Research Article

Sociodemographic and labor characteristics of health personnel who responded to the COVID-19 pandemic

Abstract

Introduction: This article describes the sociodemographic, occupational, and occupational risk factors of health personnel from four hospital institutions who provided frontline emergency care in the face of the COVID-19 pandemic. The objective of this work was to characterize the health personnel of four institutions that provided frontline care for the COVID-19 pandemic.

Methods: A cross-sectional descriptive study was conducted in which sociodemographic and labor variables of 362 frontline health workers who faced the COVID-19 pandemic were explored. Data collection was carried out through digital self-completion.

Results: Health technicians and nursing professionals represent 61% of the population studied, in relation to sex it was found that of 100% of those infected by COVID-19, 66% correspond to women; A statistical association was found between the work performance unit and the daily hours worked.

Conclusions: The health workers who participated in the study, according to the work carried out, the highest prevalence within the sample belongs to technicians and nursing professionals; being the female sex the one that predominates in these institutions and the same group with the highest frequency of contagion by COVID-19. Likewise, it was shown that in the Emergency services and in the Intensive Care Unit the shifts are extensive since they work ≥ 12 hours for 4 days a week, these being the most contagious services.

Keywords: demographics, occupational hazards, risk factors, health personnel, coronavirus infections

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Introduction

COVID-19 is a disease caused by the novel coronavirus known as SARS-CoV-2, a virus that has had a major impact on humanity. WHO first became aware of the existence of this new virus on 31 December 2019, when it was informed of a cluster of cases of "viral pneumonia" that had been reported in Wuhan, People's Republic of China.[1,2] Coronaviruses (CoV) are a large family of viruses that can cause various conditions, ranging from the common cold to more serious illnesses, such as the disease that causes Middle East respiratory syndrome (MERS-CoV) and that which causes severe acute respiratory syndrome (SARS-CoV). The emerging virus (CoV) is a new strain of coronavirus that had not previously been identified in humans. This process of spread was replicated by each of the countries until it became a pandemic that has been circulating to date. two years. For the year 2021, it was documented that in the Americas about 570,000 health workers have been infected and 2,500 have died from COVID-19, leaving a total of 567,500 recovered[3] and 17,000 have died from COVID-19 in the last year worldwide. Every 30 minutes, a health professional dies from COVID-19 worldwide; In Colombia for the year 2022 the reported cases of COVID 19 in health personnel are 73,220 and the fatal cases are 349 for a total of 72,821 recovered.[4]

Frontline rescuers around the world have risked their lives to try to protect humanity from COVID-19, but in too many cases they have done so without any protection, paying the highest price for it.[5] With the above, it is intended to extrapolate the results and make known what are those conditions, characteristics and factors that increase or predispose to be infected by Covid-19. This leads this work to inform health personnel and especially those who work on the front line of response about what measures should be taken both in their daily lives and in their working lives. This research is structured in three sections: First, the sociodemographic characteristics defined as the set of biological, socioeconomic and cultural characteristics that are present in the population studied are described,[6] these traits can be as simple as the means of transport in which a frontline response health worker travels from home to work and vice versa or be as complex as the genetic factors that predispose a subject to be more susceptible to contracting a disease and becoming a severe case.

The second section deals with the job characteristics of frontline response health workers and is defined as the professional who has a higher risk of exposure to perform direct care activities for patients with COVID-19 (close contact and with longer exposure time), in addition to being more likely to have contact with a person infected with SARS-CoV2. In addition, this population group is also prioritized by the principles of social benefit and reciprocity.[7] With the above, it is not necessary to clarify that the frontline personnel in COVID-19 care are all those health workers, whether professionals, technicians or technologists facing this crisis. The third section deals with the most prevalent risk factors, defining a risk factor as any detectable characteristic or circumstance of a person or group of people that is known to be associated with the probability of being especially exposed to developing or suffering a morbid process, its characteristics are associated with a certain type of damage to health.[8] A risk factor may be specific to one or more types of harm, and at the same time, several risk factors may affect the same type of harm.[8] This research work aims to characterize the health personnel of four health institutions who participated in health care from the first line of response in the health emergency caused by COVID-19.

Methods

A cross-sectional descriptive study was conducted exploring sociodemographic and labor variables of 362 frontline response health officials who faced the Covid-19 pandemic. The 362 participants were discriminated against in 213 health professionals and 149 health technicians, from 4 hospital institutions located in the center of the country (Colombia) health institutions of second and third level of complexity. The collection of the sample was carried out in a period of time from December 2020 to August 2021, the subjects who participated voluntarily through electronic informed consent, with a direct contract with the health entity, (without intermediaries or contractors) and who were active in the work in the period from December 2020 to August 2021 professionals and technicians exclusive to the four hospital institutions located in the center of the country (Colombia - Bogotá DC) second and health institutions of third level of complexity, those health professionals and technicians who filled out the information incompletely and those who were not part of the health care of those patients positive for COVID-19 were excluded. This collection was carried out through digital self-completion using the Google Docs tool, which included questions related to three dimensions: a) sociodemographic characteristics, including biological, socioeconomic and cultural characteristics, b) job characteristics, such as number of jobs, close contact, work shifts, longer exposure time, and having a higher probability of contact with a SARS-CoV2 positive person; and (c) risk factors of higher prevalence among health personnel, such as developing or suffering from a comorbidity that deteriorates the physical, mental and/or social health of the professional.

Statistical analysis

The data were analyzed using descriptive statistics to characterize the study population, for the associations of the variables Chi-square and Fisher statistics were used in the study program R, the level of statistical significance was p (0.005). This project was approved by the Ethics and Research Committee of the University of Applied and Environmental Sciences UDCA (Bogotá Colombia). The ethical principles of research with human beings contained in the Declaration of Helsinki and resolution number 8430 of 1993 (October 4), which establish scientific, technical and administrative standards for Colombian health research, were considered.

Results

The study population consisted of 366 health officials who faced the COVID-19 pandemic between December 2020 and August 2021 from 4 hospital institutions located in the center of the country (Colombia - Bogotá DC); of which 362 met the inclusion criteria for the study. 1 study subject was excluded for completing the questionnaire incompletely and 3 for not being part of the health personnel who directly faced the COVID-19 pandemic. Of the 362 study subjects, 214 health professionals and 148 health technicians were discriminated against according to Figure 1; These are characterized according to the position they occupy within the institution where they work: 148 health technicians (nursing assistants, laboratory assistants, oral health assistants, radiology technicians and social technicians), 71 nurses, 45 doctors (AS), 44 medical specialists, 42 in other professions (bacteriologists, biomedical engineers, surgical instrumentalists, nutritionists, physiotherapists, dentists and psychologists) and 12 respiratory therapists. Regarding the sociodemographic characterization of this population, the data were considered according to variables such as age, which was reclassified into intervals, sex, marital status, race, socioeconomic level; as shown

in Table 1. It is specified that within the labor characteristics are the variables: number of jobs, position occupied within the institution, prevalence of COVID-19, work shift, unit of performance, number of weekly working hours, close extra-labor contact with a COVID-19 patient and work experience expressed in years; See Table 2.
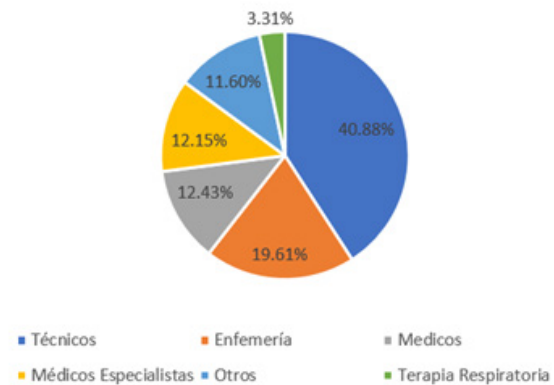

Figure 1 Distribution by work activity.

Prepared by the authors

Table 1 Sociodemographic variables of health personnel who faced the COVID-19 pandemic

Sociodemographic variables		Number (%)
Age	Mean=34 years Standard Error =0.5 Range (18 to 65)	
Age of on and off	20 to 30 years	140 (38)
	30 to 40 years	130 (36)
	40 to 50 years	54 (15)
	50 to 60 years	30 (8)
	< 20 years	6 (2)
	> 60 years	21
Sex	Men	75 (21)
	Woman	287 (79)
Marital status	Bachelor	186 (51)
	Common-law marriage	89 (25)
	Married	70 (19)
	Divorced	15 (4)
	Widower	21
Race	Mestizo	184 (51)
	White	171 (47)
	Afrocolombiano (afrodescendiente)	5 (1)
	Indigenous	21
Socioeconomic	I	17 (5)
	2	137(38)
	3	131 (36)
	4	53 (15)
	5	19 (5)
	6	5 (1)

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Table 2 Occupational variables of health personnel who faced the COVID-19 pandemic

Labor variables		Number (%)	Labor variables		Number (%)
Number of jobs	1	241 (67)		UCI	182 (50)
	≥2	121 (33)		Other	76 (21)
Position held in the institution	Technical	148 (41)	Performance unit	Emergency	53 (15)
	Nurses	71 (20)		Hospitalization	26 (7)
	Medical	45 (12)		Outpatient consultation	25 (7)
	Medical specialists	44 (12)		Average= 12	
			Working hours	Standard error = 0.2	
	Other	42 (12)		Range (4 to 24)	
	Respiratory therapy	12 (3)	Close contact with a COVID-19 patient at extra work	Yes	76 (21)
Positive for COVID-19	Yes	71 (20)		No	286 (79)
	No	291 (80)	Experience in years	Average = 6 years Standard error = 0.4 Range (0 to 40)	
Work shift	Day	87 (24)			
	Night	102 (28)			
	Rotary	173 (48)			

Source: Authors.

The risk factors in the health personnel (study population) were found through the analysis of two joint variables, which yielded the following results: The association of the performance unit and the hours worked was significant because it was found that in the services of the Intensive Care Unit (ICU), 72% of health workers and 81% in the emergency service work 12 hours a day. $p: (<0.0001)$; For the association of days worked and hours worked, statistical significance was found because 88% of health workers work 12 hours for 4 days $p: (< 0.0001)$; In relation to sex, statistical significance was found because of the 100% of those infected by COVID-19, 66% correspond to women $p: (0.002)$. In relation to the negative association for COVID-19 and number of jobs, it was found that 70% of the negative population declares that they work in 1 institution, otherwise for the group of COVID-19 positive officials who have 2 or more jobs they are positive in 48% $p: (0.004)$; In the variables labor contract and number of jobs, the association found that 50% of workers who are linked to the institution by contract for the provision of services have a tendency to seek two or more jobs $p: (<0.0001)$ and finally, for the association of positive for COVID-19 and close contact outside the hospital, It was found that 39% of the population infected with COVID-19 has had close contact with positive patients outside hospital facilities $p: (<0.0001)$.

Discussion and conclusion

According to the results of this study, COVID-19 infection has a higher prevalence in women, likewise, as the WHO says, pandemics and outbreaks have differential effects on women and men. From risk of exposure and biological susceptibility to infection to social and economic consequences, people's experiences are likely to vary according to their gender and biological characteristics and their interaction with other social determinants.[9–12] The WHO, in a breakdown by sex, conducted an analysis of the data showing a relatively uniform distribution of infections between women and men

(47% versus 51%, respectively)[9] that contrasts with the results of the research since most of the infections occurred in the female sex, clarifying that this happened due to the distribution that was presented in the study sample of the four health institutions. As previously shown in the results, the sex that has the greatest presence in the first line of emergency due to the pandemic caused by COVID-19 is female, as supported by the Pan American Health Organization (PAHO) where it says: The stress endured by health personnel is not the same for men and women. Globally, 70% of frontline health workers are women. In the Region of the Americas, 86% of nursing staff, professionals who have to be in very close contact with patients, are women.[13]

According to the bivariate results of this study, in the association "sex and COVID positive" women became more infected, but at the same time men in these four institutions were more than expected, which Coello confirms in his research where men have been more affected,[14,15] this is clearly explained not only with the COVID-19 virus but in general with most viruses, given that the genetic characteristics of each gender are different and lead to infections and development of infection in a very different way as expressed by Ruiz in his article where he states that the following women generate an immune response More active than men, sufficient to protect them and counteract infectious diseases, this attribute of a better immune response against pathogens is thought to be related to estrogens and immunostimulatory genes that reduce infectivity. and infection. mortality from SARS-CoV-2, unlike the male sex, in which testosterone increases levels of the two critical molecules or genes ACE2 and TMPRSS2, which increase viral load.[16]

As for race, in the United States people of African descent have a higher rate of infection and mortality compared to people of other races. This is also expressed by the World Health Organization and the Pan American Health Organization (WHO / PAHO) that due to inequality and racial discrimination, they present a greater

vulnerability to COVID-19 infection where they also showed greater biological vulnerability.[17,18] Indeed, this did not happen in a similar way in this study, since due to the geographical location where the study was conducted (Bogotá DC - Colombia) the races were not evenly distributed, which is a limitation that does not allow the association, since the participants of African descent in this study were only 1%.

For age according to the data obtained from this research, the population of the most affected sample was that of 20 to 40 years, which agrees with the statistics described by the National Institute of Health of Colombia (INS) and the Ministry of Health. of Bogotá DC, where it is specified that most of the infections occurred between the ages of 20 and 39.[19–21] These ages are representative for this population as they are characterized by active work. The social inequalities that exist are evident mainly in the economic stratum, which hinders access to health systems and adequate housing conditions, this can translate into higher rates of infection and mortality from COVID-19,[22] which was evidenced in this research work thanks to the fact that most of the infections that occurred in the four institutions where the sample was collected were in stratum 2 of the frontline response workers; As stated by the Universidad de los Andes (Colombia - Bogotá DC) in the hypothesis of a research "there is a greater probability of infection for the most vulnerable people socioeconomically, it is because they are less likely to isolate, either because they cannot afford to stay at home or because they prefer not to do so.[23]

In relation to close contact outside the hospital, it was found that in this study one-fifth of health workers reported having had close contact with COVID-positive patients. These contacts could occur due to the approach with an active family member transmitting the virus, in public transport, in social gatherings or in various establishments where the allowed capacity is exceeded. This result is consistent in part with that reported by Orbegoso in 2021, who mentions that almost a quarter (24.3%) of infected health personnel had contact with a family member previously diagnosed with COVID-19 (out-of-hospital infection).[24] And similarly, López and Layo in 2020 conclude that the main causes of infection by health workers would be: late recognition of COVID-19 symptoms, lack of experience in the treatment of respiratory pathogens, exposure to a large number of patients in long shifts with inadequate rest periods, lack of personal protective equipment (PPE), lack of measures to prevent the spread in hospitals, out-of-hospital or community contagion.[25]

It was evidenced that within the four institutions in which the study was conducted, the job with the highest prevalence were people who act as technicians and nurses; as demonstrated by Vera in 2021 when she said that, within the labor factors of the health personnel of the Emergency Department of the María Auxiliadora Hospital, March-December 2020, the jobs that stood out the most were nurses and technicians) with 60% and 36% respectively.[26] In relation to the variables daily hours worked, days worked per week and the number of jobs of the study subjects, it was evidenced that the greater the exposure, the greater the risk of contracting COVID-19 infection, as demonstrated by the Ministry of Health of Argentina. with the risk assessment and management of healthcare workers exposed to COVID-19, where it states that healthcare workers and other essential workers are on the front lines of the response to the COVID-19 outbreak and, as such, are more exposed to situations of potential exposure, putting them at risk of infection.[27]

Similarly, the Occupational Safety and Health Administration (OSHA) states that jobs with a very high risk of exposure to known or suspected sources of COVID-19 are those that are related to specific medical procedures, mortuary work, or laboratory procedures. However, it states that workers in this category include: Health and morgue workers who perform procedures that generate aerosols or collect/handle samples from potentially infectious patients or bodies of people known or suspected to have COVID-19. 19 at the time of death.[28] It can be concluded that the health workers in the first line of emergency linked to the four hospital institutions that participated in the study, according to the work carried out, the highest prevalence belongs to nursing technicians and professionals, these two being the ones that predominated within the sample; therefore, the female sex was the one that prevailed in these institutions, this being the same group with the highest frequency of COVID-19 infection. Socioeconomic strata 2 and 3 predominated; Likewise, in the study population, an age range between 20 and 40 years was found, which is characterized by being actively working. It is also highlighted that a large number of infected workers had close contact outside the institutions with COVID-positive patients. Finally, it is concluded that the greater the exposure, the greater the contagion by COVID -19. It was also evidenced that in the Emergency Services and the Intensive Care Unit the shifts are extensive and ≥ 12 hours and for 4 days a week, these being the most contagious services.

Acknowledgments

Conflicts of interest

The author declares there is no conflict of interest.

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