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Mental Health Burden of the COVID-19 Pandemic in Healthcare Workers in Four Latin American Countries

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Abstract

The aim of the study was to assess the mental health burden of the COVID-19 pandemic in healthcare workers in four Latin American countries in 2020.

An online survey was carried out with 1721 participants from Argentina, Chile, Colombia and Mexico in 2020. A non-probabilistic convenience sampling method was used to recruit voluntary participants. Post-traumatic stress symptoms were assessed with the SPRINT-E scale, Perceived Discrimination was assessed with a Spanish version of the scale developed by Molero, and anxiety toward death was assessed with the Spanish version of the Templer scale. All instruments were assessed for internal consistency. The overall frequency of post-traumatic stress symptoms was 23.9%. The frequency by countries was 26.4% in Argentina, 29.8% in Chile, 19.9 in Colombia, and 23.8% in Mexico. Post-traumatic stress symptoms were associated with individual subtle discrimination, anxiety toward the death of the elderly, lack of Personal Protective Equipment, and exposition to the death. The COVID-19 pandemic has imposed a mental health burden on health workers in the countries included in the study, not only due to the implications of the disease in the face of exposure to death, but also due to institutional conditions and in which they carry out their work.

Highlights

- **What do we already know about this topic?**
  - Studies have revealed that health personnel exposed to working with sick patients in an epidemic context have a higher risk of suffering from short-term and long-term mental health problems.
- **How does your research contribute to the field?**
  - This study assesses the mental health burden of healthcare workers in four Latin American countries during the COVID-19 pandemic.
- **What are your research's implications toward theory, practice, or policy?**
  - As the COVID-19 pandemic is not resolved yet, governments should implement interventions to protect the mental health of health workers in Latin America.

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mental health burden, post-traumatic stress, anxiety, perceived discrimination, COVID-19, healthcare workers

Introduction

The COVID-19 pandemic brought with it multiple challenges that had to be quickly confronted, by the countries that began taking centralized measures, in the face of the health and economic consequences of the pandemic. For Latin America, the dilemma was between safeguarding the measures designed to contain infections in the population versus counteracting the economic impact derived from mobility restrictions imposed by governments to reduce transmission of infections, during the first quarter of 2020. Among the most widely implemented measures in Latin American countries was physical distancing. However, these measures prevented people from going to work, which negatively impacted during the first phase of the pandemic, by exacerbating poverty and income inequality.[1] These adverse effects of the lockdowns had a particular impact on those people whose daily livelihood lies in informal employment, which at the beginning of the pandemic, in the most disadvantaged quintiles, were 37.8% in Argentina, 32% in Chile, 62.4% in Colombia, and 59.9% in Mexico.[2]

One year after those events, Mexico, Argentina, and Colombia each exceeded two million infected persons, while Chile was close to reaching one million infected.[3] This posed a real challenge to the healthcare systems of these countries, characterized by the socioeconomic conditions of the population and their vulnerability,[4] added to the deep social inequalities that remain and impact the inequitable access to health services.[5]

Based on research carried out in Asia, the critical conditions in which front-line health personnel were working, and the associated risks of presenting with distress and other mental health symptoms, began to be reported. Lai[6] found that the increased number of persons confirmed with COVID-19, the overwhelming workload, and the limitation of availability of personal protection elements, among other factors, increased the mental health burden on health personnel.

Research carried out in different pandemic settings shows that the continuous burden on health personnel, the deaths produced in contexts of pandemics, disaster situations, and discrimination resulting from the disease can provoke post-traumatic stress reactions.[7-10]

According to Levin,[11] post-traumatic stress results in invasive thoughts, sleep disturbances, and flashbacks of past traumatic circumstances, leading to significant social, occupational, and interpersonal dysfunction; hence, the importance of detecting and treating it in health personnel, who play a strategic role in guaranteeing the continuity of essential health services in the event of a pandemic.[12] The results of a meta-analysis by Yuan et al[13] revealed that PTSD is common among those who experience infectious disease outbreaks and that it can last for long periods of time, with health personnel being a vulnerable group, as they have a greater potential to develop post-pandemic PTSD. Studies have revealed that health personnel exposed to working with sick patients in an epidemic context have a higher risk of suffering from short-term and long-term mental health problems, among which are psychological anguish, insomnia, alcoholism and drug abuse, depression, anxiety, exhaustion, anger, and symptoms of PTSD.[14,15] The lack of PPE also had a negative impact on workers' mental health; according to Simms et al,[16] in their study of 3401 health workers found that those with inadequate PPE reported common mental health disorders (OR: 2.49; CI: 2.03-3.06), PTSD (OR: 2.99; CI: 2.11-4.24), worse general health (OR: 2.09; CI: 1.62-2.70), and emotional problems (OR: 1.69; CI: 1.38-2.06).

For their part, Mosheva et al[17] found that exposure to death in the healthcare personnel who cared for patients in COVID-19 wards was associated with a four times greater likelihood of presenting PTSD symptoms (OR: 3.97; CI: 1.58-9.99), compared to people who worked inward with patients without COVID-19 (OR: .91; CI: .51-1.61), which would imply a risk factor for those who care for and experience death in people from COVID-19.

In addition to the above, healthcare personnel are exposed to discrimination and rejection by the population, due to the prejudice that they may be carriers of the diseases which they treat daily,[11,18] which results in increasing the risk of suffering from mental illnesses, such as anxiety, depression, PTSD, and suicidal tendencies.[19] Given the complexity that the understanding of these intersections entails in the face of a worldwide pandemic that is not yet overcome, and that presents particularities typical of developing countries, this study aimed to assess the mental health burden of healthcare workers in four Latin American countries during the COVID-19 pandemic; specifically, the relationship between anxiety about death, and perceived discrimination with post-traumatic stress, was analyzed in a sample of healthcare personnel.

Methodology

A descriptive and cross-sectional study was carried out in health personnel, who worked in the context of the COVID-19 pandemic between the months of May to October 2020 in Argentina, Chile, Colombia and Mexico. A non-probabilistic sample of an intentional type was used, aimed at capturing a minimum quota of 1500 health professionals, to whom a structured online questionnaire was applied, lasting approximately 15 minutes.

Procedure for Selecting and Recruiting Participants

Participants were recruited using the social distancing precautions issued by the governments of the four countries

involved in the study.[20-23] An online survey design was used as with other studies in the field of mental health in other countries,[24-29] following current recommendations to conduct online surveys in the context of the COVID-19 pandemic.[30]

The link to the online survey was distributed to the target population, combining a snowball technique and recruitment through social networks, following the recommendations of other authors for this type of targeting.[31-33] For this last modality, the link was distributed in the form of Facebook advertising, with geographical segmentation and by interests of the Facebook social network users.

In the distributed link, the survey was opened privately outside the social network, complying with the corresponding privacy and confidentiality criteria. There were no records of participation or non-participation, nor records of responses on the social networks.

The intentional criteria that were sought when integrating the sample were:

1. Be a health professional.
2. Working in the context of the COVID-19 pandemic.
3. Agree to participate in the study.
4. Participation in popular social networks. Given that the online survey was distributed through social networks, this was an inclusion criterion.

It is assumed that in this type of online survey there is a natural bias due to sample self-selection,[26,31,34] so the conclusions of these types of studies should be taken with some caution.

Intentional sampling can be very useful for situations where it is necessary to reach a specific sample quickly and where sampling for proportionality is not the primary concern.[35] With an intentional sample, we aimed to obtain the frequency of the mental health burden in the target population. We are aware that it is not a representative sample and that, therefore, the results are not generalizable, but it was possible to have some quick measurements to design quick actions of mental health first aid for health workers. Thus, the purpose is not the generalization of results, but to obtain the first approximations toward this particular topic, in an accelerated time frame.

Instruments and Variables

The instruments used were self-applied, as an online survey method was used. The screening instrument used to capture the symptoms of post-traumatic stress was the SPRINT E scale originally developed by Norris et al[36] and subsequently validated in the Chilean population in the 2010 earthquake and tsunami.[37,38]

The 12-item scale measures symptoms of PTSD. Items 1-4 refer to each of the 3 groups of DSM-IV symptoms: item 1 measures Criterion B "intrusive re-experiencing"; items 2 and 3 measure Criterion C "avoidance and numbing"; and item 4 measures Criterion D "hyperactivity." Items 5 and 7 assess depression and healthy behavior; items 6, 9, and 10 refer to the functional impairment of the person, resulting in questions about stress tolerance, performance in their daily work and social functioning, respectively. Items 8 and 11 assess that the person has need of help and item 12 assesses suicidal intention.[36]

Each question has an intensity scale from 0 (minimum intensity) to 4 (maximum intensity), except for item 12 which is dichotomous (0 "yes" and 1 "no"). Item 12 was removed from the original scale, as our study did not ask about suicidal ideation, but rather about the availability of Personal Protective Equipment for health personnel. This decision was made based on the fact that there was much controversy surrounding the availability of this equipment in several Latin American countries.

Regarding the interpretation of this scale, if the answer to a question is greater than or equal to 3 points (1 for item 12), it is considered intense. A total of 3 or more intense responses indicate a high probability of PTSD, although with 7 or more responses the probability of a false positive occurring is very low.[36]

Secondly, to capture the discrimination perceived by health professionals, the Multidimensional Scale of Perceived Discrimination developed and validated by Molero et al[39] was applied. This scale has been used in various population groups (immigrants, people living with HIV, and LGTB groups) in Europe.

The scale consists of 20 items grouped into four sub-scales that reflect the following aspects of perceived discrimination:

1. Obvious group discrimination: seven items;
2. Subtle group discrimination: three items;
3. Obvious individual discrimination, seven items;
4. Subtle individual discrimination: three items.

All items on the scale are scored on a 5-point Likert scale of agreement (1 = completely disagreement, up to 5 = complete agreement). The scale has no cut-off points, so its interpretation indicates that the higher the score on each item on the scale, the greater the discrimination perceived by the person surveyed.

Third, anxiety about the possible death of older adults was measured using the Mexican version of the Templer scale, validated by Rivera Ledesma.[40] This scale of 15 items scores from 1 to 4 in a Likert scale, where 1 represents "never or almost never," 2 "some of the time," 3 "most of the time," and 4 "all of the time." Thus, the minimum total score is 15 (minimum anxiety) and the maximum total score is 60 (maximum anxiety).

For the general application of all the instruments in the four Latin American countries, it was necessary to carry out a semantic adaptation of the three scales, as well as an adaptation to capture anxiety, discrimination, and post-traumatic stress in relation to this "new" phenomenon that has been evaluated during the pandemic. After the adaptation carried

out, the instruments were subjected to a pilot test on a reduced sample.

Reliability, measured in this study through the Alpha Cronbach coefficient, for the perceived discrimination scale was .95 (.871 for the obvious group discrimination sub-scale, .842 for the subtle group discrimination sub-scale, .930 for the obvious individual discrimination sub-scale, and .905 for the subtle individual discrimination sub-scale), for the SPRINT E scale was .925 and .938 for the Templer scale.

For the Multidimensional Scale of Perceived Discrimination scale, the corrected item-Total correlation in our study was between .561 and .779. For the SPRINT E scale, the corrected item-Total correlation was between .619 and .813, and for the Templer scale was between .523 and .825. The three scales were validated in their original publications showing acceptable coefficients for the construct validity.[37,39,40]

A block of preliminary questions was also added for the identification of generic variables: Sex, Age, Marital status, Educational level, Profession, Work sector, Years of work, and Type of contract.

Statistical Analysis

For the description of the variables, measures of central tendency and dispersion were applied for quantitative variables and frequency measures for categorical variables.

The frequencies of post-traumatic stress symptoms were determined according to the instructions of the SPRINT E scale, that a total of 3 or more intense responses indicate a positive screening for post-traumatic stress.

To determine the association of anxiety, perceived discrimination and other exposure factors on the post-traumatic stress variable, a logistic regression model was defined according to the following detail:

Variable Y: Screening for post-traumatic stress. Y = 0 negative screening; Y = 1 positive screening.

Regressive variables: age, perceived discrimination, anxiety about the death of older adults, availability of PPE, exposure to death of older adults and country of residence.

Results

Sample Characteristics

The final sample was made up of 1721 health professionals from Argentina (28.4%), Chile (25.6%), Colombia (20.0%), and Mexico (26.0%). 88% of the total sample was female, the mean age was 36.8 (SD = 9.1) years, and the mean work seniority was 10.3 (SD = 8.5) years.

48.1% of the sample were nurses, 7.9 were doctors, and 44% were other health professionals (physiotherapists, radiologists, biochemists, and others). The preponderant level of instruction was undergraduate (59.4%), followed by other undergraduate levels (pre-university technicians, 42.9%) and professionals with postgraduate degrees (21%). 57.6% of the professionals were permanent staff at the time of answering the survey, 29.2% were contracted, and 13.2% had other types of employment relationship (including interns).

60.4% of the professionals surveyed were not exposed to the death of COVID-19 patients at the time of answering the survey, and 38.3% stated that they did not have their Personal Protective Equipment (PPE) available every time it was necessary.

These characteristics of the sample, by country, can be seen in Table 1.

Post-Traumatic Stress, Anxiety, and Discrimination

The frequency of positive screening for symptoms of PTSD in general was 23.9%. Health professionals from Chile were the ones with the highest frequency of post-traumatic stress symptoms (29.8%), followed by Argentina (26.4%) (Table 2).

Regarding the death anxiety scores of older adults, the highest were observed in Chile (mean 39.4; SD = 10.9), followed by Colombia (mean 36.4; SD = 9.6) (Table 2). Regarding discrimination experienced by health professionals, the highest scores of the four dimensions of the scale were observed in Colombia, followed by Mexico, and also with respect to the total score of the perceived discrimination scale (Table 2).

After exploring the results at a descriptive level, a logistic regression model was defined to find the variables associated with positive screening for post-traumatic stress symptoms (measured through the SPRINT E scale). In this model, a very slight association was observed with the age variable (OR: .97; 95% CI: .96-.98) (Table 3). An association was also observed between post-traumatic stress symptoms and subtle individual discrimination (OR: 1.5; 95% CI: 1.3-1.7); In other words, the more subtle individual discrimination perceived, the greater the risk of presenting post-traumatic stress symptoms. The same association was observed in the variable "anxiety about the death of the elderly," the greater the anxiety, the greater the risk of presenting symptoms of post-traumatic stress (OR: 1.12; CI 95%: 1.10-1.14). Variables such as lack of PPE (OR: 2.1; 95% CI: 1.6-2.9) and having faced the death of older people (OR: 1.3; 95% CI: 1.0-1.7) also implied a higher risk of stress post-traumatic symptoms (Table 3). This analysis was carried out by controlling the variable "country of residence," where an association of post-traumatic stress symptoms was observed in residents of Chile, although the frequency of these symptoms is also present in all four countries, as mentioned in previous paragraphs.

Discussion

In this study, the prevalence was between 19.9% (Colombia) and 29.8% (Chile). These results are compared with the prevalence of post-traumatic stress reported in previous studies in Mexico, where they have been between 7.9% and 38%.[41,42] For its part, Chile has reported prevalence between 7% and 30%,[43] and 50% in Argentina.[43] It should be noted

Table 1. Sociodemographic Characteristics of the Surveyed Healthcare Professionals. Year 2020.

		Argentina		Chile		Colombia		Mexico		
Variables	Categories	N	%	n	%	n	%	n	%	Total (100%)
Gender	Females	418	27.5	417	27.5	319	21.0	364	24.0	1518
	Males	66	35.5	20	10.8	21	11.3	79	42.5	186
	Other	5	29.4	3	17.6	4	23.5	5	29.4	17
Profession	Physician	52	38.2	12	8.8	35	25.7	37	27.2	136
	Nurses	318	38.5	105	12.7	94	11.4	310	37.5	827
	Other	119	15.7	323	42.6	215	28.4	101	13.3	758
Level of instruction	BSc	168	16.4	125	12.2	107	10.5	622	60.9	1022
	Postgraduate	104	28.8	56	15.5	77	21.3	124	34.3	361
	Other	217	29.4	259	35.1	160	21.7	102	13.8	738
Employment relationship	Contracted	91	18.1	175	34.8	121	24.1	116	23.1	503
	Permanent staff	352	35.5	188	19.0	158	15.9	293	29.6	991
	Other	46	20.3	77	33.9	65	28.6	39	17.2	227
Faced the death of COVID-19 patients	No	384	37.0	245	23.6	217	20.9	193	18.6	1039
	Yes	70	13.0	155	28.8	90	16.7	223	41.4	538
	Not sure	35	24.3	40	27.8	37	25.7	32	22.2	144
PPE available whenever it was needed	No	161	32.9	167	38.0	120	34.9	212	47.3	660
	Yes	328	67.1	273	62.0	224	65.1	236	52.7	1061

Table 2. Frequency of Post-Traumatic Stress Symptoms and Scores of Anxiety and Discrimination by Countries. Year 2020.

Variables	Argentina	Chile	Colombia	México	*P* value
Post-traumatic screening (%)	26.4	29.8	19.9	23.8	.001
Anxiety toward death mean (SD)	31.2 (9.3)	39.4 (10.9)	36.4 (9.6)	33.8 (10.3)	.001
Blatant group discrimination DGE mean (SD)	23.2 (5.7)	22.6 (5.8)	26.6 (5.2)	24.5 (5.8)	.001
Subtle group discrimination DGS mean (SD)	11.1 (2.6)	10.8 (2.5)	12.5 (2.3)	11.6 (2.4)	.001
Blatant individual discrimination DIE mean (SD)	18.3 (6.2)	18.4 (6.3)	21.3 (6.7)	19.2 (6.4)	.001
Subtle individual discrimination DIS mean (SD)	9.7 (2.9)	9.9 (3.1)	10.9 (2.9)	9.9 (3.0)	.001
Discrimination total score mean (SD)	62.6 (15.3)	61.7 (15.8)	71.3 (15.0)	65.3 (15.3)	.001

Table 3. Odds Ratio of Variables Associated with Post-Traumatic Stress Symptoms. Year 2020.

		95% CI		
Variables	Odds Ratio	Lower	Upper	*P* value
Age	.976	.962	.989	.001
Subtle individual discrimination	1.529	1.339	1.747	.001
Anxiety toward death of the elderly	1.125	1.105	1.145	.001
Lack of PPE	2.197	1.644	2.934	.001
Faced the death of COVID-19 patients	1.341	1.006	1.788	.450
Country (ref: Argentina)				.001
Mexico	.557	.395	.786	.001
Chile	1.676	1.116	2.517	.013
Colombia	.558	.383	.813	.002

that this is the first study that reports symptoms of post-traumatic stress, using the same instrument, in these four Latin American countries. However, besides such country-specific characteristics, individual factors might play a role in determining part of the variance in the observed findings. Strong evidence describes factors such as affiliative responses to stress, trait resilience, emotion regulation capacity, and social support have been reported as significant protective factors in frontline personnel at grips with the COVID-pandemic.[44,45]

The mental health burden imposed by the COVID-19 pandemic on health workers has already been previously suggested by other authors in other regions of the world,[46-49] but in the Latin American region, it has not yet been analyzed under the concept of mental health burden, but in isolated studies of anxiety, depression, or stress. This study gives visibility to healthcare workers, a group that is especially vulnerable due to the pressure involved in caring for people with an uncertain discharge diagnosis, and allows the deployment of the necessary evidence for the generation of emergency health policies by the States which implies safeguarding the occupational health of those responsible for preventing the spread of the disease among citizens, risking their lives for it.[50]

In addition, this study has found an association of post-traumatic stress with another phenomenon that has been very frequent in several places in Latin America: discrimination against health personnel.[51,52] In this sense, other countries have proposed strategies to reduce the discrimination of the population toward healthcare workers.[53-55]

Regarding the impact of the lack of PPE on healthcare workers, this dimension has also been previously analyzed by other authors in the United States.[56,57] This shows that the availability of PPE directly impacts the mental health outcomes of healthcare workers during the pandemic.

Regarding the association between post-traumatic stress and anxiety in the face of death of older adults and direct exposure to death, it should be first noted that both Chile and Argentina stand as the oldest countries in Latin America with an old-age dependency ratio of 23.4 and 22.4, respectively.[58] However, Chile achieved one of the highest mortality rates in the world in the elderly during the first wave of the pandemic, especially in men older than 70 years,[59] which resulted in a debate about the ethical dilemma regarding the characteristics of the patient who would receive the so-called "last bed" in a health system that faced a possible total saturation of hospital beds, and where healthcare personnel would have the difficult role of assigning that bed to a patient with a good prognosis and long life expectancy over another with little chance of living,[60] as in the case of the elderly.

This could be a factor to consider when understanding the results of this study with respect to the higher frequency of post-traumatic stress and anxiety in the face of death of the elderly, presented by healthcare personnel in Chile. In addition, before this last point, it is important to note that a study carried out in Italy revealed that healthcare personnel who experienced the death of patients from COVID-19 showed higher levels of psychological suffering, especially personnel under 40 years of age who demonstrated higher levels of somatization, symptoms of depression, anxiety, and PTSD.[61]

On the other hand, despite the fact that the governments of the countries undertook to provide the necessary resources in the health sector to increase the number of hospital beds with highly complex services, increase the number of healthcare personnel, and purchase personal protection elements, among other methods, spending was uneven among Latin American countries,[62] affecting, for example, the availability of personal protection items. According to Otonín-Rodríguez and Lorca-Sánchez,[63] the lack of personal protection elements necessary to address the pandemic was experienced in all countries affected by COVID-19, which contributed to the generation of fear and insecurity in workers due to the uncertainty as to whether the material used was sufficient to prevent both the spread of the virus and its contagion.

A result of this study revealed was that one in three healthcare workers did not have personal protection elements available when their use was required, which contributed to increasing the mental health burden on workers exposed to these conditions.

Perceived discrimination has already been reported in China, constituting a self-imposed barrier by healthcare personnel in the face of fear of discrimination, in order to seek pharmacological and psychotherapeutic interventions.[64] Our results reveal that in Colombia and Mexico, perceived discrimination was higher in healthcare personnel. As the disease progressed, reports from Mexico and Colombia revealed that it manifested itself in healthcare personnel through refusal of public transportation and acts of verbal or physical violence.[65-67] Although no studies were found that delved into the characteristics of perceived discrimination in Mexico, in Colombia, Monterrosa-Castro et al[68] presented results similar to ours, establishing that two out of every five doctors reported feeling discriminated against. However, the study by Cassiani-Miranda et al[69] carried out in the general Colombian population found that this discrimination is higher in the general population in comparison to healthcare personnel.

The study has few limitations. The first is the bias due to self-selection since the survey was distributed through social networks; however, we could only conduct a web-based survey due to the physical distancing recommended by health authorities in the four countries. The second limitation is related to the sampling strategy, that implies a lack of representativeness of non-probabilistic data, and consequently lack of generalizability. The third is related to its cross-sectional design which may support association but cannot prove causation. The fourth is regarding the dynamics of the pandemic, since it passed through various stages with different effects on healthcare workers, but this cannot be studied using the cross-sectional design of the study.

Conclusion

The cOVID-19 pandemic has imposed a mental health burden on healthcare workers in the countries included in the study. This burden is attributable to the exposure to death and the institutional conditions where they work.

Health personnel significantly compromise their mental integrity, as they are the front-line workers restoring the health of those affected by this pandemic. Therefore, neglected mental health problems over time can trigger negative thoughts from staff against their own lives. Consequently, this

causes health systems to lose their highly qualified personnel in the recurrent waves caused by COVID-19 infections. This mental health burden implies that States must invest in health personnel in actions such as psychotherapeutic support for those who work in COVID-19 units, financing the compensatory rest for workers, and increasing jobs to allow a continuous replacement of those who manifest physical and mental fatigue as a result of working under pressure.

Declaration of Conflicting Interests

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Ethical Approval

The research project from which this study is derived has the approval of the Institutional Review Board 078/2020 from the Universidad Nacional de Santiago del Estero, Argentina. This research conforms to the provisions of the Declaration of Helsinki (as revised in Brazil 2013). All participants gave informed consent for the research, and their anonymity was preserved.

Data Availability

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy.

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