

Original

## Critical phase of the COVID-19 pandemic and health and working conditions in nursing

*Fase crítica da pandemia da COVID-19 e as condições de saúde e trabalho na enfermagem*  
*Fase crítica de la pandemia de COVID-19 y condiciones de salud y trabajo en enfermería*

*Ana Cristina Ribeiro La*

*Scaléa<sup>1</sup>*

ORCID: 0000-0002-0493-8376

*Francine Zentil Boaro<sup>1</sup>*

ORCID: 0000-0002-0966-8395

*Rafaela Carla Piotto*

*Rodrigues<sup>1</sup>*

ORCID: 0000-0001-8587-3115

*Rodrigo das Neves Cano<sup>1</sup>*

ORCID: 0009-0002-5570-8279

*Silvia Carla da Silva André*

*Uehara<sup>1</sup>*

ORCID: 0000-0002-0236-5025

### Abstract

**Objective:** to identify changes in the health and work conditions of nursing professionals working in Primary and Tertiary Care during the critical phase of the COVID-19 pandemic. **Methods:** this was a descriptive, cross-sectional study with retrospective data collection conducted between December 2022 and June 2023. Ninety-six of the 230 eligible professionals who worked for at least three months during the critical phase of the pandemic participated. Data were collected through a self-administered questionnaire and analyzed using frequencies and Fisher's exact test, with a significance level of 5%. This study was approved by the Ethics Committee. **Results:** there was a significant association between Tertiary Care and the provision of training on the use of Personal Protective Equipment ( $p < 0.01$ ), while Primary Care professionals were associated with a greater feeling of devaluation and lack of recognition by the user population ( $p = 0.01$ ). **Conclusion:** inequalities were identified regarding working and health conditions during the critical phase of the COVID-19 pandemic, highlighting the need for specific strategies to support nursing professionals at different levels of care during health emergencies.

**Descriptors:** Covid-19; Occupational Health Nursing; Health; Work; Health Status.

<sup>1</sup> Universidade Federal de São Carlos. São Carlos, São Paulo, Brazil.

Corresponding author:  
Silvia Carla da Silva André Uehara  
E-mail: [silviacarla@ufscar.br](mailto:silviacarla@ufscar.br)

#### What is already known on this?

The health emergency imposed during the initial years of the COVID-19 pandemic profoundly affected nursing professionals, generating fear of personal and family contamination, as well as abrupt changes in work processes and professional routines. The consequences for these professionals' health were reverberated in the medium and long term.

#### What this study adds?

The results of this study add to the literature on aspects related to the critical phase of the pandemic, such as the association between Tertiary Health Care (THC) nursing professionals and the increased availability of training on the proper use of PPE, and the discomfort related to the work environment configuration associated with the increased work hours in Primary Health Care (PHC). Furthermore, PHC nursing professionals were associated with feelings of devaluation and lack of recognition by the population.



**How to cite this article:** Scaléa ACR, Boaro FZ, Rodrigues RCP, Cano RN, Uehara SCSA. Critical phase of the COVID-19 pandemic and health and working conditions in nursing. Rev. enferm. UFPI. [internet] 2025 [Cited: ano mês abreviado dia];14:e6209. DOI: 10.26694/reufpi.v14i1.6209

**Resumo**

**Objetivo:** identificar as alterações nas condições de saúde e trabalho dos profissionais de Enfermagem atuantes na Atenção Primária à Saúde e na Atenção Terciária à Saúde durante a fase crítica da pandemia da COVID-19. **Métodos:** estudo transversal descritivo, com coleta retrospectiva de dados realizada entre dezembro de 2022 e junho de 2023. Participaram 96 dos 230 profissionais elegíveis, que atuaram por pelo menos três meses durante a fase crítica da pandemia. Os dados foram obtidos por questionário autorrespondido e analisados por frequências e teste exato de Fisher, com nível de significância de 5%. Este estudo foi aprovado pelo Comitê de Ética. **Resultados:** houve associação significativa entre a Atenção Terciária à Saúde e o oferecimento de treinamentos para o uso de Equipamentos de Proteção Individual ( $p < 0,01$ ), enquanto profissionais da Atenção Primária à Saúde estiveram associados a maior sentimento de desvalorização e falta de reconhecimento pela população usuária ( $p = 0,01$ ). **Conclusão:** identificaram-se desigualdades quanto às condições de trabalho e saúde durante a fase crítica da pandemia da COVID-19, evidenciando a necessidade de estratégias específicas para apoiar os profissionais de Enfermagem em diferentes níveis de atenção durante emergências sanitárias.

**Descritores:** Covid-19; Enfermagem do Trabalho; Saúde; Trabalho; Condições de Saúde.

**Resumén**

**Objetivo:** identificar los cambios en las condiciones de salud y trabajo de los profesionales de enfermería que trabajan en Atención Primaria y Terciaria durante la fase crítica de la pandemia de COVID-19. **Métodos:** estudio descriptivo y transversal con recolección retrospectiva de datos, realizado entre diciembre de 2022 y junio de 2023. Participaron 96 de los 230 profesionales elegibles que trabajaron al menos tres meses durante la fase crítica de la pandemia. Los datos se recopilaron mediante un cuestionario autoadministrado y se analizaron mediante frecuencias y la prueba exacta de Fisher, con un nivel de significación del 5%. Este estudio fue aprobado por el Comité de Ética. **Resultados:** se observó una asociación significativa entre Atención Terciaria y la capacitación en el uso de Equipos de Protección Individual ( $p < 0,01$ ), mientras que los profesionales de Atención Primaria se asociaron con una mayor sensación de desvalorización y falta de reconocimiento por parte de la población usuaria ( $p = 0,01$ ). **Conclusión:** se identificaron desigualdades en las condiciones de trabajo y de salud durante la fase crítica de la pandemia de COVID-19, destacando la necesidad de estrategias específicas para apoyar a los profesionales de enfermería en los diferentes niveles de atención durante las emergencias de salud.

**Descriptores:** Covid-19; Enfermería del Trabajo; Salud; Trabajo; Estado de Salud.

## INTRODUCTION

The COVID-19 pandemic spread rapidly, substantially affecting health systems, government structures, economies, and social structures on a global scale. During some of the most critical periods of the pandemic, there were shortages of hospital supplies, including a lack of medicines, respirators, Personal Protective Equipment (PPE), and healthcare professionals – all essential resources for dealing with a health emergency.<sup>(1)</sup>

Regarding human resources, the COVID-19 pandemic has generated significant changes in the working conditions of healthcare professionals, especially among nursing workers, who make up the majority of the healthcare workforce. Nursing staff work at all levels of care and were on the front lines during the critical phase of the pandemic, providing assistance ranging from awareness-raising activities on disease prevention in Primary Health Care (PHC) to more complex care in Tertiary Health Care (THC).<sup>(2)</sup>

Faced with an unusual work situation with the emergence of COVID-19, the risk of self-contamination, the fear of transmission to family members, along with a sudden transformation in their professional routines, took a toll on the physical and mental health of nursing workers.<sup>(2)</sup> In this context, research has indicated that, during the most critical period of the pandemic, nursing professionals not only faced the risk of contracting the virus but also became susceptible to other health conditions. In both Canada and Brazil, nurses were observed to exhibit significant levels of post-traumatic stress, as well as anxiety and depression of varying degrees of intensity.<sup>(3-4)</sup>

Many of these symptoms may be related to the working conditions to which nursing professionals were exposed during the critical phase of the pandemic. However, it is worth noting that, prior to the pandemic, these working conditions were already characterized by intense and long work hours, accompanied by professional and financial devaluation, which in themselves are determining factors for physical and psychological exhaustion. However, during critical periods during the pandemic, inadequate working conditions were exacerbated by the lack of adequate quantity and quality of PPE and the intense routine of training aimed at combating the disease, situations that intensified professional burnout.<sup>(5)</sup>

Given the above, the role of nursing professionals in the critical phase of the COVID-19 pandemic stands out, including disease prevention and case management actions, as well as the changes observed in physical and emotional health, in addition to the working conditions of this group.<sup>(2-5)</sup>

However, although the literature has described that the pandemic generated changes in the routines of nursing professionals, there is a gap in knowledge regarding the experiences of different nursing professional categories, such as nursing technicians and nurses, as well as the specificities of the

different levels of health care in which they worked. Therefore, this study aimed to identify changes in the health and working conditions of nursing professionals working in PHC and HTA during the critical phase of the COVID-19 pandemic.

## METHODS

This is a descriptive, cross-sectional study based on retrospective data, following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations for observational studies.<sup>(6)</sup> The study was conducted between December 2022 and June 2023, with retrospective data collection, considering the experiences of nursing professionals during the critical period of the pandemic.

The study was conducted in the municipality of São Carlos, located in the state of São Paulo. The municipality's healthcare system is organized into different levels of care, including PHC, with 12 Basic Health Units (UBS) and 22 Family Health Teams (EqSF); medium-complexity care; and hospital services, with a notable presence of philanthropic and university hospitals. The study covered primary and secondary care services, including the University Hospital of the Federal University of São Carlos (HU-UFSCar) and the Santa Casa de Misericórdia de São Carlos.

The initial target population consisted of 137 primary care professionals, 220 from HU-UFSCar, and 447 from the Santa Casa de Misericórdia de São Carlos. Inclusion criteria defined that participants must have worked for at least three months in healthcare services during the critical phase of the COVID-19 pandemic (2020 and 2021), while exclusion criteria considered those on leave, on vacation, or unavailable to respond to the questionnaires after three attempts. After applying the inclusion and exclusion criteria, 76 primary care nursing professionals and 154 primary care nursing professionals were eligible for the study, totaling 230 nursing professionals. During the critical years of the pandemic, there was an increase in the number of temporary employees to meet the demand, which impacted the definition of eligible participants for the study. Therefore, convenience sampling was chosen, as sample size calculations were not feasible due to the context.

Data were collected through a self-administered questionnaire, using a validated instrument from the "Working Conditions of Healthcare Professionals in the Context of COVID-19" survey developed by FIOCRUZ and available on the institution's official website.<sup>(7)</sup> The questionnaire included variables such as demographic characteristics, weekly work hours, ergonomic conditions, physical and emotional changes, situations of workplace violence, interaction and support between professionals, staff, and the institution during the COVID-19 pandemic, and assessments of PPE training.

Data collection was conducted through in-person distribution of questionnaires during scheduled visits to healthcare facilities. Thus, the questionnaires were personally delivered to the research participants at different times, depending on their shifts, and were collected on a previously agreed-upon date.

After obtaining the physical questionnaires, the data were transcribed into digital format, maintaining the same structure, constituting a database. The data were described using absolute frequencies and percentages, both in general terms and according to the level of care of the facility where the professional worked in the fight against COVID-19. Associations between the qualitative variables of interest were analyzed using Fisher's exact test. All analyses were performed using SAS 9.4 software, and a significance level of 5% was adopted in all analyses.

Regarding ethical aspects, the study was approved by the Research Ethics Committee (CEP) of the Federal University of São Carlos (UFSCAR), under CAAE 59444722.7.0000.5504, and data collection began after the signing of the Informed Consent Form (ICF).

## RESULTS

Of the 230 eligible nursing professionals, 96 professionals from the city of São Carlos agreed to participate in the study: 29 (30.5%) nurses, 44 (46.3%) nursing technicians, and 22 (23.2%) nursing assistants. It is noteworthy that 16 (55.2%) nurses were from PHC and 13 (44.8%) from tertiary care; 11 (25.0%) technicians from PHC and 33 (75.0%) from HTA; and the 22 (100%) nursing assistants participating were from PHC.

It is observed that 84 (87.5%) participants were female and 12 (12.5%) were male; 54 (56.3%) were between 36 and 50 years old, 17 (17.7%) between 51 and 60 years old, 16 (16.6%) between 26 and 35 years old, seven (7.3%) were over 61 years old and two (2.1%) participants were under 25 years old. Regarding race/color, 61 (63.5%) declared themselves white, 26 (27.1%) brown, six (6.3%) black and three (3.1%) yellow; in addition, 46 (47.9%) had completed higher education, 31 (32.3%) completed high school, 18

(18.8%) incomplete higher education and 1 (1.0%) had completed basic education. Finally, 39 (41.5%) reported having some risk factor for developing severe COVID-19, and 55 (58.5%) reported having no risk factors.

The questionnaire allowed more than one answer for each question related to variables regarding physical and emotional changes, professional support during the COVID-19 pandemic, and PPE training. When analyzing the level of health care and the provision of courses/training on proper PPE use by the facility to nursing professionals, there was a statistically significant difference, demonstrating an association between HTA and the provision of training for health professionals. During the critical years of the COVID-19 pandemic, nursing professionals were exposed to various forms of violence; it is noteworthy that 68.7% of PHC professionals and 75.6% of HTA professionals reported not having experienced violence or discrimination. Furthermore, an association was found between professionals' feelings after carrying out work during the emergency phase of the COVID-19 pandemic: PHC professionals felt more undervalued and less recognized by the population (Table 1).

**Table 1.** Association between exposure to violence, discrimination, professional sentiment, and levels of health care among nursing professionals during the COVID-19 pandemic. São Carlos (SP), Brazil, 2024

Level of health care	PHC (n=50)	HTS (n=46)	Valor-p*
<b>Have you introduced any of the changes below in a significant way?</b>			
Sleep disturbances, such as insomnia and hypersomnia	23 (46%)	25 (54,35%)	0,54
Feelings of loneliness when facing daily life	7 (14%)	10 (21,74%)	0,42
Difficulty experiencing happiness	3 (6%)	8 (17,39%)	0,11
Irritability/frequent crying/general disturbances	8 (16%)	11 (23,91%)	0,44
Increased consumption of medications, alcohol or energy drinks, cigarettes	7 (14%)	10 (21,74%)	0,42
Others <sup>1</sup>	5 (10%)	3 (6,52%)	0,72
<b>At this establishment, was there a course/training for staff on the proper use of PPE when working on the front lines in the fight against COVID-19?</b>			
I learned from a colleague.	4 (8,16%)	2 (4,44%)	<0,01
No.	25 (51,02%)	2 (4,44%)	<0,01
Yes.	14 (28,57%)	40 (88,89%)	<0,01
Video I found on the internet.	6 (12,24%)	1 (2,22%)	<0,01
Frequency missing=2			
<b>During the pandemic, have you suffered any type of violence or discrimination?</b>			
No	33 (68,75%)	34 (75,56%)	0,50
Yes	15 (31,25%)	11 (24,44%)	
Missing Frequency = 3			
<b>How did you feel about the COVID-19 pandemic in your professional life?</b>			
Better team relationships	5 (10%)	10 (21,74%)	0,16
More welcomed by management/services	3 (6%)	5 (10,87%)	0,47
Less valued and recognized by users	18 (36%)	6 (13,04%)	0,01
Less respected and valued by management/services	20 (40%)	10 (21,74%)	0,08
Nothing changed	12 (24%)	14 (30,43%)	0,50
<b>Did you receive any support from the facility working to combat COVID-19?</b>			
No	25(52,08%)	26 (60,47%)	0,53
Yes	23(47,92%)	17 (39,53%)	
Missing Frequency = 5			

\* Significance level p<0,05; 1The "other" category involves other physical and emotional changes experienced during the pandemic. Source: Prepared by the authors based on the instrument developed by FIOCRUZ.

A significant relationship was found between workplace discomfort during the COVID-19 health emergency and the weekly workload of PHC nursing professionals, with longer working hours being

associated with higher levels of discomfort. Furthermore, the analysis showed that, in the post-pandemic period, those with greater workloads more frequently reported feelings of devaluation and less recognition from the public (Table 2).

**Table 2.** Association between ergonomic problems/wear, professional category and weekly working hours of PHC professionals. São Carlos (SP), Brazil, 2024.

Professional category PHC	Nursing Assistant (n=22)	Nursing (n=16)	Nursing Technician (n=11)	Valor-p*
<b>Have you experienced discomfort caused by the configuration of your work environment when dealing with COVID-19?</b>				
Very Low	6 (27,27%)	2 (12,5%)	0 (0%)	0,49
Low	6 (27,27%)	3 (18,75%)	3 (30%)	
Fair	4 (18,18%)	5 (31,25%)	5 (50%)	
High	5 (22,73%)	4 (25%)	1 (10%)	
Very High	1 (4,55%)	2 (12,5%)	1 (10%)	
Frequency Missing = 1				
<b>Weekly working hours</b>				
	<b>21-40 (n=45)</b>	<b>41-60 (n=4)</b>	<b>61-80 (n=1)</b>	<b>Valor-p*</b>
<b>Have you experienced discomfort caused by the configuration of your work environment when dealing with COVID-19?</b>				
Very Low	8 (18,18%)	0 (0%)	0 (0%)	0,02
Low	12 (27,27%)	0 (0%)	0 (0%)	
Fair	14 (31,82%)	0 (0%)	0 (0%)	
High	6 (13,64%)	4 (100%)	1 (100%)	
Very High	4 (9,09%)	0 (0%)	0 (0%)	
Frequency Missing = 2				
<b>How did you feel, in your professional life, with the COVID-19 pandemic?</b>				
Better team relationships	4 (8,89%)	0 (0%)	1 (100%)	0,14
Less valued and recognized by users	13 (28,89%)	4 (100%)	1 (100%)	<0,01
Less respected and valued by management/supervisors	16 (35,56%)	3 (75%)	1 (100%)	0,13
Nothing has changed	12 (26,67%)	0 (0%)	0 (0%)	0,67
<b>Have you received any support from the establishment working to combat COVID-19?</b>				
No	21 (48,84%)	3 (75%)	1 (100%)	0,61
Yes	22 (51,16%)	1 (25%)	0 (0%)	
Frequency Missing = 2				

\* Significance level p<0.05. Source: Prepared by the authors based on the instrument developed by FIOCRUZ.

This study, within the scope of HTA, found an association between changes in appetite, weight, and the weekly work hours of nursing professionals. The longer the workload, the more these professionals reported these symptoms during the health emergency phase of the pandemic. Furthermore, a significant association was found between professional categories and the expression of feelings of loneliness, with nursing technicians reporting a higher frequency of these feelings during the critical phase of the pandemic (Table 3).

The results also revealed a significant association between the intensity of risks posed by the physical space and the discomforts posed by the layout of the work environment and the HTA professional category, with nursing technicians reporting that the intensity of these risks could be considered low to moderate. Finally, a significant association between weekly work hours and the support received from health services is noteworthy; however, a variation was found between the different working hours, with support being most reported by those who worked more than 80 hours and between 41 and 60 hours per week (Table 3).

**Table 3** - Association between ergonomic problems/wear, professional category and weekly working hours of ATS professionals. São Carlos (SP), Brazil, 2024.

Weekly working hours	21-40 (n=34)	41-60 (n=6)	61-80 (n=3)	More than 80 hours (n=3)	Valor-p*
<b>Have you introduced any of the changes below in a significant way?</b>					
Changes in appetite/weight	7 (20,59%)	3 (50%)	3 (100%)	1 (33,33%)	0,02
Loss of confidence in oneself, one's team, or one's work	5 (14,71%)	0 (0%)	2 (66,67%)	0 (0%)	0,14
Difficulty experiencing happiness	6 (17,65%)	0 (0%)	2 (66,67%)	0 (0%)	0,14
Irritability/frequent crying/general disturbances	8 (23,53%)	0 (0%)	2 (66,67%)	1 (33,33%)	0,12
Increased consumption of medications, alcohol, energy drinks, or cigarettes	5 (14,71%)	3 (50%)	1 (33,33%)	1 (33,33%)	0,11
<b>Have you received any support from the establishment where you work in the fight against COVID-19?</b>					
No	21 (65,63%)	2 (40%)	3 (100%)	0 (0%)	0,04
Yes	11 (34,38%)	3 (60%)	0 (0%)	3 (100%)	
Frequency Missing = 3					
Professional category	Nursing (n=13)	Nursing Technician (n=33)		Valor-p*	
<b>Have you introduced any of the changes below in a significant way?</b>					
Feelings of loneliness when facing everyday life	0 (0%)	10 (30,3%)		0,04	
Negative feelings about the future	0 (0%)	8 (24,2%)		0,08	
<b>Have you noticed the risks posed by the physical space in which you work?</b>					
Very low	1 (7,69%)	4 (12,12%)		0,01	
Low	0 (0%)	12 (36,36%)			
Fair	6 (46,15%)	13 (39,39%)			
High	5 (38,46%)	2 (6,06%)			
Very high	1 (7,69%)	2 (6,06%)			
<b>Have you experienced any discomfort caused by the layout of your work environment while responding to COVID-19?</b>					
Very low	2 (15,38%)	7 (21,21%)		0,01	
Low	1 (7,69%)	9 (27,27%)			
Fair	3 (23,08%)	14 (42,42%)			
High	5 (38,46%)	1 (3,03%)			
Very high	2 (15,38%)	2 (6,06%)			

\* Significance level p<0.05. Source: Prepared by the authors based on the instrument developed by FIOCRUZ.

## DISCUSSION

The results of this study highlighted changes in the health and work routines of PHC and ATS nursing professionals during the critical phase of the COVID-19 pandemic, demonstrating distinct associations between each category of these workers.

Prior to the COVID-19 pandemic, a study on Brazilian nursing showed that, regardless of professional category, nursing professionals were mostly white and female. However, there was a

significant and symbolic increase in the participation of self-identified Black people in the profession. Between the 2000 and 2010 census, the increase in the number of Black and brown people was approximately 8%, demonstrating the positive effects of social policies in guaranteeing access rights for people of different races to predominantly white spaces.<sup>(8)</sup>

Regarding the greater participation of nursing technicians in the study, this may be related to the staffing levels of the nursing workforce. In Brazil's primary healthcare system, according to the Federal Nursing Council (COFEN), the minimum number of nursing professionals required to care for patients varies according to the severity and dependency of the care to be provided.<sup>(9)</sup> Regarding primary healthcare, Ordinance No. 2,436 of September 21, 2017, establishes that staffing levels – including nursing professionals – should consider demographic criteria, team structure and performance, the profile of the population served, and the health actions and services to be offered.<sup>(10)</sup>

Given the significant and varied composition of the workforce, it is essential to highlight the association between participation in PPE use training and primary healthcare. As observed in this study, nursing professionals at this level of care had more opportunities to receive training on the proper and safe use of PPE during the critical phase of the pandemic. During the initial period of the pandemic, there was global concern about ensuring PPE for healthcare professionals, especially in hospital settings, given the communicable and unknown disease involved, in addition to the high number of patients requiring hospitalization.<sup>(11)</sup>

In this context, participants in this study, both from PHC and ATS, highlighted the discomfort caused by the configuration of the work environment in the fight against COVID-19. It is recognized that healthcare services needed to reorganize to meet the high demand of patients with COVID-19 and to maintain routine care. Therefore, PHC reorganized to ensure patient care; however, these services were depleted, and management focused on the hospital setting, which prevented the efficient use of the potential of this level of care in combating the pandemic. Thus, it is clear that the distribution of PPE was not associated with the training of health professionals in PHC, and given the unknown situation, the inadequate and irrational use of this equipment was widely observed.<sup>(11)</sup>

A study conducted during the critical period of the COVID-19 pandemic demonstrated that healthcare institutions at different levels of care should offer and ensure professional training (especially on donning and doffing techniques), as well as supervision over the use, maintenance, and replacement of PPE.<sup>(10)</sup> Some studies conducted in Brazil and Germany have shown that inadequate use of PPE contributed to the transmission of diseases, including Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), due to a lack of training and non-adherence to the use of this equipment.<sup>(12-13)</sup>

During the critical period of the pandemic, in PHC settings, healthcare professionals who were in contact with suspected or confirmed cases of COVID-19 only during certain work shifts were less likely to fully comply with PPE use and adherence compared to those who cared for infected patients throughout the shift.<sup>(14)</sup> It is understood that professionals who work directly with COVID-19 patients may be more aware of the risks of the disease, which may influence their behavior regarding the use of PPE.<sup>(14)</sup> In this context, an analysis conducted in Italy on working conditions during the critical phase of the pandemic, involving more than 11,000 nurses, showed that training on disease management and PPE use was considered extremely low or non-existent by most nurses.<sup>(15)</sup>

It is clear that, regarding working conditions, even before the pandemic, inadequate conditions and overload were already observed, which were even more pronounced during the public health emergency. This is particularly true in Brazil, where double shifts for nursing professionals, which for many were not an option but a necessity, are compounded by low pay, devaluation of the profession, precarious employment relationships, and even temporary contracts. Furthermore, during the critical period of the pandemic, uncertainty about job retention prevailed, exacerbating emotional exhaustion and psychophysical suffering, in addition to contributing to illness.<sup>(15-17)</sup>

In Australia, a study showed that nurses reported threats of termination during the critical phase of the pandemic, as well as considering dismissal themselves. Among the main reasons were concerns about physical and psychological safety and lack of job security.<sup>(16)</sup> In Brazil, during this period, the majority of nursing professionals were hired under precarious employment contracts, including fixed-term contracts, or worked without contracts/informally. There was also an increase in overtime, which was justified as necessary due to the insufficient number of nursing staff, delays in shift changes, as well as illness and/or absences.<sup>(17)</sup>

It is noteworthy that the high number of professionals with comorbidities, since the pre-pandemic period, directly influenced the reassignment or removal of these individuals at risk of developing severe COVID-19, directly interfering with human resource management, as well as the work routines of other workers.<sup>(15-17)</sup>

Thus, the COVID-19 pandemic, especially in its first two years, was associated with negative effects on the working and health conditions of nursing professionals, resulting in illness and affecting their health in the short and long term. In China, during the initial phase of the pandemic, healthcare professionals reported developing psychological problems, including anxiety, depression, and stress, which interfered with rest and sleep.<sup>(18-19)</sup>

In this context, the aforementioned factors may also have influenced the association found in this study between nursing technicians' reports and the frequency of feelings of loneliness and changes in appetite. It is also noteworthy that nursing technicians were among the professionals most susceptible to burnout-enhancing processes, considering they were directly involved in patient care. However, nursing assistants and nurses were also vulnerable, constituting the group of professionals who took the least time off from work.<sup>(20)</sup>

Regarding the health conditions of nursing professionals during the COVID-19 pandemic, this study demonstrated a low or fair association with ergonomic problems among nursing technicians. This inconsistency with nursing professional practice itself is observed, especially during a period of high patient demand, which requires constant and repetitive physical effort from these professionals, particularly assistants and technicians. Nursing professionals remain in direct contact with patients for longer periods and, consequently, are more exposed to agents that cause ergonomic risks. Therefore, the length of exposure is not only a determining factor, but also a determining factor in the development of work-related illnesses that can render professionals unable to perform their duties.<sup>(21)</sup>

The well-being of nursing professionals is reflected in their work routine and influences their health. Thus, illnesses caused by ergonomic risks have a silent and prolonged progression, often triggered by daily repetition, which makes it difficult to recognize work as a causal agent of illness, as well as the risk factors to which they are exposed.<sup>(21)</sup>

The results of this study showed an association between PHC nursing professionals and feelings of devaluation and lack of recognition by the population. In this context, it can be inferred that, in Brazil, the politicization of the COVID-19 pandemic also influenced how society perceived these professionals. In the initial period of the pandemic, healthcare professionals were exalted, especially those working in HTA; Later, with the advent of the vaccine, PHC nursing professionals gained notoriety. However, as time passed and the population grew weary of the restrictive measures, the political duality of the time, and the spread of fake news about the disease and the vaccine, nursing professionals began to be harassed by part of society, as in the attacks suffered when they held a peaceful protest in honor of colleagues killed by COVID-19, on May Day 2021, at the Esplanada dos Ministérios, in Brasília (DF).<sup>(22)</sup>

Nursing became an important media source in public health during the critical period of the pandemic, due to its capillarity and the broad scope of its practices at different levels of care and health services. However, it is important to highlight that, after the critical period of the pandemic and the return to normality, there was a regression to the pre-pandemic period in terms of the visibility of the profession in different media, as well as in actions to value and recognize it, whether by the population or by managers. The COVID-19 pandemic has intensified a nursing work environment long characterized by work overload, scarcity of human and material resources, lack of space for rest and food, lack of training, delayed vacations, productivity stress, and dehumanization of work, in addition to the devaluation of the profession.<sup>(4,5,10-17,20-21)</sup> It is important to highlight that, in Brazil, in terms of professional development and financial aspects, it was only in mid-2022 that the minimum wage for nursing professionals was established through Law No. 14,434/22, for professionals hired under the Consolidation of Labor Laws; however, this is still a reality far from being implemented in all health services.<sup>(23)</sup>

It is clear that nursing working conditions directly influence the quality of care offered to health service users, and institutional support is essential, especially during health emergencies such as the COVID-19 pandemic. In this scenario, the reorganization of health services to address a health emergency should not be limited to supplies, PPE, beds, and technology, but should also pay special attention to the human aspect of work processes, considering that it is impossible to achieve adequate health indicators without addressing the needs of these workers.

This study had some limitations, such as the difficulty in participant participation due to the limited time available. Another limitation of this study concerns the retrospective nature of data collection, conducted through a self-administered questionnaire. Because these experiences were experienced during the critical period of the COVID-19 pandemic, there is a possibility of recall bias, which can compromise the accuracy and reliability of the information obtained. Furthermore, participants' perceptions may have been influenced by subsequent interpretations of the events, introducing a degree of subjectivity into their responses. However, the significant and emotionally significant nature of this period for nursing professionals may have contributed to the preservation of memories, partially mitigating these biases.

Furthermore, as a limitation of this study, the cross-sectional and descriptive design, combined with retrospective data collection, prevents the inference of causality between the analyzed variables, limiting the findings to the identification of associations and the description of nursing professionals' experiences. However, despite the aforementioned limitations, this study offers important contributions by expanding knowledge about the health and work conditions of nursing professionals in PHC and HTA during the critical phase of the COVID-19 pandemic.

## CONCLUSION

The results of this study demonstrated associations between HTA and professional training in the proper use of PPE; however, devaluation and lack of recognition by the public were associated with PHC nursing professionals. Furthermore, the study allowed us to outline the sociodemographic profile of nursing during the critical period of the pandemic in a major Brazilian municipality. It highlighted the predominance of female professionals, aged 36 to 50, white, and nursing technicians.

Finally, this study reinforces that the health and working conditions of nursing professionals were associated with changes during the critical phase of the COVID-19 pandemic. It is important to emphasize that nursing should be considered a fundamental component of the Brazilian healthcare system; therefore, this study contributes to strengthening the theoretical framework necessary for formulating strategies aimed at valuing these professionals and reducing the adverse effects on their physical and psychological conditions resulting from work demands, both in routine work and during health emergencies.

## CONTRIBUTIONS

Contributed to the conception or design of the study/research: Boaro FZ, Uehara SCSA. Contributed to data collection: Boaro FZ, La Scalea ACR, Rodrigues RCP. Contributed to the analysis and/or interpretation of data: La Scalea ACR, Uehara SCSA. Contributed to article writing or critical review: La Scalea ACR, Cano RN, Rodrigues RCP, Boaro FZ. Final approval of the version to be published: Cano RN, Uehara SCSA.

## ACKNOWLEDGMENT

To the support of the Coordination for the Improvement of Higher Education Personnel – Brazil (CAPES) – Funding Code 001 and the São Paulo Research Foundation – Process 2021/08505-0).

## REFERENCES

1. Stelnicki AM, Carleton RN, Reichert C. Nurses' mental health and well-being: COVID-19 impacts. *Can J Nurs Res.* 2020 [cited 2024 Jan 20]; 52(3):237- 9. DOI: <https://doi.org/10.1177/0844562120931623>.
2. Choi KR, Jeffers KS, Longsdon MC. Nursing and the novel coronavirus: Risks and responsibilities in a global outbreak. *J Adv Nurs.* 2020 [cited 2024 Jan 20]; 76(7):1486-1487. DOI: <https://doi.org/10.1111%2Fjan.14369>.
3. Crowe S, Howard AF, Vanderspank-Wright B, Gillis P, McLeod F, Penner C, et al. The effect of COVID-19 pandemic on the mental health of Canadian critical care nurses providing patient care during the early phase pandemic: A mixed method study. *Intensive Crit Care Nurs.* 2021 [cited 2024 Jan 17]; 63:102999. DOI: <https://doi.org/10.1016%2Fj.iccn.2020.102999>.

4. Maier MR, Kanunfre CC. Impact on nursing personnel's mental health and sleep quality during the COVID-19 pandemic. *Rev. enferm. UERJ.* 2021 [cited 2024 Jan 20];29(1):e61806. DOI: <https://doi.org/10.12957/reuerj.2021.61806>.
5. Miranda FMA, Santana LL, Pizzolato AC, Saquis LMM. Working conditions and the impact on the health of the nursing professionals in the context of covid-19. *Cogitare enferm.* 2020 [cited 2024 Jan 27]; 25. DOI: <http://dx.doi.org/10.5380/ce.v25i0.72702>.
6. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandebroucke JP; STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *J Clin Epidemiol.* 2008 [cited 2025 Mai 21]. Apr;61(4):344-9. Available from: <https://www.strobe-statement.org/strobe-publications/>.
7. Machado MH. Condições de trabalho dos profissionais de saúde no contexto da Covid-19 no Brasil. Rio de Janeiro: ENSP/CEE-Fiocruz; 2020/2021 [cited 2024 Jan 20]. Available from: <https://portal.fiocruz.br/noticia/pesquisa-analisa-o-impacto-da-pandemia-entre-profissionais-de-saude>.
8. Marinho GL, Oliveira BLCA, Cunha CLF, Tavares FG, Paz EPA. Nursing in Brazil: socioeconomic analysis with a focus on the racial composition. *Rev Bras Enferm.* 2021 [cited 2024 Jan 23];75(2):e20201370. DOI: <https://doi.org/10.1590/0034-7167-2020-1370>.
9. Brasil. Conselho Federal de Enfermagem. Resolução COFEN nº 543/2017 – revogada pela Resolução COFEN nº 743/2024. Atualiza e estabelece parâmetros para o dimensionamento do quadro de profissionais de enfermagem nos serviços/locais em que são realizadas atividades de enfermagem [Internet]. Brasília: COFEN; 2017 [cited 2024 Jan 20]. Available from: <https://www.cofen.gov.br/resolucao-cofen-5432017/>.
10. Ministério da Saúde(BR). Portaria nº 2.436, de 21 de setembro de 2017. Aprova a Política Nacional de Atenção Básica, estabelecendo a revisão de diretrizes para a organização da Atenção Básica, no âmbito do Sistema Único de Saúde (SUS) [Internet]. Brasília: Diário Oficial da União; 2017 [cited 2024 Jan 20]. Available from: [https://bvsms.saude.gov.br/bvs/saudelegis/gm/2017/prt2436\\_22\\_09\\_2017.html](https://bvsms.saude.gov.br/bvs/saudelegis/gm/2017/prt2436_22_09_2017.html)
11. Soares SSS, Souza NVDO, Silva KG, César MP, Souto JSS, Leite JCRAP. Covid-19 pandemic and rational use of personal protective equipment. *Rev. enferm. UERJ.* 2020 [cited 2024 Jan 20];28:e50360. DOI: <https://doi.org/10.12957/reuerj.2020.50360>.
12. Teixeira CFS, Soares CM, Souza EA, Lisboa ES, Pinto ICM, Andrade LR, *et al.* The health of healthcare professionals coping with the Covid-19 pandemic. *Cien Saude Colet.* 2020 [cited 2024 Jan 27];25(9):3465-3474. DOI: <https://doi.org/10.1590/1413-81232020259.19562020>.
13. Neuwirth MM, Mattner F, Otwemah R. Adherence to personal protective equipment use among healthcare workers caring for confirmed COVID-19 and alleged non-COVID-19 patients. *Antimicrob Resist Infect Control.* 2020 [cited 2024 Jan 20];9(1):199. DOI: <https://doi.org/10.1186/s13756-020-00864-w>.
14. Abed Alah MTT, Abdeen S, Selim N, Tayar E, Bougmiza I. Occupational Prevention of COVID-19 Among Healthcare Workers in Primary Healthcare Settings: Compliance and Perceived Effectiveness of Personal Protective Equipment. *J Patient Saf.* 2022 [cited 2024 Feb 12];18(8):747-755. DOI: <https://doi.org/10.1097/pts.0000000000001004>.

15. Pérez-Raya F, Cobos-Serrano JL, Ayuso-Murillo D, Fernández-Fernández P, Rodríguez-Gómez JA, Almeida Souza A. COVID-19 impact on nurses in Spain: a considered opinion survey. *Int Nurs Rev.* 2021;68(2):248-255. DOI: <https://doi.org/10.1111/inr.12682>.
16. Halcomb E, McInnes S, Williams A, Ashley C, James S, Fernandez R, Stephen C, *et al.* The Experiences of Primary Healthcare Nurses During the COVID-19 Pandemic in Australia. *J Nurs Scholarsh.* 2020[cited 2024 Feb 12];52(5):553-563. DOI: <https://doi.org/10.1111/2Fjnu.12589>.
17. Magalhães APN, Souza DO, Macêdo FP, Silva Cruz SAF, Pereira-Abagaro C, Rosales-Flores RA. Working conditions in nursing in the face of Covid-19 from the perspective of precariousness. *Rev Bras Enferm.* 2023[cited 2024 Feb 12];76(Suppl 1):e20220679. DOI: <https://doi.org/10.1590/0034-7167-2022-0679pt>.
18. Liu Y, Long Y, Cheng Y, Guo Q, Yang L, Lin Y, *et al.* Psychological Impact of the COVID-19 Outbreak on Nurses in China: A Nationwide Survey During the Outbreak. *Front Psychiatry.* 2020[cited 2024 Feb 17];11:598712. DOI: <https://doi.org/10.3389%2Ffpsyt.2020.598712>.
19. Dong HS, Gao JJ, Dong YX, Han SX, Sun L. Prevalence of insomnia and anxiety among healthcare workers during the COVID-19 pandemic in Jilin Province. *Braz J Med Biol Res.* 2021[cited 2024 Feb 17];54(9):e10602. DOI: <https://doi.org/10.1590/1414-431x2020e10602>.
20. Silva LS, Passos HR, Oliveira JV, Amaral GG. Contextos de saúde e trabalho de profissionais de enfermagem em tempos de pandemia de COVID-19. *Enferm. actual Costa Rica.* 2023[cited 2024 Feb 12];44:54263. DOI: <http://dx.doi.org/10.15517/enferm.actual.cr.i44.49421>.
21. Pacheco AS, Santos LJ. A importância da prevenção dos riscos ergonômicos no ambiente hospitalar e as estratégias para melhorar o ambiente de trabalho do enfermeiro. *Revista FT.* 2023[cited 2024 Feb 15];123. DOI: <http://dx.doi.org/10.5281/zenodo.8092546>.
22. Freire NP, Castro DA, Fagundes MCM, Ximenes Neto FRG, Cunha ICKO, Silva MCN. News on Brazilian Nursing in the COVID-19 pandemic. *Acta Paul Enferm.* 2021[cited 2024 Feb 12];34:eAPE02273. DOI: <http://dx.doi.org/10.37689/acta-ape/2021AO02273>.
23. Brasil. Lei nº 14.434, de 4 de agosto de 2022. Altera a Lei nº 7.498, de 25 de junho de 1986, para instituir o piso salarial nacional do Enfermeiro, do Técnico de Enfermagem, do Auxiliar de Enfermagem e da Parteira [Internet]. Brasília: Presidência da República; 2022 [cited 2024 Feb 12]. Available from: [https://www.planalto.gov.br/ccivil\\_03/\\_ato2019-2022/2022/lei/l14434.htm](https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2022/lei/l14434.htm).

Conflicts of interest: No  
Submission: 2024/10/09  
Revised: 2025/07/16  
Accepted: 2025/08/21  
Publication: 2025/11/19

Editor in Chief or Scientific: Jose Wictor Pereira Borges  
Associate Editor: Guilherme Guarino de Moura Sá

Authors retain copyright and grant the Revista de Enfermagem da UFPI the right of first publication, with the work simultaneously licensed under the Creative Commons Attribution BY 4.0 License, which allows sharing the work with acknowledgment of authorship and initial publication in this journal.