

## Impact of COVID-19 on nursing work in emergency units

Impacto da COVID-19 no trabalho de enfermagem em unidades de urgência/emergência  
Impacto del COVID-19 en el trabajo de enfermería en unidades de urgencia/emergencia

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### Abstract

**Objective:** To analyze the impact of the Coronavirus Disease 2019 pandemic (COVID-19) on nursing work in emergency units.

**Methods:** A qualitative research conducted among nursing professionals operating in emergency units in the state of Rio de Janeiro, Brazil. Data collected online through a semi-structured form and submitted to lexicographic analysis in the software *Interface de R pour Analyses Multidimensionnelles de Textes Et de Questionnaires* (IRAMUTEQ).

**Results:** Thirty-one nursing professionals participated. The use of the text *corpus* accounted for 94.9%, through the generation of six classes of text segments, which made it possible to identify that professionals working in these units have experienced overload in developing work, given the exhausting workload, as well as the lack of infrastructure, protective equipment and human resources. Also, physical and mental exhaustion was evidenced, with emphasis on stress and exhaustion, in addition to the feeling of fear for fear of contamination.

**Conclusion:** The COVID-19 pandemic promoted direct impacts on nursing work in emergency units regarding aspects related to human and material resources and infrastructure, in addition to the care provided to patients in severe conditions.

### Resumo

**Objetivo:** Analisar o impacto da pandemia da *Coronavirus Disease 2019* (COVID-19) no trabalho de enfermagem em unidades de urgência e emergência.

**Métodos:** Pesquisa de abordagem qualitativa realizada entre profissionais de enfermagem atuantes em unidades de urgência e emergência no estado do Rio de Janeiro, Brasil. Dados coletados via online por meio de formulário semiestruturado e submetidos à análise lexicográfica no software *Interface de R pour Analyses Multidimensionnelles de Textes Et de Questionnaires* (IRAMUTEQ).

**Resultados:** Participaram 31 profissionais de enfermagem. O aproveitamento do *corpus* textual foi de 94,9% mediante a geração de seis classes de segmentos de textos, que possibilitou identificar que os profissionais que atuam nessas unidades têm vivenciado sobrecarga no desenvolver laboral, dada a carga horária de trabalho exaustiva, bem como a falta de infraestrutura, de equipamentos de proteção e de recursos humanos. Ainda, evidenciaram-se desgastes físicos e mentais, com ênfase para o estresse e a exaustão, além do sentimento de medo pelo receio de contaminação.

**Conclusão:** A pandemia da COVID-19 promoveu impactos diretos no trabalho de enfermagem em unidades de urgência e emergência no que tange a aspectos relacionados a recursos humanos e materiais e infraestrutura, além da assistência prestada aos pacientes em condições graves.

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### Descriptores

Profissionais de enfermagem; Emergências; Infecções por  
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### Descripores

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## Resumen

**Objetivo:** Analizar el impacto de la pandemia de *Coronavirus Disease 2019* (COVID-19) en el trabajo de enfermería en unidades de urgencia y emergencia.

**Métodos:** Investigación de enfoque cualitativo realizada entre profesionales de enfermería que actúan en unidades de urgencia y emergencia en el estado de Rio de Janeiro, Brasil. Datos recopilados en línea a través de formulario semiestructurado y presentados para análisis lexicográfico en el *software Interface de R pour Analyses Multidimensionnelles de Textes Et de Questionnaires* (IRAMUTEQ).

**Resultados:** Participaron 31 profesionales de enfermería. El aprovechamiento del *corpus* textual fue del 94,9 % mediante la producción de seis clases de segmentos de textos, lo que posibilitó identificar que los profesionales que actúan en esas unidades han vivido una sobrecarga en el quehacer laboral, considerando la duración de la jornada de trabajo agotadora, como también la ausencia de infraestructura, de equipos de protección y de recursos humanos. Además, se evidenciaron desgastes físicos y mentales, con énfasis en el estrés y el agotamiento, además del sentimiento de miedo por el temor a la contaminación.

**Conclusión:** La pandemia de COVID-19 ocasionó impactos directos en el trabajo de enfermería en unidades de urgencia y emergencia en lo que se refiere a aspectos relacionados con recursos humanos y materiales y con la infraestructura, además de la atención brindada a los pacientes en condiciones graves.

## Introduction

As of September 2021, the world has recorded more than 200 million cases and more than four million deaths from *Coronavirus Disease 2019* (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), with Brazil ranking second in number of deaths.<sup>(1)</sup> In the nursing team, the largest professional health category, this disease has already affected 58,358 Brazilian workers, with 865 deaths, with emphasis on Rio de Janeiro with 9.5% of occurrences, behind only São Paulo and Bahia.<sup>(2)</sup>

The recommendation to refer people with more severe symptoms of COVID-19 to hospitals resulted in an increased flow of care in emergency services throughout Brazil.<sup>(3)</sup> Nursing teams, which provide the first visits to the population in these scenarios, are on the front line of coping with this problem when caring for patients suspected or confirmed with the disease, in addition to asymptomatic but infected patients.<sup>(4)</sup>

In these work environments, characterized as critical and complex, these professionals experience in a peculiar way the impact generated by the pandemic, both on the health system and on quality of life itself.<sup>(5)</sup> They are not only vulnerable to a higher risk of infection of themselves and their family, but also to mental health disorders, requiring working conditions that reduce the chances of transmission, in addition to specialized care that promotes their physical and mental health.<sup>(6)</sup>

There is little Brazilian scientific evidence on the real impact of the pandemic caused by SARS-CoV-2 on nursing work, an essential profession in this cop-

ing, especially in emergency units. Protocols with recommendations of individual measures (hygiene and use of personal protective equipment - PPE) still prevail, fundamental, but insufficient to cover the complexity of the several factors involved in the work processes in this time of crisis.<sup>(4)</sup>

Believing that nursing teams have invaluable information about the problem, we sought to give professionals a voice so that public policies and institutional strategies are established in order to meet the real needs of this group, envisioning a safe and quality care for all. Thus, the objective was to analyze the impact of the COVID-19 pandemic on nursing work in emergency units.

## Methods

This is qualitative research, with data collected online between April 20 and 24, 2020 through a semi-structured form applied among nursing professionals (nurses and technicians) working in emergency units in the state of Rio de Janeiro, Brazil, who assisted suspected and/or confirmed cases of patients with COVID-19.

Professionals were invited by e-mail and WhatsApp, through the snowball technique to locate possible participants,<sup>(7)</sup> being the first indicated by the researchers and, later, by the professionals themselves.

The first part of the form contained data on participant characteristics, including sex, age, professional category, training time, specialization, type of hospital, sector of activity, work schedule and training on COVID-19. The second part addressed questions about coping with COVID-19 at work.

The forms' responses constituted the primary source of data submitted to lexicographic analysis, through the software *Interface de R pour Analyses Multidimensionnelles de Textes Et de Questionnaires* (IRAMUTEQ) by Classical Textual Statistics and Descending Hierarchical Classification (DHC).<sup>(8)</sup>

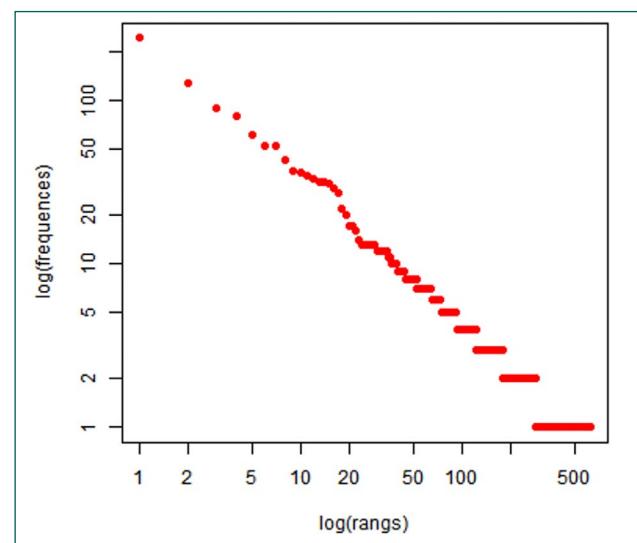
The active forms of the classes of text segments (nouns, adjectives, verbs and unrecognized forms) were rescued, with emphasis on those that obtained in the chi-square test ( $\chi^2$ ) a value  $\geq 3.84$ , therefore,  $p < 0.05$ . The lower the  $\chi^2$ , the less the terms are related to the class, on the other hand, the lower the p-value, the greater this ratio. Words with  $p < 0.0001$  are extremely significant, as they denote with more than 99.99% certainty that their allocation to the class was not random. The number of participants in the course of the field work was defined, through data saturation,<sup>(9)</sup> identified during the organization of empirical material for processing in IRAMUTEQ.

This project was approved by the Research Ethics Committee (Opinion 3,980,287), under CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 30612920.6.0000.0008. An alphanumeric code was used by order of participation.

## Results

The study was attended by 31 (100%) nursing professionals, mostly women (n=25/96.1%), with a mean age of 37.4 years, working as nurses (n=24/77.4%) in emergency hospital services for adults from different municipalities in the state of Rio Janeiro, especially the capital (n=13/41.9%) and Teresópolis (n=5/16.1%). Ten professionals (32.3%) reported not having participated in training on COVID-19. By classical textual statistics, which presents the relationship between frequency and quantity of lexical units, the text *corpus* was composed of 31 texts, with a total of 2,525 occurrences, of which 626 (100%) were distinct words, of which 341 (54.5%) were single occurrences (hapax legomenon), with an average of 81.45 words per text. In the Zipf Diagram, it is possible to observe a

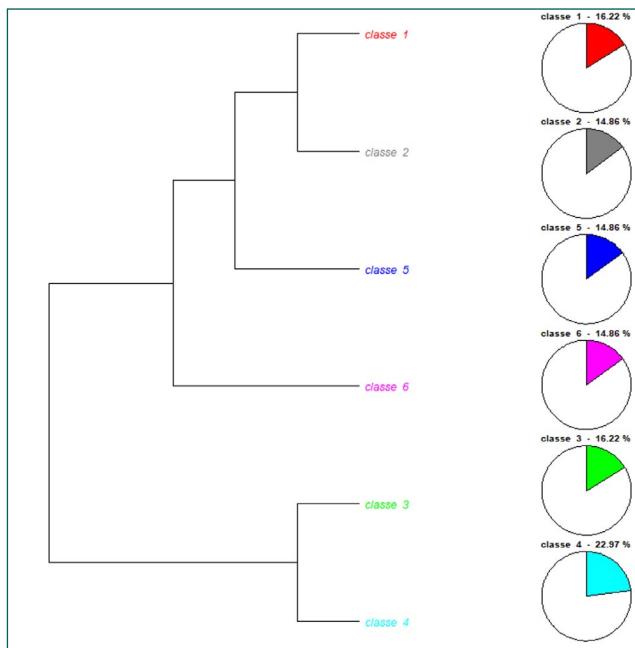
decreasing curve, in which the points located at the upper limit of the graph, closer to the Y axis, represent the words with a high frequency of repetition, but less numerous in comparison to the set of terms that make up the analyzed material, according to indicates X axis (Figure 1).



**Figure 1.** Zipf diagram provided by IRAMUTEQ

It can be seen that for the left side of the curve there are few words that are repeated many times, and on the right side there are many words that are repeated few times. The five most frequent active forms in the responses, in order of ranking, were PPE (f=36), absence (f=33), training (f=32), team (f=31) and patient (f=29). The use of these terms is related to one of the main impacts of the COVID-19 pandemic on nursing work in emergency units, such as the lack of PPE in satisfactory quantity and quality, in addition to the need for constant training for teams to adequately promote care for patients suspected or confirmed of the disease. DHC provided the grouping of different text segments by classes, depending on their words, as the set of them was divided considering the presence or absence of lemmatized forms, thus constituting different lexical worlds. Each class has similar vocabulary to each other, according to common lexical parameters, and different vocabulary from the text segments of the other classes. A total of 78 text segments were distinguished, with classification of

74 of them, therefore, 94.9% use. Lemmatization resulted in 626 lemmas (reduced forms) with 554 active forms. In DHC, six classes of text segments were generated (Figure 2).



**Figure 2.** Dendrogram provided by IRAMUTEQ in Descending Hierarchical Classification

The text *corpus* was divided into two independent chunks (sub-*corpus*). The first was composed of class 6 (14.86%), a second subdivision including class 5 (14.86%) and another subdivision with classes 2 (14.86%) and 1 (16.22%), which have more close semantic contents, but with some differentiation. The other chunk was formed by classes 3 (16.22%) and 4 (22.97%), being the most isolated from the others, demonstrating greater proximity and homogeneity between the two. Chart 1 presents the main words of each class with  $p < 0.05$ , especially in the third column for the extremely significant words with  $p < 0.0001$ .

From the semantic contents, exposed in Chart 1, the two chunks of class grouping were named.

### Chunk 1: The impact of COVID-19 on work organization: human resources, materials and infrastructure

In class 6, it is clearly evident that the COVID-19 pandemic has had direct consequences on nursing work in emergency units regarding the overload of

**Chart 1.** Distribution of active forms with  $p < 0.0001$  and  $p < 0.05$  by classes and chunks

Text corpus 78 text segments - 94.9%			
Chunks	Classes	Associated words ( $p < 0.0001$ )	Associated words ( $p < 0.05$ )
Chunk 1	Class 6 (14.86%)	overload ( $p < 0.0001$ ) time ( $p < 0.0001$ ) needed ( $p < 0.0001$ )	exhausting ( $p = 0.002$ ) front ( $p = 0.010$ ) reduction ( $p = 0.010$ ) deal ( $p = 0.042$ ) daily ( $p = 0.042$ ) good ( $p = 0.042$ ) COVID-19 ( $p = 0.049$ )
	Class 5 (14.86%)	human ( $p < 0.0001$ ) population ( $p < 0.0001$ ) health ( $p < 0.0001$ ) resource ( $p < 0.0001$ ) fear ( $p < 0.0001$ )	train ( $p = 0.003$ ) contaminated ( $p = 0.010$ ) material ( $p = 0.010$ ) infrastructure ( $p = 0.010$ ) importance ( $p = 0.010$ ) education ( $p = 0.010$ ) correct ( $p = 0.010$ ) training ( $p = 0.010$ ) disease ( $p = 0.012$ ) quality ( $p = 0.029$ ) PPE ( $p = 0.032$ ) awareness ( $p = 0.042$ ) protection ( $p = 0.042$ )
	Class 2 (14.86%)	None	adequate ( $p = 0.0001$ ) overloaded ( $p = 0.010$ ) strategy ( $p = 0.010$ ) head ( $p = 0.010$ ) sick ( $p = 0.010$ ) team ( $p = 0.023$ ) greater ( $p = 0.042$ ) stressful ( $p = 0.042$ ) emergency ( $p = 0.042$ ) service ( $p = 0.049$ )
Chunk 2	Class 1 (16.22%)	care ( $p < 0.0001$ )	fear ( $p = 0.004$ ) hard ( $p = 0.014$ ) orientation ( $p = 0.015$ ) psychologist ( $p = 0.015$ ) direct ( $p = 0.015$ ) demand ( $p = 0.015$ ) perform ( $p = 0.044$ )
	Class 3 (16.22%)	provide ( $p < 0.0001$ ) assistance ( $p < 0.0001$ ) give ( $p < 0.0001$ ) symptom ( $p < 0.0001$ )	COVID-19 ( $p = 0.009$ ) day ( $p = 0.015$ ) general ( $p = 0.015$ ) form ( $p = 0.015$ ) client ( $p = 0.015$ ) case ( $p = 0.015$ ) assist ( $p = 0.015$ ) present ( $p = 0.015$ ) arrive ( $p = 0.019$ ) risk ( $p = 0.044$ )
	Class 4 (22.97%)	None	doctor ( $p = 0.0001$ ) severe ( $p = 0.0001$ ) stay ( $p = 0.001$ ) time ( $p = 0.001$ ) receive ( $p = 0.001$ ) team ( $p = 0.002$ ) patient ( $p = 0.010$ ) role ( $p = 0.010$ ) sector ( $p = 0.013$ ) only ( $p = 0.041$ ) need ( $p = 0.041$ )

professionals in the area who work directly in patient care. Participants pointed out the pressing need for a less exhaustive workload, culminating in the formation of a particular semantic content class, in which the words “overload”, “time” and “needed” were extremely significant ( $p < 0.0001$ ).

*"Exhausting, exhaustive workload and maximum exposure." (P30)*

*"Reduction in workload [...] and quality rest." (P12)*

Class 5 presented the highest number of associated terms (n=18), with the words "human", "population", "health", "resource" and "fear" as the most relevant ( $p<0.0001$ ). The text segments of this class indicated lack of infrastructure and human and material resources, including PPE, to ensure protection for professionals and the population in the pandemic. The word "fear" was recurrent, mainly due to fear of contamination.

*"Lack of human resources, fear of becoming contaminated." (P11)*

*"Very afraid and without the proper protections. Lack of adequate infrastructure and quality PPE. [...] train professionals about the disease [...]. Increase team scale and provide correct infrastructure." (P31)*

Class 2, interconnected at the same hierarchical level with Class 1, groups text segments related to the perception of overload of nursing professionals in emergency units, including the removal of co-workers due to COVID-19.

*"Stressful, overloaded by lack of professionals due to illness and removal of many." (P18)*

Class 1 has in its lexical world issues that indicate that nursing care in times of a pandemic is difficult, especially because of fear, in addition to the stress and exhaustion that affect workers in the area, leading to the pressing need for psychological support for them. In this class, the only word that obtained a  $p<0.0001$  was "care".

*"It has been very stressful and exhausting for everyone involved in care, not just nursing. Fear of contamination. [...] psychological support to professionals living in constant fear." (P23)*

*"Nursing care [...], tiring, threatening, but rewarding. [...] lack of psychological follow-up." (P12)*

## Chunk 2: The impact of COVID-19 on patient care

In class 3, the most significant terms ( $p<0.0001$ ) were "provide", "assistance", "give" and "symptom". Its semantic content reveals that the provision of safe nursing care for oneself and for the other, during the pandemic caused by SARS-CoV-2, in itself is a major challenge in emergency hospital environments, especially due to the risk of contamination.

*"A technician and a nurse at the front door, and when two cases arrive at the same time, one always takes an extra time to be assisted. The main challenges are to provide assistance securely not only to the customer, but to the professional." (P16)*

Class 4 also includes words that refer to care, but differs in that it refers to the severity of patients who arrive at hospital units, which sometimes do not have vacancies, materials or equipment, such as PPE and mechanical ventilators, to meet the demands of care in these complex and critical care environments. It is also noteworthy the lack of training to handle the new equipment.

*"Patients arrive severe for me and have no more vacancies in my sector due to lack of ventilator. I get patient saturating 60 with 40-degree fever, and the medical staff cannot intubate for lack of ventilators." (P10)*

*"Assisting in procedures in more severe patients. Difficult for lack of adequate PPE. Lack of mechanical respirator and the few new ones that arrived, lack of training [...] on handling." (P14)*

## Discussion

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The limitation of this study refers to the use of an electronic form, which implied shorter and more objective responses when compared to the face-to-face interview, which is not feasible considering the

social distancing recommendations. Moreover, this investigation explored the reality of nursing work in only one of the federative units in Brazil, limiting the generalization of findings. Therefore, we emphasize the need for further research with other methodological designs and in other scenarios, to expand knowledge about this theme.

The results of this study present relevant contributions to scientific advance related to coping with the pandemic in emergency units, by showing strong impacts on the development of work in nursing. Therefore, it is urgent to develop public policies and institutional strategies that allow a reorganization of work processes, especially with regard to psychological and emotional support to workers, in addition to the adequate provision of human and material resources.

It was evidenced that an important impact of COVID-19 refers to the overload and exhaustion of participants resulting from an exhaustive workload; therefore, stressors, previously recognized as characteristic in the daily lives of these professionals who work in emergency units, were visibly potentiated in times of pandemic.

A study conducted with nurses to assess stress, anxiety, attention levels and psychomotor functioning found that all professionals, after a 24-hour shift, did not present satisfactory concentration, demanding extra mental cost for performing tasks inherent to the profession in adverse conditions. Workload was significantly correlated with the increase in stress levels and decreased care processes, memory and psychomotor capacity.<sup>(10)</sup>

The decrease in the attention and concentration capacity of these professionals, especially after a high workload, can favor exposure and contamination by SARS-CoV-2, especially with regard to the activity of donning and doffing, a complex technique that spends a lot of time and implies in various body movements,<sup>(11)</sup> requiring, therefore, special attention from health managers.

Overload and exhaustion are added to the lack of infrastructure and material resources, including PPE in adequate quantity and quality, that can ensure safe and damage-free action for all. Such evidence corroborates literature that indicates that the risks to which

nursing workers working on the front line in the care of people with COVID-19 are mainly related to the scarcity and quality of PPE offered, especially in places of high demand for care.<sup>(12)</sup>

A study that estimated the impact of the current pandemic on the organization of emergency services in 246 Spanish hospitals reinforced the distinct impacts of this problem on nursing work in these units, as it also showed a shortage of material resources, as well as limitation of spaces for care and tests for the diagnosis of the disease. Moreover, more than 5% of nurses were on sick leave 19% of the time.<sup>(13)</sup>

The feeling of fear at risk of contamination was recurrent among the participants of this study. A multinational study conducted among 906 health professionals stated that approximately 16% were identified with anxiety and 5% with work-related stress in this pandemic period. These professionals also experienced the feeling of fear of contamination, exacerbating psychological distress, as well as facing the dilemma of overloading team members through sick leave,<sup>(14)</sup> compatible with current results, making it essential to provide physical and emotional support for the management of these difficulties.

The lack of human resources, despite being a problem prior to the pandemic, intensified in the face of absences. The intense pace of work generates more physical and emotional exhaustion, occupational diseases, sick leaves and, consequently, an increase in absenteeism at work,<sup>(15)</sup> therefore, more work overload, imposing the need for effective management actions to ensure adequate staffing in these emergency units.

The pandemic is also capable of enhancing presenteeism in nursing, generating significant repercussions on workers' health and patient safety, as professionals, because they do not have the physical and/or mental conditions to work, can make errors in care and/or contaminate other professionals and patients, if infected. This type of presenteeism was observed during the COVID-19 pandemic in Australia, when a health team infected with SARS-CoV-2 worked for up to seven days, even with respiratory symptoms, contributing to an outbreak among employees.<sup>(16)</sup>

With the pandemic, hospital services sought to prepare to receive patients affected by COVID-19. However, most of these institutions already had overcrowded beds due to other diseases that affect the population.<sup>(17)</sup> To this scenario, already overloaded, added new demands for care for the nursing team that works with duty rosters, reaching, for instance, 24 uninterrupted hours.<sup>(4)</sup>

Under the current scenario, the provision of safe nursing care for one another and for the other is a great challenge, because knowledge about this disease is still evolving and the scarcity of PPE is a global reality. In this sense, these professionals are exposed to the imminent risk, given the high potential for transmissibility of SARS-CoV-2, when caring for patients suspected or confirmed with COVID-19 during long working hours,<sup>(6,18)</sup> as evidenced by participants.

The current pandemic also brought the need for redirection of care for the care of patients with respiratory disorders, potentially related to infection by the new coronavirus. This sudden change influenced the services' ability to meet both the demands related to respiratory syndromes and other conditions that involve critical and complex care. In this line, a study that sought to describe the influence of the pandemic in an emergency service in Japan highlighted the difficulty in hospital acceptance of patients with acute diseases.<sup>(19)</sup>

Research in an emergency service in Singapore presented as important measures to minimize contagion in the hospital the use of broader criteria for suspected cases in triage, through a risk-stratified approach to the use of PPE, and surveillance for potentially exposed patients and professionals. It was highlighted that the early detection of cases in emergency services cannot be underestimated, mainly due to the high exposure of health professionals in the management of COVID-19 cases without adequate PPE,<sup>(20)</sup> a fact identified in the present study.

## Conclusion

The COVID-19 pandemic promoted direct impacts on nursing work in emergency units regarding

aspects related to human resources, materials and infrastructure, in addition to the care provided to patients in severe conditions. There is an overload in the development of work, given the exhaustive workload, as well as the lack of infrastructure, material resources, including PPE, and human, due to absences. Also, physical and mental exhaustion was evidenced, with emphasis on stress and exhaustion, in addition to the feeling of fear due to the fear of contamination. Given the peculiarities of these scenarios that constitute the gateway to hospitals, these impacts imply obstacles to the nursing team in promoting quality and safe care for themselves (professional) and for others (patients, co-workers, family members). There is a need for specific training, in addition to the reorganization of work processes in health, with psychological and emotional support to professionals, as well as the adequate provision of human and material resources in the necessary quantity and quality, aiming at a safe care for all.

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## Collaborations

Góes FGB, Silva ACSS, Santos AST, Pereira-Ávila FMV, Silva LJ, Silva LF and Goulart MCL contributed to the project design, data analysis and interpretation, article writing, critical review and final approval of the version to be published.

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