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Trends

### **Mental health, functioning and quality of life between work in the office and work from home employees during first wave of COVID19 in Brazil**

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## **Mental health, functioning and quality of life between work in the office and work from home employees during first wave of COVID19 in Brazil.**

Mental health in workers in the COVID 19 pandemic

Silvia Dubou Serafim, Jéferson Ferraz Goularte, Giovana Dalpiaz, Marco Antonio Caldieraro, Adriane Ribeiro Rosa

Corresponding author: Dra Adriane Ribeiro Rosa.  
Federal University of Rio Grande do Sul  
Laboratory of Molecular Psychiatry  
Ramiro Barcelos, 2350; 90410-004  
Porto Alegre, RS, Brazil  
E-mail: [adrianerrosa@gmail.com](mailto:adrianerrosa@gmail.com)

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## **Mental health, functioning and quality of life between work in the office and work from home employees during first wave of COVID19 in Brazil.**

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Silvia Dubou Serafim<sup>1-3</sup>, Jéferson Ferraz Goularte<sup>1-3</sup>, Giovana Dalpiaz<sup>1</sup>, Marco Antonio Caldieraro<sup>1-3</sup>, Adriane Ribeiro Rosa<sup>1-2-3-4\*</sup>

<sup>1</sup>Laboratory of Molecular Psychiatry, Hospital de Clínicas de Porto Alegre (HCPA), Rua Ramiro Barcelos, 2350, Porto Alegre, RS, Brazil;

<sup>2</sup>Department of Pharmacology, Federal University of Rio Grande do Sul (UFRGS), Rua Sarmiento Leite, 500, Porto Alegre, RS, Brazil;

<sup>3</sup>Postgraduate Program in Psychiatry and Behavioral Sciences, Federal University of Rio Grande do Sul (UFRGS), Rua Ramiro Barcelos, 2400, Porto Alegre, RS, Brazil;

<sup>4</sup>Postgraduate Program in Pharmacology and Therapeutics, Federal University of Rio Grande do Sul (UFRGS), Rua Sarmiento Leite, 500, Porto Alegre, RS, Brazil.

### **Abstract**

**Background:** COVID-19 was declared a global pandemic early in 2020, period that governments imposed strict measures of social distancing to slow its transmission. However, most essential services remained open, and the work in the office faced a higher risk of infection compared to work in home. We compare the occurrence and potential determinants of mental health outcomes, functioning and quality of life in a sample of Brazilian individuals who worked from home and those who worked in the office during the first wave of COVID-19.

**Methods:** Data were collected during the first wave of COVID-19, using an online survey to assess sociodemographic and clinical variables, functioning (FAST-D), quality of life (EUROhisQOL), depression (PROMIS depression), anxiety (PROMIS anxiety), and stress symptoms (IES-R scale) in a huge sample consisted of individuals who worked in office (n=1685) and worked from home (n=1338).

**Results:** Analysis revealed that depressive and post-traumatic stress symptoms were less prevalent in individuals who worked from home as well as they have higher functioning and quality of life than those worked in the office. Individuals who worked in the office were younger, more likely to be female, had lower household income level, low education levels and were more unmarried than the other group.

**Conclusion:** Our findings support the notion of the negative impact of the COVID-19 pandemic on mental health in both work in the office and work from home; however, the group who worked from home seems to be more resilient with less psychiatric symptoms and better functioning.

**Keywords:** COVID-19; Depression; Anxiety; Post-Traumatic Stress Disorder; Functioning; Quality of life; work from home; work in office.

## 1 Introduction

In December 2019, the coronavirus disease (COVID-19) was first recognized as a disease caused by the severe acute respiratory syndrome coronavirus (SARS-CoV-2) with its initial infection site in Wuhan, Hubei Province, China.<sup>1</sup> Initially, the disease was believed to be only confined to this area, but it quickly spread worldwide and there have been 532,201,219 confirmed cases of COVID-19 and 6,305,358 people have died around the world due to COVID-19 (as of 10th June 2022).<sup>2-3</sup> The COVID-19 pandemic has had a negative impact on everyday life, has threatened people's health both mentally and physically, and has impair social and economic development.<sup>4-5-6</sup>

The burden of COVID-19 cases forced many countries around the world to impose lockdowns and social distancing practices, before vaccines arrived, to avoid the spread of the coronavirus. However, many services were not interrupted, and a number of work in the office employees, including custodial staff and orderlies in hospitals, as well as teachers and child-care workers, grocery clerks and supermarket workers, delivery people, factory and farm workers, and restaurant staff faced a high risk of infection with the new coronavirus.<sup>7</sup> Furthermore, health care workers are in direct contact with coronavirus-infected patients in hospitals and are thus at risk of SARS-CoV-2 infection.<sup>8-5</sup>

Experience from previous pandemics showed that some factors might affect mental health in the general population, such as quarantine, fears of infection, frustration and boredom, inadequate supplies, and a lack of information.<sup>6-7</sup> However, work in the office employees might face additional challenges in the workplace, including the lack of adequate distancing, the lack of personal protection equipment, work overload, and deaths related to COVID-19, and face the need to commute to work by public transport.<sup>9-10-11</sup> In addition, early career and young healthcare workers and women are more vulnerable to additional impacts of mental health in the workplace.<sup>11-12</sup> Taken together, these factors suggest work in the office employees are at a higher risk of psychological distress than work from home who do not face direct contact with sources of infection during the COVID-19 pandemic.

A meta-analysis of cross-sectional studies reported relatively high rates of anxiety, depression, post-traumatic stress disorder, psychological distress, and stress in the general population during the COVID-19 pandemic in eight countries<sup>13</sup> and Brazil.<sup>14</sup> In particular, studies focused on work in the office also showed a substantial burden of mental health symptoms in this population in distinct cultures. In China, a cross-sectional study showed a considerable proportion of symptoms of depression, anxiety, insomnia, and distress in healthcare workers, with more severe symptoms in workers on the front lines.<sup>10</sup> In Italy, one of the most severely affected countries based on the number of deaths in the ongoing pandemic,

high levels of depression, anxiety and post-traumatic stress symptoms were reported by healthcare workers, with an increased risk for post-traumatic stress disorder among front line workers.<sup>15</sup> In the United States, Young et al.,<sup>16</sup> reported that approximately 40% of the medical staff suffered from mood disorders during the pandemic. In Canada, the prevalence of anxiety and depression among medical staff was also significant.<sup>17</sup> The study conducted by Fournier et al.,<sup>11</sup> demonstrated that the pandemic had a marked psychological impact on all professionals working in healthcare facilities in France, mainly due to increased stress related to the pandemic.

Thus far, no study compared mental health outcomes, functioning and quality of life between individuals who worked from home and those who worked in the office in a sample during the COVID-19 pandemic. Our hypothesis is that employees who worked from home experienced lower levels of distress, anxiety, depression and consequently, better functioning and quality of life than those who worked in the office. Therefore, this study aimed to compare mental health outcomes, functioning and quality of life between individuals who worked from home and those who worked in the office.

## **2 Methods**

### *2.1 Study population*

We administered a cross-sectional web-based survey using an anonymous online questionnaire available via social networks (Facebook, Instagram and Twitter) and a convenience sampling strategy to target adult Brazilian population. The data were collected between May 20th and September 13th in 2020, the first peak period of COVID-19 contagion in Brazil. Work from home were identified by the question "You worked from home?". The online questionnaire consisted of sociodemographic items, questions used to assess participants' knowledge regarding COVID-19, prevalence of previous psychiatric disorders and previous chronic disease, symptoms of COVID-19, attitudes and practices with respect to COVID-19, quality of life, cognitive functioning, the severity of depression and anxiety and symptoms of post-traumatic stress disorder. Approval for this study was obtained from the local institutional review board at Hospital de Clínicas de Porto Alegre (CAAE 30741920.8.0000.5327). Online informed consent was obtained from the participants.

## 2.2 Measures

### 2.2.1 Knowledge regarding COVID-19

The knowledge portion of the questionnaire consisted of 10 questions regarding the clinical characteristics and prevention of COVID-19. These questions were answered on a true/false basis with an additional “I don't know” option.<sup>18</sup> The proportion of correct answers were analysed.

### 2.2.2 Quality of life (QoL)

Quality of life was assessed by the EUROHIS-QOL-8-item index consisting of eight items (overall QoL, general health, energy, daily living activity, self-esteem, social relationships, finances, and home). Each item was rated on a five-point scale<sup>19</sup> based on the two weeks prior to survey participation. The total score is the sum of each item, with a higher score indicating a better quality of life.

### 2.2.3 Psychosocial functioning

The Functioning Assessment Short Test (FAST)<sup>20</sup> was used to assess multiple areas of functioning, namely, autonomy, work, cognition, finance, interpersonal relationships and leisure. For the purposes of the present study, we used the FAST online scale to allow for the assessment of the degree of functional impairment experienced during the COVID-19 pandemic. Items in each domain were rated on a four-point scale based on the two weeks prior to survey participation. The total score is the sum of each item, and a higher score indicates poor functioning. The FAST online has been validated in a sample of Brazilian population during the COVID-19 pandemic, presenting satisfactory psychometric properties.<sup>21</sup>

### 2.2.4 Psychiatric assessment

The severity of depression, anxiety, and stress was measured as follows:

- a) The Patient-Reported Outcomes Measurement Information System (PROMIS) for depression (PROMIS Short Form v1.0 - Depression 8a) assesses negative mood (sadness, guilt), views of self (self-criticism, worthlessness), and social cognition

(loneliness, interpersonal alienation), as well as decreased positive affect and engagement (loss of interest, meaning, and purpose).<sup>22-23</sup>

- b) The PROMIS anxiety assesses self-reported fear (fearfulness, panic), anxious misery (worry, dread), hyperarousal (tension, nervousness, restlessness), and somatic symptoms related to arousal (racing heart, dizziness).<sup>22-23</sup>
- c) The Impact of Event Scale-Revised (IES-R) is a self-rated, 22-item questionnaire divided into three domains (avoidance, intrusion, and hyperarousal), which evaluates the distress caused by a traumatic event. Each item is rated on a 5-point scale (0=not at all; 1=a little bit; 2=moderately; 3=quite a bit; 4=extremely). The IES-R total score is the sum of the average of each domain. A total score greater than 5.6 indicates psychological stress.

Each of the PROMIS instruments used consists of an 8-item questionnaire that assesses symptoms over the previous seven days, with items rated on a 5-point scale (1=never; 2=rarely; 3=sometimes; 4=often; 5=always). All PROMIS scores are presented as T-scores calculated by the Health Measures Scoring Service ([https://www.assessmentcenter.net/ac\\_scoring-service](https://www.assessmentcenter.net/ac_scoring-service)) from the raw sum score, using T-scores from the general population of the United States. The T-score is a standardized score, with a mean of 50 and a standard deviation of 10. For depression and anxiety, a T-score lower or equal to 55 indicates no significant symptoms, a score higher between 55 and 60 indicates mild symptoms, a score higher between 60 and 70 indicates moderate symptoms, and a score between 70 and 84.1 indicates severe symptoms. For the purpose of our study, we classified both PROMIS depression and anxiety T-scores into two categories of severity: no significant/mild symptoms (normal/mild symptoms) and moderate/severe symptoms.<sup>24-25</sup>

### 2.3 Statistical analysis

Descriptive statistics (number and %) were used to present sociodemographic and clinical characteristics. We used Mann-Whitney or chi-square tests for comparisons between groups as appropriate. We used linear regression to identify potential variables associated with mental health outcomes (e.g., stress, anxiety and depression) and potential confounders of sex (man as reference), age, marital status (married or in a stable relationship), household income (lower income as reference), days of social distancing, previous psychiatric disorders (without psychiatric disorder as reference), and education level (lower education as reference) for the work in the office and work from home. Analyses were performed with SPSS version 18. Statistical significance was set at  $P < .05$ , and all tests were 2-tailed.

### 3 Results

#### 3.1 Sample characteristics

A total of 4069 participants read and agreed to answer the survey and 3023 individuals completed the survey. Of the 3023 respondents, 1685 were work in the office and 1338 were work from home. The work in the office were younger (years) (31 vs 33,  $U=1006461$ ,  $p<0.001$ ) and more likely to be female (87.4% vs. 81.2%,  $p<0.001$ ) than the work from home. A greater percentage of the work in the office were in the lower household income level (46.8% vs. 21.3%,  $p<0.001$ ), had a low education level (57% vs. 25.4%,  $p<0.001$ ) and were unmarried (57.9% vs. 53.5%,  $p<0.001$ ) compared to the work from home (Table 1). Other sample characteristics are reported in Table 1.



**Table 1.** Characteristics and mental health symptoms in work from home and work in the office (N=3023).

Variables	Work from home n=1338	Work in the office n=1685	Statistic	df	p value
Age, Mdn (Q1,Q3)	33 (25,43)	31 (23,41)	$U=1006461$	-	<0.001
Household, Mdn (Q1,Q3)	3 (2,4)	3 (2,4)	$U=981404$	-	<0.001
Social distancing <sup>a</sup> , Mdn (Q1,Q3), days	85 (64, 120)	88 (60, 103.5)	$U=959606$	-	<0.01
Household income (BRL) <sup>b</sup>					
>10,386.52	350(26.2%)	204(12.1%)	$X^2=238.39$	2	<0.001
>2,965.69-10,386.52	703(52.5%)	692(41.1%)			
<708,19-2,965.69	285(21.3%)	789(46.8%)			
Sex					
Women	1082(81.2%)	1461(87.4%)	$X^2=21.98$	1	<0.001
Men	251(18.8%)	211(12.6%)			
Marital Status					
Married	622(46.5%)	709(42.1%)	$X^2=5.89$	1	<0.001
Unmarried	716 (53.5%)	976(57.9%)			
Education					
Graduated	998(74.6%)	725(43%)	$X^2=303.1$	1	<0.001
Ungraduated	340(25.4%)	960(57%)			
PROMIS Depression					
Normal/Mild	521(38.9%)	473(28.1%)	$X^2=39.91$	1	<0.001
Moderate/Severe	817(61.1%)	1212(71.9%)			
PROMIS Anxiety					
Normal/Mild	247(18.5%)	231(13.7%)	$X^2=12.65$	1	0.111
Moderate/Severe	1091(81.5%)	1454(86.3%)			

FAST COVID-19, Mdn (Q1,Q3), score	23 (15, 32)	27(17, 38)	$U=940188.5$	-	<0.001
EUROhisQOL, Mdn (Q1,Q3), score	27 (22, 31)	24(20, 28)	$U=876124$	-	<0.001
IES-R					
Symptoms of PTSD	353(26.4%)	656 (38.9%)	$\chi^2=52.82$	1	<0.001

<sup>a</sup> Work from home(N=1316), work in the office (N=1557). <sup>b</sup> 1 BRL = 0.20 USD. Abbreviations: sd: Standard deviation

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### 3.2 Psychological impact, depression and anxiety symptoms

The psychological impact of COVID-19, assessed by the IES-R scale, revealed that those who worked from home had a lower prevalence of (61.1% vs 73.6%,  $p < 0.001$ ) symptoms of post-traumatic stress than those who worked in the office. Depression assessed by PROMIS Depression showed that work from home had a lower prevalence of moderate to severe depression symptoms than work in the office (71.9% vs. 61.1%,  $p < 0.001$ ). However, the prevalence of moderate to severe anxiety assessed by PROMIS Anxiety was similar in the two groups (86.3% vs. 81.5%,  $p = 0.11$ ) (Table 1).

### 3.3 Previous psychiatric disorders

The prevalence of self-reported psychiatric disorders was greater in work in the office than at work from home (43.4 vs. 38.8%, respectively,  $p = 0.01$ ). The work from home had a lower prevalence of depression (23.4% vs. 29.6%,  $p < 0.001$ ), self-reported panic disorders (6.1% vs. 10.7%,  $p < 0.001$ ), and social phobia (2.1% vs. 4.5%  $p < 0.001$ ) than work in the office (Table 2).

**Table 2.** Self-reported psychiatric disorder, in work from home and work in the office (N=3023).

Variables	Work from home n=1338	Work in the office n=1685	$\chi^2$	df	p value
Any psychiatric disorder	519 (38.8%)	732 (43.4%)	6.656	1	0.010
Main diagnosis					
Depression	313 (23.4%)	498 (29.6%)	14.424	1	<0.001
Panic disorder	81 (6.1%)	181 (10.7%)	20.707	1	<0.001
Generalized Anxiety Disorder	291 (21.7%)	430 (25.5%)	5.84	1	0.016
Obsessive-compulsive disorder	27 (2.0%)	51 (3.0%)	3.019	1	0.082
Social phobia	28 (2.1%)	75 (4.5%)	12.60	1	<0.001
Bipolar disorder	46 (3.4%)	88 (5.2%)	5.607	1	0.018
Schizophrenia	1 (0.1%)	4 (0.2%)	1.195	1	0.274
Drug abuse	11 (0.8%)	17 (1.0%)	0.284	1	0.594
Post-traumatic stress disorder	37 (2.8%)	67 (4.0%)	3.292	1	0.070
Other diagnosis	58 (4.3%)	71 (4.2%)	0.027	1	0.870

### 3.4 Knowledge towards COVID-19

Regarding knowledge about COVID-19, work in the office and work from home had similar responses, except for a question: Persons with COVID-2019 cannot infect others when a fever is not present (93.9% vs. 87.4%,  $p<0.001$ ) (Table 3). In the ongoing pandemic, work in the office had a higher prevalence of COVID-19 diagnosis (4% vs. 2.2%,  $p<0.01$ ), need to visit a doctor (10.3% vs. 5.1%,  $p<0.01$ ), met someone with COVID-19 (24.5% vs. 14.1%,  $p<0.001$ ) or loose loved one to COVID-19 (8.4% vs 5.6%,  $p<0.01$ ) (Table 4).

**Table 3.** Correct answers to questions about knowledge towards COVID-19 of work from home and work in the office (N=3023).

Answers	Work from home n=1338	Work in the office n=1685	X <sup>2</sup>	df	p value
1. The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia. (True)	1147 (85.7%)	1401 (83.1%)	3.75	1	0.053
2. There currently is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection. (True)	1242 (92.8%)	1555 (92.3%)	0.315	1	0.575
3. Not all persons with COVID-2019 will develop to severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases. (True)	810 (60.5%)	1048 (62.2%)	0.865	1	0.352
4. Eating or contacting wild animals would result in the infection by the COVID-19 virus. (False)	975 (72.9%)	1187 (70.4%)	2.153	1	0.142
5. Persons with COVID-2019 cannot infect to others when a fever is not present. (False)	1256 (93.9%)	1472 (87.4%)	35.92	1	<0.001
6. The coronavirus spreads via respiratory droplets of infected individuals. (True)	1312 (98.1%)	1639 (97.3%)	1.99	1	0.159
7. It is not necessary for children and young adults to take measures to prevent the infection by the coronavirus. (False)	1314 (98.2%)	1656 (98.3%)	0.023	1	0.880
8. To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportations. (True)	1297 (96.9%)	1629 (96.7%)	0.161	1	0.688
9. Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus. (True)	1303 (97.4%)	1634 (97%)	0.455	1	0.500
10. People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days. (True)	1303 (97.4%)	1622 (96.3%)	2.999	1	0.083

**Table 4.** Events, attitudes, and practises towards COVID-19 of work from home and work in the office (N=3023).

Events, attitudes, and practises	Work from home n=1338	Work in the office n=1685	X <sup>2</sup>	df	p value
Visited a doctor	68 (5.1%)	173 (10.3%)	27.33	1	<0.01
Positive COVID-19 diagnosis	29 (2.2%)	67 (4%)	7.94	1	<0.01
Needed hospitalization	1 (0.1%)	7 (0.4%)	3.28	1	0.70
Met someone with COVID-19	189 (14.1%)	413 (24.5%)	50.43	1	<0.001

Loose loved one to COVID-19	75 (5.6%)	141 (8.4%)	8.58	1	<0.01
Positive Attitudes					
Agree that COVID-19 will finally be successfully controlled	366 (27.4%)	510 (30.3%)	3.77	2	0.152
Confident that Brazil can win the battle against the coronavirus	845 (63.2%)	1150 (68.2%)	8.63	1	<0.01
Positive Practices, <i>n</i> (%)					
Have not gone to any crowded place in recent days	131 (9.8%)	257 (15.3%)	19.88	1	<0.001
Worn a mask when leaving home in recent days	1325 (99.0%)	1663 (98.7%)	0.73	1	0.39

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### 3.5 Functioning and QoL

Work from home had lower scores on FAST scale (24 vs. 28,  $t=8.58$ ,  $p<0.001$ ), suggesting greater functionality and a higher score on the EUROhisQOL questionnaire (26 vs. 24,  $t=-10.67$ ,  $p<0.001$ ), indicating a better quality of life than work in the office (Table 1).

### 3.6 Multivariate analysis

We used linear regression models to analyse determinant factors associated to the scores on IES-R, depressive PROMIS depression and anxious PROMIS anxiety. In addition, we included the working status (work in the office or work from home) during the pandemic in the models. All models were statistically significant to predict higher or lower scores of IES ( $F=50.921$ ,  $df=10$ ,  $p<0.001$ ), depression ( $F=104.195$ ,  $df=10$ ,  $p<0.001$ ), and anxiety ( $F=91.160$ ,  $df=10$ ,  $p<0.001$ ). In addition, the final models explained 15.2% of variability of IES scores, 23.5% of depression scores, and 21.2% of anxiety scores.

In the IES scores, seven variables significantly contributed to the model: gender ( $B=1.9$ , 95% CI 0.93 to 1.46,  $p<0.001$ ), age ( $B=-0.03$ , 95% CI -0.04 to -0.02,  $p<0.001$ ), education level ( $B=-0.37$ , 95% CI -0.58 to -0.16,  $p<0.01$ ), household income level (medium income  $B=-0.91$ , 95% CI -1.13 to -0.69,  $p<0.001$ ; high income  $B=-1.45$ , 95% CI -1.74 to -1.16,  $p<0.01$ ), history of psychiatric illness ( $B=0.88$ , 95% CI 0.69 to 1.07,  $p<0.001$ ), and contact with someone with COVID-19 ( $B=0.36$ , 95% CI 0.12 to 0.61,  $p<0.01$ ). Therefore, female, younger age, having lower education level, lower income, having a self-reported history of psychiatric illness, and contact with someone were associated with higher scores of IES-R (Table 5).

**Table 5.** Association of PTSD, depression and anxiety symptoms and gender, age, education level, household income level, history of psychiatric illness, contact with someone with COVID and marital status.

Variable	IES-R <sup>a</sup>			PROMIS depression <sup>b</sup>			PROMIS anxiety <sup>b</sup>		
	B	CI 95%	P value	B	CI 95%	P value	B	CI 95%	P value
Intercept	4.76	4.28–5.24	<.001	61.85	60.48–63.21	<.001	66.74	65.41–68.14	<.001
Gender	1.19	0.93–1.46	<.001	3.41	2.64–4.17	<.001	3.86	3.09–4.63	<.001
Age	-0.03	-0.04, -0.02	<.001	-0.19	-0.21, -0.17	<.001	-0.17	-0.19, -0.15	<.001
Education Level	-0.37	-0.58–0.16	<.001	-1.08	-1.67–0.48	<.01	-1.12	-1.72–0.52	<.001
Household Income Level									
Medium	-0.91	-1.13, -0.69	<.001	-2.56	-3.19, -1.94	<.001	-2.17	-2.80, -1.54	<.001
High	-1.45	-1.74, -1.16	<.001	-4.56	-5.39, -3.72	<.001	-4.14	-4.98, -3.30	<.01
History of Psychiatric Illness	0.88	0.69–1.07	<.001	4.20	3.66–4.75	<.001	4.14	3.60–4.70	<.001
Contact with Someone with COVID19	0.36	0.12–0.61	<.01	0.327	0.371–1.026	0.358	1.05	0.34–1.75	<.01
Marital Status	0.031	-0.171, 0.233	0.763	1.17	0.58, -1.75	<.001	0.429	-0.154, 1.011	0.149

<sup>a</sup>IES-R: The Impact of Event Scale-Revised.

<sup>b</sup>PROMIS: The Patient-Reported Outcomes Measurement Information System.



In the depression scores, seven variables significantly contributed to the model: gender (B=3.41, 95% CI 2.64 to 4.17,  $p<0.001$ ), age (B=-0.19, 95% CI -0.21 to -0.17,  $p<0.001$ ), education level (B=-1.08, 95% CI -1.67 to -0.48,  $p<0.01$ ), household income (medium income B=-2.56, 95% CI -3.19 to -1.94,  $p<0.001$ ; high income B=-4.56, 95% CI -5.39 to -3.72), history of psychiatric illness (B=4.20, 95% CI 3.66 to 4.75,  $p<0.001$ ), and marital status (B=1.17, 95% CI 0.58 to 1.75,  $p<0.001$ ). Therefore, being female, younger age, having lower education level, lower income, having self-reported history of psychiatric illness, and being single were associated with higher scores of PROMIS depression (Table 5).

In the anxiety scores, seven variables significantly contributed to the model: gender (B=3.86, 95% CI 3.09 to 4.63,  $p<0.001$ ), age (B=-0.17, 95% CI -0.19 to -0.15,  $p<0.001$ ), education level (B=-1.12, 95% CI -1.72 to -0.52,  $p<0.001$ ), household income (medium income B=-2.17, 95% CI -2.80 to -1.54,  $p<0.001$ ; high income B=-4.14, 95% CI -4.98 to -3.30,  $p<0.01$ ), history of psychiatric illness (B=4.14, 95% CI 3.60 to 4.70,  $p<0.001$ ), and contact with someone with COVID-19 (B=1.05, 95% CI 0.34 to 1.75,  $p<0.01$ ). Therefore, being younger age, having lower education level, lower income, self-reported history of psychiatric illness, and contact with someone with COVID-19 were associated with higher scores of PROMIS anxiety (Table 5).

#### 4 Discussion

The present study compared mental health outcomes, functioning and quality of life and associated variables between work in the office and work from home during the first wave ongoing COVID-19 pandemic in Brazil. We show that both groups have experienced a negative impact of COVID-19 on their mental health during the ongoing pandemic; however, participants who worked from home experienced lower levels of anxiety, stress, and depression than participants who worked in the office, even after controlling for possible confounders. Regarding sociodemographic characteristics, work in the office were younger, female, had lower family income, were more likely to be single, and had lower levels of education. These factors may have contributed to the harmful effects of the COVID-19 pandemic, according recent studies.<sup>16-26</sup>

In addition, the psychological distress experienced by both groups (work in the office and work from home) corroborates with recent studies,<sup>5-10-11-26-27-28-29-30</sup> and it can be explained, to some extent, due to psychological overload, sleep problems, physical distancing and fear of spreading the virus.<sup>5-11-20-26-27-29</sup> The prevalence of mental health problems in both the work in the office and work from home in our sample agreed to somewhat with studies performed in other countries.<sup>13-15-26-31-32-33</sup> In the work in office population, our results regarding symptoms of depression (71.9%) and anxiety (86.3%) were higher than those in a meta-analysis of cross-sectional studies in the general population, which reported the prevalence of symptoms of depression as high as 48.3% and of anxiety as high as 50.6%.<sup>13</sup> However, post-traumatic stress

symptoms (38.9%) were in line with the range found in other countries (from 7% to 53.8%) in the same meta-analysis.<sup>13</sup>

Comparing work in the office and work from home, we found more symptoms of depression and distress in the former. Our study is similar to those conducted in Spanish population that found mental health problems in health professionals<sup>31</sup> and particularly in those individuals that were on frontline.<sup>34</sup> In Italy, the prevalence of post-traumatic stress disorder symptoms in front line healthcare workers was around 50% and slight higher that prevalence found in our work in office.<sup>15</sup> In China, a cross-sectional study in a single centre reported a smaller proportion of participants with severe symptoms of depression and anxiety among medical and administrative staff compared to that of our sample of work in the office.<sup>32</sup> Finally, our data diverge from with a cross-sectional study in the United Kingdom showing that respondents self-declared as work in the office had lower levels of depressive symptoms than work from home.<sup>33</sup> In summary, some discrepancies among the studies are probably because we assessed work in the office of any profession, different from previous studies that reported results only for healthcare workers, as well as sociocultural differences. According to Sole et al.,<sup>35</sup> psychiatric symptoms have traditionally been associated with poor functioning in clinical samples, in agreement with our study that lower psychiatric symptoms were associated with better functioning.

Our study showed that people who worked from home had fewer depressive symptoms, stress and anxiety than people who worked in office, suggesting they were more resilient to cope with the adversities of the pandemic. This hypothesis is supported by previous studies that have shown an association between greater resilience with less severity of depression, suicidal ideation, anxiety symptoms, and less concern about the effects of COVID-19.<sup>36-37</sup> Additional studies are needed to assess mental health outcomes in the ongoing pandemic considering resilience as a mediator of pandemic stressors regarding work in home.

To the best of our knowledge study, this is the first study to report data comparing mental health status, between the Brazilian work in the office and work from home during the ongoing COVID-19 pandemic. Interpretation of our results should consider some limitations of the study. First, we used an online survey with a convenience sample method, what may not be representative sample of the total Brazilian work in the office and home worker population. Second, the work in the office subpopulation was not based only on healthcare workers, but also included essential non-health care workers, what might represent a bias, since the former were more exposed to infection by SARS-CoV-2 and death by COVID-19 than the later. Third, all outcomes were self-reported instead of evaluated by a clinician. Finally, there is a chance that only individuals that were struggling with their mental health during the pandemic would be interested in answering the questionnaire.

## 5 Conclusion

Our findings support the notion of the negative impact of the COVID-19 pandemic on mental health in both work in the office and work from home; however, the work from home in our study experienced lower levels of stress, anxiety and depression than the work in the office, even after controlling for potential confounders. These findings suggest that work from home may reduce the negative effects of the ongoing pandemic in terms of symptoms of depression and post-traumatic stress disorder, most likely by having more resilience and knowledge of COVID-19.

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