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Factors associated with the diagnosis and complications of COVID-19 among health personnel

Fatores associados ao diagnóstico e complicações da COVID-19 entre profissionais da saúde

Factores asociados al diagnóstico y complicaciones de la COVID-19 entre el personal de salud

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ABSTRACT

Introduction: health personnel play a crucial role on the front line against COVID-19, with activities that can increase the risk of infection and complications from the disease. Gaps in tackling the pandemic, especially related to resources, were identified. **Aim:** to analyze the factors associated with the diagnosis and complications of COVID-19 among health personnel. **Design:** this is an analytical cross-sectional study, carried out in Piauí, with health personnel, regardless of serological status for COVID-19. Data collection was carried out in a virtual environment. Mann-Whitney and Pearson's Chi-square statistical tests were used. The strength of association was measured by Odds Ratio. **Results:** working in primary health care reduced the chances of diagnosis, while the use of certain prophylaxes, such as hydroxychloroquine, increased the chances. Dexamethasone as prevention increased the complications. Sharing a break room, having multiple jobs, performing endotracheal tube suctioning and nasal/oral swabs increased the chances (statistically significant data). **Implications:** working directly with patients involves actions that influence the risk of COVID-19, covering health interventions, risk behaviors and factors such as airway manipulation, workload, and work environment. The study emphasizes the urgency of preventive strategies and improved working conditions to protect health personnel.

DESCRIPTORS

COVID-19; Health Personnel; Risk Factors; Delivery of Health Care.

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INTRODUCTION

The COVID-19 pandemic began in 2020, a disease caused by the coronavirus SARS-CoV-2. Its route of transmission includes droplets, aerosols and contact with the virus,[1] the disease is systemic and can affect vital organs.[2] There are population groups that are more vulnerable to infection, such as health personnel, as they are routinely exposed due to the different clinics presented by patients and the risks related to care practices.[3-4] This was the first group to receive doses of the vaccine against COVID-19, whose priority is justified due to the high level of reported infections, considering their occupational exposure to SARS-CoV-2.[5]

Despite the passing of epidemiological weeks, the professionals continue to be exposed to this infection. Even after the loosening of COVID-19 prevention measures, as cases increase again, professionals tend to present more flu-like symptoms. In January 2022, in the capital of the state of Piauí (Brazil), 624 professionals were removed from their duties because they had the disease or flu-like symptoms. Other Brazilian states had a similar absenteeism profile with difficulties in maintaining the number of active personnel.[6]

In addition to exposure to the COVID-19 virus itself, the pandemic highlighted several difficulties faced by health personnel that may influence the prevalence of infection in this category. Among the main ones are: precarious working conditions in many services, overload, lack of inputs to protect workers, scarcity of human and material resources.[7] Depending on the dynamics of the care provided, the patient's health status and the increase of cases, these conditions may favor worker exposure to the disease.

It should be noted that, in the care environment, one of the main protective measures adopted by the professionals is the use of Personal Protective Equipment (PPE). In this population, being a woman, working in an intensive care environment and receiving education about COVID-19 are factors associated with the use of PPE. In general, professionals tend to use them, especially in situations of greater exposure, such as in procedures involving the release of aerosols.[8] However, it is clear that reports of non-adherence and insufficient amounts of PPE by professionals prevail.[9]

When affected by the disease, there is a concern about the development of complications, such as viral pneumonia, acute discomfort syndrome, acute cardiac injury, arrhythmias, acute kidney injury, secondary infection, sepsis, or shock.[10-12] These can last for a long time and lead to death.

In view of this problem and considering the magnitude of COVID-19 in this population, there is an urgent need for research focused on this topic, in order to provide subsidies for scientific knowledge, identifying risk or protective factors and enabling more targeted strategies to maintain the safety of these professionals.

That said, the following question arises: "What are the factors associated with the diagnosis and complications of COVID-19 among health personnel?" This study aims to analyze the factors associated with the diagnosis and complications of COVID-19 among health personnel who worked in care during the pandemic.

METHOD

Study design, period and location

Analytical cross-sectional study carried out in the state of Piauí, Brazil. Data collection happened from April to July 2021, in a virtual environment.

Population and sample

The population was made up of healthcare workers (licensed practical nurses and certified nursing assistants, nurses, doctors, dental surgeons, community health agents, pharmacists, physiotherapists, psychologists, nutritionists, among others). The sample corresponded to those who were working in health care in the state of Piauí during the period of the COVID-19 pandemic, in the public and/or private network.

Professionals aged 18 or over, Brazilians, who had been tested for COVID-19, were included. Those with diagnoses confirmed by examination (self-reported), RT-PCR (Reverse-Transcriptase Polymerase Chain Reaction), Rapid Antibody Test (IgG/IgM), Rapid Antigen Test, Serological Antibody Test (IgG/IgM) were counted as positive. Professionals who were not working in care at the time of data collection were excluded.

Sampling was non-probabilistic, for convenience, and participants were recruited using the Snowball Sampling technique,[13] in which participants are asked to nominate new professionals for collection.

Instrument and data collection

The data collection instrument was developed through a literature review and was submitted for content evaluation and adaptation. The questionnaire was placed on Google Forms, the professionals were contacted via WhatsApp or email. A team of data collectors was formed to help with the collection and contact with each professional was made in a personalized way, aiming to create an initial bond and, after acceptance, the research link was made available and participants were asked to confirm, via message, when they had completed the questionnaire. In order to reduce losses, whenever necessary, participants who had not yet informed about the completion of the research were contacted.

Variables

The dependent variables were: being diagnosed with COVID-19 and having evolved some complication as a result of the disease.

The independent variables encompassed: sociodemographic aspects (age, sex, color, marital status, income, educational attainment), occupational aspects (professional category, sector/place of activity, employment bond, training), self-reported health conditions (pre-existing health status, nutritional status, vaccination status related to COVID-19, use of prophylaxis), role in assistance (front line, sharing of work environments, procedures) and the use of personal protective equipment (PPE) (type, situation of risk involving PPE, type and use of mask).

Organization and analysis of data

After coding the variables in an Excel spreadsheet, data processing was carried out using the Statistical Package for the Social Sciences (SPSS® for Windows®), version 20.0. The numerical variables did not present a symmetrical distribution, using the Kolmogorov-Smirnov normality test. To represent them, the median, minimum, and maximum value in descriptive statistics were adopted. The categorical ones were reported using absolute and percentage frequencies.

To verify the association between the variables, Mann-Whitney (numeric variables) and Pearson's Chi-square tests (categorical variables) were applied. When Chi-square assumptions were violated, statistical significance was presented by Fisher's Exact test. The Odds Ratio (OR), with 95% confidence intervals (CI), was performed to verify the strength of association between the qualitative variables, in the univariate analysis. The reference category was chosen based on the clinical importance.

For all analyses, a statistical significance level of 5% was set a priori to reject the null hypothesis. The findings were discussed based on existing literature on the topic.

Ethical aspects

This research followed all recommendations for research involving human beings in Resolution No. 466/2012 of the National Health Council. It is approved by the Research Ethics Committee of the Federal University of Piauí, with Opinion number: 4.122.120 and CAAE: 34109420.9.0000.5214. The Free and Informed Consent Form (TCLE) was signed by the

researchers and made available for download in the online questionnaire itself, and participants were informed, requesting virtual consent.

RESULTS

204 healthcare professionals partook in it. As to the sociodemographic profile, the category "nurses" prevailed (62.7%), followed by "licensed practical nurses" (15.2%); "females" (82.4%); "brown" (72.1%); marital status "without a partner" (60.3%); and monthly income exceeding R$ 4,400.00 (four thousand and four hundred Reais) (30.8%). The majority had a graduate degree (66.7%), worked in the public network (67.2%) and had more than two jobs (50.5%).

Regarding clinical aspects, the number of professionals who had COVID-19 was 88 (43.1%). The median of the variable age was 30 years old; the professionals had working experience of around 5 years and long weekly working hours. Body mass index (BMI) showed statistical significance with the diagnosis (p=0.002). Professionals who had COVID-19 had a higher BMI than those who did not (25.82 kg/m^2 and 23.65 kg/m^2, respectively) (Table 1).

Table 1. Differences in sociodemographic and clinical quantitative variables in relation to the diagnosis of COVID-19. Teresina, Piauí, Brazil, 2021. (n=204)

Variables	Median	Minimum	Maximum	*p* value**
Age	30	22	58	0.166
Training time (years)	6	0.25	30.0	0.724
Career duration (years)	5	0.00*	36	0.426
Weekly working hours	44	4	180	0.144
BMI	24.33	17.69	72.44	**0.002**

*Less than a year, minimum 3 months. **Mann-Whitney Test.
Source: authors, 2021.

Professionals with obesity had increased odds (OR:3.46; CI: 1.35-8.82; p=0.007) of being diagnosed with COVID-19. The use of prophylaxis with azithromycin (OR:1.85; CI: 1.04-3.29; p=0.035), ivermectin (OR:1.85; CI: 1.05-3.26; p=0.030) and dexamethasone (OR:2.21; CI: 1.08-4.50; p=0.026) also increased the chances of the same outcome. All participants who reported using hydroxychloroquine for prevention had the diagnosis, and the use of the medication was statistically associated (p=0.001) (Table 2).

Table 2. Differences in sociodemographic and clinical qualitative variables in relation to the diagnosis of COVID-19. Teresina, Piauí, Brazil, 2021. (n=204)

Variables	COVID-19 Diagnosis		Brute OR	IC 95%	*p* value
	Yes	No			
	n (%)	n (%)			
Sex					
Male*	13(36.1)	23(63.9)	0.70	0.33-1.47	0.348
Female	75(44.6)	93(55.4)			
Marital status					
Have a partner*	34(42.0)	47(58.0)	0.92	0.52-1.63	0.786
Do not have a partner	54(43.9)	69(56.1)			
Obesity					
Yes*	16(69.6)	7(30.4)	3.46	1.35-8.82	**0.007**
No	72(39.8)	109(60.2)			

Arterial hypertension					
Yes*	3(30.0)	7(70.0)	0.55	0.13-2.18	0.520**
No	85(43.8)	109(56.2)			
Chronic respiratory disease					
Yes*	6(40.0)	9(60.0)	0.87	0.29-2.54	0.799
No	82(43.4)	107(56.6)			
Use of alcohol					
Yes*	43(47.8)	47(52.2)	1.40	0.80-2.45	0.234
No	45(39.5)	69(60.5)			
Use of tobacco					
Yes*	3(60.0)	2(40.0)	2.01	0.32-12.3	0.654**
No	85(42.7)	114(57.3)			
Prophylaxis with hydroxychloroquine					
Yes*	8(100.0)	0(0.0)	-	-	**0.001****
No	80(40.8)	116(59.2)			
Prophylaxis with chloroquine					
Yes*	2(66.7)	1(33.3)	2.67	0.23-29.9	0.579**
No	86(42.8)	115(57.2)			
Prophylaxis with azithromycin					
Yes*	40(52.6)	36(47.4)	1.85	1.04-3.29	**0.035**
No	48(37.5)	80(62.5)			
Prophylaxis with ivermectin					
Yes*	46(51.7)	43(48.3)	1.85	1.05-3.26	**0.030**
No	42(36.5)	73(63.5)			
Prophylaxis with dexamethasone					
Yes*	23(59.0)	16(41.0)	2.21	1.08-4.50	**0.026**
No	65(39.4)	100(60.6)			

* Reference category. ** Fisher's exact test.
Source: authors, 2021.

Those who had two or more employment bonds (OR:1.84; CI:1.05-3.22; p=0.032) had an increased chance of being diagnosed with COVID-19, while those who worked in primary health care (OR:0.42; CI:0.21-0.83; p=0.011) showed lower chances (Table 3).

Sharing a break room with another professional, without using a mask, for a period longer than fifteen minutes (OR:2.02; CI:1.14-3.60; p=0.015), performing endotracheal tube suctioning (OR :2.06; CI:1.02-4.15; p=0.041) and performing nasal and oral swab (OR:1.77; CI:1.00-3.15; p=0.048) increased the chances of having COVID-19 (Table 3).

The use of PPE was frequent among cases and non-cases of COVID-19, none of the variables analyzed had a statistically significant association. It was observed that the use of the N95 mask had lower chances of diagnosing the disease, even if not associated (OR: 0.89; CI: 0.42-189: p=0.769). The lack of PPE was the most reported situation by health personnel who had COVID-19 (50.6%; p=0.092) (Table 3).

Table 3. Differences in occupational variables and use of PPE in relation to the diagnosis of COVID-19. Teresina, Piauí, Brazil, 2021. (n=204)

Variables	COVID-19 Diagnosis		Brute OR	CI 95%	*p* value
	Yes	No			
	n (%)	n (%)			
Training on COVID-19					
Yes*	59(46.8)	67(53.2)	1.48	0.83-2.65	0.176
No	29(37.2)	49(62.8)			
Two or more employment bonds					
Yes*	52(50.5)	51(49.5)	1.84	1.05-3.22	**0.032**
No	36(35.6)	65(64.4)			
Work in the hospital wards (public)					
Yes*	39(50.0)	39(50.0)	1.57	0.85-2.90	0.148
No	35(38.9)	55(61.1)			
Work in the ICU (public)					
Yes*	19(52.8)	17(47.2)	1.56	0.74-3.28	0.234
No	55(41.7)	77(58.3)			
Work in the primary health care (public)					
Yes*	17(30.4)	39(69.6)	0.42	0.21-0.83	**0.011**
No	57(50.9)	55(49.1)			
Work in the urgency and emergency (public)					
Yes*	20(50.0)	20(50.0)	1.37	0.67-2.79	0.385
No	54(42.2)	74(57.8)			
Work in a field hospital (public)					
Yes*	7(38.9)	11(61.1)	0.78	0.29-2.14	0.641
No	67(44.7)	83(55.3)			
Work in the hospital wards (private)					
Yes*	13(48.1)	14(51.9)	1.72	0.63-4.66	0.282
No	14(35.0)	26(65.0)			
Work in the urgency and emergency (private)					
Yes*	7(46.7)	8(53.3)	1.40	0.44-4.45	0.568
No	20(38.5)	32(61.5)			
Front line					
Yes*	63(43.4)	82(56.6)	1.04	0.56-1.92	0.888
No	25(42.4)	34(57.6)			
Sharing a break room [(a)]					
Yes*	42(53.8)	36(46.2)	2.02	1.14-3.60	**0.015**
No	46(36.5)	80(63.5)			
Endotracheal intubation					
Yes*	21(56.8)	16(43.2)	1.95	0.95-4.02	0.064
No	67(40.1)	100(59.9)			
Nebulization					
Yes*	21(41.2)	30(58.8)	0.89	0.47-1.70	0.744
No	67(43.8)	86(56.2)			

Endotracheal tube suctioning					
Yes*	23(57.5)	17(42.5)	2.06	1.02-4.15	**0.041**
No	65(39.6)	99(60.4)			
Tracheostomy tube suctioning					
Yes*	23(52.3)	21(47.7)	1.60	0.81-3.13	0.167
No	65(40.6)	95(59.4)			
Nasal and oral Swab					
Yes*	40(51.9)	37(48.1)	1.77	1.00-3.15	**0.048**
No	48(37.8)	79(62.2)			
Use of gloves during proceedings					
Yes*	75(42.9)	100(57.1)	0.92	0.41-2.03	0.843
No	13(44.8)	16(55.2)			
Use of surgical mask					
Yes*	77(43.8)	99(56.2)	1.20	0.53-2.71	0.658
No	11(39.3)	17(60.7)			
Use of N95 mask					
Yes*	73(42.7)	98(57.3)	0.89	0.42-1.89	0.769
No	15(45.5)	18(54.5)			
Use of medical cap					
Yes*	79(43.6)	102(56.4)	1.20	0.49-2.92	0.680
No	9(39.1)	14(12.1)			
Use of face shield					
Yes*	44(45.8)	52(54.2)	1.23	0.70-2.14	0.464
No	44(40.7)	64(59.3)			
Use of safety goggles					
Yes*	35(45.5)	42(54.5)	1.16	0.65-2.05	0.603
No	53(41.7)	74(58.3)			
Non-adequate adjust of the mask					
Yes*	50(45.5)	60(54.5)	1.22	0.70-2.14	0.470
No	38(40.4)	56(59.6)			
Lack of EPI					
Yes*	39(50.6)	38(49.4)	1.63	0.92-2.89	0.092
No	49(38.6)	78(61.4)			
Low quality PPE					
Yes*	49(43.8)	63(56.2)	1.05	0.60-1.84	0.845
No	39(42.4)	53(57.6)			

* Reference category; [(a)]without using the mask for more than 15 minutes.
Source: authors, 2021.

In relation to health personnel who had COVID-19 (43.1%; n=88), the most frequently reported symptoms were cough (67.5%), myalgia (56.8%) and fever (51.1%). RT-PCR was used for the majority of diagnoses (51.1%). It was evident that azithromycin (79.5%) and ivermectin (72.7%) were the medications most frequently used for treatment. The prevalence of complications related to COVID-19 was 10.8% (22/88), with arrhythmia being the most reported one (12.5%) (Table 4).

Regarding the variable sex, females had more complications (81.8%), as did those without a partner (54.5%) and nurses (54.5%); the median age was 30.5 years. Obesity was the most common pre-existing health complication in those who had complications (27.3%). Professionals who worked in hospital wards

(52.4%, p=0.972) and Intensive Care Units (33.3%, p=0.343) had more complications. There was no significant association between these variables (Table 4).

Among the variables associated with the diagnosis, the use of prophylaxis with dexamethasone (OR:3.39; CI:1.20-9.56; p=0.017) increased the chances of complications from COVID-19 (Table 4).

Table 4. Differences in variables associated with the diagnosis of COVID-19 with the outcome of disease complications. Teresina, Piauí, Brazil, 2021. (n=88)

Variables	COVID-19 Complications		Brute OR	CI 95%	*p* value
	Yes	No			
	n (%)	n (%)			
Obesity					
Yes*	6(37.5)	10(62.5)	2.10	0.66-6.66	0.215**
No	16(22.2)	56(77.8)			
Hydroxychloroquine prophylaxis					
Yes*	3(37.5)	5(62.5)	1.92	0.42-8.81	0.407**
No	19(23.8)	61(76.2)			
Azithromycin prophylaxis					
Yes*	12(30.0)	28(70.0)	1.62	0.61-4.30	0.323
No	10(20.8)	38(79.2)			
Ivermectin prophylaxis					
Yes*	13(28.3)	33(71.7)	1.44	0.54-3.83	0.460
No	9(21.4)	33(78.6)			
Dexamethasone prophylaxis					
Yes*	10(43.5)	13(56.5)	3.39	1.20-9.56	**0.017**
No	12(18.5)	53(81.5)			
Have two or more employment bonds					
Yes*	12(23.1)	40(76.9)	0.78	0.29-2.06	0.617
No	10(27.8)	26(72.2)			
Work in primary health care (public sector)					
Yes*	5(29.4)	12(70.6)	1.06	0.32-3.51	1.000**
No	16(28.1)	41(71.9)			
Share a break room [(a)]					
Yes*	10(23.8)	32(76.2)	0.88	0.33-2.33	0.805
No	12(26.1)	34(73.9)			
Perform endotracheal tube suctioning					
Yes*	9(39.1)	14(60.9)	2.57	0.91-7.23	0.069
No	13(20.0)	52(80.0)			
Perform nasal and oral swab					
Yes*	9(22.5)	31(77.5)	0.78	0.29-2.07	0.621
No	13(27.1)	35(72.9)			

*Reference category. **Fischer's Exact Test. (a) with other professionals, without the mask for more than 15 minutes.
Source: authors, 2021.

DISCUSSION

In the sociodemographic characterization, as described in the literature, it is a young population, of economically active age (average age of 38.73 to 39.5 years).[14] Variables such as (age, sex, and race) were not associated with the diagnosis for COVID-19, as highlighted in a survey with 991 healthcare workers in the United Kingdom.[15] It is highlighted that, in general, older people are more susceptible to developing complications as a result of COVID-19.[16]

Regarding the analysis of self-reported health conditions, obesity and BMI increased the chances of having COVID-19. This condition is a risk factor for complications, since, as the BMI increases, there is an increased risk for developing the severity of the disease.[17] Other comorbidities, such as hypertension, diabetes and pre-existing respiratory diseases are also associated with complications, as well as the high prevalence of fatal outcomes.[18]

When it comes to the use of prophylaxis, it is clear that hydroxychloroquine and ivermectin had little effect for this purpose. WHO contraindicated the use of hydroxychloroquine prophylaxis for individuals who do not have COVID-19, as, in addition to not having considerable effects on prevention, it has no effect on mortality and hospitalization outcomes.[19] Cardiac changes, such as prolongation of the QT interval, arrhythmias and even cardiac arrest have been associated with its use during the pandemic.[20]

As to ivermectin, the level of evidence supporting the prophylactic use of the medication is low, its action in prevention is not sustained, not even for treatment.[21] Furthermore, the existence of reports associated with the toxicity of this drug is described, such as : gastrointestinal discomfort, confusion, ataxia, weakness, hypotension, convulsions and skin rash.[22] In view of this, it is worth reflecting on the reasons that led health personnel to adhere to pharmacological prophylaxis, since they contradict one of the foundations of their actions, which is practice based on scientific evidence.

Another medication that had its use questioned during the COVID-19 crisis was azithromycin. Like the other drugs mentioned, its use does not have a high level of recommendation in the context of the pandemic, especially for treatment, as it does not have considerable effects in reducing recovery time. Careful evaluation is recommended to reduce the incidence of antimicrobial resistance[23-24] since it is common to prescribe this pharmacological class to treat viral infections.

In the workplace, exposure - remaining in the break room, with other professionals, without a mask for more than 15 minutes (p=0.000) - is a statistically significant risk factor for infection.[25] Maintain social distancing in the workplace is a big challenge. It is inferred that the exposure time and the distance maintained are important factors in whether or not the infection is acquired.

In the scope of health care actuation, working in primary health care may represent a possible risk reduction factor for infection. Compared to the hospital sector, there are different characteristics that can influence exposure to COVID-19. While in the first there is a greater circulation of people and more complex procedures; in the second, the invasive care routine is reduced. Even though these two environments are distinct, it is observed that there is a greater influence of low availability and inadequate training on the use of PPE, in addition to excessive working hours, on infection among healthcare personnel.[26]

It is noteworthy that, in the capital of the state of Piauí, Basic Health Units were made available to exclusively treat cases of flu-like syndrome, relying on the “fast-track” methodology.[27] This made it possible to reduce crowds and avoid contact between suspected patients and others without symptoms. In this way, it is possible that the risk of infection in professionals working in primary care has also been influenced by this organization. In any case, the place of work, combined with the way in which the professional protects themself during they

professional activity, can reduce or increase the chances of infection.

Another exposure factor was performing procedures involving the airways, such as endotracheal tube suctioning and nasal/oral swabs. Studies have shown that similar procedures, such as nebulization[28] and endotracheal intubation,[29] have been associated with COVID-19 in healthcare personnel. The increased exposure to infection through these procedures is justified as they involve care that potentially generates aerosols, the transmission route for SARS-CoV-2.[30]

With regard to the use of PPE, the majority of those surveyed used them during work. A study carried out with 751 professionals in India showed that equipment such as masks (N95 or PFF2), surgical caps and aprons were associated with a reduced chance of acquiring SARS-CoV-2 infection.[29] The use of the N95 mask during care for patients with COVID-19 was associated with reduced risk.[31] However, inappropriate use when caring for patients with COVID-19 can contribute to infection ($p=0.003$),[25] as well as contamination, falling, or displacement of them.[32] The availability of material and correct clothing or not are factors that can contribute to the presence of new cases of the disease in this population.

The data presented in this study point to the high prevalence of COVID-19 among healthcare personnel who work directly with patients, including a high number of cases that evolved into complications of the disease. A similar infection rate (52%; n=1,045) was also observed when PCR testing was carried out on employees at a hospital in London.[33] Many professionals were infected while providing direct patient care.[28,31] This type of assistance contributes so that, on a daily basis, they are involved in actions that expose them to the risk of infection, as well as working in an environment potentially favorable to the spread of viruses and other pathogens.

Once affected by COVID-19, healthcare personnel reported fever, cough, and myalgia as the most frequent symptoms. In adults, fever and a normal or dry cough are the most common symptoms.[34] Healthcare personnel in Denmark who had any symptoms of COVID-19 had it associated with a significantly increased seroprevalence of IgG or IgM antibodies compared with asymptomatic patients ($p<0.001$). Loss of taste or smell was the symptom most strongly associated with seropositivity.[35]

Among those who had complications from the disease, there were no associations between sociodemographic variables, pre-existing health conditions and occupational conditions, with the exception of dexamethasone prophylaxis. The literature points out that people whose health status has worsened due to COVID-19, for the most part, have some pre-existing health condition, such as advanced age, being a smoker and having underlying comorbidities (hypertension, diabetes, obesity, cardiovascular, respiratory and kidney diseases).[36]

This study has limitations in relation to the lack of sample calculation, the fact that data collection was carried out online and the impossibility of measuring certain parameters relating to the health of those surveyed. Participants were also not asked whether they had reinfection or whether they were currently or recently diagnosed with COVID-19.

CONCLUSION

It was identified that obesity, prophylaxis with hydroxychloroquine, dexamethasone, ivermectin and azithromycin, sharing a rest room without a mask for more than 15 minutes, having two or more employment bonds, performing endotracheal tube suctioning and performing a nasal/oral swab increased the chances diagnostics for COVID-19. Working in primary health care reduced the chances.

The use of dexamethasone as prophylaxis for COVID-19 increased the chances of complications from the disease. The prevalence found of both cases and complications is considered high, denoting that

healthcare personnel are at an increased risk of contracting COVID-19 and developing some unfavorable outcome.

The great occupational exposure they have in fighting the pandemic can increase the presence of new infections and reinfections. There are variants of SARS-CoV-2 circulating in the country and around the world and safety measures during work must be maintained and encouraged to ensure the safety of these professionals. Issues related to the surgical/hospital clothes and professional practice must be emphasized, even with the flexibility of coping measures and the reduction of cases, in order to maintain the continuity of the adoption of protective measures within the work environment.

RESUMO

Introdução: Profissionais de saúde desempenham papel crucial na linha de frente contra a COVID-19, com atuação que pode aumentar o risco de infecção e complicações da doença. Lacunas no enfrentamento da pandemia, especialmente relacionadas a recursos, foram identificadas. **Objetivo:** analisar os fatores associados ao diagnóstico e complicações da COVID-19 entre profissionais de saúde. **Delineamento:** estudo transversal analítico, realizado no Piauí, com profissionais da saúde, independente do *status* sorológico para COVID-19. A coleta foi realizada em ambiente virtual. Utilizou-se os testes estatísticos Mann-Whitney e Qui quadrado de Pearson. A força de associação foi aferida pela *Odds Ratio*. **Resultados:** Participaram 204 profissionais. Atuar na atenção primária reduziu as chances do diagnóstico. Profilaxia com hidroxicloroquina, dexametasona, ivermectina e azitromicina; compartilhar sala de descanso, ter dois ou mais vínculos empregatícios, realizar aspiração tubo endotraqueal e swab nasal/oral aumentaram as chances (dados estatisticamente significativos). Profissionais que fizeram uso da dexametasona como prevenção, tiveram chances aumentadas de complicações da doença. **Implicações:** a atuação na assistência predispõe ações que podem aumentar ou reduzir o risco frente a COVID-19, tais como realizar intervenções em saúde envolvendo vias aéreas, carga e tipo de ambiente de trabalho, além de comportamento de risco como a adoção de profilaxias contra a COVID-19.

DESCRITORES

COVID-19; Pessoal de Saúde; Fatores de Risco; Atenção à Saúde.

RESUMEN

Introducción: Los profesionales de la salud desempeñan un papel crucial en la primera línea contra el COVID-19, con actividades que pueden aumentar el riesgo de infección y complicaciones de la enfermedad. Se identificaron deficiencias en la lucha contra la pandemia, especialmente en materia de recursos. **Objetivo:** analizar los factores asociados al diagnóstico y complicaciones de la COVID-19 entre profesionales de la salud. **Delineación:** estudio analítico transversal, realizado en Piauí, con profesionales de la salud, independientemente del estado serológico para COVID-19. La recogida se realizó en un entorno virtual. Se utilizaron las pruebas estadísticas Chi-cuadrado de Mann-Whitney y Pearson. La fuerza de la asociación se midió mediante el Odds Ratio. **Resultados:** Participaron 204 profesionales. Trabajar en atención primaria redujo las posibilidades de diagnóstico. Profilaxis con hidroxicloroquina, dexametasona, ivermectina y azitromicina; compartir un baño, tener dos o más trabajos, realizar aspiración con tubo endotraqueal e hisopos nasales/orales aumentaron las posibilidades (datos estadísticamente significativos). Los profesionales que utilizaron dexametasona como prevención tuvieron mayores posibilidades de sufrir complicaciones por la enfermedad. **Implicaciones:** brindar asistencia predispone acciones que pueden aumentar o reducir el riesgo de COVID-19, como la realización de intervenciones de salud que involucran vías respiratorias, carga y tipo de ambiente de trabajo, además de conductas de riesgo como la adopción de profilaxis contra el COVID-19.

DESCRIPTORES

COVID-19; Personal de Salud; Factores de Riesgo; Atención a la Salud.

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EFS, RAS, BSPS e RLB: Substantial contributions to the conception or design of the work; or acquisition, analysis, or interpretation of data. EFS, RKR, OOC, DRJF e RLB: Prepare the work or review it critically for intellectual content. EFS, RKR, OOC, DRJF, RAS, BSPS e RLBM: Final approval of the version to be published. **All authors agree and are responsible for the content of this version of the manuscript to be published.**

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