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Repercussion of the COVID-19 pandemic on the lives and work of ICU nursing technicians

Repercussão da pandemia da COVID-19 na vida e trabalho de técnicos de enfermagem em UTI

Repercusión de la pandemia de COVID-19 en la vida y el trabajo de los técnicos de enfermería en UCI

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ABSTRACT

Objective: To investigate the impact of the COVID-19 pandemic on personal dimensions and its relationship with the work context of nursing technicians who worked in ICUs.

Method: A cross-sectional mixed-method study (convergent parallel). A total of 229 nursing technicians from intensive care units participated and responded a questionnaire. The study was conducted using the IRaMuTeQ software for lexicographic verification and similarity analysis of the corpus and the Minitab 19 software for comparison between means and logistic regression.

Results: Fear was found that the biggest impact on the lives of nursing technicians. The professionals experienced stress and anxiety as a consequence of the fear of Coronavirus infection and its transmission to their families.

Conclusion: The pandemic affected the daily personal lives of nursing technicians, in the same work context, in different ways.

Descriptors: Pandemics. COVID-19. Working conditions. Occupational health. Nursing.

RESUMO

Objetivo: Investigar a repercussão da pandemia da COVID-19 nas dimensões pessoais e sua relação com o contexto laboral dos técnicos de enfermagem que atuaram em unidades de terapia intensiva.

Método: Pesquisa transversal de natureza mista (paralelo convergente). Participaram 229 técnicos de enfermagem de unidades de terapia intensiva que responderam um questionário. O estudo foi realizado com auxílio do software IRaMuTeQ para verificação lexicográfica e análise de similitude do corpus e o software Minitab 19 para comparação entre médias e regressão logística.
Resultados: Verificou-se que a maior repercussão na vida dos técnicos de enfermagem foi o medo. Os profissionais apresentaram estresse e ansiedade que se configuraram como desdobramento do medo de contaminação pelo Coronavírus e disseminação para familiares.
Conclusão: A pandemia afetou de formas distintas o cotidiano de vida pessoal dos técnicos de enfermagem, inseridos no mesmo contexto laboral.
Descritores: Pandemias. COVID-19. Condições de trabalho. Saúde ocupacional. Enfermagem.

RESUMEN
Objetivo: Investigar el impacto de la pandemia de la COVID-19 en las dimensiones personales y su relación con el contexto de trabajo de los técnicos de enfermería que actuaban en las UTI.
Método: Estudio transversal de carácter mixto (paralelo convergente). Participaron 229 técnicos de enfermería de unidades de cuidados intensivos que respondieron un cuestionario. El estudio mixto se realizó con la ayuda del software IRaMuTeQ para verificación lexicográfica y análisis de similitud del corpus y el software Minitab 19 para comparación entre medias y regresión logística.
Resultados: Se constató que la mayor repercusión en la vida de los técnicos de enfermería fue el miedo. Los profesionales tenían estrés y ansiedad como consecuencia del miedo a la contaminación por el Coronavirus y la diseminación a los familiares.
Conclusión: La pandemia afectó el cotidiano personal de los técnicos de enfermería, en el mismo contexto de trabajo, de formas diversas.
Descriptores: Pandemias. COVID-19. Condiciones de trabajo. Salud laboral. Enfermería.

INTRODUCTION

The COVID-19 pandemic emerged as a global concern and required efforts from the scientific community and healthcare professionals, who committed themselves to overcome the health crisis, with 767,750,853 cases of COVID-19 and 6,941,095 deaths worldwide by June 2023, and Brazil had a high morbidity and mortality rate, with 37,601,257 confirmed cases and 702,907 deaths[1].

According to data from the Federal Nursing Council Observatory, there were 65,029 cases of COVID-19 and 872 deaths of nursing professionals by June 2023, with the category of nursing technicians being most compromised[2], which performs almost all of the activities involving direct patient contact. Previous research conducted prior to the pandemic had already highlighted the precariousness of working conditions, intensification of work and physical and emotional exhaustion of these professionals[3].

During the health crisis, the occupational risks of the health workforce worsened, due to overload, risk of infection, shortage of personal protective equipment (PPE), and

overcrowding of intensive care units (ICU)[4]. These conditions influenced the quality of life of nursing professionals[5], leading them to physical and mental exhaustion, which affected their ability to work[6]with a direct influence of stress on their personal life[7], an increase in Burnout Syndrome symptoms[8], in addition to the prevalence of anxiety and depression symptoms[9].

According to the World Health Organization, quality of life (QoL) is related to a individual's personal understanding of their own life and their particular aspirations for the future, encompassing dimensions of physical and psychological health, level of independence, social relationships, environment and spirituality[10].

Nursing professionals experienced significant pressure during the COVID-19 pandemic, with impacts on the QoL of those who worked directly in care, resulting in sleep disorders, chronic fatigue, irritability, loss of motivation and depressive symptoms[11].Additionally, there were alterations in work performance and overall health, mainly increased by psychological factors such as stress and anxiety[5,12].

A study conducted in China revealed that healthcare professionals who had direct contact with patients infected by the Coronavirus were almost twice as likely to suffer from anxiety and depression[13]and research conducted in Brazil showed that these symptoms were prevalent among nursing technicians who worked in the ICU[9].

The workplace context in hospital institutions requires qualified nursing staff with technical and scientific knowledge to provide quality and safe care to patients. ICUs are complex settings that require excellent skills and competencies from nursing technicians. Given that the COVID-19 pandemic is a recent event, studies that explore the relationship between work environment and aspects of personal life are essential, as they allow to expand situational knowledge and assist in planning actions to promote worker health and patient safety. In this context, the present study aims to investigate the impact of the COVID-19 pandemic on personal dimensions and its relationship with the work context of nursing technicians who worked in ICUs.

METHOD

This is a cross-sectional mixed-method study using convergent parallel design[14], characterized by the simultaneous collection of qualitative (QUAL) and quantitative (QUAN) data, with equal weighting (QUAL+QUAN) and with an integrated combination of data according to the criteria outlined in the Mixed Methods Appraisal Tool. The method and

strategy were chosen with the intention of complementing the findings of the two approaches through data integration.

The research was conducted in two hospitals chosen for convenience, located in the city of Campinas, in the interior of the state of São Paulo. Both are large, tertiary-level, teaching, and research general hospitals, one of which is public, which serves the Unified Health System (SUS), and the other is a non-profit private hospital.

The research included nursing technicians who provided direct care to patients with COVID-19 during the pandemic and worked for at least six months in the institutions' ICU, in dayshift, afternoon and night shifts. Professionals who were on vacation, leave or on absent due to health problems were excluded.

The study was conducted in the hospital ICU, with the population consisting of 294 nursing technicians and there was no sampling procedure, as all professionals were invited to participate in person, with the refusal of 8 individuals (6 from the public institution and 2 from the private). A total of 229 subjects participated in the research and fully responded to the questionnaire, corresponding to 77.9% of the population.

Data collection was conducted in a private environment in the ICU, from March to June 2022. A specific questionnaire was developed to this study, with objective questions and one open question, being structured into three main blocks:

Block1 - Personal and professional characterization of participants, including gender, age, marital status, time working in institutions and ICU and number of jobs held during the pandemic.

Block 2 - Related to worker health: number of leaves in 2020 and 2021, perception of protection at work with response (Yes-No), number of COVID-19 infections, mental illness with medical diagnosis and physical capacity for work, compared to before the pandemic, with response options (Improved significantly = 5; Improved = 4; Same capacity = 3; Worse = 2 and Much worse = 1).

Block 3 - With the open question: "What was the biggest impact of the COVID-19 pandemic on your personal life?".

To process the qualitative data, the questionnaire responses were transcribed into a text editor software, in full, reviewed and organized into a single file, constituting the corpus, which was subjected to lexographic analysis and similarity analysis, with the support of free software IRaMuTeQ (*Interface de R pour les Analyzes Multidimensionnelles de Textes et de Questionnaires*). Data transformation was carried out by identifying the most frequent words (considered as subgroups), resulting from the lexographic analysis of the corpus.

The quantitative data were organized in the software Microsoft Excel® version 2016. After checking for typing errors and inconsistencies, the quantitative analysis was conducted with the support of the Minitab 19 software, with the tests of mean, proportions, Pearson's paired linear regression and binary logistic regression. In all statistical analyses, $p < 0.05$ was considered statistically significant.

The most frequent words resulting from the lexicographic analysis were considered as dependent variables, while sociodemographic, labor, and health-related variables were treated as independent variables.

The databases (QUAL+QUAN) were integrated in all stages of the research. The integration was conducted to expand the understanding of the characteristics of the subjects in each subgroup. The lexographic analysis led to the formation of these subgroups (excerpts) that were analyzed using quantitative statistical tools and the results were integrated into the similarity analysis and interpretation of *corpus* excerpts.

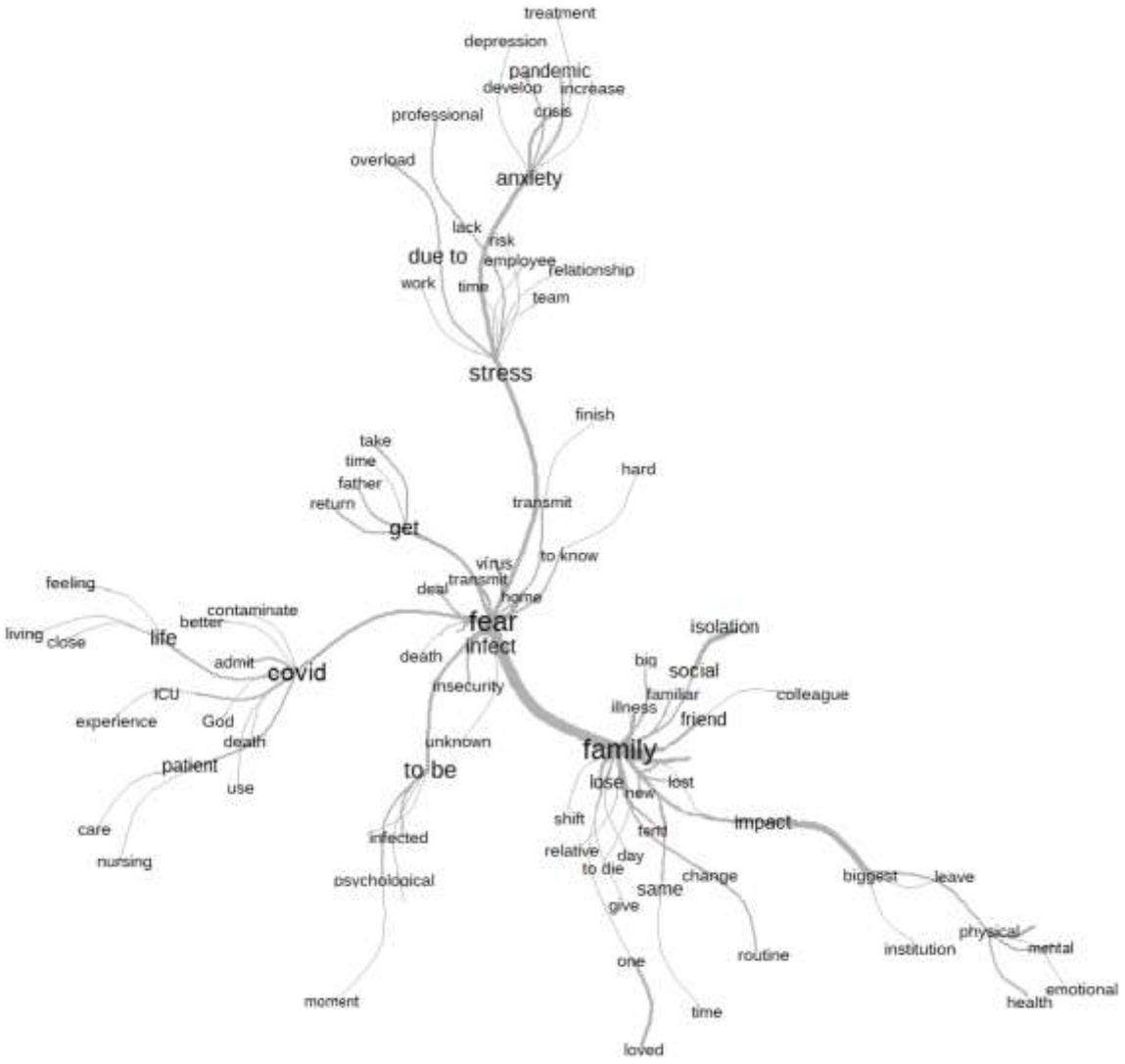
All ethical precepts of Resolution No. 466/2012 of the National Research Council were complied. The study project was submitted to the Research Ethics Committee, being approved under opinion no. 5.250.595/2022 and Certificate of Presentation of Ethical Appreciation (CAAE) no. 54009221.8.0000.5404. Participants signed the Informed Consent Form. To preserve anonymity, the texts segments used were associated with an identifier (acronym ID), followed by an Arabic number.

RESULTS

A total of 229 nursing technicians participated in the study, 59.5% from public institutions and 41.5% from private institutions. Among the respondents, 174 were women and 55 men, with a mean age of 38.1± 8.9 (mean ± standard deviation), the majority were married/and or in a stable union (n=129-56.3%), with average working time in institutions of 7.7 ± 6.5 years and in ICU of 6.0 ± 5.5 years. The average number of jobs was 1.5 ± 0.6 and 46.3% of participants declared having more than one job.

Figure 1 shows the similarity analysis constructed, with the support of the IRaMuTeQ software, with the corpus texts. In this processing, active forms with a minimum frequency of six were used, that is, they appeared in the texts at least 6 times. It was found that the words that stood out were: "family", "fear", "stress", "covid" and "anxiety", with frequencies 65, 63, 44, 39 and 35, respectively.

Figure 1 - Similarity analysis of the corpus of words with a minimum frequency of 6. Campinas, São Paulo, Brazil, 2022



Source: Research data, 2022.

Figure 1 displays the occurrences between words and the connection between the terms present in the corpus. Several connections can be observed from the central word “fear” and the relative importance of the connection is represented by the thickness of the line that connects the words. Visual inspection shows the main clusters connected with the word “family” (cluster 1), which highlights:

Fear→ family→ illness→ impact→ biggest→ physical→ (fatigue, emotional, health, mental); fear→ family→ social→ isolation; fear→ family→ change→ routine; fear→ family→ infection→ friend→ colleague.

The similarity analysis of this cluster showed that nursing technicians felt fear, due to the risk of infection and spread of the new Coronavirus to family, colleagues, and work friends, amidst a scenario marked by uncertainty, due to the unpredictability of the disease.

Here are some excerpts from the nursing technicians related to the word “family”:

> *Social isolation, not having contact with family and friends*. (ID69)
>
> *Adaptation to a new reality, social isolation* [...] *without contact with* [...] *family/friends* [...] *Total change of personal routine.*(ID101)
>
> [...]*fear, concern about infecting my family. Work overload, due to school closures, having to teach children at home.*(ID120)
>
> *In the beginning* [...] *I lived with my parents and 2 brothers, due to the rapid increase in the number of cases and a certain panic* [...] *me and my girlfriend decided to live together isolated from our families*[...]. (ID205)
>
> [...]*because it's family* [...] *being away from mother* [...] *was the hardest part.*(ID290)
>
> *The biggest impact* [...] *was the physical and mental fatigue, with the busy daily life, having to deal with adverse situations* [...] *and sadness with the losses and experiencing it together with family members*. (ID214)

Figure 1 also shows the connection between the word “fear” and the word “Covid” (cluster 2): fear→ covid→ life→ (living, feeling, close); fear→ covid→ patient→ (care, nursing); fear→ covid→ hospitalization→ ICU→ experience; fear→ covid→ (death, contaminate, God).

In this cluster, there are some excerpts that must be highlighted:

> *Before, it was just worry and fear until I get Covid myself, it's distressing* [...] *we don't know how each person reacts to this disease.*(ID57)
>
> *Fear of being on the front line* [...], *having to return home* [...] *financial difficulties, as my husband was unemployed and also my son.*(ID64)
>
> *I had Covid-19 and I thought I was going to die, because I spent 14 days in hospital and I know how difficult it is. I thank God every day for life*. (ID90)
>
> *Psychological* [...] *people dying* [...] *intubated* [...] *I had a very bad experience* [...] *that affected* [...] *me; feelings that will remain with me* [...] *and that I carry to this day.*(ID209)
>
> [...] *it's something I'll never* [...] *explain* [...]. *I discovered the* [...] *meaning of "life"* [...] *it matured me spiritually* [...] *as a human being* [...] *I keep prayers for the souls* [...] *for the loss of the war.*(ID221)
>
> [...] *seeing a patient beg to die or be intubated had a huge impact on my emotions, I will never forget* [...] *patients with Covid-19.* (ID232)

> [...] *loss of certainty of cure. Separation from family, loneliness, then what caused post-covid. Fatigue, reduced capacity to think, visual acuity.* (ID275)
>
> [...] *I was afraid of the sequelae* [...] *afraid of getting Covid* [...] *and evolving to death* .(ID289)

Visual inspection of figure 1 shows another prominent connection (cluster 3), starting from the central word "fear":fear→stress→employee→anxiety→ (crisis, pandemic, develop, depression); fear→stress→due to→overload; fear→stress→lack→professional; fear→stress→(work, relationship, risk, equipment, time).

In this cluster, we have some relevant statements from nursing technicians:

> [...] *stressful* [...] *I had an anxiety attack* [...] *when I was leaving the shift* [...] .(ID4)
>
> *The stress and fear of not knowing if the patient is really infected by Covid-19* [...] *and then* [...] *testing positive* [...].(ID30)
>
> *I was diagnosed with depression, and I am undergoing treatment/anxiety* [...]. (ID74)
>
> *Work overload due to understaffing* [...] *Depression and lack of anxiety control. Stress due to high employee turnover* [...]. (ID72)
>
> *Stress, due to increased risk of contamination. Increase in the severity of patients.* (ID99)
>
> *Anxiety, difficulty to sleep* [...] *stress, stomach pain; uncertainties about the future, lack of motivation to work.* (ID138)
>
> *The fear of contamination* [...] *how the disease would react and its complications* [...] *stress and work overload* [...] *had impacts on health.* (ID201)
>
> [...] *I don't have the same physical effort* [...] *Physical and psychological stress* [...]*a high demand.* (ID220)
>
> *Stress, physical and emotional fatigue.* (ID273)
>
> *I developed anxiety and taking controlled medication due to stress and the fast pace of work.* (ID294)

Analysis of the excerpts showed that frontline professionals fighting against the COVID-19 pandemic faced adverse situations in the ICU, with physical, mental, and emotional fatigue as the greatest impact.

Based on the connections of the three clusters, observed in figure 1, an attempt was made to construct a set of statistical analyses that could relate, even partially, the personal dimensions with the work context. Based on the similarity analysis, the words "family", "covid", "stress" and "anxiety" were selected for inclusion in the quantitative analysis.

Table 1 shows the results of the quantitative variables related to the participants, whose words “family”, “covid”, “stress” and “anxiety” appear in the *corpus* texts.

Table 1 -Results of the variables distributed with the words from the *corpus*. Campinas, São Paulo, Brazil, 2022

Variable	Words from the corpus				
	Family	**Covid**	**Stress**	**Anxiety**	**p**
Number of nursing technicians	65	32	44	36	-
Age	38.3±9.2	40.9±12.1	36.7±8.3	36.6±10.3	0.226
Gender (Female/Male)	50/15	28/4	36/8	35/1	<0.001
Married/stable union (Yes/No)	42/23	21/11	27/16	25/11	>0.05
Time of ICU	6.4±5.7	8.8±7.8	5.2±4.3	4.8±4.6	0.127
Time of Institution	7.6±6.6	9.9±8.8	7.1±5.5	6.4±4.6	0.538
Number of jobs	1.5±0.5	1.3±0.5	1.6±0.6	1.4±0.6	0.057
Number of training sessions	2.7±1.6	2.7±1.8	2.5±1.5	2.9±1.7	0.440
Leaves in 2020	29	21	29	18	0.080
Leaves in 2021	20	8	20	13	0.255
COVID Infections	0.74±0.69	1.13±0.71	0.84±0.61	0.86±0.59	0.078
Felt protected (No)	6	8	9	6	0.196
Had institutional support (No)	16	11	19	15	0.165
Mental illness (Yes)	7	5	8	12	0.043

Source: Research data, 2022.

The results in Table 1 showed that professionals, who in their response to the open question mentioned the word “anxiety”, had a higher proportion of mental illness (p=0.043). The overall gender ratio of respondents (174 female/55 male) was compared with the proportion of participants, with the respective words from the corpus (family – 50/15, covid – 28/4, stress – 35/8 and anxiety – 35 /1). Only professionals whose excerpts contained the word “anxiety” showed statistically significant proportions (p<0.001). The female gender (97.1%) was higher when compared to the total number of respondents (76.0% women), that is, the proportion of women was greater than the proportion of men who mentioned the word “anxiety”. The other words did not have significant differences in gender proportions.

The borderline condition of the number of jobs stands out (p = 0.057), indicating that professionals who reported the word “covid” had the lowest average number of jobs.

The mental illness variable, indicated in Table 1, corresponds to illnesses self-reported by nursing technicians with a medical diagnosis, including anxiety, depression, panic disorder, anxiety attacks, among others.

Table 2 shows the results of the paired Pearson linear correlation coefficients between the words from the corpus and variables of interest.

Table 2 - Paired Pearson linear correlation coefficients of the words from the corpus and variables of interest. Campinas, São Paulo, Brazil, 2022

Variable	Words from the corpus			
	Family	**Covid**	**Stress**	**Anxiety**
Age	0.010	0.126‡	-0.079‡	-0.073
Gender	-0.09	-0.106‡	-0.058	-0.213†
Married	0.109‡	0.007	-0.047	0.109‡
Time of ICU	0.045	0.204†	-0.078	-0.092‡
Time of Institution	-0.017	0.138*	-0.048	-0.090‡
Number of jobs	0.021	-0.127‡	0.096‡	-0.108‡
Number of training sessions	0.083	0.042	-0.013	0.104‡
Leaves in 2020	-0.063	0.131*	0.183†	0.009
Leaves in 2021	-0.131*	-0.132*	0.058	-0.040
COVID Infections	-0.075	0.168*	0.008	0.022
Felt protected	0.200†	-0.025	0.014	0.056
Had institutional support	0.131*	0.001	-0.098‡	-0.065
Mental illness	-0.100‡	0.036	0.139*	0.234†
Physical capacity for work	0.268†	-0.159*	-0.137*	-0.053

Source: Research data, 2022.
†p<0.01; *p<0.05; ‡p<0.2

Table 3 shows the results of the binary logistic regression of the variables, which in the Pearson regression (Table 2), showed significance $p < 0.20$.

Table 3 -Result of the binary logistic regression of variables associated with the words from the *corpus*. Campinas, São Paulo, Brazil, 2022

Confidence Interval for OR 95%								
Variable	**Family**		**Covid**		**Stress**		**Anxiety**	
	OR	**Coef**	**OR**	**Coef**	**OR**	**Coef**	**OR**	**Coef**
Age	-	-	0.98	-0.02	0.96	-0.04	-	-
Gender	-	-	0.40	-0.91	-	-	13.3	2.59*
Married/stable union	1.93	0.66	-	-	-	-	3.17	1.15†
Time of ICU	-	-	1.13	0.13	-	-	0.89	-0.12
Time of Institution	-	-	0.97	-0.03	-	-	1.03	0.03
Number of jobs	-	-	0.65	-0.43	1.57	0.45	0.52	-0.65
Number of training sessions	-	-	-	-	-	-	1.26	0.23
Leaves in 2020	-	-	2.40	-0.87	2.69	0.99*	-	-
Leaves in 2021	0.82	-0.20	0.22	-1.51†	-	-	-	-
COVID Infections	-	-	2.63	0.97†	-	-	-	-
Felt protected	2.68	0.99*	-	-	-	-	-	-
Had institutional support	1.33	0.29	-	-	0.65	-0.43	-	-
Mental illness	0.45	-0.81	-	-	1.80	0.59	3.67	1.30†
Physical capacity for work	1.81	0.59†	0.55	-0.59*	0.71	-0.35	-	-

ROC	0.723	0.808	0.711	0.803
Hosmer-Lemeshow	0.952	0.193	0.089	0.160

Source: Research data, 2022.
†p<0.01; *p<0.05ROC-Receiver Operating Characteristic; OR-Odds ratio

The correlations with statistical significance were: “family”: felt protected and physical capacity for work; “covid”: leaves in 2021, COVID infections and physical capacity for work; “stress”: absences in 2020; “anxiety”: gender, married/stable union, and mental illness.

There was no indication that multicollinearity biased the results, as none of the variance inflation factor (VIF) scores exceeded the value of 3.0. The Hosmer-Lemeshow test (p>0.05) indicated that the predicted odds did not deviate from the observed odds.

The predictive capacity was evaluated using the Receiver Operating Characteristic (ROC) curve, where values below 0.7 indicate the model’s inability to classify variables, values between 0.7 and 0.8 are considered acceptable, values between 0.8 and 0.9 are excellent, and values above 0.9 are outstanding[15]. Therefore, the analyses related to the model are acceptable for the words “family” and “stress”, and excellent for the words “covid” and “anxiety”.

The quantitative analysis showed that nursing technicians who mentioned the word “family” had 2.68 times higher odds of feeling protected and 1.81 times higher odds of having their physical capacity for work preserved. Participants who mentioned the word “covid” had 2.63 times higher odds of contracting COVID-19, 1.82 times higher odds of worsening their physical capacity for work, and 4.54 times higher odds of not taking leaves in 2021.

Participants who stated the word “stress” had the highest average number of jobs (1.6) and 2.69 times higher odds of taking leaves in 2020. Respondents with the word “anxiety” in the corpus had 13.3 times higher odds of being female, 3.17 times higher odds of being married or in a stable union, and 3.67 times higher odds of experiencing mental illness.

DISCUSSION

During the health crisis, the nursing team underwent significant changes in their personal lives and work context, and due to the increased workload, they had physical and mental distress.

In the present study, nursing technicians expressed fear, due to the risk of becoming infected and spreading the new Coronavirus to their families. This result is consistent with the

literature that reports that frontline professionals in ICU had higher fear scores on psychometric scales compared to other units[5,12,13].

Professionals on the frontlines of the services to cope with the COVID-19 pandemic faced challenges, with situations characterized by high workloads, continuous fatigue, with few possibilities for rest, and physical, mental and emotional strain of the worker, which is in line with the literature[5].

Given the high transmissibility of SARS-CoV-2, health authorities adopted public health measures, with social distancing, isolation of asymptomatic and/or infected people[16], with special attention to elderly individuals (over 60 years old), which were considered to be more vulnerable to more severe cases of the disease[17].

From the perspective of greater self-protection and protection of family members, participants who declared the word "family" (cluster 1) adhered to preventive health measures, with a reduction in social interaction, especially among the elderly. The literature shows that nursing professionals redoubled protective measures, to prevent the infection of family members[11].

Many nursing technicians faced substantial changes in their work and personal life routines and those who were parents faced an aggravating situation due to the suppression of in-person classes in schools[16], making it necessary to reconcile the care/education of children and professional duties.

The results of the present study showed that having a family was a protective factor. The professionals had a positive perception of institutional support, which contributed to the restoration of balance[18], and preserved the physical capacity for work. Although the result of comparing means does not present statistical significance for COVID-19 infections, participants who declared the word "family" had the lowest mean of infection.

In cluster 2 (fear→covid) of the similarity analysis, it was observed that nursing technicians provided care for several COVID-19 patients, and it was a difficult experience, given the high mortality rate of patients in the ICU.

In the excerpts related to the word "covid", there was "fear of dying", "getting ill", "post-covid" and "financial difficulties". As it was an unknown disease, there was worry and an imminent feeling of being infected, emotional tension after the end of shifts and apprehension about providing for the family.

Faced with an unprecedented health crisis, several excerpts point to "God" and refer to spirituality. From a historical perspective, in times of calamity and suffering, people often seek spiritual support[19]. The spirituality of nursing technicians was observed as a resource

for resilience and coping, this term being used in Psychology to designate the cognitive and behavioral strategies adopted by individuals to deal with stressful situations[20].

In cluster 2, the word “life” was observed along with excerpts related to the emotional distress, reflections on life and a sense of gratitude from those ill due to COVID-19 and recovered. Due to their frequent exposure to death and the feelings of sorrow for ICU patients, healthcare professionals experienced emotional turmoil. Similar results were found in a study conducted in Brazil, which found the psychological involvement of nurses with patients and bereaved family members, which led to feelings of pain, suffering and frustration[21].

Aspects such as reflection on life and/or gratitude are a result of individuals' subjectivity, religiosity and/or spirituality, and constitute resources to reorder the perception of oneself and the world, give meaning to life and fostering hope in the face of challenges[20].

In overcoming the challenges, a new stage emerged with the offer of COVID-19 vaccines to the population, and in the present study, there was less leaves of nursing technicians in the period of 2021, as this advance reduced severe cases and deaths among priority groups and provided greater protection for nursing professionals[22].

However, the worsening of the participants' physical capacity for work may be related to their higher average age (40.9 years), despite not showing statistical significance, or due to the sequelae of “long Covid”. Individuals who have had COVID-19, even in mild cases, may experience Post-Covid Syndrome or “Long Covid”, characterized by organic dysfunctions and/or chronic symptoms lasting for days to several weeks, the most frequent being: fatigue, muscle weakness, headache, attention, insomnia, hair loss, dyspnea[23].

Despite not showing statistical significance, numerically, professionals who stated “covid” had, in addition to a higher average age, longer working time in the ICU (8.8 years) and in institutions (9.9 years). It is likely that direct care to patients was performed by professionals with greater technical skill, who are invariably those with greater seniority and expertise in the ICU, and the greater infection of this group may be related to the care and procedures that generate aerosols, which are of very high risk for occupational exposure to COVID-19[24].

In cluster 3 (fear→stress→anxiety), it was observed that stress and anxiety were configured as an outcome of the fear of Coronavirus infection. In the similarity analysis of the corpus, it was observed that the COVID-19 pandemic was a period of fear for nursing technicians, as at the beginning, the proportion of the disease was unknown.

In the excerpts, there were descriptions related to stress, lack of knowledge about patients' tests status, understaffing, work overload and mental illness. In the present study, it was observed that occupational factors weakened professionals, making them vulnerable to emotional health problems, where the role of nursing management regarding support and organization of services must be highlighted. A study in China with 1.897 participants also showed acute psychological effects, such as stress, work overload and insufficient resources for protection, with nursing technicians being most affected[25].

It should be noted that the reaction to psychological stress, through the adrenal-medullary sympathetic system and hypothalamic-pituitary adrenal system axes, can increase risk factors for cardiovascular diseases and cause depression, anxiety, post-traumatic stress disorder and musculoskeletal pain[26].

At the beginning of the pandemic, there was a substantial increase in the number of hospitalizations, generating work overload[4], and when associated with the absence of vaccines[22], it contributed to illness and an increase in sick leaves in 2020. Added to this, there was an economic shock, with suspended employment contracts, wage reductions[16]and precarious working and/or living conditions[27], leading nursing technicians to seek additional jobs to supplement their income.

In the similarity analysis, it was observed the connection between the word “anxiety” and the word “stress”, in the same cluster 3, indicating that anxiety was a consequence of the stress experienced by nursing technicians. This can be observed in the content of the excerpts: “anxiety attacks”, “depression”, “lack of anxiety control”, “developed a crisis” and “treatment”.

The findings of this study indicate that women expressed more the word “anxiety”. In this regard, several studies corroborate the results of this research, indicating that women are more susceptible to anxiety disorders[25]and are associated with higher levels of stress and being married[28], and frontline professionals were more likely to of developing depression, anxiety and insomnia[29].

During the pandemic, women had an increase in their workload as they had to balance their professional lives with domestic responsibilities and childcare/education of their children due to the suspension of school classes. From the gender perspective and nursing praxis, it is highlighted that unsatisfactory working conditions associated with the accumulation of activities culturally assigned to women can trigger mental disorders and Burnout Syndrome[30].

This present study presents relevant contributions to the area of Nursing. The use of mixed methods, conducted with the support of statistical programs, can open new teaching/research perspectives, using Minitab 19 software, in the analysis of subgroups (extracts), obtained from the most frequent words, calculated by IRaMuTeQ software. The investigation of the subgroups deepened and complemented the results, observed from the similarity analysis of the *corpus* and interpretation of the excerpts.

The results of this study can contribute to institutional managers in implementing intervention actions, aimed at preserving workers' health. It is hoped that this research can support professional associations in the search for better working conditions and remuneration for nursing professionals.

As for limitations, it should be noted that data collection took place in 2022, which was outside the peak of the pandemic, and relied on participants' memories, which may have some degree of bias. Although there may be similarities in nursing practice in the ICU, the comparison of results with other healthcare institutions must be cautious, due to the chronological aspects of the pandemic scenario, from the perspective of regionality.

CONCLUSION

The analysis set allowed for inferences about a chronology of events during the health crisis. Despite the separation of the clusters in the similarity analysis, a strong correlation was observed between them, and the pandemic affected the daily personal lives of nursing technicians in different ways, even though they were in the same work context.

The biggest impact of the COVID-19 pandemic on the personal and professional lives of nursing technicians was the feeling of fear, mainly due to the risk of Coronavirus infection and transmission to their families. Professionals experienced stress and anxiety, which were seen as a result of the fear of infection. When associated with the presence of work-related and personal stressors, they resulted in mental illness, and with anxiety being more prevalent in female participants, married and/or in a stable union.

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