improved quality of life and reduced health spending.

In this sense, this study aimed to describe the knowledge on the identification, prevention and self-care measures directed to acute kidney injury (AKI) in hypertensive and/or diabetic patients, from the nurse's perspective in the primary health care context.

METHOD

This is a cross-sectional and quantitative study, developed in the basic units of the western region of Brasilia, Federal District-Brazil, between August and December 2017. The sample was non-probabilistic (consecutive) and consisted of 57 PHC nurses.

Nurses with at least six months of work in PHC were included and those on sick or work leave and on vacation were excluded.

The operationalization of the research followed the following stages:

Stage 1: Visit to the basic unit for data collection at a time and date previously agreed with the nursing management, in order to minimize any interference in the care process performed by the nurse.

Stage 2: Application of semi-structured questionnaire with items related to identification, training and specific knowledge about renal function and self-care and prevention measures. The knowledge test totaled from zero to 100 points. The cutoff score was 50 points, so nurses with a score below 50 were considered with below average knowledge. The time to complete the questionnaire was 30 minutes and occurred in a private area of the work environment.

For statistical analysis, double entry and export of data from the *Microsoft Excel*® 2010 program for the IBM *Statistical Package for the Social Sciences (*SPSS®) version 23. Subsequently, descriptive analysis was performed with calculation of summary measures (absolute and relative frequency, mean, median) and dispersion measures (standard deviation and 25th and 75th percentiles). Normality when tested was asymmetric, so the nonparametric Mann-Whitney and Fisher's exact tests were adopted. The results with $p \leq 0.05$ were considered significant.

In compliance with Resolution 466/2012, this study was approved by the Research Ethics Committee of the Health Sciences Teaching and Research Foundation (*Fundação Ensino e Pesquisa em Ciências da Saúde*, FEPECS), opinion 2.283.651, CAAE: 46509915.3/0000.5553 were observed.

RESULTS

Fifty-seven PHC nurses with a young profile (age 42 ± 9 years old) and professional practice time being 9 ± 6 years participated in the study. Of this total, more than half of the 50 (87.7%) stated that they liked the type of activity performed in care practice, while six (10.5%) revealed the opposite feeling. Among the reasons for such imbalance, the following stood out as positive: the pleasure itself for exercising activities inherent to the position,

mentioned by 31 (54.4%) participants, as well as the personal identification to the work performed, described by six (10.5%) of the participants. On the other hand, the negative points included the lack of working conditions, mentioned by four (7.0%) of the participants, as well as the inadequate physical structure, described by two (3.5%).

The majority, 30 (52.6%) of nurses, graduated from a private higher education institution, while 27 (47.4%) from a public higher education institution. Of the total number of nurses, 44 (77.2%) had a *lato sensu* graduate degree (specialization) in different areas, especially Public Health 13 (22.8%) and Family Health ten (17.5%), but there was one (1.8%) *stricto sensu* (master's degree) graduate nurse.

Regarding knowledge related to AKI, the overall average score achieved by nurses was 48 ± 19 points, below the cutoff score (50 points), although more than half of them specifically answered the concept of this syndrome 41 (71.9%). Most of them, 52 (91.2%), claimed to be unaware of the relationship between elevation of serum creatinine level as an indicator for referral of patients to the nephrologist. More than half 32 (56.1%) of the nurses demonstrated knowledge about markers of kidney injury, even though it did not apply it to clinical practice 55 (96.5%). The lack of knowledge about the classification and current stratification of AKI was reported by 49 (86%) professionals. The results showed that most nurses reported knowing prevention measures for renal dysfunction 49 (86%), as well as their primary risks 33 (57.9%) (Table 1).

Table 1. Nurses' knowledge (n=57) about acute kidney injury. Ceilândia, Brasília, 2017.

Questionnaire items	n (%)
Q7. -Definition as acute kidney injury	
Yes	41 (71.9)
No	14 (24.6)
Did not answer	2 (3.5)
Q9. Knowledge on the value of serum creatinine as an indicator for referral to the nephrologist	
Yes	5 (8.8)
No	52 (91.2)
Q10. Knowledge about markers of kidney injury	
Yes	32 (56.1)
No	19 (33.3)
Did not answer	6 (10.5)
Q11. Knowledge about current classification for stratification of acute kidney injury	
Yes	6 (10.5)
No	49 (86.0)
Did not answer	2 (3.5)
Q13. Use of this classification in clinical practice	
Yes	2 (3.5)
No	55 (96.5)
Q14. Knowledge about preventive measures to minimize/prevent renal dysfunction	
Yes	49 (86.0)
No	8 (14.0)
Q15. Knowledge about the primary risks of AKI patients	
Yes	33 (57.9)
No	22 (38.6)
Did not answer	2 (3.5)
Q24. Knowledge of self-care measures for AKI patients	
Right	32 (56.1)
Wrong	25 (43.9)

The risk factors described by these professionals as determinants of AKI were mainly exposure to drugs 56 (98.2%), diabetes mellitus 49 (86%) and hypertension 47 (82.5%). Of the total, 32 (56.1%) reported that disease prevention is one of the indicators of patients' need for immunization (influenza/pneumococcus) (Table 2).

It was observed that the age and length of practice in PHC did not influence the knowledge of nurses about AKI, as well as having completed training in public higher education and postgraduate course (p>0.05). Knowledge about the need for referral to the nephrologist linked to changes in serum creatinine levels was significantly influenced by the length of professional practice (p=0.004) (Table 3).

The results showed that the control of the underlying disease was recognized by nurses as one of the main preventive measures to minimize or prevent the occurrence of AKI 33 (57.9%), as well as healthy eating 22 (38.6%) and water intake 25 (43.8%).

One of the most recognized strategies by nurses to identify primary risks for AKI was their knowledge of appropriate risk stratification and patient drug management 33 (57.9%) (Table 4).

The self-care measures included in the nursing consultation with the AKI patient by the nurses were healthy eating 21 (20.19%), blood pressure control, blood glucose, cholesterol and glycated hemoglobin 16 (15.38%) and water control 14 (13.46%) (Table 5).

Table 2. Nurses' knowledge (n=57) about factors related to acute kidney injury. Ceilândia, Brasília, 2017.

Questionnaire items	n (%)
Q8. Risk factors for Acute Kidney Injury	
Smoking	28 (49.1)
Drug exposure	56 (98.2)
Water intake	6 (10.5)
Arterial hypertension	47 (82.5)
Diuretic use	20 (35.1)
Diabetes mellitus	49 (86.0)
Dehydration	39 (68.4)
Q17- Reasons for immunization (influenza/pneumococcus) of patients with SAH/DM/AKI/CKD	
Harm prevention	32 (56.1)
Wrong answer	9 (15.8)
Did not answer	16 (28.1)
SAH/DM	57 (100.0)
Cardiovascular disease	33 (57.9)
Nephrotoxic Medication	51 (89.5)
Moderate physical exercise	2 (3.5)
Reduction in Glomerular Filtration Rate	49 (86.0)
Healthy eating habits	1 (1.8)
Clots/Cholesterol	41 (71.9)
Realtives with CKD	25 (43.9)
Q 18. Reasons related to renal dysfunction	
SAH/DM	57 (100.0)
Cardiovascular disease	33 (57.9)
Nephrotoxic Medication	51 (89.5)
Moderate physical exercise	2 (3.5)
Reduction in Glomerular Filtration Rate	49 (86.0)
Healthy eating habits	1 (1.8)
Clots/Cholesterol	41 (71.9)
Realtives with CKD	25 (43.9)

Table 3. Univariate analysis of the relationship between knowledge of acute kidney injury and creatinine alteration and referral to the nephrologist with demographic and vocational training variables. Ceilândia, Brasília, 2017.

Variables	Conceptual knowledge about AKI			Knowledge about alteration in serum creatinine and need for referral to nephrologist		
	Yes (n = 41)	No (n=14)	p	Yes (n = 5)	No (n=52)	p
	Median (25-75)	Median (25-75)		Median (25-75)	Median (25-75)	
Age	40 (33 − 46)	42.5 (37 − 46)	0.6	48 (45 − 49)	41.0 (33.5 − 46)	0.1
Time in the PHC	6.0 (3 − 11)	8.5 (5 − 9)	0.3	20.0 (18 − 20)	7.0 (3.5 − 10.5)	0.004
Public University Graduation	18 (43.9)	8 (57.1)	0.4	3 (60.0)	24 (46.2)	0.7
Having completed some post-graduate	30 (73.2)	13 (92.9)	0.2	4 (80.0)	40 (76.9)	0.9

Mann-Whitney test; Fisher's exact test; PHC – Primary Health Care; AKI – Acute Kidney Injury

Table 4. Distribution of strategies for identifying primary risks of acute kidney injury according to nurses' opinion. Ceilândia, Brasília, 2017.

Strategy	n (%)
Stratify appropriate risk and manage patient medication	33 (57.9)
Improve drug management and not risk stratification	0 (0.0)
Collect urine 24 hours and do not communicate the probable diagnosis to the patient	0 (0.0)
No need for creatinine and albumin monitoring	1 (1.7)
Collect urine 24 hours, perform routine checkups periodically as acute kidney injury (AKI) progressively develops	21 (36.8)
No response to the question.	3 (5.3)

Table 5. Self-care measures for acute kidney injury according to nurses. Brasília, Ceilândia, 2017.

Answers	n (%)
Healthy eating	21 (20.19)
Maintaining a healthy weight	3 (2.88)
Controlling blood pressure levels: blood pressure, blood glucose, cholesterol, glycated hemoglobin	16 (15.38)
Decrease salt intake to <90 mmol (2 g)/ day of sodium	4 (3.84)
Perform health-compatible exercise	7 (6.7)
Correct use of prescribed medications. Avoid nephrotoxic drugs	10 (9.61)
Avoid alcohol, drugs, smoking	5 (4.80)
Water control	14 (13.46)
Did not answer the question unknowingly	24 (23.07)

Each participant indicated more than one answer.

DISCUSSION

The results showed aspects of fundamental importance for the management and direction of nursing guidelines in the prevention and self-care of AKI to risk groups predisposed to complications, such as those with NCDs. In addition, it contributed to the understanding of the gaps related to the effectiveness of the work process of the nursing team and also fostered the importance of generating proposals and strategies that can minimize this condition.

Insufficient knowledge about the criteria for stratification and classification of AKI in PHC was recognized in the nurses' statement as a limiting factor for the strategic elaboration of intervening measures in the decision-making process and the possibility of real change and improvement of health, even though they were able. to recognize some specific risk factors, such

as drug exposure, diabetes mellitus, and high blood pressure. In this context, knowledge of prevention measures directed to AKI directly impacts the daily clinical practice of nurses, as a health educator, given the need to include preventive measures in their care plan, able to reduce complications, and the progression itself disease for more severe conditions than in the general spectrum may compromise the user's quality of life.[12]

The difficulties faced by nursing professionals to provide full care and the reason for dissatisfaction with work has been a controversial condition in the health field and, generally, are attributed to the excess workload resulting from the work. low number of staff, overload of duties, inadequate qualification and fragmented view of the care process, constituting barriers to the quality of care.[13] A situation also recognized by the nurses in this study.

Actions are needed to support the early diagnosis and staging of kidney injury in patients with NCDs at all levels of care, especially in primary care, considering this as the gateway to the Brazilian Public Health System (Sistema Único de Saúde -SUS) where decision-making can make a difference in disease recovery and prevention process.[7] Therefore, a qualified nursing team would be essential, but the gaps identified in the professionals' responses reflect the fragility of care and the limitations for developing a strategic guidance plan with self-care measures, while alerting to early diagnosis.[7] Assessing this process can help in understanding the causal assumptions that underpin the implementation of an intervention that can work in a real-world context as well. This, in turn, may be useful in constructing evidence bases to substantiate the practice.[14]

Certainly, the orientation of self-care measures is linked to health promotion, but also greater well-being by the emphasis on healthy habits, besides allowing the investigation and exposure of the potential risks of non-adherence to treatment and, consequently, the targeting of the guidelines. According to the self-care model, it is possible to enhance the patient's ability to acquire greater independence and autonomy over their treatment, as well as a greater burden of responsibility, aiming at improving the understanding and acceptance of the necessary care for life maintenance and general well-being.[15]

To be successful in implementing care practices, it is necessary to consider the personal and human characteristics of nurses, and the age range is one of them. In this study, unlike others, the age of these professionals was intermediate (42 ± 9 years old), while in other scientific evidence directed to PHC nurses, the age group identified was younger, i.e., 20 to 30 years old[16] and 26 to 30 years old.[17]

PHC practice seems to be a prominent option among younger professionals, which may be related to the relatively recent insertion of this content in undergraduate nursing curricula.[18]

Affinities with job-related activities and job satisfaction can be a key factor in implementing good health care practices. Thus, job satisfaction reported by most nurses may be the key. Found also highlighted by other scientific evidence by highlighting the affinity with the care provided by the professional as one of the factors that influences their good performance in PHC.[18]

In the context of primary care, the FHS has gained space and its progress has been based on the use of complex and low density technologies, necessary to solve problems related to population health. In this context, human resources have been highlighted as a fundamental technology for the health service, in which nurses gain a central role, so the qualification of this professional's education can be an ally. In this study, it was possible to identify that most of these professionals had a postgraduate degree *lato sensu*, a result similar to that found in scientific evidence developed in the state of Mato Grosso, where the majority (73.4%) of nurses also had this same level of education.[17]

Knowing the profile of professionals working in the care process has become a fundamental tool for strategic direction and implementation of improvements in the health care. The recognition of weaknesses and potentialities allows, in a way, to assume transformative measures and improvements, aiming to expand the activities developed according to the demands of the population.[17]

Nurses' knowledge was insufficient to recognize risk factors, prevention and self-care of kidney disease. Therefore, there is a need for PHC nurses' training to optimize early AKI identification, avoiding progression and chronicity of this disease.

CONCLUSIONS AND IMPLICATIONS FOR PRACTICE

Gaps in the knowledge about the identification, prevention measures and self-care in AKI by nurses were identified for patients with NCDs such as hypertension and diabetes mellitus in PHC.

In this study, it was found that although nurses know the concept of AKI, the prevention and self-care measures for renal dysfunction were broad and generic, with low specificity for the renal system.

The profile of younger nurses was characterized by their ability to recognize and identify AKI a little better, which in the long term may contribute to improving the preventive approach to kidney injury in patients with NCDs, not underestimating the importance of professional training. permanent.

The limitations of this study were related to the temporal and human resources restrictions evidenced by the professional unavailability, justified by the overload and accumulation of functions impacting on the need to return to the same environment to finalize data collection. On the other hand, considering the results of the study, it is evident the need for permanent training of nurses working in PHC as a sub-strategy to improve self-care planning directed to NCDs and early identification of AKI, in order to avoid progression, chronification and complications of these diseases. This study is a warning for the need for transformations of large systems, but we cannot underestimate their complexities, based only on health technologies and organizational management. Improving health sector performance should not only be linked to structural interventions, but also to individual behaviors of the professionals.

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