COVID-19 in nursing professionals in Maranhão (2020-2021): clinical-epidemiological characteristics of cases and factors associated with deaths

COVID-19 em profissionais de enfermagem no Maranhão (2020-2021): características clínico-epidemiológicas dos casos e fatores associados aos óbitos

COVID-19 en profesionales de enfermería en Maranhão (2020-2021): características clínico-epidemiológicas de casos y factores asociados a muerte

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ABSTRACT
Objective: to identify clinical-epidemiological characteristics of the cases of COVID-19 in nursing professionals and to analyze factors associated with deaths. **Method**: a cross-sectional study was carried out with cases and deaths from COVID-19 in nursing professionals registered between April 2020 and March 2021 in Maranhão. Descriptive statistics and logistic regression models were used. **Results**: we verified 2,116 cases of COVID-19 in nursing professionals, mostly among technicians (63.23%), females (86.48%), of black/brown ethnicity (48.20%), aged from 31 to 40 years (40.69%), and with a mean age of 38.11 years (SD=9.58). Systemic arterial hypertension was the main comorbidity (62.03%). The risk factors for death were age >60 years and comorbidities such as systemic arterial hypertension, diabetes mellitus and obesity. **Conclusion**: our findings can support more effective health interventions to minimize the risk of infection and damage to the health of these workers.
Descriptors: COVID-19; Nursing; Epidemiology; Risk Factors; Occupational Health.

RESUMO
Objetivo: descrever características clínico-epidemiológicas dos casos de COVID-19 em profissionais de enfermagem e analisar fatores associados aos óbitos. **Método:** estudo transversal realizado com casos e óbitos por COVID-19 em profissionais de enfermagem registrados no período entre abril de 2020 e março de 2021 no estado do Maranhão. Utilizou-se a estatística descritiva e modelos de regressão logística. **Resultados:** verificaram-se 2.116 casos de COVID-19 em profissionais de enfermagem, a maioria eram técnicos (63,23%), sexo feminino (86,48%), raça/cor preta/parda (48,20%), na faixa etária de 31 a 40 anos (40,69%) e média de idade de 38,11 anos (DP=9,58). A hipertensão arterial sistêmica foi a principal comorbidade apresentada (62,03%). Os fatores de risco para o óbito foram: idade >60 anos, comorbidades como hipertensão arterial sistêmica, diabetes mellitus e obesidade. **Conclusão:** esses dados podem direcionar intervenções em saúde mais efetivas com intuito de minimizar os riscos de infecção e os danos à saúde desses trabalhadores.
Descritores: COVID-19; Enfermagem; Epidemiologia; Fatores de Risco; Saúde do Trabalhador.

RESUMEN
Objetivo: identificar las características clínico-epidemiológicas de casos de COVID-19 en profesionales de enfermería y analizar los factores asociados a muertes. **Método:** se realizó un estudio transversal con casos y muertes por COVID-19 en profesionales de enfermería registrados entre abril de 2020 y marzo de 2021 en Maranhão. Se utilizaron estadísticas descriptivas y modelos de regresión logística. **Resultados:** verificamos 2.116 casos de COVID-19 en profesionales de enfermería, en su mayoría técnicos (63,23%), del sexo femenino (86,48%), de etnia negra/blanca/morena (48,20%), con edad de 31 a 40 años (40,69%) y edad media de 38,11 años (DE=9,58). La hipertensión arterial sistémica fue la principal comorbilidad presentada (62,03%). Los factores de riesgo de muerte fueron: edad > 60 años y comorbilidades como hipertensión arterial sistémica, diabetes mellitus y obesidad. **Conclusión:** esos hallazgos pueden respaldar intervenciones de salud más efectivas para minimizar el riesgo de infección y daño a la salud de estos trabajadores.
Descriptores: COVID-19; Enfermería; Epidemiología; Factores de Riesgo; Salud Laboral.

INTRODUCTION

2020 was considered important for nursing professionals, as it was defined by the WHO as the Year of Nursing, which also celebrated the 200th anniversary of Florence Nightingale's birth[1,2]. However, coincidentally, the COVID-19 pandemic plagued humanity, mainly affecting health professionals involved in combating the disease, especially nursing professionals, who represent more than 50% of the health workforce[3].

Such professionals deal directly with suspected cases of the disease[1], which favored the high probability of contagion and illness among them[4]. Data from the *International Council of Nurses* (ICN) showed that, at the global level and in the first year of the pandemic alone, approximately 3,000 deaths of nursing professionals were reported as a result of COVID-19[5]. A research study that evaluated the COVID-19 global scenario revealed that, from the beginning of the pandemic until May 2020, Brazil had the highest mortality in this period (20.2%; n=137)[6].

Through the Nursing Observatory, the Federal Nursing Council (*Conselho Federal de Enfermagem*, COFEN) showed that, by July 2022, 36,424 cases and 872 deaths of nursing professionals due to the disease had already been confirmed in the country[7]. A number of studies also showed that most of those infected belonged to the age group from 31 to 40 years old[8], that mortality was higher among men (4.5%[8];4.6%[9]), and that the highest prevalence of cases (62.9%[8]) and deaths (70%[10]) corresponded to nursing technicians.

Until May 28th, 2020, the Northeast region of the country recorded 2,060 COVID-19 cases among nursing professionals, of which 29 evolved to death[9], whereas the state of Maranhão, from March 20th to May 31st, 2020, had recorded 120 cases[11] and 6 deaths due to the disease until June 12th of the same year[12]. Current data revealed that such numbers rose and, by the end of July 2022, 9,317 cases and 139 deaths were confirmed in the Northeast and there were 244 cases and 16 deaths among nursing professionals in Maranhão[7].

It is worth mentioning that, due to their self-informative nature, such data may not represent the COVID-19 real scenario in the category. Given that underreporting possibility, conducting studies that consider the COVID-19 pandemic context, the risks of illness and death to nursing professionals is essential to know about the different working conditions of the category and the relevance of the assistance provided by these professionals[13].

Therefore, a study carried out in Brazilian territory with data referring to the period from March 2020 to August 2021, which analyzed the factors associated with deaths due to COVID-19 among these professionals in the country, showed a significant association between the Nursing Assistant category, male gender and the North region of the country, with the highest prevalence of deaths, which indicates a warning about the capacity to respond to the pandemic through the health care network of each region[14].

In addition, evaluating the health data of such professionals is important because it makes it possible to understand the situation of vulnerability they experience, which favors the development of strategies that guarantee the safety level required for the nursing practice[8]. It is also noted that, more than two years after the first records of cases and deaths due to COVID-19, there is no knowledge of the existence of studies with an approach to the object researched in the Maranhão territory; therefore, the objectives of this study are to describe the clinical-epidemiological characteristics of COVID-19 cases in Nursing professionals and to analyze the factors associated with deaths in the category.

METHOD

This is a cross-sectional study, which followed the recommendations set forth in *Strengthening the Reporting of Observational Studies in Epidemiology* (STROBE), carried out from April 2020 to March 2021 in the state of Maranhão, Brazilian Northeast region.

The subjects included were all new COVID-19 cases and deaths due to the disease among Nursing professionals in the state, and with occupational registration according to the Brazilian Classification of Occupations (*Classificação Brasileira de Ocupações*, CBO) as Nurses, Nursing Technicians and Nursing Assistants.

The data were collected in September 2021 from the database of the Maranhão COVID-19 Notification System (SNC-19 MA), which is linked to the Health Monitoring and Evaluation Department belonging to the Superintendence of Epidemiology and Disease Control of the Maranhão State Health Department (SES/MA).

Sociodemographic and clinical-epidemiological variables such as notification date, age, gender, race/skin color, occupation/professional category, municipality where the case was recorded, types and results of tests performed, type of laboratory where the test was performed, occurrence and types of comorbidities, and status/evolution of the case were selected.

The sociodemographic and clinical-epidemiological variables were analyzed using descriptive statistics, and their absolute and relative values were expressed. In order to verify the association between exposure (clinical-epidemiological variables) and outcome (death), single and multiple logistic regression models[15] were used, given that the answer was binary: Death - Yes/No. For the univariate (unadjusted) logistic analysis, all variables with p-values<0.20 were considered. With the variables selected, multivariate (adjusted) logistic regression was performed to estimate the Odds Ratios (ORs), with 95% confidence intervals and 5% significance level. It is noted that there was no multicollinearity between the independent variables evaluated. In this phase of the analyses, unknown or not reported data were disregarded. All statistical analyses were performed using IBM SPSS®, version 24.0[16].

Research Article
Artigo de Pesquisa
Artículo de Investigación

The study was conducted in accordance with national and international ethics guidelines, and the research protocol was submitted to and approved by the Research Ethics Committee of the institution involved.

RESULTS

In Maranhão, 4,432 COVID-19 cases were recorded in health professionals between April 2020 and March 2021, of which 2,116 were Nursing professionals, with 29 evolving to death. The professional occupation was not reported in nearly 10% of all confirmed cases among health professionals.

Given the clinical-epidemiological characteristics of the nursing professionals with confirmed COVID-19 in the state of Maranhão, it was observed that most of the cases were in nursing technicians (1,338; 63.23%), female individuals (1,830; 86.48%), who underwent diagnosis in a public laboratory (2,051; 96.93%) through the rapid test (1,306; 61.72%) and who did not present comorbidities (1,721; 81.33%); Systemic Arterial Hypertension (SAH) stood out among the comorbidities (245; 62.03%) and most were discharged from quarantine (2070; 97.83%) (Table 1).

TABLE 1: Clinical-epidemiological characteristics of the COVID-19 cases among Nursing professionals in Maranhão, from April 2020 to March 2021 (n=2,116). São Luís, MA, Brazil, 2021.

Variables		n	f(%)
Professional Category	Nursing technicians	1,338	63.23
	Nurses	778	36.77
Age	18-30 years old	475	22.45
	31-40 years old	861	40.69
	41-50 years old	512	24.20
	51-60 years old	196	9.26
	>60 years old	46	2.17
	Not reported	26	1.23
Gender	Female	1,830	86.48
	Male	286	13.52
Ethnicity	Black/Brown	1,020	48.20
	White	323	15.26
	Asian	250	11.82
	Not reported	523	24.72
Type of laboratory	Public	2,051	96.93
	Private	65	3.07
Type of test	Rapid test	1,306	61.72
	RT-PCR	718	33.93
	Serological	92	4.35
Comorbidities	No	1,721	81.33
	Yes	395	18.67
Type of comorbidity*	Systemic Arterial Hypertension	245	62.03
	Diabetes Mellitus	76	19.24
	Respiratory	52	13.16
	Cardiac	27	6.84
	Obesity	19	4.81
	Oncological	8	2.03
	Metabolic disorders	7	1.77
	Renal failure	6	1.52
	Rheumatological	6	1.52
	Addiction to chemical substances	6	1.52
	Neurological	5	1.27
	Psychiatric	3	0.76
	Autoimmune	3	0.76
	Smoking habit	2	0.51
	Digestive	2	0.51
	Hematological	1	0.25
	Dermatological	1	0.25
Status/Evolution	Discharge from quarantine	2,070	97.83
	Hospitalization in ward	9	0.42
	Home isolation	8	0.38
	Death	29	1.37

Note: ***The same professional may present more than one comorbidity. RT-PCR - Reverse-Transcriptase Polymerase Chain Reaction.

It was identified that the highest preponderance of cases occurred in the age group from 31 to 40 years old (861; 40.69%) and in the black/brown race/skin color (1,020; 48.20%). The facts that no cases were recorded in nursing assistants and that variables such as age (26; 1.23%) and race/skin color (523; 24.72%) presented not reported data also stood out.

In the unadjusted analysis, the "age from 51 to 60 and >60 years old", "black/brown race/skin color", "type of laboratory: private", "type of test: RT-PCR" (Table 2) and "having a comorbidity" variables, as well as the "SAH", "DM", "Obesity", "Cardiac", "Neurological", "Oncological", "Renal failure", "Smoking habit", "Rheumatological" and "Autoimmune" comorbidities (Table 3), were statistically significant (p<0.20) and constituted risk factors for deaths due to COVID-19.

TABLE 2: Univariate and multivariate analysis of clinical-epidemiological characteristics in relation to the deaths of Nursing professionals due to COVID-19 in Maranhão. São Luís, MA, Brazil, 2021.

Variables	Death			
	Univariate (unadjusted) Odds Ratio (95% CI)	p-value*	Multivariate (adjusted) Odds Ratio (95% CI)	p-value**
Gender				
Male	1.68 (0.68 – 4.17)	0.26	-	-
Female	1.00	-	-	-
Age				
18-30 years old	1.00	-	-	-
30-40 years old	1.66 (0.44 – 6.16)	0.44	0.80 (0.18 – 3.46)	0.76
41-50 years old	0.30 (0.03 – 2.97)	0.30	0.17 (0.02 – 1.86)	0.15
51-60 years old	3.27 (1.22 – 14.78)	0.12	0.53 (0.06 – 4.70)	0.57
>60 years old	25.52 (7.95 – 106.24)	<0.001	12.00 (1.74 – 37.51)	<0.001
Race/Skin color				
Black/Brown	1.96 (1.03 – 4.76)	<0.14	2.02 (0.77 – 4.54)	0.09
White	1.45 (0.97 – 3.23)	0.22	1.33 (0.91 – 3.34)	0.17
Asian	1.00	-	-	-
Professional Category				
Nurses	1.10 (0.51 – 2.39)	0.79	-	-
Nursing Technicians	1.00	-	-	-
Type of laboratory				
Public	1.00	-	-	-
Private	2.76 (1.12 – 8.78)	0.13	4.73 (0.94 – 23.69)	0.07
Type of test				
RT-PCR	2.26 (1.08 – 6.74)	0.14	2.01 (0.89 – 4.40)	0.08
Serological	**	-	**	-
Rapid test	1.00	-	-	-
Comorbidities				
Yes	12.22 (5.37 – 27.80)	<0.001	10.00 (3.37 – 37.82)	<0.001
No	1.00	-	-	-

Note: *Wald's chi-square test. **Presence of zero values that preclude calculating the Odds Ratio (OR). 95% CI: 95% Confidence Interval, p-value*<0.20, p-value**<0.05. RT-PCR - Reverse-Transcriptase Polymerase Chain Reaction.

Regarding the adjusted analysis, the statistically significant variables (p<0.05) that remained as risk factors for death were age >60 years old (OR = 12.32; 95% CI = 1.74 – 87.51), comorbidity - yes (OR = 10.00; 95% CI = 3.37 – 37.82) (Table 2), SAH (OR = 4.00; 95% CI = 1.98 – 12.94), DM (OR = 15.00; 95% CI = 4.46 – 46.55) and obesity (OR = 8.00; 95% CI = 2.85 – 26.30) (Table 3).

TABLE 3: Univariate and multivariate analysis for the types of comorbidities in relation to the deaths of Nursing professionals due to COVID-19 in Maranhão. São Luís, MA, Brazil, 2021.

Variables	Death			
	Univariate (unadjusted) Odds Ratio (95% CI)	p-value*	Multivariate (adjusted) Odds Ratio (95% CI)	p-value**
SAH				
Yes	3.52 (1.58 – 13.84)	<0.001	4.00 (1.98 – 12.94)	<0.001
No	1.00	-	-	-
DM				
Yes	19.01 (5.63 – 41.87)	<0.001	15.00 (4.46 – 46.55)	<0.001
No	1.00	-	-	-
Obesity				
Yes	11.10 (1.85 – 31.30)	0.11	8.00 (2.85 – 26.30)	<0.001
No	1.00	-	-	-
Cardiac				
Yes	7.91 (1.33 – 35.00)	0.16	5.10 (0.93 – 13.32)	0.10
No	1.00	-	-	-
Respiratory				
Yes	1.42 (0.19 – 6.68)	0.73	-	-
No	1.00	-	-	-
Neurological				
Yes	4.45 (1.21 – 14.46)	0.17	5.35 (0.91 – 13.12)	0.31
No	1.00	-	-	-
Oncological				
Yes	2.04 (1.22 – 9.63)	0.19	1.55 (0.22 – 4.63)	0.09
No	1.00	-	-	-
Metabolic				
Yes	1.00	-	-	-
No	**	-	-	-
Renal failure				
Yes	2.87 (1.33 – 9.44)	0.18	2.09 (0.83 – 6.44)	0.22
No	1.00	-	-	-
Smoking habit				
Yes	4.50 (2.54 – 12.18)	0.16	5.57 (0.96 – 11.55)	0.09
No	1.00	-	-	-
Digestive				
Yes	1.00	-	-	-
No	**	-	-	-
Psychiatric				
Yes	1.00	-	-	-
No	**	-	-	-
Rheumatological				
Yes	4.87 (1.68 – 13.44)	0.17	4.12 (0.89 – 9.44)	0.10
No	1.00	-	-	-
Autoimmune				
Yes	3.23 (1.54 – 12.59)	0.10	2.21 (0.79 – 6.45)	0.11
No	1.00	-	-	-
Addiction to chemical substances				
Yes	1.00	-	-	-
No	**	-	-	-
Hematological				
Yes	1.00	-	-	-
No	**	-	-	-
Dermatological				
Yes	1.00	-	-	-
No	**	-	-	-

Note: *Wald's chi-square test. **Presence of zero values that preclude calculating the Odds Ratio (OR). 95% CI: 95% Confidence Interval, p-value*<0.20, p-value**<0.05. SAH - Systemic Arterial Hypertension. DM - Diabetes Mellitus.

DISCUSSION

Through the description of the clinical and epidemiological characteristics of the COVID-19 cases, this study verified how COVID-19 affected nursing professionals. Regarding the professional category, in this research it was observed that the nursing technicians were the professionals most affected by the disease, a result that is line with several research studies carried out in the national scenario[10,11]. Together with the nursing assistants, such professionals comprise 77% of the workforce of the category in the country[17] who, due to contact with and direct assistance to infected patients, are at a higher risk for SARS-CoV-2 infection[18].

It is noted that there were no COVID-19 cases in nursing assistants during the study period, unlike those observed in an ecological study with data from the Nursing Observatory, where six cases of the disease were reported among assistants in Maranhão at the beginning of the pandemic[11]. Non-recording of cases of the disease in this category, specifically in this study, where many health professionals (n=454; 10%) did not report their occupation, can be related to the inadequate inclusion of data referring to this variable, a mandatory field in health information systems[19]. In addition, it should be considered that non-confirmation of cases regarding the disease due to lack of mass testing in nursing professionals[9] especially at the beginning of the pandemic may have impacted the reliability of the COVID-19 data in the category.

Regarding comorbidities in nursing professionals, most cases (81.33%) have no comorbidities. However, among the professionals that presented at least one comorbidity, SAH (62.03%) stood out the most. In addition to that, stress in the work environment is strongly related to the development of SAH and, in fact, psychosocial conditions render nursing professionals even more vulnerable to developing this comorbidity[20]. In this sense, the COVID-19 pandemic has represented a compilation of stressful situations for nursing. In this regard, a study carried out with the general population in Wuhan, China, showed higher mortality rates due to COVID-19 in groups of patients with SAH when compared to the rates of groups without comorbidity[21].

Regarding the nursing professionals' age, it was evidenced that the largest share of COVID-19 cases was in those aged between 31 and 40 years old, corroborating a study carried out in Brazilian territory that estimated burden of the disease in the category, showing that individuals in this age group comprised 42.4% of the cases[22]. The same was observed in another two studies, where nursing professionals of both genders had the highest involvement rates: 43.9%[9] and 42.06%[13]. Such results are believed to be associated with the large number of professionals aged between 30 and 49 years old, with restricted professional experience and without specific training, hired on an emergency basis during the pandemic[23].

With regard to gender, international data showed that 72.5% of the COVID-19 cases among health professionals in Italy were in women[24]. These findings are consistent with those observed in this research, as COVID-19 cases predominated in female nursing professionals, corroborating studies carried out in Brazil, which considered data from the beginning of the pandemic[9,22]. In another Brazilian study, the number of nurses affected by COVID-19 was also high: 83.4% of the records[13]. It is possible that these findings are related to the significant number of female nursing professionals working in the country[23]. It is noted that, although the category is still predominantly comprised by women (85.1%)[25], the demand for men for this profession is growing[26].

As for black/brown race/skin color (n=1,020; 48.20%), this result reflects the profile of Brazilian Nursing, where 53% of the professionals are black- or brown-skinned[25]. A similar situation is observed in the composition of the Brazilian population, according to data from the National Household Sample Survey (*Pesquisa Nacional por Amostra de Domicílios*, PNAD), where black- and brown-skinned people account for 56.2% of the country's population[27].

In relation to the COVID-19 diagnosis, in this study, the rapid test was the main performed exam, mostly in public laboratories. Overall, the immunochromatography test (rapid test) has lower sensitivity, with the best results (around 90%), achieved after the 10th day of infection[4]. Despite this, and considering the Ministry of Health, recommendations for states and municipalities to prioritize health professionals considered more exposed to SARS-CoV-2 transmission, as well as their home contacts, the professionals reported difficulties undergoing the test in the public network, considering issues such as lack of inputs or non-severity as a reason[28].

Despite the risks arising from SARS-CoV-2 infection, in this study, most of the nursing professionals with COVID-19 (97.83%) were discharged from quarantine (release after disappearance of all symptoms), similarly to what was observed in other studies carried out in Brazil[19,12]. Therefore, it is estimated that many professionals' lacks of training associated with input unavailability, as well as failures in their use, may have contributed to cases in which the outcomes were less favorable[29].

When analyzing the factors associated with death due to COVID-19 among nursing professionals in Maranhão, it was found that age >60 years old increases the chances of death by 12.32 times when compared to the other age groups. It is already known that COVID-19 can affect people of all ages; however, a review study showed that the most severe cases of the disease, which evolved with pneumonia, were most often associated with advanced age, male gender and the fact that there was some comorbidity[30]. A study carried out in Brazil between March and May 2020 showed that the deaths of nursing professionals due to COVID-19 were more prevalent in the age group from 41 to 50 years old, followed by those aged from 51 to 60 years old, which accounted for the highest lethality (6.2%)[9].

In this sense, and considering that these professionals are in the fourth (4th) phase, also called "professional slowdown", it is considered an important measure to transfer or relocate them, especially those with comorbidities, to sectors with lower risk of SARS-CoV-2 infection, as well as with better working conditions[12]. In addition, these measures take into account the fact that COVID-19 is a highly contagious disease, with virus transmission in a hospital environment considered a threat to health professionals, especially those from nursing who, in charge of care, are more vulnerable to SARS-CoV-2 infection[31]. In addition to that, qualifying these professionals becomes urgent so that they can act with due knowledge and safety in the face of threats such as COVID-19[32].

It is also noted that the presence of comorbidities in patients with COVID-19 has been a cause for concern, in view of their association with severe forms of the disease[33], a situation that was observed in this study, where the fact that nursing professionals have some comorbidity also had a statistically significant association with occurrence of the death outcome, with 10.00 times more chances when compared to professionals with no comorbidities. A similar result was observed in the general population from the state of Rio Grande do Norte, where presence of comorbidities was the most important risk factor for the occurrence of deaths due to the disease, increasing the risks of this outcome by 10.44 times[34].

In the current context, and considering that society is increasingly obese, working to prevent chronic non-communicable diseases has been an everyday challenge[33]. In France, a study showed that, in the general population, obesity is a risk factor for severe forms of COVID-19, with prevalence in ICU patients (47.6%) and 7.36 times more chances of using mechanical ventilation for patients with Body Mass Index (BMI) values greater than 35 kg/m^2 when compared to patients with BMI below 25 kg/m[35].

In this study, the results showed that obesity and conditions such as SAH and DM represented the highest chances for nursing professionals with COVID-19 to evolve to death. It is noted that, although these results are from nursing professionals, they reflect what is observed in the general population from the state of Maranhão[36], which may not be a specific risk factor for these professionals. It is likely that SAH in critically-ill patients is associated with an increased risk of in-hospital mortality, as this comorbidity favors the development of lesions in target organs such as kidney and heart, with the possibility of aggravation due to SARS-CoV-2 infection[37]. And with regard to DM patients, the study alerts to acute problems that require urgent care such as acute myocardial infarction or diabetic ketoacidosis, and that patients in these conditions should be diagnosed and treated early in time, due to the risk of evolving to death[38].

It was evidenced that the large number of cases in which the "race/skin color" variable was not reported contributes to establishing a pattern of underreporting, making the analysis of social disparities even more difficult[39].

Study limitations

The limitations include underreporting and incomplete reporting of cases, as the study had secondary data. In this sense, the absence of important information stands out, such as occupation in nearly 10% of the records of the disease in health professionals, and the "race/skin color" variable in 24.72% of the nursing professionals. The need for training for correct data collection is reinforced, as well as the complete feeding of information systems so that reliable information can be generated that favors decision-making in the face of the disease.

CONCLUSION

Most of the COVID-19 cases among nursing professionals in the state of Maranhão were in female nursing technicians, who underwent diagnosis in a public laboratory through the rapid test and who did not present comorbidities, although among those who did, there was emphasis on systemic arterial hypertension, and with the discharge from quarantine outcome. Most of the cases included the age group from 31 to 40 years old and black/brown race/skin color, and no cases were recorded in nursing assistants. In addition to that, age >60 years old and having comorbidities such as systemic arterial hypertension, diabetes mellitus and obesity, were considered risk factors for death.

The study contributed important knowledge about COVID-19 clinical and epidemiological aspects in nursing professionals and, from this perspective, it constitutes a pioneering study in the state of Maranhão. Such findings emerge as subsidies for nursing managers and professionals in coping with COVID-19 and other health crises that may occur in the future, directing more effective health interventions in order to minimize the risks of infection and harms to the health of these workers.

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