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Strategies for coping with the COVID-19 pandemic in university hospitals: a descriptive study

Estratégias para o enfrentamento da pandemia de COVID-19 em hospitais universitários: estudo descritivo

Estrategias para enfrentar la pandemia de COVID-19 en hospitales universitarios: estudio descriptivo

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ABSTRACT

Objective: To describe strategies developed to cope with the COVID-19 pandemic in university hospitals. **Method**: A descriptive research study with a quantitativeand qualitative approach, developed from an online survey with 104 nurses from three Brazilian university hospitals. Data processing was performed through textual analysis with the aid of the IRAMUTEQ® software. **Results:** Six semanticclasses were obtained that represent the main strategies developed to cope withthe COVID-19 pandemic in the hospital environment: 1) Provision of Personal Protective Equipment (17.2%); 2) Training of the team for the care to be provided (18.8%); 3) Training of the support team (15.6%); 4) Acquisition of good quality equipment (14.1%); 5) Definition of institutional flows (20.5%); and 6)Promotion of psychological support (14.1%). **Conclusion:** The strategies listed by the nurses have contributed to the quality of the care provided to the patients,as well as to preserving the workers' health.
Descriptors: Infections by Coronavirus; Organization and Administration; University Hospitals.

RESUMO

Objetivo: Descrever estratégias desenvolvidas para o enfrentamento da pandemia de COVID-19 em hospitais universitários. **Método:** Pesquisa descritiva, com abordagem quanti-qualitativa, desenvolvida a partir de um *survey online* com 104 enfermeirosde três hospitais universitários brasileiros. O processamento dos dados foi realizado por meio de análise textual com auxílio do software IRAMUTEQ®. **Resultados:** Foram obtidas seis classes semânticas que representam as principais estratégias desenvolvidas para o enfrentamento da pandemia de COVID-19 no ambiente hospitalar: 1) Fornecimento de Equipamentos de Proteção Individual (17,2%); 2) Capacitações da equipe para o cuidado (18,8%); 3) Treinamento da equipe de apoio (15,6%); 4) Aquisição de equipamentos com boa qualidade (14,1%); 5) Definição de fluxos institucionais (20,5%) e 6) Promoção de apoio psicológico (14,1%). **Conclusão:** As estratégias elencadas pelos enfermeiros têm contribuído para a qualidade da as-sistência prestada aos pacientes, bem como a manutenção da saúde do trabalhador.
Descritores: Infecções por Coronavírus; Organização e Administração; Hospitais Universitários.

RESUMEN

Objetivo: Describir las estrategias que se desarrollaron en los hospitales universitarios para enfrentar la pandemia de COVID-19. **Método:** Investigación descriptiva, con enfoque cuantitativo y cualitativo, desarrollada a partir de *survey online* con 104 enfermeros de tres hospitales universitarios brasileños. El procesamiento de datos se realizó mediante análisis textual con la ayuda del software IRAMUTEQ®. **Resultados:** Se obtuvieron seis clases semánticas que representan las principales estrategias desarrolladas para enfrentar la pandemia de COVID-19 en el ámbito hospitalario: 1) Suministro de Equipos de Protección Personal (17,2%); 2) Capacitación del equipo para la atención (18,8%); 3) Entrenamiento del equipo de apoyo (15,6%); 4) Adquisición de equipos de buena calidad (14,1%); 5) Definición de flujos institucionales (20,5%) y 6) Promoción de apoyo psicológico (14,1%). **Conclusión:** Las estrategias enumeradas por losenfermeros han contribuido a la calidad de la atención que se les prestó a los pacientes y a mantener la salud de los trabajadores.
Descriptores: Infección por Coronavirus; Organización y Administración; Hospitales Universitarios.

INTRODUCTION

The first case of coronavirus SARS-CoV-2 was reported on December 31st, 2019, in a city in the province of Hubei, China. Approximately one month later, the World Health Organization (WHO) declared a Public Health Emergency of International Importance, as human-to-human transmission had already been identified in 19 countries[1]. In Latin America, the first case was recorded in Brazil[2] on February 26th, 2020. Until 08/15/2021, Brazil had nearly 20.4 million cases, 569,000 of which had death as outcome. Worldwide, there were 207 million confirmed cases and nearly 4.36 million deaths associated with the disease[3].

The Coronavirus Disease 2019 (COVID-19) is characterized as a highly transmissible illness, associated with alveolar damage and progressive respiratory failure, with fever, tiredness and dry cough as main symptoms[1-3]. As it is a new disease and lacks specific treatment, it was necessary to restructure the health services to care for suspected and confirmed COVID-19 cases, especially in hospitals that received patients with more severe conditions of the disease requiring intensive care[4].

In this context, the nurses' role has gained prominence, especially in the participation of planning commissions to reformulate the physical structure, prepare care flows and streamline human resources, inputs and technologies[5,6]. However, at the same time, nurses have experienced negative emotions such as anxiety, institutional helplessness and fear of contamination of family members and co-workers. In addition to that, there is unpreparedness to cope with a pandemic, especially in the face of lack of knowledge about the disease[7].

Thus, given the magnitude of the pandemic, adequacy of the management and work processes is a necessary condition, which required the development of organizational strategies to ensure care quality and adequate working conditions for the health professionals. Thus, this research was outlined with the following guiding question: Which strategies were developed to cope with the COVID-19 pandemic in university hospitals?

Discussing this question is important to identify trends and challenges that permeate the Nursing work in a time of health crisis. In addition to that, this study is also justified from a bibliometric research study on the scientific production that addresses COVID-19, according to which national publications in relation to the management and operationalization of strategies to cope with the pandemic still have little expressiveness when compared to the international scope[8].

This study aimed at describing the strategies to cope with the COVID-19 pandemic developed in university hospitals.

METHOD

This is a descriptive research study with a quantitative and qualitative approach. The research scenario consisted in three large-sized Brazilian university hospitals, two located in the South region and one in the Southeast region. Choice of the hospitals was in order to contemplate the greater cultural diversity of the Brazilian Southeast region, considering the institutions to which the researchers are linked and the existence of an ongoing macro-project involving members of the research team.

The participants were nurses from different sectors of the institutions. Sample size was calculated using the Epi-Info software, version 7.2.3.1. Considering a population of 616 nurses from the three hospitals, unknown prevalence of 50% and a 95% confidence level, the intended sample size was 134 nurses for a maximum error of 7.5%. Recruitment was conducted by means of non-random convenience sampling. The nurses were invited by email to participate in the study, with weekly follow-up reminders. Additionally, the Nursing managers of the institutions were asked to disclose the questionnaire in WhatsApp® groups of nurses. According to the period for conducting the study, a total number of 104 participants was reached, which can be considered reasonable for online research studies[9], especially in the face of the COVID-19 pandemic.

The eligibility criteria were defined by the inclusion of nurses who were working in the care of suspected or confirmed COVID-19 patients at the time of the study, or with the perspective of doing so. This inclusion criterion was informed to the participants at the time of the invitation to answer the online questionnaire, which was the data collection technique used in the research in view of the COVID-19 pandemic.

Data collection was carried out via Google Forms® from April 27th to June 27th, 2020. The data collection instrument consisted of two parts, with an estimated response time of 10 minutes. The first contained data of the nurses' socio-professional characterization: age, gender, marital status,

child(ren), sector, function, training and time of professional experience (in years). There were also two closed questions: 1) How do you assess the experience of acting or coming to act in the care of suspected or confirmed COVID-19 patients? (negative, neutral or positive); and 2) How do you perceive the support provided by the Nursing management area during the pandemic? (deficient, average, good).

The second part consisted of an open question, whose answer was optional, about the strategies developed to cope with the COVID-19 pandemic in the hospital environment. Of the total study participants, 86 answered this question.

Before data collection, a pilot test of the questionnaire for face and content validity was conducted with two clinical nurses and two teaching nurses. From this, minor corrections were made in relation to spelling and to the order in which the questions were presented.

The quantitative data were organized in an electronic spreadsheet and the analysis was performed using the Statistical Package for Social Sciences (SPSS), version 19. For the analysis of the qualitative variables, it was decided to evaluate the percentage and absolute frequencies, while position measurements such as mean, minimum and maximum, and standard deviation were used for the quantitative variables.

The qualitative data were processed using the *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (IRAMUTEQ®), which allows analyzing word clusters in a text body called textual corpus. In this study, the analysis was performed by means of the Descending Hierarchical Classification (DHC), which generates semantic classes that allow interpretation of the data by the researchers.

Preparation of the text file was done in the Open Office® program. Possible typing or writing errors were corrected, as well as compound words for data processing were unified, such as: "patient_safety".

This study is part of a multicenter macro-project about nurses' work environment and empowerment in the hospital context.

To carry out this research, an amendment to the original project was approved by the Research Ethics Committee of the reference institution, under opinion number 2,465,337. To access the survey questionnaire, the participants were first clarified through a page with general data regarding the research. Subsequently, the Informed Consent Form was made available online. To access the questionnaire, the participants had to indicate that they agreed to participate in the study. Thus, the resolutions that establish the rules for research with human beings in Brazil were met.

RESULTS

In the socio-professional results there was predominance of female participants (n=87; 83.7%), with a mean age of 38.9 (±8.8) years old and a mean of 13.69 (±8.99) years of professional experience. The majority worked as clinical nurses (78.8%) in Hospitalization Units (23.1%). In relation to training, there was predominance of nurses with some Specialization/Residency (46.2%). The experience of acting or coming to act in the care of suspected or confirmed COVID-19 patients and support from the Nursing management area during the pandemic were positively evaluated by most of the participants. Table 1 presents the nurses' socio-professional characterization data.

A total of 88 texts were included for the analysis in IRAMUTEQ®; however, 84 texts segments were generated and 70.37% of the answers related to the strategies implemented in the workplace in the face of the COVID-19 pandemic were used. As a result, six semantic classes were obtained that represent the strategies developed to cope with the COVID-19 pandemic in the hospital environment, namely: 1) Provision of Personal Protective Equipment (17.2%); 2) Training of the team for the care to be provided (18.8%); 3) Training of the support team (15.6%); 4) Acquisition of good quality equipment (14.1%); 5) Definition of institutional flows (20.5%); and 6) Promotion of psychological support (14.1%).

As a complementary strategy, the program provides the associative strength of each of the words that comprise the semantic classes. Associative strength is calculated by the Chi-Square Test (χ^2) and results greater than 3.84 and $p<0.0001$ indicate strong correlations between the words of a given class.

In relation to the associative strength, semantic class 1 had the words "Personal Protective Equipment" (33.7; $p<0.0001$), "Provide" (30.03; $p<0.0001$) and "Adequate" (27.01; $p<0.0001$) representing the highest relationship indices. The second semantic class has correlations between "Training" (23.87; $p<0.0001$), "Care" (18.49; $p<0.0001$) and "Team" (5.81; $p<0.0001$). Similarly, in class 3, the word "Team" (20.65; $p<0.0001$) presented greater correlation strength with the words

Table 1 - Socio-professional characterization of the nurses. Florianópolis, SC, Brazil, 2020

Variable	Sample(%)
Gender	
Female	87(83.7%)
Male	17(16.3%)
Sector	
Hospitalization Units	24(23.1%)
Pediatric or Neonatal Units	18(17.3%)
Intensive Care Unit	20(19.2%)
Emergency Department	12(11.5%)
Surgical Center and Recovery Room	6(5.8%)
Others	24(23.1%)
Function	
Clinical Nurse	82(78.8%)
Nurse Manager	13(12.5%)
HICC Nurse or epidemiological surveillance or continuing/permanent education or related to work	9(8.7%)
Education	
Graduation	12(11.5%)
Specialization/Residency	48(46.2%)
Master's Degree	38(36.5%)
PhD	6(5.8%)
Experience of acting or coming to act in the care of suspected or confirmed COVID-19 patients	
Negative	32(30.8%)
Neutral	30(28.8%)
Positive	42(40.4%)
Perception of the support provided by the Nursing management area during the pandemic	
Deficient	25(24.0%)
Average	30(28.8%)
Good	49(47.1%)

Source: Elaborated by the authors, 2021.

"Training" (29.26; p<0.0001) and "Improve" (20.25; p<0.0001). The fourth semantic class had "Quality" (26.29; p<0.0001), "Acquire" (19.13; p<0.0001) and "Personal Protective Equipment" (13.11; p<0.0001). Class 5 correlated "Institution", "Definition" and "Flow" with the same correlation strength (21.28; p<0.0001), which can explain their overlapping in the dendrogram. Accordingly, the last semantic class has the same correlation strength (19.23; p<0.0001) between the words "Psychological", "Support" and "Worker".

Figure 1 illustrates the semantic classes and their articulations.

In the dendrogram, all the classes were initially superimposed by class 6, which consequently relates to class 5, which succeeds the articulated division between semantic classes 1 and 4 and between 2 and 3. Thus, it can be interpreted that psychological support to nurses is related to the creation of new flows of care and institutional assistance; this fact correlates with the acquisition and distribution of equipment, as well as with the training and qualification provided to the teams.

The association between classes 1 and 4 reflects that the adequate provision of Personal Protective Equipment is linked to the acquisition of good quality equipment by the service. Accordingly, the third and second classes have in common the training of care teams and support services.

The first semantic class, "Provision of Personal Protective Equipment", reports provision as a strategy. With progression of the pandemic, the acquisition PPE was even more urgent and indispensable for the health professionals' protection, given the increase in the hospital demand regarding use of these materials.

The class called "Training of the team for the care to be provided" refers to the expansion of the training promoted by the institution to provide care to people with COVID-19. As a result of the articulation of class 2, the third class, "Training of the support team", portrays the expansion of training for other teams and support services. In this sense, training stands out as strategies implemented to improve the professionals' skills, considering the changes in the work environment and challenges arising from the pandemic.

The fourth semantic class, "Acquisition of good quality equipment" portrays the concern with the purchase of good quality Personal Protective Equipment by the hospital for the professionals' safety. Subsequently, the creation of new care flows and assistance-related courses of action is evidenced as a strategy to cope with the COVID-19 pandemic in the "Definition of institutional flows" class. The last class, called "Promotion of psychological support", indicates the provision of psychological support for the professionals

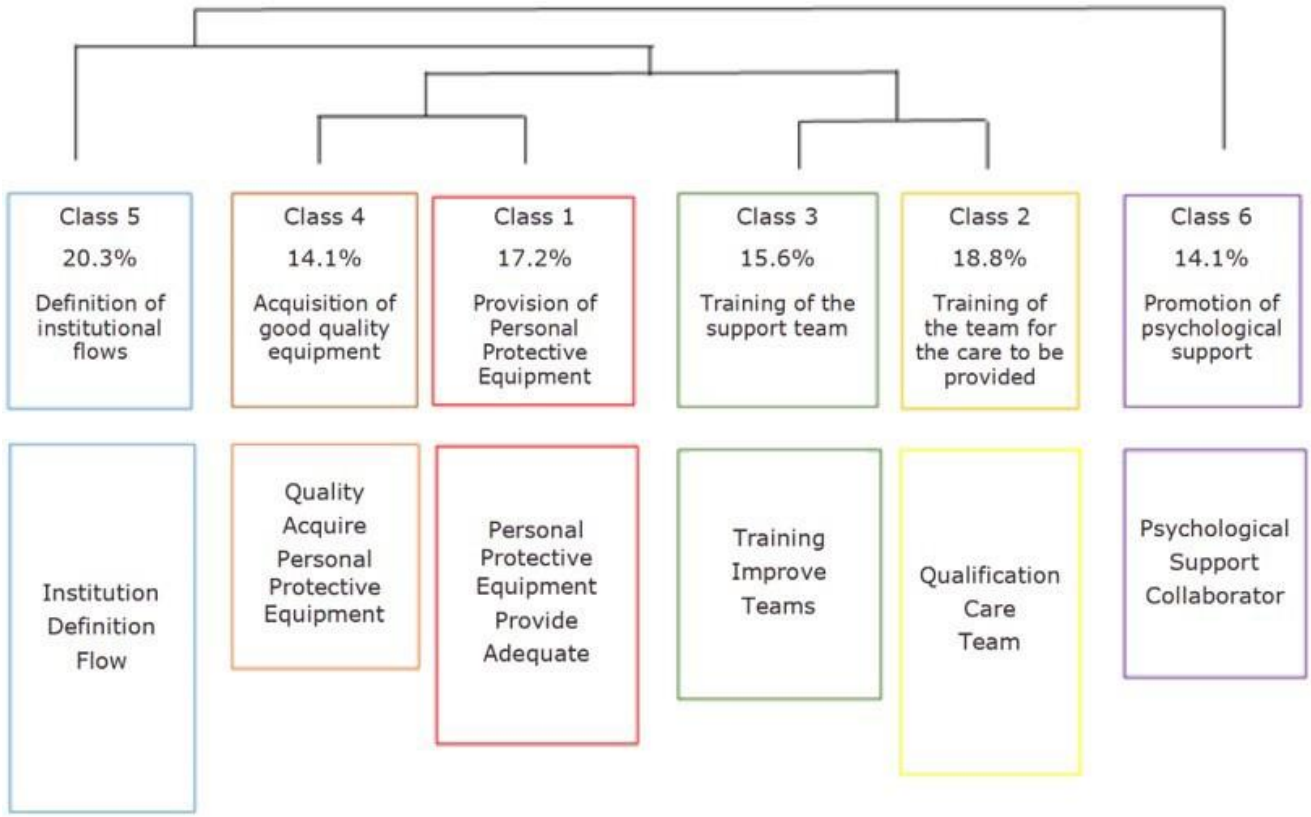

Figure 1 - Semantic classes. Florianópolis, SC, Brazil, 2020
Source: Elaborated by the authors, 2021.

working in care due to the emerging health crisis that directly affects nurses' mental health. Figure 2 is presented below, with representative testimonials from each semantic class

DISCUSSION

One of the results of this study that drew the attention was the nurses' positive evaluation in relation to the performance in the care of suspected or confirmed COVID-19 patients. Previous studies have identified negative feelings among the nursing team, especially fear of being infected[7,10]. Thus, it can be considered that the participants' answers in this study evidence resilience and development of an emotional structure to face this moment of difficulty and adaptations in the work context.

In addition to that, this finding can also be related to the positive perception reported by nurses regarding the support provided by the Nursing management area during the pandemic. Turbulent periods require the presence and support of institutional leaders. It is important, more than ever, that hospital administrators, Nursing managers and service managers develop ways to connect with their teams and seek approaches to mitigate their concerns[11].

In the qualitative results, five of the six semantic classes are related to strategies aimed at making the work environment safer for the health professionals and support teams, through the provision of PPE, training and psychological support. The other class identified is related to the structural dimension of the hospital services, which involves the definition of new institutional flows for the care of suspected and/or confirmed COVID-19 patients.

With the advent of a new infectious-contagious disease, the urgency of using PPE items has become vital to cope with the pandemic. PPE items are the main instruments used to prevent biological, physical and chemical accidents in the work environment, reducing the risk of harms during the work practice. With proper PPE use, contamination of professionals is reduced, preventing spread of the virus to other professionals and patients.

CLASS 1 - Provision of Personal Protective Equipment
Acquisition of more **Personal Protective Equipment** items.
Providing adequate Personal Protective Equipment and information.
Providing Personal Protective Equipment in **adequate** numbers for all those involved in the service.
We started using more **Personal Protective Equipment** items than we used to.
CLASS 2 – Training of the team for the care to be provided
Training and more safety in the diverse information and guidelines provided to the **teams**.
Training the **team** regarding the **care measures** and flows.
Expanding institutional technical **training** on **care** management for COVID-19 patients.
CLASS 3 – Training of the support teams
Conducting **training** of the support teams.
Training of the hygiene and maintenance team, for example.
Improving training for the hospital **teams**.
Training of all the **teams**
CLASS 4 – Acquisition of good quality equipment
Acquiring good quality Personal Protective Equipment.
Acquiring good quality Personal Protective Equipment for the employees.
Maintaining a team with good **quality Personal Protective Equipment**.
CLASS 5 – Definition of institutional flows
Definition of the courses of action for both the diagnosis and the **flow** of patients within the **institution**.
Consolidation of the patient **flows** within the **institution**.
Definition of planning **flows** in the face of increased patient demand.
CLASS 6 – Promotion of psychological support
More effective **psychological support** for the **collaborator**.
Psychological support to the employees who are working directly with patients.
Promotion of greater **psychological support** for the **collaborator**.

Figure 2 - Testimonials of the participants. Florianópolis, SC, Brazil, 2020

Source: Elaborated by the authors, 2021.

Thus, PPE use is the most effective method for protecting the workers' health in the pandemic. In the meantime, the importance is observed of strategies capable of reducing possible shortages, such as reprocessing of this equipment, analysis of the exposure risks for a correct distribution of support professionals, and acquisition in sufficient numbers to ensure supply for at least four weeks[12]. In addition to quantity, another major concern was to ensure quality of the PPE. The lack of adequate and good quality PPE items is directly related to the development of stress, anxiety and insecurity in the professionals to act in the front line against COVID-19. Thus, it is perceived that the coping measures go beyond the availability of PPE items; they are also related to the quality of the materials that are being offered. Thus, the need for dynamic and innovative methods and strategies for inventory management is evidenced, with the intention of guaranteeing protection of the health professionals and quality of the care provided to the patients[13].

The professionals must also be trained in the proper use of the PPE items, as well as to care for patients with previously unknown pathologies. This was the focus of semantic classes 2 and 3, which refer to the training of the team for the care to be provided and to training of the support team, respectively.

In this sense, Permanent Education in Health (PEH) proved to be an important tool for coping with COVID-19, based on the adaptation of educational

activities according to the needs of the health professionals and services. Development of the team can occur through the provision of courses and training for professional qualification, as well as the use of educational resources available to assist in the practical process. Similarly, a study reports that PEH is one of the main actions developed in the work unit, followed by acquisition of PPE and distancing of the professionals belonging to the risk groups([14].

PEH actions for the workers became an object of concern in order to minimize the risks of accidents and absenteeism among workers. Such actions enable access to health information and education to the workers, contributing to the qualification of attitudes and behaviors in the face of the biosafety measures in the hospital environment. It is fundamental that probable difficulties are identified, establishing risk control and prevention measures aimed at improving communication between all involved. Thus, all workers must have access to educational actions in the hospital context, including the hygiene team and the hospital equipment maintenance team[15].

Another result evidenced was in relation to the psychological support provided to the professionals (semantic class 6). Traditionally, the nurses' work environment is marked by feelings of both pleasure and psychological distress[16]. The impacts of work overload were intensified with the COVID-19 pandemic, and may manifest physical and emotional signs of exhaustion. The tension and insecurity inherent to the care provided to patients with a suspected and/or confirmed COVID-19 diagnosis increases stress and affects countless factors related to the workers' health, leading to wear out and professional exhaustion. Therefore, the emotional burden associated with work overload is one of the main causes of stress in nurses, which can lead them to illness and dissatisfaction at work[17]. In this context, the importance of the role of nurse-managers in the search for strategies to reduce possible psychological problems resulting from insecurity, excessive workload and exhaustive work, among other factors that are affecting professionals stands out[18].

A study conducted with health professionals from 34 hospitals that treated COVID-19 patients in several regions of China evidenced a considerable increase in depression, anxiety, insomnia and distress symptoms in health professionals. According to this study, the professionals who suffer most are the nurses, as they work directly in the care of suspected or confirmed COVID-19 patients[19].

Finally, in the semantic class called "Definition of institutional flows" it is perceived that, with the arrival of the COVID-19 pandemic, it was necessary to readjust the care flows to adapt the hospital environment and prevent contagion among professionals and patients. Similar results have been described in a previous study, in which modifications have emerged, mainly involving the organization of a support structure for requesting complementary exams with timely results, structuring of an adequate physical space for possible suspected cases, and preparation of medication and equipment stocks[20]. Regarding organization of the work, although not specifically mentioned by the participants of this study, another research also highlighted the expansion and relocation of the care team to avoid work overload among the professionals[8].

Regarding the limitations of this study, it is noted that the interpretations of the results can be considered limited in scope due to the research cross-sectional design and to the adoption of a non-probabilistic convenience sample. This type of sampling does not allow knowing if the people selected are really representative of the population. It can also be mentioned that the length of the data collection period and the adoption of an online questionnaire may have hindered the participants' access and greater adherence.

The findings of this research may support the development of strategies to cope with new "waves" of the COVID-19 pandemic in the hospital environment, or even other pandemics and/or infectious diseases in the future. Considering the temporality of the production of scientific knowledge in Health and Nursing, the study also contributes to recording the current historical moment for posterity, highlighting the importance of the role of Nursing in this context. It is also worth mentioning that the results presented may contribute to the formulation of new research studies on the impact of the pandemic on the professional nursing practice.

CONCLUSION

This study made it possible to describe the strategies for coping with the COVID-19 pandemic in the hospital context. The strategies identified were as follows: 1) Provision of Personal Protective Equipment; 2) Training of the team for the care to be provided; 3) Training of the support team; 4) Acquisition of good quality equipment; 5) Definition of institutional flows; and 6) Promotion of psychological

support. It was found that the strategies listed by the nurses exert an influence on the care provided to the patients, as well as on the workers' health.

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CONFLICT OF INTEREST

The authors have declared that there is no conflict of interest.

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