Cogitare Enfermagem

ORIGINAL ARTICLE

PATIENT SAFETY CULTURE IN DIALYSIS SERVICES DURING THE COVID-19 PANDEMIC: NURSING PERSPECTIVE*

HIGHLIGHTS

1. Patient safety was rated as excellent by nursing staff.
2. Non-punitive response to errors was an identified weakness.
3. Staff sizing was a weakness identified.
4. Dialysis service management influenced safety culture.

Marília Alves Hoffmann[1]
Aline Carrilho Menezes[2]
Cissa Azevedo[3]
Fabrícia Moreira Amorim Amaral[4]
Tatiana Aparecida Rodrigues[4]
Helen Cristiny Teodoro Couto Ribeiro[3]
Luciana Regina Ferreira da Mata[5]

ABSTRACT

Objective: to evaluate the patient safety culture from the perspective of nursing staff in dialysis services in the context of the COVID-19 pandemic. **Method:** cross-sectional study with 56 nursing professionals from three dialysis services in Minas Gerais - Brazil, between March and June 2021. The Hospital Survey on Patient Safety Culture instrument was used. The data were analyzed by descriptive and inferential statistics; chi-square test; and Generalizable Estimating Equations ($p \leq 0.05$). **Results:** Patient safety was rated as good or excellent by 69.6% of participants. The dimension "Expectations and actions of the service management that favor safety" was considered a strength (85.42%). "Non-punitive response to errors" (23.99%) and "Staff sizing" (45.83%) were considered weak. There was a higher percentage of positive responses in public and philanthropic services ($p<0.001$). **Conclusion:** few dimensions indicated strengths, and the type of management influenced the percentage of positive responses.

DESCRIPTORS: Patient Safety; Organizational Culture; Safety Management; Renal Dialysis; Nursing, Team.

HOW TO REFERENCE THIS ARTICLE:
Hoffmann MA, Menezes AC, Azevedo C, Amaral FMA, Rodrigues TA, Ribeiro HCTC, *et al*. Patient safety culture in dialysis services during the COVID-19 pandemic: nursing perspective. Cogitare Enferm. [Internet]. 2023 [cited in "insert year, month, day"]; 28. Available in: https://dx.doi.org/10.1590/ce.v28i0.92134.

[1]Universidade Federal de Minas Gerais, Escola de Enfermagem, Belo Horizonte, MG, Brasil.
[2]Universidade Federal de São João del-Rei, Programa de Pós-graduação Ciências da Saúde, Divinópolis, MG, Brasil.
[3]Universidade Federal de São João del-Rei, Grupo de Atuação Docente Saúde do Adulto e Idoso, Divinópolis, MG, Brasil.
[4]Universidade Federal de São João del-Rei, Programa de Pós-graduação em Enfermagem, Divinópolis, MG, Brasil.
[5]Universidade Federal de Minas Gerais, Escola de Enfermagem, Depto. de Enfermagem Básica, Belo Horizonte, MG, Brasil.

INTRODUCTION

Patient safety (PS) can be defined as a set of activities to create cultures, procedures, behaviors, technologies, and environments in health care to reduce avoidable harm[1]. Safe organizations are known for fostering the development of a culture of PS, which is a pattern of individualized and collective behavior based on beliefs, perceptions, attitudes, and values. Strengthening the culture of PS makes it possible to reduce the occurrence of harm, in addition to directing the type and commitment of the health organization's management in relation to PS[1].

Dialysis services are considered highly complex and therefore receive patients susceptible to adverse events associated with the severity of their health condition and the intrinsic characteristics of dialysis treatment[2]. Such characteristics refer to invasive procedures, use of complex equipment and potentially dangerous drugs. The most frequent adverse events in dialysis services are inadequate blood flow, vascular access infection and bleeding[3].

In the context of the COVID-19 pandemic, a disease caused by the Sars-CoV-2 virus, it has become necessary to expand the discussion on the promotion of PS culture and the development of protocols aimed at reducing the spread of the virus among patients in dialysis services[4]. In addition, the need for renal replacement therapy because of Sars-CoV-2 infection has resulted in increased demand due to the high prevalence and incidence of chronic diseases[5-6].

The increase in demand for dialysis services and the absence from work of nurses and nursing assistants/technicians resulted in work overload and intensified physical and mental suffering from these professionals during the COVID-19 pandemic[7]. Thus, these labor challenges associated with the level of severity of the patient affected by COVID-19 implied an increased risk of adverse events[8].

In this context, the evaluation of the PS culture is an essential tool for managers to develop a situational diagnosis and action plan for continuous improvement of the care offered[9]. Therefore, it is expected that the periodic evaluation of the PS culture from the perspective of the nursing team will contribute to the proposal of strategies that reduce the underreporting of adverse events and, consequently, the improvement of quality[10]. Thus, the objective of this study was to evaluate the culture of PS from the perspective of nursing staff in dialysis services in the context of the COVID-19 pandemic.

METHOD

This is a cross-sectional, analytical study based on the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE Statement)[11]. The study was conducted in three dialysis services in Belo Horizonte, Minas Gerais (MG), Brazil.

The services have different types of management: public, philanthropic, and private. The public dialysis service operates in a federal university hospital, a reference in the state, which performs approximately 1,000 dialysis sessions per month. The philanthropic dialysis service is in a university hospital and performs approximately 900 dialysis sessions per month. The for-profit private dialysis service is in a private clinic. In this service, 400 dialysis sessions are performed monthly. All 17 nurses and 61 nursing assistants/technicians linked to these institutions were invited. The inclusion criteria were belonging to the nursing team and working in the service for at least three months. Nursing professionals with no employment relationship (academics, interns, internship preceptors and residents) and/or who were absent due to leave of any nature and/or medical certificate were excluded.

Data collection was carried out from March to June 2021. During this period, one of the peaks of the COVID-19 pandemic in Brazil occurred, according to epidemiological data made available by the Ministry of Health[12]. The research team obtained the e-mail account and telephone contact of all nursing professionals. Thus, the questionnaire and the Informed Consent Form (ICF) were sent by e-mail.

Three emails were sent to each professional within seven, 10 and 15 days. Then, in addition to virtual contacts, it was necessary to conduct data collection in person using tablets in all services, in the morning, afternoon and evening shifts.

The Brazilian and electronic version of the Hospital Survey on Patient Safety Culture (HSOPSC)[13] was used to assess the culture of PS in dialysis services. The HSOPSC questionnaire consists of 42 questions about the culture of PS. The questions are evaluated based on a Likert-type scale, composed of five alternatives: strongly disagree; disagree; neither agree nor disagree; agree; strongly agree; or: never; seldom; sometimes; almost always; and always. The 42 questions are grouped into 12 dimensions, namely: D1. Frequency of reported events (three items); D2. Perception of safety (four items); D3. Expectations and actions of the management/supervision of the unit/services that favor safety (four items); D4. Organizational learning/continuous improvement (three items); D5. Teamwork in the unit/service (four items); D6. Openness to communications (three items); D7. Feedback and communication on errors (three items); D8. Non-punitive response to errors (three items); D9. Staffing (four items); D10. Hospital management support for patient safety (three items); D11. Teamwork between units (four items), and D12. Problems in shift changes and transitions between units/services (four items). The questionnaire also presents a question on the overall assessment of the level of PS, in which professionals assign scores from one to ten, where one and two, terrible; three and four, bad; five and six, fair; seven and eight, good; and nine and ten, excellent; and another question on the number of adverse events reported in the last year[13].

The collected data were processed and analyzed in the Statistical Package for the Social Science (SPSS), version 22.0. Data were analyzed using descriptive statistics with frequency analysis for categorical variables and mean/standard deviation for continuous variables.

To compare the classification of PS scores in dialysis services, the chi-square test (X2) was used, based on the likelihood ratio due to expected counts less than five in more than 20% of the cells in the contingency table. The 95% confidence interval (95%CI) was presented for overall PRP and the dimensions of HSOPSC, according to the type of dialysis service (public, philanthropic and private) and professional category (nurses and nursing assistants/technicians).

The dimensions of the HSOPSC were considered strengths when the items had 75% or more positive responses ("agree/strongly agree" to the positively described items or "disagree/strongly disagree" to the negatively described items); and considered weaknesses when the items had 50% or less positive responses ("disagree/strongly disagree" to the positively described items or "agree/strongly agree" to the negatively described items); items <75% and >50% are considered opportunities for improvement[13]. The PRP of the dimensions of the culture of PS were calculated through the average percentage of positive responses estimated for each dialysis service[13].

To construct the explanatory model for the PS score outcome, Generalizable Estimating Equations (GEE) were used, and the dialysis service variable was considered as subject/group and participants as within subject/group. An unstructured working correlation matrix, identity link function and log-linear distribution were used. To test the relevance of each of the independent variables in the model, the Wald chi-square test was applied with the GEE and the quality of fit by the interpretation of the Quasi-likelihood under the Independence model Criterion (QIC). As a measure of effect, the coefficient of the equation (β) was analyzed, which in positive values indicates a directly proportional association, and in negative values an inverse relationship with the outcome. A significance

level of 5% was adopted.

The present study was approved by the Research Ethics Committee under opinion number 4.063.904.

RESULTS

Fifty-six nursing professionals participated in the study (response rate of 71.8%) and of these, 36 (64.3%) worked in the public service, 14 (25%) in the philanthropic service and six (10.7%) in the private service. Table 1 shows the characterization of nursing professionals regarding the length of time working in the service and unit, weekly hours worked and time of specialty.

Table 1 - Characterization of the profile of nursing professionals in three dialysis services. Belo Horizonte, Minas Gerais, Brazil, 2022

	Total	Nurse		Nursing assistant/ technician	
	n	n	%	n	%
Profession	56	12	21.4	44	78.6
Time working in the institution in years†	6.67 (±4.59)	4.91	±1.56	7.15	±5.02
Working time in the dialysis service in years†	7.76 (±5.89)	7.58	±7.62	7.81	±5.43
Weekly hours†	34.53 (±11.34)	31.33	±11.76	35.4	±11.20
Time in specialty in years†	13.55 (±7.43)	11.58	±8.64	14.09	±7.08

Source: The authors (2022).

Note: †Quantitative variables described with mean and standard deviation.

Among the nurses and nursing assistants/technicians, 39 (69.6%) rated the PS as excellent or good. Only three (6.8%) nursing assistants/technicians classified the PS as poor, and this grade was not attributed by any nurse. It was found that nurses and nursing assistants/technicians gave different scores for PS. However, there was a statistically significant difference between the scores given by nurses and nursing assistants/technicians (Table 2).

Table 2 - Patient safety (PS) score classification among nursing professionals. Belo Horizonte, Minas Gerais, Brazil, 2022

Patient Safety Score (PS) classification							
Professional Category	**Poor***	**Fair***	**Good***	**Excellent***	**Total**	**X^2 (gl)**	**p**
Nurse	0 (0)	3 (25)	7 (58.3)	2 (16.7)	12	1,72 (6)	0,632
Nursing assistant/technician	3 (6.8)	11 (25)	21 (47.7)	9 (20.5)	44		
Total	3 (5.4)	14 (25)	28 (50)	11 (19.6)	56		

Source: The authors (2022).

Note: X2= chi-square test; gl= degrees of freedom *n(%).

Nursing professionals had different perceptions regarding the evaluation of the dimensions of the culture of PS. Only nurses considered dimensions of the PS culture as strengths (PPR≥ 50%), namely: "Expectations and actions of the unit/service supervision that favor safety", "Organizational learning/continuous improvement" and "Feedback and communications on error". Seven dimensions were classified as weak areas (PPR ≤ 50%) by nurses, and the dimensions "Frequency of reported adverse events", "Hospital management support for patient safety" and "Problems in shift changes and transitions between units/services" were classified by nursing assistants and technicians as opportunities for improvement. Nurses rated seven dimensions as fragile (PPR ≤ 50%) while nursing assistants/technicians considered five dimensions (Table 3).

The dimension "Expectations and actions of the management/supervision of the unit/service that favor safety" obtained the highest PPR for both nurses (85.42%) and nursing assistants/technicians (71.46%). However, this dimension was considered a strength (greater than 75%) only by nurses. The dimension that presented the lowest PPR among all nursing professionals was "Non-punitive response to errors". In addition, a wide confidence interval (95%CI) was identified in the dimensions "Frequency of reported adverse events" and "Perception of safety" evaluated by nurses, and in the dimensions "Expectations and actions of the unit/service supervision that favor safety" and "Organizational learning/continuous improvement" evaluated by nursing assistants/technicians (Table 3).

Table 3 - Comparison of the dimensions of patient safety (PS) culture among nursing professionals. Belo Horizonte, Minas Gerais, Brazil, 2022

Dimensions	**Nurses (CI95%)†**	**Nursing assistant/ technician (CI95%)†**
Percentage of positive responses (PPR‡)	56.22§ (63.55-48.89)	55.44§ (60.80-50.08)
D1: Frequency of reported adverse events	33.33†† (60.01-6.66)	52.62§ (58.20-47.04)
D2: Perception of safety	41.67†† (82.23-1.11)	47.90†† (80.15-15.65)
D3: Expectations and actions of the unit/service supervision that favor safety	85.42‡‡ (95.69-75.21)	71.46§ (80.54-62.41)
D4: Organizational learning/continuous improvement	75.00‡‡ (109.00-41.20)	63.16§ (90.14-36.25)
D5: Teamwork in the unit/service	64.58§ (81.42-47.75)	60.56§ (65.62-55.49)

D6: Openness to communication	63.89§ (83.52-44.26)	46.00†† (70.07-21.92)
D7: Feedback and communications on error	75.00‡‡ (84.43-65.57)	51.5§ (56.71-46.28)
D8: Non-punitive response to errors	23.99†† (63.13-15.15)	20.76†† (36.13-5.39)
D9: Sizing of staff	45.83†† (76.02-15.64)	44.37†† (67.34-21.40)
D10: Support from hospital management for patient safety	40.91†† (49.82-32.00)	54.88§ (62.04-47.71)
D11: Teamwork between units	40.91†† (51.82-30.00)	48.42†† (59.13-37.70)
D12: Issues in shift changes and transitions between units/services.	41.36†† (55.48-27.25)	56.91§ (67.79-46.04)

Source: The authors (2022).

Note: †CI95% - 95% Confidence Interval; ‡PPR - Percentage of Positive Responses; §Dimensions classified as opportunities for improvement; ††Dimensions classified as weaknesses; ‡‡Dimensions classified as strengths.

The association between PRP and the dialysis service management type variable was identified in the crude analysis (X^2= 58.06; p<0.001). Therefore, there was a greater tendency for positive responses by the nursing staff of the public service (β=0) and philanthropic service (β= - 3.23) compared to the private service (β= -10.81). No prediction value was found for the other variables in relation to PRP (p>0.05) (Table 4).

Table 4 - Crude model for the explanation of the outcome of the total percentage of positive responses (PRP) regarding the patient safety (PS) culture in the work environment in dialysis services. Belo Horizonte, Minas Gerais, Brazil, 2022

Variables		95% Wald's CI‡		Hypothesis test		
	β_{bru} †	Inferior	Superior	X^2§ Wald	gl††	P
Hospital						
Public service	-	-	-	-	-	-
Private service	-10.81	-18.874	-2.763	6.929	1	0.008
Philanthropic service	-3.23	-11.863	5.389	0.541	1	0.462
Professional category						
Nursing assistant/technician	-	-	-	-	-	-
Nurses	-3.534	-19.990	12.923	0.177	1	0.674
Length of time working in the institution	0.325	-1.498	2.148	0.122	1	0.727
Working time in the dialysis service	0.148	-2.030	2.326	0.018	1	0.894
Weekly working hours	-0.142	-0.783	0.498	0.190	1	0.663
Time in specialty	-0.222	-1.289	0.844	0.167	1	0.683

Source: The authors (2022).

Note: †β_{bru} - Slope coefficient of the overall patient safety score variable as a function of the independent variable; ‡CI - Confidence interval; X^2- Wald chi-square test; ††gl - degrees of freedom.

DISCUSSION

The present study originally contributed to the understanding between PS culture levels and work factors. The findings also enabled a comparison between types of dialysis service management in the context of the SARS-CoV-2 pandemic from the perspective of nursing. Few dimensions were identified as strengths in the study scenarios, revealing an incipient PS culture. Only the professional category nurses pointed out dimensions of the culture of PS as strengths. It was also found that the type of management influenced the PRP, since there was a greater tendency to positive responses by the nursing teams of the public and philanthropic services.

Most of the participants in this research were nursing assistants/technicians, since they constitute the largest workforce of the nursing team in Brazilian health services. The culture of PS in the dialysis services under study may be related to the pattern of behavior, workload, and work characteristics of these nursing professionals, since the culture of PS is influenced by work factors[14], and is also a reflection of beliefs, attitudes, perceptions, and values that underlie the individual or collective behavior pattern of professionals[1].

Most nursing professionals from the three dialysis services classified the PS as good or excellent, even in the face of the pandemic scenario. On the other hand, a Brazilian study conducted in hospital institutions obtained a PS classification that ranged from regular too feeble from the nursing perspective[15]. Another study obtained a feeble PS classification from the perspective of the multi-professional team[16]. The positive perception of nursing for the dialysis services evaluated may have been influenced by the commitment of the management of the services to the measures adopted to prevent the spread of the Sars-CoV-2 virus[17], given that few dimensions were considered as strengths. Therefore, it is believed that the pandemic scenario required nursing professionals to develop resilience in managing a new organization of the work process and care flows. Professionals were also faced with a shortage of equipment and supplies, especially personal protective equipment (PPE)[18].

Variation was found in the way nurses and nursing assistants/technicians evaluated the dimensions of PS culture, corroborating the results of research developed in Europe[19]. In addition, a variation in the perception of PS culture was observed among the same professional category. Therefore, it is important to consider that PS culture is not perceived by professionals in the same way, since aspects such as hierarchical position and professional category imply different perceptions of the same scenario[20]. In this sense, it is recommended that actions be developed to promote the theme among all nursing professionals to promote the improvement of care and the quality of care provided in health services, including during the COVID-19 pandemic, in which weaknesses related to PS became more evident[17].

Nurses were the only ones to report strong dimensions, on the other hand, they were also the ones who reported the highest number of dimensions as fragile. It is believed that nurses with management positions tend to have a more positive perception of PS when compared to direct patient care professionals. It should also be emphasized that work appreciation, professional motivation and periodic discussions about the work process are factors that also imply different perceptions about PS culture in the nursing team[21].

The results of the present study highlighted as priority areas for actions to improve the PS culture, among all nursing professionals, the dimensions "Perception of safety", "Non-punitive response to errors", "Staff sizing" and "Teamwork between units".

The dimension "Non-punitive response to errors" reached lower PRP in the perception of both professional categories. In this context, national[15-16] and international[22-23] studies reported similar findings on this dimension. The existence of a punitive PS culture in the global scenario may inhibit nursing professionals from reporting adverse events due to the fear of being blamed[14]. In the present study, for example, the dimension "Frequency of

reported events" was also considered a weakness by nurses. Considering this, the need to foster a safe organizational culture in which professionals learn from mistakes is evident[1].

The dimension "Staff sizing" also received a low PRP according to the nursing team, corroborating the findings of Brazilian studies developed in a hospital environment[9,16]. It is assumed that the negative perception about staff sizing is related, among other factors, to the deficit of human resources[14]. In the critical scenario of the COVID-19 pandemic, the absence due to physical and mental illness resulted in a reduction in the number of health professionals in dialysis services, which may have contributed to the negative perception of this dimension by the nursing team[24].

In addition, the dimensions "Perception of safety" and "Teamwork between units" were pointed out as weaknesses by the nursing team. These results do not differ from another study conducted in three Brazilian hospital institutions, in a period before the pandemic, in which the same weaknesses were identified[15]. Teamwork, understood as a potential area for improvement, favors the search for safer care, mainly because good cooperation between teams directly influences the establishment and adherence to strategies to prevent adverse events[21].

The identification of weak areas within the PS culture in dialysis services is an opportunity to develop quality improvement strategies to be implemented by the local PS Centers. Investments in training and improvement of effective communication are strategies to promote safe care. The nurse, as the leader of the nursing team, has a primary role in the realization of these actions that provides the strengthening of the PS culture in environments that involve nursing practice[8].

Regarding the strengths of the PS culture, the dimension "Expectations and actions of the management/supervision of the unit/service that favor safety" stood out, reinforcing the recognition of the management/supervision of the three dialysis services of the importance of the PS culture. This finding corroborates a Brazilian study conducted in high-complexity hospital institutions from the perspective of the nursing team[14] and the multi-professional health team[16]. The commitment of health institutions to promote PS actions reflects the scope of the strategies promoted by the National Patient Safety Program (PNSP, in Portuguese), which, since 2013, has demanded efforts to strengthen safer care in the country[25].

Researchers who evaluated the perception of the nursing team in surgical centers evidenced the importance of the role of the manager or supervisor in promoting PS and in accepting the suggestions for improvement proposed by the health team[26]. It is noted that the manager/supervisor exercises team leadership and actively participates in decision-making. Thus, these professionals have managerial skills to instill knowledge and promote positive attitudes of the team to strengthen the PS culture in health services[26].

However, during the pandemic scenario, the actions that fostered PS became a challenge to be faced by health service managers and supervisors. In this perspective, it is necessary to guarantee the provision of safe, welcoming, and protective care for nursing professionals, always considering their physical and mental health, including in the context of stress generated by the COVID-19 pandemic[27].

Nursing assistants and technicians did not evaluate any dimension of the patient's PS culture as a strength. It is believed that this fact can be explained by the nurses' perception ability to identify the PS climate more positive when compared to nursing assistants or technicians. This may be related to the professional training of nurses, since the competencies and skills developed also involve management and teaching, allowing the construction of a broader view of health services and patient care[28]. Another aspect that may influence this difference in perception is the superficiality in the approach to the PS theme in the curricula and programs of technical nursing courses in Brazil, which may have a negative impact on the way professionals understand and experience the PS culture in health services[3].

The association of the type of management with the PRP of PS culture was a relevant result of this research. The nursing team of the public service showed a greater tendency to indicate positive responses, when compared to the teams of the philanthropic and private service. This finding can be justified by the profile of the public dialysis service, which is a reference teaching hospital for COVID-19 treatment. It is believed that the support of continuous learning through non-specific training offered in teaching hospitals may impact on the perception of greater safety in the care provided by the team. In addition, the public hospital under study received a larger contingent of patients in need of dialysis treatment during the pandemic, which may have influenced the need to improve institutional flows and the better perception of PS culture of these professionals in the face of the scenario encountered.

On the other hand, other researchers have shown a better PRP of PS culture from the perspective of nursing in philanthropic or private management hospitals when compared to public management hospitals. Unmaintained physical structures, as well as inadequate staffing, are recurrent factors in public hospital institutions in Brazil, and imply a worse perception of the culture of PS[9,15].

Limitations of the study include the sample size and the fact that it was carried out in three dialysis services in the same geographical region, which may limit the generalization of the results to other dialysis services in Brazil. Another limitation refers to the response rate of professionals (71.8%), even with strategies of resending the questionnaire three times via e-mail and face-to-face data collection. The response rate of participants also reflects the level of culture of the institution and has been quite variable in PS culture assessment surveys around the world[9].

CONCLUSION

Most nursing staff rated PS as good or excellent, and PS culture was stronger in the public dialysis service. The dimensions of PS culture were perceived differently between nurses and nursing assistants/technicians, and only nurses considered some dimensions as strengths. This shows a need for sensitization and training of nursing assistants/technicians on the principles of safety in patient care in dialysis services.

The dimension "Expectations and actions of the management/supervision of the unit/service that favor safety" obtained the highest PRP, although it was not considered a strength by nursing assistants/technicians. The dimensions "Non-punitive responses to errors" and "Staff sizing" characterized the main weaknesses of dialysis services. The results point to the importance of the support offered by institutional leaders with a view to developing strategies that consider the singularities of the service and the different types of management.

It is hoped that the results of this study will contribute to stimulate the necessary and urgent discussion on the principles of PS in the curricula of future health professionals, including technical nursing course programs in Brazil. It is also believed that it may inspire institutional and/or dialysis service leaders to consider, in strategic planning, a set of actions in favor of continuous improvement of care and strengthening the PS culture in dialysis services. In addition, it is important to analyze the PS culture to better understand its weaknesses and potential. It is hoped that similar studies, both by nurses and other team members, will be carried out and disseminated in Brazil to better understand the PS culture in dialysis services in different regions of the country.

REFERENCES

1. Word Health Organization (WHO). Draft Global Patient Safety Action Plan 2021–2030: towards eliminating avoidable harm in health care [Internet]. Washington (DC): WHO; 2021 [cited in 2022 Oct 27]. Available in: https://cdn.who.int/media/docs/default-source/patient-safety/gpsap/final-draft-global-patient-safety-action-plan-2021-2030.pdf?sfvrsn=fc8252c5.

2. Gesualdo GD, Duarte JG, Zazzetta MS, Kusumota L, Orlandi F de S. Frailty and associated risk factors in patients with chronic kidney disease on dialysis. Ciênc. saúde coletiva. [Internet]. 2020 [cited in 2022 Dec. 21];25(11):4631–7. Available in: https://doi.org/10.1590/1413-812320202511.03482019.

3. Rocha R de PF, Pinho DLM. Occurrence of adverse events in public hemodialysis units. Enferm. glob. [Internet]. 2019 [cited in 2022 Oct 10];18(3):1–34. Available in: http://dx.doi.org/10.6018/eglobal.18.3.343361.

4. Knebel G, Breitsameter G, Proença MC da C, Breitsameter R de MM, Figueiredo CR de, Echer IC. Elaboration and validation of a protocol for the care of patients with COVID-19 in hemodialysis centers. Rev. Gaúcha Enferm. [Internet]. 2022 [cited in 2022 Oct 3];43:e20200399. Available in: https://doi.org/10.1590/1983-1447.2022.20200399.en.

5. Himmelfarb J, Vanholder R, Mehrotra R, Tonelli M. The current and future landscape of dialysis. Nat Rev Nephrol [Internet]. 2020 30;16:1–13. [cited in 2022 Oct. 03]. Available in: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7391926/.

6. NG JH, Hirsch JS, Hazzan A, Wanchoo R, Shah HH, Malieckal DA, et al. Outcomes among patients hospitalized with COVID-19 and acute kidney injury. Am J of Kidney Dis [Internet]. 2020 [cited in 2022 Oct. 03]. Available in: https://doi.org/10.1053/j.ajkd.2020.09.002.

7. Murat M, Köse S, Savaşer S. Determination of stress, depression and burnout levels of front-line nurses during the COVID‐19 pandemic. Int J Ment Health Nurs. [Internet]. 2020;30(2) [cited in 2022 Oct. 03]. Available in: https://pubmed.ncbi.nlm.nih.gov/33222350/.

8. Penariol MDCB, Pimentel ABNM, Faria ETSS, Rodrigues AS, Milagres CS. Patient safety in the context of hemodialysis: an integrative review. Brazilian Journal of of Health Review [Internet]. 2021; 4(1):1620-39 [cited in 2022 Oct. 10]. Available in: https://ojs.brazilianjournals.com.br/ojs/index.php/BJHR/article/view/23467/18845.

9. Andrade LEL, Lopes JM, Souza Filho MCM, Vieira Júnior RF, Farias LPC, Santos CCM dos, *et al*. Patient safety culture in three Brazilian hospitals with different types of management. Ciênc. saúde coletiva. [Internet]. 2018 [[cited in 2022 Dec. 21];-23(1):161–72. Available in: https://doi.org/10.1590/1413-81232018231.24392015.

10. Siqueira AKA, Rocha KP, Ferreira LS. Nursing care facing the main hemodialytic complications in patients with chronic renal failure. Rev Bras Interdiscip Saúde [Internet]. 2021 [cited in 2022 Dec]; 21;3(3):40-7. Available in: https://revistarebis.rebis.com.br/index.php/rebis/article/view/227#:~:text=Durante%20e%20ap%C3%B3s%20a%20sess%C3%A3o.

11. Elm E von, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, *et al*. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol [Internet]. 2008;61(4):344. [cited in 22 Oct 10]. Available in: https://www.ncbi.nlm.nih.gov/pubmed/18313558.

12. Ministério da Saúde (BR). Boletim epidemiológico especial: doença pelo novo Coronavírus – COVID-19 [Internet]. Brasília: Ministério da Saúde; 2021. [cited in 2022 Oct 12]. Available in: https://www.gov.br/saude/pt-br/centrais-de conteudo/publicacoes/boletins/epidemiologicos/covid-19/2021/boletim_epidemiologico_covid_75-final-13ago_15h40.pdf.

13. Agency for Healthcare Research and Quality (AHRQ). AHRQ Hospital Survey on Patient Safety

Culture. Version 2.0: user's Guide [Internet]. Rockville: AHRQ; 2019 [cited in 2022 Oct 12]. Available in: https://www.ahrq.gov/sops/surveys/hospital/index.html?msclkid=9f3a5772caeb11eca555f90efd361b6f.

14. Sanchis DZ, Haddad M do CFL, Girotto E, Silva AMR. Patient safety culture: perception of nursing professionals in high complexity institutions. Rev. Bras. Enferm. [Internet]. 2020;73(5). [cited in 2022 Oct 12]. Available in: https://doi.org/10.1590/0034-7167-2019-0174.

15. Lemos G de C, Mata LRF da, Ribeiro HCTC, Menezes AC, Penha C de S, Valadares RMC, *et al*. Patient Safety Culture in three Hospital Institutions: nursing team perspective. Rev baiana de enferm. [Internet]. 2022;36. [cited in 2022 Oct 12]. Available in: https://doi.org/10.18471/rbe.v36.43393.

16. Galvão TF, Lopes MCC, Oliva CCC, Araújo ME de A, Silva MT. Patient safety culture in a university hospital. Rev Latino-Am Enfermagem. [Internet]. 2018;26: e3014 [cited in 2022 Oct 15]. Available in: https://doi.org/10.1590/1518-8345.2257.3014.

17. Malinowska-Lipień I, Suder M, Wadas T, Gabryś T, Kózka M, Gniadek A, *et al*. The correlation between Nurses' COVID-19 infections and their emotional state and work conditions during the SARS-CoV-2 pandemic. Int J Environ Res Public Health [Internet]. 2021 [cited in 2022 Oct 15]; 18(23):12715. Available in: https://doi.org/10.3390/ijerph182312715.

18. Gnatta JR, Vieira RCA, Santos LSC, Penha SL, Sanchez GN, Oliveira JC, *et al*. Safety of nursing professionals and patient facing COVID-19 pandemic in critical care unit. Rev. Latino-Am. Enfermagem. [Internet]. 2023; 31:e3861. [cited in 2023 May 06]. Available in: https://www.scielo.br/j/rlae/a/QRTPXc63Lzt6pBZvZrJXD7t/?format=pdf&lang=en.

19. Brešan M, Erčulj V, Lajovic J, Ravljen M, Sermeus W, Grosek Š. The relationship between the nurses' work environment and the quality and safe nursing care: Slovenian study using the RN4CAST questionnaire. Plos One. [Internet]. 2021;16(12):e0261466. [cited in 2022 Oct 15]. Available in: https://doi.org/10.1371/journal.pone.0261466.

20. Silva RSC, Comassetto I, Alves WTBP, Araujo A dos S, Barboza JSA, Melo NCV. Culture of patient safety in a hemodialysis Hospital Unit. Rev Recien. [Internet]. 2021 [cited in 2022 Oct 15]; 11(34):68–77. Available in: https://doi.org/10.24276/rrecien2021.11.34.68-77.

21. Campelo CL, Nunes FDO, Silva LDC, Guimarães LF, Sousa S de MA de, Paiva S de S. Patient safety culture among nursing professionals in the intensive care environment. Rev Esc Enferm USP. [Internet]. 2021[cited in 2023 May 06]; 55:e03754. Available in: https://doi.org/10.1590/S1980-220X2020016403754.

22. Aljaffary A, Al Yaqoub F, Al Madani R, Aldossary H, Alumran A. Patient safety culture in a teaching Hospital in Eastern Province of Saudi Arabia: assessment and opportunities for Improvement. Risk Manag Healthc Policy. [Internet]. 2021. [cited in 2022 Oct 15]; 14:3783–95 Available in: https://doi.org/10.2147/rmhp.s313368.

23. Zabin LM, Zaitoun RSA, Abdullah AA. Patient safety culture in Palestine: university hospital nurses' perspectives. BMC Nurs. [Internet]. 2022 [cited in 2022 Oct 15]; 21(204):1-10. Available in: https://doi.org/10.1186/s12912-022-00987-y.

24. Vedovato TG, Andrade CB, Santos DL, Bitencourt SM, Almeida LP de, Sampaio JF da S. Health workers and COVID-19: flailing working conditions? Rev. bras. saúde ocup. [Internet]. 2021 [cited in 2022 Oct 15]; :46:e1:1-15. Available in: http://dx.doi.org/10.1590/2317-6369000028520.

25. Ministério da Saúde (BR). Portaria n. 529 de 1° de abril de 2013: institui o Programa Nacional de Segurança do Paciente (PNSP). [Internet]. Brasília (DF); 2013. [cited in 2023 May 06]. Available in: http://vigilancia.saude.mg.gov.br/index.php/download/portaria-no-529-01-abril-2013-programa-nacional-de-seguranca-do-paciente/?wpdmdl=5778.

26. Rocha RC, Abreu IM, Carvalho REFL de, Rocha SS da, Madeira MZ de A, Avelino FVSD. Patient safety culture in surgical centers: nursing perspectives. Rev. Esc. Enferm. USP.[Internet]. 2021 [cited in 2022 Oct 15]; 55:e03774. Available in: https://doi.org/10.1590/S1980-220X2020034003774.

27. Rangachari P, Woods JL. Preserving Organizational Resilience, Patient Safety, and Staff Retention during COVID-19 Requires a Holistic Consideration of the Psychological Safety of Healthcare Workers. Int J Environ Res Public Health. [Internet]. 2020(17):4267:1-12. [cited in 2022 Oct 15]; Available in: http://dx.doi.org/10.3390/ijerph17124267.

28. Tondo JCA, Guirardello E de B. Perception of nursing professionals on patient safety culture. Rev. bras. enferm.[Internet]. 201770(6):1284–90. [cited in 2022 Oct 16]; Available in: https://doi.org/10.1590/0034-7167-2016-0010.

***Article extracted from the master's thesis** "Cultura de Segurança do paciente em três serviços de hemodiálise: fatores laborais e institucionais associados no contexto da pandemia da COVID-19 ", Universidade Federal de São João del-Rei, Divinópolis, MG, Brasil, 2021.

Received: 16/11/2022
Approved: 25/06/2023

Associate editor: Dra. Luciana Nogueira

Corresponding author:
Aline Carrilho Menezes
Universidade Federal de São João del-Rei, Campus Centro-Oeste Dona Lindu-CCO
Rua Sebastião Gonçalves Coelho, 400- Chanadour, Divinópolis- MG, 35501-296
E-mail: alinecarrilhomenezes@gmail.com

Role of Authors:
Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **Hoffmann MA, Rodrigues TA, Ribeiro HCTC, Mata LRF**. Drafting the work or revising it critically for important intellectual content - **Hoffmann MA, Menezes AC, Azevedo C, Amaral FMA, Rodrigues TA, Ribeiro HCTC, Mata LRF.** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **Hoffmann MA, Rodrigues TA, Ribeiro HCTC, Mata LRF**. All authors approved the final version of the text.

ISSN 2176-9133