

## Impact of anxiety, stress, and burnout symptoms in Brazilian health professionals during the COVID-19 pandemic

Ana Paula Salvador, Alexandre Jaloto, Ana Carolina Zuanazzi, André Pereira Gonçalves, Gisele Magarotto Machado, Lucas de Francisco Carvalho

### Summary

**Aim:** The study aimed to investigate the impacts of the COVID-19 pandemic on Brazilian healthcare workers who work directly with patients diagnosed with COVID-19.

**Material and methods:** 634 individuals divided into three groups. Non-health workers ( $n = 372$ ) with a mean age of 36.6 years ( $SD = 9.14$ ) and 85.5% female; Health Workers ( $n = 94$ ) with a mean age of 37 years ( $SD = 7.97$ ) and 90% female; COVID-19 Health Workers ( $n = 168$ ) with a mean age of 36.23 years ( $SD = 7.97$ ) and 90% female. We administer the Post-Traumatic Stress Disorder Checklist – Civilian Version, the Generalized Anxiety Disorder 7, and Burnout Inventory. We conduct data collection via Google Forms.

**Results:** Health workers working in the front line in the fight against COVID-19 showed higher levels of anxiety and psychological distress when compared to health professionals who do not deal directly with COVID-19 and professionals who are not in the area of health.

**Conclusions:** Our findings suggest that health professionals who work on the front lines in the fight against COVID-19 tend to have higher levels of concern and anguish about the future, a high level of stress, mental tiredness, irritation, and fatigue. The findings indicate that these public demands psychological and psychiatric support to face the pandemic's challenges.

**pandemics, psychological symptoms, mental health**

### INTRODUCTION

In late 2019, a respiratory disease caused by viruses, named by the World Health Organization (WHO) for coronavirus disease 2019 (COVID-19)

[1,2], emerged in Wuhan province (China). COVID-19 spread quickly to other regions of China, contaminating around 83,000 people and killing 4,637,000. Contamination by COVID-19 took on enormous proportions, reaching several countries worldwide, being declared a pandemic by WHO on March 11, 2020 [1].

The five countries most affected by the disease to date are the United States, Brazil, Russia, India, and the United Kingdom. Worldwide,

---

Ana Paula Salvador, Alexandre Jaloto, Ana Carolina Zuanazzi, André Pereira Gonçalves, Gisele Magarotto Machado, Lucas de Francisco Carvalho: Universidade São Francisco, Brasil

Correspondence address: salvador.anapaula@outlook.com

about 100,946,259 people have been infected, 72,983,162 are already recovered, and 2,170,104 deaths have been confirmed [3]. In Brazil, the country in which this study was conducted, data on contamination are provided by the Ministry of Health (<https://covid.saude.gov.br/>). About 8,933,356 cases have already been confirmed, 7,798,655 recovered, 915,823 are being followed up, and 218,878 deaths.

To date, there is no specific drug treatment for COVID-19. Researchers are looking for prevention methods like the vaccine, and despite encouraging preliminary results [4] and emergency approval in several countries, most of the world's population has not yet been vaccinated. In this scenario, the Pan American Health Organization (PAHO) and WHO, suggested the following containment measures to slow the spread of COVID-19: isolation and social distance, use of masks, and constant hygiene of hands and objects [5].

Although containment measures have been shown to be effective in combating the coronavirus [6], previous studies have indicated that some of them, such as social isolation, can enhance the development of mental health-related problems [7, 8, 9, 10], drawing attention to the development of research that seeks to understand how the pandemic can impact people's mental health, in their various social contexts.

Negative mental health outcomes were observed with special attention in health professionals who work directly with people infected with COVID-19. In addition to the fear of becoming infected, these workers also deal with daily stress, the need to adapt, anxiety, fatigue, insomnia, and fear of contaminating family and friends [11, 12, 13]. This context can trigger Burnout Syndrome symptoms [14], characterized by emotional exhaustion, depersonalization, and low performance at work [15, 16].

The indications of worsening mental health of workers who are on the front lines of fighting COVID-19, when compared to professionals who do not work directly with infected patients, are confirmed by two meta-analyses, conducted by Pappa et al. [17] and by Silva and Neto [18], and a systematic review conducted by Sheraton et al. [19]. In these studies, the increase in anxiety, depression, somatic symptoms, and insomnia stands out. In another study that sought to re-

view the literature produced on the consequences of COVID-19 on the mental health of the health workers, 62.5% of the workers had general health concerns, 43.7% fear, 37.9% insomnia, 37.8% psychological distress, 34.4 % burnout, 29.0% anxiety, 26.3%, depressive symptoms, and 20.7% post-traumatic stress disorder [20].

This study aimed to investigate the impacts of the COVID-19 pandemic on Brazilian health workers who work directly with patients diagnosed with COVID-19. We hypothesized that health professionals who are on the front lines of fighting COVID-19 should have higher levels of anxiety, post-traumatic stress, and symptoms related to burnout when compared to professionals who are not working with patients diagnosed with COVID – 19 [17, 18, 19, 20].

## METHODS

### *Participants*

This is a cross-sectional study, and we conducted data collection with a community sample. The sample had 634 participants, divided into three groups. The first group was composed of people who do not work in the health field ( $n = 372$ , Non-health workers), aged between 19 and 66 years ( $M = 36.6$ ;  $SD = 9.14$ ), the majority female 85.5%, Caucasian (68.3%), residents of the southeastern region of Brazil (55.6%), married/stable union (49.7%), with complete postgraduate education (46%) and university education (36%). Finally, 26.1% reported having a psychiatric diagnosis.

Health professionals who do not work directly in treating patients with COVID-19 ( $n = 94$ , Health workers) form the second group. This group is composed of individuals aged between 23 and 59 years ( $M = 37$ ;  $SD = 7.97$ ), the majority female (90%), Caucasian (62.8%), residing in the southeastern region of the country (58.5%), single (48.9%), with complete postgraduate education (53.2%). 22.3% reported having a psychiatric diagnosis.

The third group was composed of health professionals who work to treat patients diagnosed with COVID-19 ( $n = 168$ , COVID-19 health workers). This group had individuals aged between 21 and 57 years old ( $M = 36.23$ ;  $SD = 7.57$ ), the

majority female (92.3%), Caucasian (64.9%), residing in the southeastern region of the country (53%), married / stable union (56%), with complete postgraduate education (49.4%). Finally, 35.1% reported having a psychiatric diagnosis.

## MEASURES

### *Post-Traumatic Stress Disorder Checklist – Civilian Version (PCL-C) [21].*

The PCL-C assesses Post-Traumatic Stress Disorder (PTSD) symptoms in civilian populations and consists of 17 items that correspond to DSM-5 symptoms of PTSD. Using a 5-point scale, respondents indicated how much they had been bothered by each symptom in the past month. Symptoms were keyed to a traumatic stressor. This test showed good psychometric properties [22]. The internal consistency reliability was  $\alpha = .95$  in our study.

### **Generalized Anxiety Disorder 7 (GAD-7) [23]**

The GAD-7 was designed for use in primary care patients. The GAD-7 consists of a self-report questionnaire that identifies generalized anxiety disorder symptoms. Subjects are asked if they were bothered by anxiety-related problems over the past two weeks by answering seven items on a 4-point scale. The GAD-7 showed good psychometric indicators in the previous studies [24, 25]. The internal consistency reliability was  $\alpha = .91$  in our study.

### **Burnout Inventory – CESQT [26]**

The CESQT assesses the level of burnout in workers in different types of work. Twenty items in four factors structure compose it: Enthusiasm toward the job, Psychological Exhaustion, Indolence, Guilt. The response key is a five-point Likert scale ranging from 0 “never” to 4 “very often”. The internal consistency reliability was .88 in our study.

## PROCEDURE

This study’s procedures complied with the Declaration of Helsinki provisions regarding research on Human participants [27]. All participants signed an informed consent form before participating. Data collection was performed online via Google Forms. We shared the research link on the social media website Facebook and via WhatsApp, inviting individuals to participate and engaging on the snowball strategy to reach a more substantial number of participants.

## DATA ANALYSIS

We separated the sample into three groups, Non-health workers, Health workers and, COVID-19 health workers. We compared the scores obtained by each group in the mental health indicators using ANCOVA with post hoc (Bonferroni), controlling the effect of the variable “psychiatric diagnosis” (answer key: yes or no). This variable was controlled to decrease the impact of psychiatric symptoms previously existing in the groups. To perform ANCOVA, we investigated two assumptions: a) the effect of the group variable on the covariate should not be statistically significant, and b) the regression parameters should be homogeneous, and the p-value should not be significant [28]. We considered the p-value as significant when  $p < .05$ , and the partial eta squared was used as the effect size indicator. The partial eta squared was interpreted as 0.01 (small), 0.09 (medium) and 0.25 (large) [29]. Subsequently, we inserted the variables with a significant difference in a multiple linear regression model. The mental health indicators were the independent variables, and the group was the dependent variable. Also, in the regression analysis, we controlled the “psychiatric diagnosis” variable.

## RESULTS

We tested two assumptions for using ANCOVA: a) the effect of the group variable on the psychiatric diagnosis covariate was not significant ( $p = .60$ ); and b) the homogeneity of the regression parameters was verified through the effects of the interaction between the group and the diagnosis, with values ranging between .22 and

.69. The findings indicate that the assumptions for conducting ANCOVA have been met.

ANCOVA's findings indicated that the three groups of workers showed significant differences in all mental health measures: post-traumatic stress [F (1,630) = 43.84; p <.01]; anxiety [F (1,630) = 18,832; p <.01]; psychological exhaustion [F (1,630) = 10.54; p <.01]; indolence [F (1,630) = 10.08; p <.01]; guilt [F (1,630) = 5.38; p <.05]; and burnout [F (1,630) = 13.63; p <.01]. In addition, the results indicated that the covariable psychiatric diagnosis is significant in the relationship between the working groups and the

scores in mental health measures, since after controlling for the effect of this variable, the groups ceased to present statistically significant differences in post-traumatic stress [F (2,630) = 2.03; p = .13] and guilt [F (2,630) = 1.35; p = .26]. As regards anxiety [F (2,630) = 09.07; p <.01], enthusiasm toward the job [F (2,630) = 3.49; p <.05], psychological exhaustion [F (2,630) = 13.40; p <.01], indolence [F (2,630) = 4.86; p <.01], and burnout [F (2,630) = 4.86; p <.01], the differences remained even with control of the psychiatric diagnosis variable. Table 1 shows the results of the post hoc analysis.

**Table 1.** ANCOVA's Post Hoc analysis on mental health variables.

Measure	Group	M (SD)	95% Confidence Interval		Partial Eta Squared
			Lower Bound	Upper Bound	
Anxiety	Non-health workers	2.57 (.81)	2.49	2.65	.03*
	Health workers	2.51 (.79)	2.36	2.68	
	COVID-19 health workers	2.87 (.81)	2.74	2.98	
Enthusiasm toward the job	Non-health workers	2.68 (.87)	2.60	2.77	.01*
	Health workers	2.94 (.83)	2.77	3.12	
	COVID-19 health workers	2.77 (.86)	2.64	2.91	
Psychological exhaustion	Non-health workers	2.56 (.95)	2.46	2.65	.04*
	Health workers	2.31 (.92)	2.13	2.50	
	COVID-19 health workers	2.89 (.84)	2.75	3.03	
Indolence	Non-health workers	2.00 (.73)	1.92	2.07	.01*
	Health workers	1.74 (.64)	1.60	1.89	
	COVID-19 health workers	1.98 (.68)	1.87	2.08	
Burnout	Non-health workers	2.11 (.58)	2.06	2.17	.02*
	Health workers	1.92 (.52)	1.80	2.03	
	COVID-19 health workers	2.18 (.52)	2.09	2.26	

*Note:* \* = small partial eta squared. Non-health workers = professionals who do not work in the health field; Health workers = health professionals who do not work with patients diagnosed with COVID-19; COVID-19 health workers = health professionals who work with patients diagnosed with COVID-19. We test models by controlling sex, education, and age. The results indicated that they do not contribute to the explanation of the dependent variable.

The health workers group presented a lower mean in the indolence factor and lower levels of burnout compared to the other groups. The COVID-19 health workers group showed higher levels of anxiety and psychological exhaustion than the other groups.

The mental health variables able to separate the groups were inserted into a regression model to verify whether these variables in interaction predict the group variable. Table 2 presents the results.

**Table 2.** Multiple linear regression with mental health variables as predictors of groups of workers.

Model		B	Std. Error	Beta	t	p	R <sup>2</sup> Adjusted
1	(Constant)	1.06	.41		2.59	.01	.04
	<b>Anxiety</b>	<b>.12</b>	<b>.05</b>	<b>.12</b>	<b>2.33</b>	<b>.02</b>	
	Enthusiasm toward the job	.12	.07	.12	1.86	.06	
	Psychological exhaustion	.11	.07	.12	1.51	.13	
	Indolence	-.20	.11	-.16	-1.73	.06	
	Burnout	.14	.23	.09	.60	.55	
	Psychiatric diagnostic	-.02	.01	-.01	-.23	.81	

Note: Significant weights are presented in bold. We test models by controlling sex, education, and age. The results indicated that they do not contribute to the explanation of the dependent variable

The dependent variables were able to predict 4% of the variance of the independent variable. When in interaction, only anxiety showed a significant single contribution to predict the group variable.

## DISCUSSION

This study aimed to investigate the impacts of the COVID-19 pandemic on Brazilian health-care workers. Our hypotheses have been partially corroborated. Health care workers working on the front lines to combat COVID-19 showed higher levels of anxiety and psychological distress, one of the components of burnout. However, the overall score for burnout and post-traumatic stress did not indicate statistically significant differences.

The anxiety level was the mental health indicator that most differentiated the groups, with the highest average being obtained by the COVID-19 health workers group. Besides, anxiety was the only indicator that made a significant contribution to identifying groups within the regression model. Anxiety refers to feelings of fear in the face of situations or events and exaggerated concern about future events [30]. In previous studies, anxiety symptoms are among the most frequent symptoms among health professionals in the COVID-19 pandemic period [12, 31]. The high levels of anxiety found in our sample, for the COVID-19 health workers group, were also found in investigations in Spain [11], China [13], and Iran [32], in addition to being observed in systematic reviews [17, 18, 19, 20].

Ornell et al. [14] indicated that the COVID-19 pandemic could lead health workers to emotional exhaustion, a distinctive burnout symptom. In our sample, professionals working directly with COVID-19 presented higher means of Psychological exhaustion, which can reach the emotional and physical exhaustion generated by the work environment, typical of the burnout syndrome [26]. Similar results were observed in the literature [14, 20].

Our findings indicate that health professionals who are at the forefront of combating COVID-19 tend to have higher levels of concern and anguish about the future, in addition to higher levels of stress, mental tiredness, irritation, and fatigue compared to professionals health professionals not directly dealing with COVID-19 and with people not working in the health field. These findings indicate that dealing directly with COVID-19 patients demand psychological and psychiatric support to face the pandemic's challenges.

Some limitations must be considered in interpreting the results of our study. Although the sample is large, it is mostly female and from Brazil's southeastern region, restricting the generalization of our findings. Considering the methodological design, a cross-sectional study does not allow monitoring whether the levels of post-traumatic stress, anxiety, and burnout are being affected throughout the COVID-19 pandemic. It has not been verified whether workers in other areas are dealing directly with people with COVID-19. We suggest that future studies seek to expand the sample and follow it up through a longitudinal study to verify whether there is a gradual increase in anxiety and burnout levels.

We also suggest that future studies look at what factors may be protective for mental health and assist in tackling the pandemic.

## REFERENCES

1. WHO. (2020, January, 27). Timeline: WHO's COVID19 response. Recuperado 26 de setembro de 2020, de Www.who.int website: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline#!>
2. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, Ho RC. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International journal of environmental research and public health*. 2020 Jan;17(5):1729.
3. Worldometer (2020). Coronavirus. <https://www.worldometers.info/coronavirus/> (accessed January, 27 2020).
4. CNS, Conselho Nacional de Saúde (2020). Vacinas contra a Covid-19: comissão do CNS aprova novo estudo. Recuperado de <http://conselho.saude.gov.br/ultimas-noticias-cns/1289-vacinas-contra-a-covid-19-comissao-do-cns-analisa-dois-novos-estudos>
5. WHO, World Health Organization. (2020b). Folha informativa – COVID-19 (doença causada pelo novo coronavírus). Recuperado de [https://www.paho.org/bra/index.php?option=com\\_content&view=article&id=6101:covid19&Itemid=875](https://www.paho.org/bra/index.php?option=com_content&view=article&id=6101:covid19&Itemid=875)
6. Schuchmann AZ, Schnorrenberger BL, Chiquetti ME, Gaiki RS, Raimann BW, Maeyama MA. Isolamento social vertical X Isolamento social horizontal: os dilemas sanitários e sociais no enfrentamento da pandemia de COVID-19. *Brazilian Journal of Health Review*. 2020 Apr 24;3(2):3556-76.
7. Gonçalves AP, Zuanazzi AC, Salvador AP, Jaloto A, Pianowski G, Carvalho LD. Preliminary findings on the associations between mental health indicators and social isolation during the COVID-19 pandemic. *Archives of Psychiatry and Psychotherapy*. 2020 Jun 1;22(2):10-9.
8. Sandin B, Valiente RM, García-Escalera J, Chorot P. Impacto psicológico de la pandemia de COVID-19: Efectos negativos y positivos en población española asociados al periodo de confinamiento nacional. *Revista de Psicopatología y Psicología Clínica*. 2020 Apr 1;25(1).
9. Schmidt B, Crepaldi MA, Bolze SD, Neiva-Silva L, Demelech LM. Impactos na Saúde Mental e Intervenções Psicológicas Diante da Pandemia do Novo Coronavírus (COVID-19).
10. Xiong J, Lipsitz O, Nasri F, Lui LM, Gill H, Phan L, Chen-Li D, Iacobucci M, Ho R, Majeed A, McIntyre RS. Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of affective disorders*. 2020 Aug 8.
11. Santamaría MD, Ozamiz-Etxebarria N, Rodríguez IR, Alboniga-Mayor JJ, Gorrotxategi MP. Impacto psicológico de la COVID-19 en una muestra de profesionales sanitarios españoles. *Revista de Psiquiatría y Salud Mental*. 2020 Jun 2.
12. Huang JZ, Han MF, Luo TD, Ren AK, Zhou XP. Mental health survey of 230 medical staff in a tertiary infectious disease hospital for COVID-19. *Zhonghua lao dong wei sheng zhi ye bing za zhi= Zhonghua laodong weisheng zhiyebing zazhi= Chinese journal of industrial hygiene and occupational diseases*. 2020 Mar 4;38:E001-.
13. Zhang C, Yang L, Liu S, Ma S, Wang Y, Cai Z, Du H, Li R, Kang L, Su M, Zhang J. Survey of insomnia and related social psychological factors among medical staff involved in the 2019 novel coronavirus disease outbreak. *Frontiers in psychiatry*. 2020 Apr 14;11:306.
14. Ornell F, Halpern SC, Kessler FH, Narvaez JC. The impact of the COVID-19 pandemic on the mental health of health-care professionals. *Cadernos de saude publica*. 2020 Apr 30;36:e00063520.
15. Carlotto MS, Câmara SG. Análise da produção científica sobre a Síndrome de Burnout no Brasil. *Psico*. 2008 Aug 29;39(2).
16. Maslach, C, Schaufeli, WB, & Leiter, MP. Job burnout. *Annual review of psychology* 2001; 52(1), 397-422.
17. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsis E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain, behavior, and immunity*. 2020 May 8.
18. da Silva FC, Neto ML. Psychological effects caused by the COVID-19 pandemic in health professionals: a systematic review with meta-analysis. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*. 2020 Aug 6:110062.
19. Sheraton M, Deo N, Dutt T, Surani S, Hall-Flavin D, Kashyap R. Psychological effects of the COVID 19 pandemic on healthcare workers globally: A systematic review. *Psychiatry research*. 2020 Oct 1;292:113360.
20. de Pablo GS, Serrano JV, Catalan A, Arango C, Moreno C, Ferre F, Shin JI, Sullivan S, Brondino N, Solmi M, Fusar-Poli P. Impact of coronavirus syndromes on physical and mental health of health care workers: Systematic review and meta-analysis. *Journal of affective disorders*. 2020 Jun 25.
21. Weathers FW, Huska JA, Keane TM. The PTSD Checklist-Civilian Version (PCL-C). Available from FW Weathers. National Center for PTSD, Boston Veterans Affairs Medical Center. 1991;150:02130.
22. Weathers FW. The PTSD Checklist: Reliability, validity and diagnostic utility. In Presented at the Annual Meeting of the International Society for Traumatic Stress Studies. San Antonio, TX, October, 1993.

23. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*. 2006 May 22;166(10):1092-7.
24. Löwe B, Decker O, Müller S, Brähler E, Schellberg D, Herzog W, Herzberg PY. Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. *Medical care*. 2008 Mar 1:266-74.
25. Moreno AL, DeSousa DA, Souza AM, Manfro GG, Salum GA, Koller SH, Osório FD, Crippa JA. Factor structure, reliability, and item parameters of the Brazilian-Portuguese version of the GAD-7 questionnaire. *Temas em Psicologia*. 2016 Mar;24(1):367-76.
26. Gil-Monte PR, Carlotto MS, Câmara SG. Validação da versão brasileira do "Cuestionario para la Evaluación del Síndrome de Quemarse por el Trabajo" em professores. *Revista de Saúde Pública*. 2010 Feb;44(1):140-7.
27. World Medical Association. World Medical Association Declaration of Helsinki. Ethical principles for medical research involving human subjects. *Bulletin of the World Health Organization*. 2001;79(4):373.
28. Wang B, Ogburn E, Rosenblum M. Analysis of Covariance (ANCOVA) in Randomized Trials: More Precision, Less Conditional Bias, and Valid Confidence Intervals, Without Model Assumptions.
29. Cohen J, Miles J, Shevlin M. *Applying regression and correlation: a guide for students and researchers*. London: Sage; 2001.
30. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub; 2013 May 22.
31. Prado AD, Peixoto BC, da Silva AM, Scalia LA. A saúde mental dos profissionais de saúde frente à pandemia do COVID-19: uma revisão integrativa. *Revista Eletrônica Aervo Saúde*. 2020 Jun 26(46):e4128-.
32. Taghizadeh F, Hassannia L, Moosazadeh M, Zarghami M, Taghizadeh H, Dooki AF, Navaei RA, Hedayatizadeh-Omran A. Anxiety and Depression in Health Workers and General Population During COVID-19 Epidemic in IRAN: A Web-Based Cross-Sectional Study. *medRxiv*. 2020 Jan 1.