

Covid-19 in Brazil: Stress as a Predictor of Depression

COVID-19 no Brasil: Estresse como Preditor da Depressão

Covid-19 en Brasil: El Estrés como Predictor de Depresión

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Revista de Psicologia da IMED, Passo Fundo, v. 15, n. 1, p. 1-12, janeiro-junho, 2023 - ISSN 2175-5027

[Submetido: jan. 11, 2021 ; Revisão1: fev. 23, 2021 Revisão2: dez. 12, 2022; Aceito: ; Publicado: ago. 7, 2023]

DOI: <https://doi.org/10.18256/2175-5027.2023.v15i1.4441>

Sistema de Avaliação: *Double Blind Review*

Editora: Márcia Fortes Wagner

Como citar este artigo / To cite this article: [clique aqui!/click here!](#)

Abstract

Studies on mental health have shown that the levels of stress and depression of people around the world have been increasing during the COVID-19 pandemic. In Brazil, even with such indicators, it is still unclear how these psychological factors may be related in individual's well-being. To fill this gap, I sought to analyze the levels of stress and depression of Brazilians, as well as to establish a predictive model between its constructs. Participants were 480 adults from different regions of Brazil, aged between 18 and 65 years ($M_{age} = 28.05$, $SD = 8.04$), mostly female (77.3%). Results showed that stress and depression levels of the participants were moderate. In addition, I find that the stress against COVID-19 was a good predictor of depression, the more people felt stressed about the topic, the more likely they were to have depressive symptoms. Therefore, I discussed these results arguing about the importance of maintaining the mental health of the population.

Keywords: stress, depression, prediction.

Resumo

Os estudos sobre saúde mental têm demonstrado que os níveis de estresse e de depressão das pessoas ao redor do mundo vem aumentando durante a pandemia da COVID-19. No Brasil, mesmo com tais indicadores, ainda não está claro como esses fatores psicológicos podem estar relacionados. Para preencher essa lacuna, buscou-se analisar os níveis de estresse e depressão dos brasileiros, bem como visou estabelecer um modelo preditivo entre os construtos. Participaram 480 pessoas adultas de diferentes regiões do Brasil, com idades entre 18 e 65 anos ($M_{idade} = 28,05$; $DP = 8,04$), sendo a maioria do sexo feminino (77,3%). Os níveis de estresse e depressão dos participantes foram moderados. Além disso, o estresse frente à COVID-19 apresentou-se como um bom preditor da depressão, de modo que quanto mais as pessoas se sentiram estressadas diante do tema, maior era a probabilidade de apresentarem sintomas depressivos. Diante disso, discute-se sobre a importância da manutenção da saúde mental da população.

Palavras-chave: estresse, depressão, predição.

Resumen

Los estudios sobre salud mental han demostrado que los niveles de estrés y depresión de las personas en todo el mundo han aumentado durante la pandemia de COVID-19. En Brasil, incluso con tales indicadores, aún no está claro cómo estos factores psicológicos pueden estar relacionados con el bienestar de las personas. Para llenar este vacío, busqué analizar los niveles de estrés y depresión de los brasileños, así como establecer un modelo predictivo entre sus constructos. Los participantes fueron 480 adultos de diferentes regiones de Brasil, con edades entre 18 y 65 años ($M_{age} = 28.05$, $SD = 8.04$), en su mayoría mujeres (77.3%). Los resultados mostraron que los niveles de estrés y depresión de los participantes fueron moderados. Además, encuentro que el estrés contra COVID-19 fue un buen predictor de depresión, mientras más personas se sentían estresadas por el tema, más probabilidades tenían de tener síntomas depresivos. Por ello, discutí estos resultados argumentando sobre la importancia de mantener la salud mental de la población.

Palabras llave: estrés, depresión, predicción.

Covid-19 in Brazil: Stress as a Predictor of Depression

COVID-19 (*Coronavirus Disease 2019*) is a disease caused by the SARS-CoV-2 virus, better known as the new Coronavirus (Amawi, Abu Deiab, Aljabali, Dua, & Tambuwala, 2020) and manifests itself as a severe acute respiratory syndrome (Zheng, 2020), being first reported in Wuhan City, China, in late 2019 (Casella, Rajnik, Cuomo, Dulebohn, & Di Napoli, 2020). Given its rapid worldwide proliferation and the increase in the number of critically patients, in just three months the World Health Organization declared a COVID-19 pandemic state (WHO, 2020a), directing international attention to this problem. With this announcement, in an attempt to avoid the overload of health systems, numerous strategies of community containment of the transmission of the new virus (Kissler, Tedijanto, Goldstein, Grad, & Lipsitch, 2020) were implemented by rulers of different countries (Wilder-Smith & Freedman, 2020).

In Brazil, even with some controversies, the main measure carried out in this way was the horizontal social isolation (Werneck & Carvalho, 2020), a strategy that advocated the restriction of social activities in public spaces to the detriment of people staying in their homes, regardless of age or participation in risk groups (WHO, 2020b). However, the country experienced one of the greatest health crises in its history, motivated mainly by political issues, exemplified by the lack of organization in the management of the Ministry of Health (Nunes, 2020). Given these facts, the uncertainty about how the disease would be controlled and the unpredictability of the duration of social isolation caused the debate about the risk factors to mental health of the Brazilian population to be increasingly disseminated in the media.

In this direction, recent studies have demonstrated how the COVID-19 pandemic can negatively impact the mental health of the population (Huang & Zhao, 2020). The main results report that, in the time of this crisis, people's levels of psychological well-being have decreased due to increased stress and depressive symptoms (Li, Wang, Xue, Zhao, & Zhu, 2020). In addition, a study conducted with Portuguese students showed that, compared to the period before the COVID-19 pandemic, young people had higher rates of stress and depression (Maia & Dias, 2020). Aligned with these results, the Secretary of the United Nations, António Guterres, drew attention to the need to care for psychological aspects in this time, given that in the face of deprivation of common life, face-to-face interaction, lack of contact with family and friends, people could present greater vulnerability to psychological suffering than in periods of normality (Guterres, 2020).

To try to cushion this problem, different psychologists around the world have been united in favor of the creation of strategies to maintain the mental health of the population. Orrù, Ciacchini, Gemignani and Conversano (2020), for example, explained about which tools and interventions have been prioritized in clinical interventions during the COVID-19 pandemic in some countries (e.g., online therapy,

psychoeducation). In symmetry, a group of Brazilian researchers systematized a series of knowledge about the greatest international public health emergency, as the authors call it, in addition to discussing the role of Psychology in this time, such as the provision of services to reduce the negative impacts of quarantine and vulnerabilities in the life of the population (Schmidt, Crepaldi, Bolze, Neiva-Silva, & Demenech, 2020). However, even in view of the social relevance of this debate, there are few studies published in Brazil that portray the psychosocial consequences of COVID-19 on the living and mental health conditions of our local population (e.g., Silva, Brito, & Pereira, 2021).

At the moment of this writing, even with the mentioned international indicators, no national study had answered about the impacts of COVID-19 on the stress and depression levels of Brazilian adults. Thus, it is not clear how these psychological symptoms may be related in explaining the negative consequences of this pandemic period for people in Brazil. To fill this gap, in the present study I sought to analyze the stress and depression levels of an adult sample of the general Brazilian population. In addition, I sought to verify the predictive power of stress on depressive symptomatology (Morris, Rao, & Garber, 2012; Young & Dietrich, 2015).

Methods

Participants

The sample used in this study was of the convenience type, composed of 480 adult people from the general Brazilian population. Major participants were female (77.3%), young ($M = 28.05$, $SD = 8.04$), aged between 18 and 65 years, mostly single marital status (75.4%) and self-declared heterosexuals (71.5%).

Instruments

Sociodemographic questionnaire. In this questionnaire, there were questions about the individual characteristics of each participant (e.g., age, gender, sexual orientation and marital status).

Reduced version of the stress, anxiety and depression scale (DASS-21). Participants answered the Brazilian-adapted version of DASS-21 (Vignola & Tucci, 2014). This instrument was constructed by Lovibond and Lovibond (1995) with the objective of evaluating the indicators of stress, anxiety and depression in adults. Given the research problem of this study, I just applied the 14 items related to stress (e.g., “I had difficulties in calming down”; $\alpha = .88$) and depression (e.g., “I had no positive feeling”; $\alpha = .90$), measured on a four-point Likert scale, ranging from 0 (not applied to me) to 3 (applied a lot to me). Elevated scores indicated elevated levels of stress and depression symptomatology.

Procedures

Ethics statements. I submitted the study to *Plataforma Brasil* for ethical appreciation and only after the favorable report for the execution of the research (CAAE n. 32062620.9.0000.5188), evaluated by an Ethics Committee of a public university in the Northeast, I began the data collection.

I asked the participants their digital signature by the Informed Consent Form (ICF), which contained information about the objectives of the research, the guarantee of the confidentiality of the information and the anonymity of their identities. Furthermore, in that document questions were clarified about the willingness to participate, the release of the provision of the requested information, and the possibility of withdrawal at any time, without any penalty. In the study, I considered only the answers of individuals older than 18 years of age who agreed to participate.

Data collection. The collection took place in mid-May 2020, so online, by *Google Forms* platform. I invited the participants through posts on social medias such as Instagram, Facebook and WhatsApp. In the posts, I shared a link to the survey. In the first page of the survey there was the information about the objectives of the study, the ethical guidelines followed and the FICF. The system presented the second page just if they agreed to participate in the study. In the next page, they were first asked to think about how they felt about the COVID-19 pandemic in the last two weeks, and then respond to the items about stress and depression, so that if the sentences contemplated how they had felt in recent times in the face of the theme, they would answer “applied a lot to me” on the scale (measured by point 3). At the end of the form they were invited to answer the sociodemographic questionnaire. The participation took about 10 minutes to fill the survey.

Data analysis. I used IBM SPSS (*Statistical Package for the Social Sciences*, version 24.0) for data analysis. In this software, I calculated descriptive statistics (e.g., frequency, mean, error measurement), in addition to inferential, such as correlation (Pearson's r), Student's T test for independent samples and multivariate variance analysis (MANOVA), to analyze the differences between means, and linear regression analysis (*enter method*) to verify the influence of stress against COVID-19 on participants' depressive symptomatology levels, establishing as associative statistical power $p < .05$.

Results

Table 1 shows the means scores of the participants for each item of stress (items 1 to 7) and depression (items 8 to 14) of the DASS-21 scale (Vignola & Tucci, 2014).

Table 1.*In the last two weeks, how have you felt thinking about the COVID-19 pandemic?*

Items	M	SD	Skew	Kurt
Stress				
1. I found it difficult to calm myself.	1.60	1.00	-.08	-1.08
2. I intended to exaggerate when I reacted to situations.	1.15	1.14	.47	-1.21
3. I felt I was always nervous.	1.55	1.12	-.06	-1.38
4. I felt restless.	2.00	1.02	-.58	-.88
5. I found it difficult to relax.	2.00	1.00	-.58	-.83
6. I was intolerant of the things that kept me from continuing to do what I had been doing.	1.43	1.04	.13	-1.16
7. I felt like I was being a little too emotional/sensitive.	1.93	1.11	-.54	-1.14
Depression				
8. I didn't experience any positive feelings.	1.17	1.07	.45	-1.06
9. It was hard for me to have the initiative to do things.	1.75	1.10	-.29	-1.26
10. I felt I had no desire for anything.	1.90	1.12	-.49	-1.20
11. I felt depressed and had no motivation.	1.95	1.06	-.54	-1.05
12. I didn't feel enthusiastic about anything.	1.43	1.13	.11	-1.38
13. I felt like I was worthless as a person.	1.35	1.25	.18	-1.61
14. I felt there was no meaning to life.	1.29	1.23	.27	-1.54

Note. M = Mean (minimum 0 and maximum 3); SD = Standard Deviation; Skew = Skewness; Kurt = Kurtosis.

To analyze the results, it was necessary to take into account that the means of the participants could vary between 0 (minimum) and 3 (maximum). Results showed that participant's stress level was 1.15 (item 2) to 2.0 (items 4 and 5); for the depression dimension, the variation was between 1.17 (item 8) and 1.90 (item 10). Thus, it was verified that, in general, the mean stress of the sample was 1.68 ($SD = .81$) and depression equal to 1.55 ($SD = .90$).

After this stage, I performed the inferential analyses. At first, I observed whether the sociodemographic variables would be related to the measures of stress and depression. The results of the MANOVA showed no significant relationship between the variables criteria and the marital status of the participants [$F(10,948) = 1.65, p = .86$]. Otherwise, the main effect of sexual orientation was significant [$F(6,952) = 3.34, p = .001, \eta^2 = .21$]. When I observed the individual ANOVAS, different of stress [$F(3,476) = 1.99, p = .11$], I found that only depression [$F(3,476) = 5.73, p < .001, \eta^2 = .03$]

was associated to sexual orientation. Multiple comparisons showed that bisexual participants ($M = 1.86$, $SD = .86$) presented higher levels of depression when compared with heterosexuals ($M = 1.44$, $SD = .90$), and this difference was statistically significant ($b = .42$, $SE = .11$, $p = .002$, $d = .46$). The effect of gender on depression [$t(478) = 1.59$, $p = .11$] was not significant. In contrast, the effect of gender on stress was significant [$t(478) = 3.72$, $p < .001$, $d = .40$]. Women ($M = 1.76$, $SD = .78$) presented higher levels of stress with COVID-19 than men ($M = 1.43$, $SD = .86$).

Finally, I verified the association between stress with COVID-19 and depression symptomatology. Results showed a positive, strong and significant association between the variables ($r = .77$, $p < .01$). To verify the predictive power between the constructs, I established a simple linear regression model, presenting stress as predictor and depression as criterion variable, given the theoretical justification (Morris, Rao, & Garber, 2012; Young & Dietrich, 2015). The analysis showed that, in fact, stress with COVID-19 was a good predictor of depression [$\beta = .86$, $p < .001$ (95% CI = .80-.92)]. It is, the higher stress scores related to COVID-19, greater the probability of individuals presenting high levels of depressive symptomatology.

Discussion

The results of this research are in line with different studies that have demonstrated how the pandemic period, as well as the outcomes of COVID-19 (i.e., social isolation, health and socioeconomic deficits), can be harmful to the mental health of the population, reverberating directly in the stress levels and vulnerability to depression (Wang et al., 2020). In Brazil, one of the possible explanations for this result is due to social factors, such as the exacerbated consumption of news (true and fake news) about the pandemic by the population (Oliveira, Duarte, France, & Garcia, 2020); political, such as the lack of a coherent national health policy to contain the local epidemic and the increase in population unemployment (Werneck & Carvalho, 2020); and epidemiological, such as fear in the face of a daily increase in the number of deaths and infections around the country.

Another point that deserves to be highlighted is the negative association of depression and stress for LGBTQIA+ people (especially bisexuals individuals) and women, respectively. Recent studies have shown that during the social isolation period, these groups are in greater contact with stressful situations (UN Women, 2020), such as contact with the family by bisexuals who are not accepted at home (Lopez, 2020) and the increase of domestic workload in relation to women (Aiello-Vaisberg, Gallo-Belluzzo, & Visintin, 2020). Still, some studies have shown that during the pandemic the cases of domestic violence has increased around the world (Marques, Moraes, Hasselmann, Deslandes, Reichnheim, 2020; Maranhão, 2020). In addition, in Brazil,

women occupy the main health positions, and they are at the forefront of the fight against SARS-CoV-2. I argue that these conditions may have influenced the results found here. So that, given the context of vulnerability, women tended to present higher levels of with COVID-19 theme than men.

In particular, this study contributes to the theoretical scope of research on stress and depression, demonstrating that in atypical situations, such as the pandemic of the new Coronavirus, the most stressed people may be more likely to develop depressive symptoms. In this direction, some lines of psychological research suggest that the stressors found during life (e.g., personal development, family, frustrations) may be responsible for associations between stress and depression (Mello et al., 2007). However, the set of results advance in this debate by empirically demonstrate how stress and depression are associated in the Brazilian reality during the COVID-19 pandemic.

However, given the conditions of the measure used, in this study I do not verified whether the stress related to COVID-19 was a chronic condition (i.e., stress as a personal predisposition) or whether the mere fact of presenting acute stress states could lead to the presentation of depressive symptoms, which is the main limitation of the study. Moreover, even with the quality of the study and the social and theoretical relevance, it is not possible to affirm, with conviction, that stress is the only predictor of depression, considering that in the time of the COVID-19 pandemic different factors may contribute to the psychological suffering of the population, such as socioeconomic difficulties, proximity to infected people and association with another psychological dimensions, such as anxiety and mortality salience, variables that were not investigated in this study.

Even with these limitations, this study shows the importance of safeguarding the population about the impacts of the COVID-19 pandemic on the mental health of Brazilians, demonstrating its importance for the current sanitary and social reality experienced in Brazil. This time, it is extremely important that in future investigations the use of specific measures for the evaluation of psychological demands in the face of the consequences of the pandemic period (i.e., instruments validated based on the characteristics of the state of crisis) are prioritized. Finally, I expect that this study will contribute to the formation of new strategies to rescue the mental health of the Brazilian population, either by social and political instances, given this relevant, multifaceted and emerging problem in the global context that is the new Coronavirus.

Final Considerations

In this study, I observed the stress and depression levels of an adult sample of the general Brazilian population in times of pandemic due to COVID-19. In addition, I analyzed the predictive power among the variables, as well as the association of those

with the sociodemographic characteristics of the participants. Overall, the results demonstrate the negative impacts of COVID-19 on the mental health of the population. Specifically, I verified that bisexual participants had significantly higher levels of depression than heterosexuals. Similarly, women had stress levels related to COVID-19 higher than men. Moreover, I found that stress with COVID-19 pandemic is a predictor of depressive symptoms.

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