

Evaluation of Depression, Anxiety and Sleep Quality in the Brazilian Population During Social Isolation Due to the New Coronavirus (SARS-CoV-2) pandemic: the DEGAS-CoV Study

Avaliação da Depressão, Ansiedade e Qualidade do Sono na População Brasileira Durante o Isolamento Social Devido à Nova Pandemia do Coronavírus (SARS-CoV-2): o Estudo DEGAS-CoV

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Introduction: The new coronavirus infection (COVID-19) has caused distress and repercussions in mental and physical health of individuals. Depression, anxiety and worsening of sleep quality have been reported in several recent articles that surveyed populations all over the globe. Our work meant to access, through a cross-sectional study, these disorders in the Brazilian population, through the application of an online questionnaire conducted on the second trimester of 2020. **Materials and Methods:** We applied an online questionnaire, filled with questions regarding social, economic, financial, educational and health status, as well as questions from the Hospital Anxiety and Depression Scale (HAD), and from the Pittsburgh Sleep Quality Index (PSQI). **Results:** We collected 2,695 valid answers, from April 24th to May 31st, 2020. Age ranged from 18 to 79 years, mean of 31.3. Women were 76.3%, men 23.7%. Symptoms of Anxiety were found in 56.5%, of depression in 46.1%, and of bad sleep in 49.2%. Some groups were more prone than others to one or more of those conditions, such as: younger people, women, mestizos, people with lesser years of education, of lower income or whose income dropped significantly during the pandemic, caregivers, students, sedentary or people practicing less physical activity, people who followed more hours of news of COVID-19 and those less engaged in social and instrumental activities. **Conclusion:** anxiety, depression and bad sleep quality were significantly high in our survey. Mental and sleep health is heterogeneously affected among individuals, depending on social, economic, financial, educational and health status.

Keywords: Anxiety, Brazil, COVID-19, Depression, Sleep Disorders.

RESUMO

Introdução: A nova infecção pelo coronavírus (COVID-19) tem causado angústia e repercussões na saúde mental e física dos indivíduos. Depressão, ansiedade e piora da qualidade do sono têm sido relatadas em vários artigos recentes que pesquisaram populações em todo o mundo. Nosso trabalho teve como objetivo acessar, através de um estudo transversal, esses distúrbios na população brasileira, mediante a aplicação de um questionário online realizado no segundo trimestre de 2020. **Materiais e Métodos:** Aplicamos um questionário online, preenchido com perguntas relativas ao status social, econômico, financeiro, educacional e de saúde, assim como perguntas da Escala de Ansiedade e Depressão Hospitalar (HAD) e do Índice de Qualidade do Sono de Pittsburgh (PSQI). **Resultados:** Coletamos 2.695 respostas válidas, de 24 de abril a 31 de maio de 2020. A idade variou de 18 a 79 anos, média de 31,3. As mulheres eram 76,3%, os homens

23,7%. Sintomas de ansiedade foram encontrados em 56,5%, de depressão em 46,1%, e de sono ruim em 49,2%. Alguns grupos eram mais propensos que outros a uma ou mais dessas condições, tais como: pessoas mais jovens, mulheres, mestiços, pessoas com menos anos de educação, de menor renda ou cuja renda caiu significativamente durante a pandemia, cuidadores, estudantes, sedentários ou pessoas praticando menos atividade física, pessoas que acompanharam mais horas de notícias da COVID-19 e aqueles menos engajados em atividades sociais e instrumentais. **Conclusão:** a ansiedade, a depressão e a má qualidade do sono foram significativamente elevadas em nossa pesquisa. A saúde mental e do sono é afetada de forma heterogênea entre os indivíduos, dependendo do status social, econômico, financeiro, educacional e de saúde.

Palavras-chave: Ansiedade, Brasil, COVID-19, Depressão, Distúrbios do Sono.

1 INTRODUCTION

Since December 2019, after the first report in China¹, the new strain of Coronavirus, prompter of a severe acute respiratory syndrome (SARS-CoV-2), designated as COVID-19 by the World Health Organization², has caused and unprecedented, worldwide distress. Public health measures are taken in many cases, in an improvised fashion and within a blink of an eye. In short intervals social restrictions might be lifted, just be implemented again later, due to the erratic behavior of the virus and oscillations in its transmission ratio and also the evidence of secondary waves of outbreak³.

In this unsteady scenario, with massive misinformation, added to the negative effect of social restrictions, a rise in the prevalence of mental disorders, such as depression and anxiety, and disruptions in the normal, physiological sleep are widely expect to occur, with possible short- and long-term consequences^{4 5}. Previous studies with data from past epidemic disorders, such as in H1N1 influenza in 2009⁶, SARS-CoV in 2002 and Middle East Respiratory Syndrome (MERS) in 2012⁷ attest this fact.

One of the first to access mental and sleep issues during the outbreak of COVID-19, Huang and Zhao applied an online questionnaire in 7,236 people living in China, finding anxiety, depression and bad sleep ratios of 35%, 20% and 18%, respectively⁸.

Several other studies, conducted in countries in all continents, showed an increase of anxiety, depression, bad sleep quality and/or stress as well^{8 9 10 11 12 13 14 15 16 17}. One study from the United Kingdom¹² found that higher levels of anxiety were associated with more somatic symptoms, like gastrointestinal disturbances or fatigue, hence impoverishing life quality in such cases.

This study intended to measure the overall prevalence of anxiety and depression symptoms, and bad sleep quality in the second trimester of 2020, among people living in Brazil, while moderate to severe social restrictions were in place, and compare rates between different groups, according to social, financial, educational, health and economic status.

2 MATERIALS AND METHODS

2.1 ETHICAL ASPECTS, INCLUSION CRITERIA AND STUDY DESIGN

We conducted a cross-sectional study, called DEGAS-CoV, an acronym for “Depression, General Anxiety and Sleep Disorders during COVID-19”. The study was based on an online survey from April 30th to May 31st 2020, when measures establishing some degree of social distancing – governmental advice or imposition of restrictions like closure of commerce, surveillance of circulation of cars and pedestrians, and even lockdown in more critical areas were in place, in Brazil.

Before commencing, ethical approval was granted by the São Leopoldo Mandic Medical College Ethical Committee. Dissemination and recruitment of participants was made entirely online, through snowball sampling¹⁸, keeping in mind the current scenario of social restrictions. Participants were approached by the researchers either directly, via social medias (i.e., WhatsApp, Facebook and others), or indirectly, when other participants, in their turn, shared the link to the survey with their acquaintances.

Participants were required to be at least 18 years old, and to be currently living in Brazilian soil. No physical or mental conditions/disorders were considered as exclusion criteria. Both people who already contracted or did not contract COVID-19 were included as well.

Before answering, the participant was presented with a consent form and was required to check that he/she had read and agreed with all conditions.

2.2 QUESTIONNAIRES APPLIED

The online form was divided in three questionnaires, and was created using the free tool Google Forms¹⁹.

The first questionnaire consisted of interrogations formulated by the researchers, and meant to access geographical, educational, financial, and health status of participants, as well as habitual behaviors, such as social activities (SA) – phone or video calls/conferences and in-person interactions with familiars, friends or other people - and

instrumental activities (IA) – care of offspring/parents/relatives, pet sitting, preparing meals, cleaning the house and other household daily chores, shopping, religious/spiritual worship - and time spent watching or reading news. Lastly, patients were required to answer two questions regarding COVID-19. First, if they had already contracted COVID-19 and, if not, how afraid they were of contracting – possible answers were “already contracted”, “no or little fear”, “moderate fear”, and “intense fear of contracting”. Secondly, they were asked to grade, in a Likert scale fashion, from 1 to 5, how severely COVID-19 had affected their lives, in general, being 1 “no/very low interference” and 5 “total interference”.

The second questionnaire was composed of the Hospital Anxiety and Depression Scale - HAD²⁰, consisting of 14 multiple-choice questions, 7 for the evaluation of possible depression and 7 for possible anxiety. The Brazilian Portuguese validated translation²¹ was used. The higher the frequency and/or intensity of symptoms, the higher the punctuation. A cut-off of 9 points for each symptom was considered for tagging the responder as a bearer of those conditions.

For the last questionnaire, researchers used a modified version of Brazilian validated translation²² of the Pittsburgh Sleep Quality Index - PSQI²³, what was called mPSQI. This instrument is designed for the triage of people with sleep of bad quality, regardless of etiology. The PSQI score is calculated by the sum of components (subset of questions), each receiving a determined weight. For most authors, a cut-off score of 5 points is adequate for the identification of bad sleepers²⁴.

The original version of the PSQI consists of 10 questions, being the first 4 open questions dealing with a free estimate of time of going to bed and getting up, sleep latency in minutes and effective hours of sleep, and the last 6 questions of multiple-choice; the higher the frequency and/or intensity of symptoms, the higher the punctuation. In the original version, the maximum score is 21 points²³.

For the mPSQI, we opted for suppression of the first 4 and also of the 10th question, leading to a maximum possible punctuation of 15 points. For the first 4 questions, we felt that calculation and estimation of time could offer some difficulty to some responders, particularly those with lesser education years, given that no presential support could be offered. Question 10 was not included because, besides not being considered for scoring, it required the participant to have a partner or other roommate to attest snoring, and given the unusual circumstances, a considerate fraction of people enrolled could not have an informant. The cut-off commonly used value of five points for

the PSQI was maintained for the mPSQI, as there was no certainty of sensitivity/specificity by adopting a lower cut-off for the mPSQI.

2.3 DATA ANALYSIS

Statistical Analysis was conducted in the Statistical Package for Social Sciences (SPSS) suite²⁵. Categorical variables were compared by Chi-Square test, with adopted significance level of 95%. For contingency tables with more than 1 degree of freedom, a Post-Hoc analysis was conducted, being the p value (α) modified by Bonferroni correction²⁶, for a contingency table of *i* lines and *j* columns, $\alpha = 0.05 / (i \times j)$. Odd ratios were calculated by univariate logistic regression. When needed, correlation was made by Spearman 2-tailed Correlation index (ρ), since data was non-parametric.

3 RESULTS

3.1 EXPLORATORY ANALYSIS

The questionnaire received a total of 2,839 inputs. After exclusions, either due to duplicity (last answer was validated) or to incoherent responses, a total of 2,695 forms remained. Mean age was of 31.3 years of age; 2,052 (76.3%) were women and 636 (23.7%) men; most auto-declared themselves as whites, followed by mestizos, blacks, Asians and indigenous. Epidemiological data of participants are further detailed in **Table 1**, ahead.

Table 1 – Exploratory analysis of different aspects of responders; for each category total valid was 2,695, unless specified

Condition	N	%	subsets, when suitable	N (%)
A - DEMOGRAPHICS				
All responders	2,695	100		
AGE			Limits	
Mean (std deviation = 0.236)	31.27	--	Low	18
Median	27	--	High	19
SEX (Total valid = 2,688)				
Women (cis or trans)	2,052	76.3		
Men (cis or trans)	636	23.7		
Race - auto declaration (Total valid = 2,652)				
White	1,964	74.1		
Mestizos	515	19.4		
Black	116	4.4		
Asian	48	1.8		
Indigenous	9	0.3		
# People living together during the pandemic				
Responder lives alone	184	6.8		
Lives with more people	2,511	93.2		
B – EDUCATION/OCCUPATION				
Schooling				
Incomplete Elementary/Middle	5	0,2		

Completed Middle, never started High School	29	1.1		
Incomplete High School	17	0.6		
Completed High School (may have started University but did not complete)	1,182	43.9		
Completed graduation	726	26.9		
Completed postgraduation	736	27.3		
Is the person currently a student?				
Yes, person is currently a student	1,162	43.1		
No, person is not currently a student	1,533	56.9		
Main Occupation Type, General				
Unemployed	125	4.6		
Freelancer	495	18.4		
Private sector	762	28.3		
Public employee	48	1.8		
Student	1,162	43.1		
Retired/Receiving pension	103	3.8		
Occupation in Health management				
Non-health worker	2,005	74.4		
Health worker/student, not involved in care of COVID patients	519	19.3		
Health worker/student, involved in care of COVID patients	170	6.3		
Caregiving				
Not a caregiver	2,590	96.1		
Caregiver	105	3.9	Caregiver – one person	85 (3.2)
			Caregiver – two people	14 (0.5)
			Caregiver – more than 2 p.	6 (0.2)

C – FINANTIAL STATUS

Family Income (Total valid = 2,388)				
Less than R\$ 1,200/month	102	4.3		
R\$ 1,200 – 3,000/month	498	20.8		
R\$ 3,001 – 10,000/month	1,021	42.7		
Above R\$ 10,000/month	768	32.1		
Change of family income				
Income did not drop	993	36.8	Income has improved	35 (1.3)
			Income hasn't changed	958 (35.5)
Income dropped	1,702	63.2	Up to 25% drop	863 (32.1)
			25 – 50% drop	567 (21.1)
			More than 50% drop	272 (10)
Provider of family income				
Responder is the main provider	727	27.0	Is the sole provider	283 (10.5)
			Other members contribute with a lesser	443 (16.5)
Responder is not the main provider	1,968	73.0	Responder contributes with some	858 (32)
			Responder does not contribute at	1,111 (41)

D – PHYSICAL CONDITIONS, COMORBIDITIES, HABITS AND BEHAVIORS

BMI (Total valid = 2,691)				
Normal (BMI < 25)	1,500	55.7		
Overweight (25 ≤ BMI < 35)	771	28.6		
Obese (BMI ≥ 35)	421	15.6		
Comorbidities or other health conditions				
No comorbidities	1,959	72.7		
With comorbidity(s)/condition	736	27.3	1 comorb., pregnancy excluded	574 (21.5)
			2 comorb., pregnancy excluded	120 (4.6)
			3 comorb., pregnancy excluded	25 (0.9)
			4 + comorb., pregnancy	10 (0.3)
Smoker				
No	2,507	93.1		
Yes	188	6.9	Up to 10 cigarettes/day	128 (4.7)
			More than 10 cig./day	60 (2.2)
Alcohol intake				
No	1,523	56.5		

Yes	1,172	43.5		
Symptoms of COVID-19				
No symptoms	2,296	85.2		
Had symptoms	399	14.8	COVID-19 test was negative	76 (3)
			Still waiting results/did not test for	295 (10.8)
			COVID-19 test was positive	28 (1)
Fear of contracting COVID-19				
Has already contracted	28	1.0		
Did not contract to the date	2,667	99.0	Not or little worried about	433 (16)
			Moderately worried	1,405 (53)
			Very much worried	809 (30)
Time spent gathering news about COVID-19 on TV and other media				
Does not follow news	134	5.0		
Follows the news	2,561	95.0	Up to one hour/day	1,515 (56.2)
			1-3 hours/day	742 (27.6)
			More than 3 hours/day	304 (11.2)
Practice of Exercises				
Did not practice before the pandemic	960	35.6	Remains sedentary	735 (27.3)
			Started practicing	225 (8.3)
Practiced before the pandemic	1,735	64.4	Is not practicing now	722 (26.8)
			Still practices, less than 3x/w	419 (15.6)
			Still practices, 3+ times/w	594 (22.0)
Time preferred for practice of exercises - for those currently practicing (Total valid = 1,487)				
Prefers morning	380	25.6		
Prefers afternoon	361	24.3		
Prefers evening	415	27.9		
Varies/no preference	331	22.3		
Time spent on social activities (SA) - phone or video calls/conferences, personal relations etc.				
Less than before the pandemic	512	19.0	Much inferior	266 (9.9)
			Somewhat inferior	246 (9.1)
Equal or more than before the pandemic	2,183	81.0	Equal	675 (25.0)
			Somewhat superior	819 (30.4)
			Much superior	689 (25.6)
Time spent in instrumental activities (IA) - care of offspring, parents or other relatives, pet sitting, cleaning the house and other household chores, religious activities etc.)				
Less than before the pandemic	260	9.6	Much inferior	122 (4.5)
			Somewhat inferior	138 (5.1)
Equal or more than before the pandemic	2,435	90.4	Equal	620 (23.0)
			Somewhat superior	860 (31.9)
			Much superior	955 (35.5)

3.2 PREVALENCE OF POSSIBLE ANXIETY, DEPRESSION AND BAD SLEEP QUALITY AND STATISTICAL ANALYSIS

Results from the statistical analysis are displayed in **Tables 2a, 2b, 2c, 2d, 3 and**

4.

3.2.1 Demographics

Prevalence of mental and sleep disorders were higher in younger people, especially in the first quartile (ages 18 to 22). Meanwhile, the oldest quartile (ages 39 to 79) was statistically less anxious and depressed than expected.

Anxiety and depression were significantly higher in mestizos, and significantly lower in whites. There was no significance in differences of sleep quality among ethnicities. There were no statistical disparities of mental or sleep issues when people who lived alone were compared to people living with more people during the pandemic.

3.2.2 Education and Occupation

People with less years of education tended to have more anxiety, depression and bad sleep symptoms, while those who had postgraduation degrees were significantly suffering less from those conditions.

Unemployed (regardless of being discharged more or less recently) and students had a higher prevalence of anxiety, depression and bad sleep quality than freelancers, workers of public or private sectors or those who were retired or received pension.

Rates of possible conditions were similar among non-health workers and health workers (regardless of dealing or not with COVID-19 cases).

Caregivers were significantly more prone to mental and sleep disorders than non-caregivers, especially depression.

3.2.3 Financial Status

Responders of families with lower monthly incomes and/or whose income had dropped during the pandemic were more prone for those conditions. Also, those who did not contribute to the family budget, or were not the main contributors were also more prone to possible anxiety and depression.

Sleep quality did not vary significantly among people with different family income, drop in family budget or among providers and non-providers.

3.2.4 Physical Conditions, Comorbidities, Habits and Behaviors

Weight did not seem to interfere in rates of disorders. Having or not comorbidities and being or not a smoker also did not interfere with anxiety and depression rates. People with no comorbidities were less prone to be bad sleepers than otherwise. Rates of bad sleep quality in smokers up to 10 cigarettes per day (65.6%) and in smokers of more than 10 cigarettes per day (73.3%) were significantly higher than in non-smokers (47.8%).

Rates of anxiety and bad sleep did not vary greatly among those who did not drink and alcohol consumers. The rate of depression was higher than expected in non-drinkers (49.6%), and lower than expected in those drinking up to twice a week and did not consume in the evening (41.6%). In general, alcohol drinkers were 27% less likely to be

diagnosed with depression, in our sample. Nocturnal drinking did not play a statistically significant difference in rates.

Participants who did not had symptoms of COVID-19, by the time of the survey, were less likely to be anxious, depressed or bad sleepers than those with symptoms, regardless of confirmation of infection by the virus. People who watched and/or read more than 3 hours per day of news were 71% (CI 1.12-2.59) more likely to be in the anxious group, and 61% (CI 1.07-2.42) more likely to be in the bad sleepers' group, when compared to those who did not follow news. They were also 39% more likely to be in the depressed group, although in this case, the CI of 0.92-2.09 did not allow a concrete confirmation of this trend.

The three disturbances had the highest ratios in those who were exercising much less than before the pandemic and in those who were sedentary by the time of the collection of data, regardless of being active or not before the pandemics. For those who were active, responders that preferred exercising in the morning had the lowest ratios of anxiety, depression and bad sleep, although only depression reached statistical significance.

Lastly, patients were asked about the time spent in social activities (SA), like phoning or video-calling friends and relatives, engaging in social interactions and relationships, and in instrumental activities (IA), such as care of offspring, parents or other relatives, pet sitting, cleaning the house, religious activities. People who increased time spent both in SA and IA were significantly less prone to anxiety, depression and bad sleep. People who spent less time in SA than before COVID-19 were 28%, 62% and 66% more likely to be in the anxiety, depression and bad sleep groups, respectively, while those who spent less time in IA than before the infection were 67%, 63% and 75% more likely to be in the anxiety, depression and bad sleep groups, respectively.

3.2.5 Correlations

Table 4 shows there was a moderate correlation between Anxiety Score – HAD (A) and Depression Score – HAD (D), and between Global mPSQI score and both HAD (A) and HAD (D). Grading of how much COVID-19 had affected the responder's life (in a Likert scale, from 1 to 5) correlated moderately with both HAD (A) and HAD (D), but weakly with mPSQI. **Graph 1** depicts the cumulative dispersion of grading versus HAD (A), HAD (D) and mPSQI. Fear of contracting COVID-19 also displayed a weak correlation with other variables.

Table 2a - Statistical analysis of different groups, by demographical characteristics (α - adjusted p after Bonferroni correction, * - $p < \alpha$; ** - $p < 0.001$ † - 100% for each subset, NS – chi square test was non-significant, hence post-hoc analysis was not performed in this category)

Condition	N	%	subsets, when suitable	α	Anxious N (%)	p	Depressed N (%)	p	Bad Sleeper N (%)	p
Total population	2,695	100		--	1,523 (56.5)	--	1,243 (46.1)	--	1,326 (49.2)	--
A - DEMOGRAPHICS										
Age in years										
1st quartile (18-22)	793	100		.006	513 (64.7)	<.001**	418 (52.7)	<.001**	423 (53.3)	.005*
2nd quartile (23-27)	589	100			356 (60.4)	.278	282 (47.9)	.317	289 (49.1)	.920
3rd quartile (28-38)	678	100			388 (57.2)	.689	317 (46.8)	.689	328 (48.4)	.617
4th quartile (39-79)	635	100			266 (51.9)	<.001**	226 (35.6)	<.001**	286 (45.0)	.016
Gender										
Female	2,052	100		.05	1,252 (61.0)	<.001**	1,011 (49.3)	<.001**	1,059 (51.6)	<.001**
Male	636	100			265 (41.7)		227 (35.7)		260 (40.9)	
Race (auto declared)										
Asian	48	100		.005	24 (50)	.37	23 (47.9)	.76	20 (41.7)	NS
Native Brazilian	9	100			7 (77,8)	.19	3 (33.3)	.42	7 (77.8)	
Mestizos	515	100			321 (62,3)	.003*	277 (53.8)	<.001**	252 (48.9)	
Black	116	100			69 (59,5)	.48	62 (53.4)	.11	54 (46.6)	
White	1,964	100			1,077 (54,8)	.004*	858 (43.7)	<.001**	968 (49.3)	
# People living together during the pandemic										
Responder lives alone	184	100		.05	93 (50.5)	NS	76 (41.3)	NS	93 (50.5)	NS
Lives with more people	2,511	100†	Total of 2 people		342 (57.2)		281 (47.0)		309 (51.7)	
			Total of 3 or 4 people		860 (56.2)		690 (45.1)		735 (48.0)	
			Total of 5 or 6 people		202 (58.9)		172 (50.1)		168 (49.0)	
			More than 6 people together		26 (65.0)		24 (60.0)		21 (52.5)	

Table 2b - Statistical analysis of different groups, by educational and occupational characteristics (α - adjusted p after Bonferroni correction, * - $p < \alpha$; ** - $p < 0.001$; † - 100% for each subset, NS – chi square test was non-significant, hence post-hoc analysis was not performed in this category)

Condition	N	%	subsets, when suitable	α	Anxious N (%)	p	Depressed N (%)	p	Bad Sleeper N (%)	p
Total population	2,695	100		--	1,523 (56.5)	--	1,243 (46.1)	--	1,326 (49.2)	--
B - EDUCATION/OCCUPATION										
Schooling										
Incomplete Elementary/Middle	5	100		.004	4 (80.0)	.27	3 (60.0)	.53	4 (80.0)	.16
Completed Middle	29	100			18 (62.1)	.55	13 (44.8)	.89	15 (51.7)	.76
Incomplete High School	17	100			10 (58.8)	.84	10 (58.8)	.29	7 (41.2)	.48
Completed High School (may have started graduation but did not complete)	1,182	100			741 (62.7)	<.001**	603 (51.0)	<.001**	625 (52.9)	<.001**
Completed graduation	726	100			385 (53.0)	.03	310 (42.7)	.031	348 (47.9)	.424
Completed postgraduation	736	100			365 (49.6)	<.001**	304 (41.3)	.002*	327 (44.4)	.003*
Is the person currently a student?										
Student	1,162	100		.05	733 (63.1)	<.001**	597 (51.4)	<.001**	610 (52.5)	*
Non-Student	1,533	100			790 (51.5)		646 (42.1)		716 (46.7)	
Main Occupation Type, General										
Unemployed	125	100†	Dismissed > 3 months ago	.004	44 (62.0)	.368	38 (53.5)	.194	38 (53.5)	.484
			Dismissed up to 3 months ago		38 (71.7)	.021	32 (60.4)	.036	31 (58.5)	.162
Freelancer	495	100			230 (46.4)	<.001**	183 (36.9)	<.001**	232 (46.8)	.230
Private sector	762	100			408 (53.5)	.045	338 (44.4)	.230	343 (45.0)	.007
Public employee	48	100			24 (50.0)	.368	20 (41.7)	.549	19 (39.6)	.194
Student	1,162	100			733 (63.1)	<.001**	597 (51.4)	<.001**	610 (52.5)	.003*
Retired/Receiving pension	103	100			46 (44.7)	.012	35 (34.0)	.012	53 (51.5)	.617
Occupation in Health management										
Non-health worker	2,005	100		.008	1,141 (56.9)	NS	943 (47.0)	NS	1,015 (50.6)	.012
Health worker/student, not involved in care of COVID patients	519	100			94 (55.3)		68 (40.0)		75 (44.1)	.057
Health worker/student, involved in care of COVID patients	170	100			288 (55.5)		232 (44.7)		236 (45.5)	.162
Caregiver										
Provides direct care to 1 or more people	105	100		.05	73 (69.5)	.006*	66 (62.9)	<.001**	66 (62.9)	.004*

Condition	N	%	subsets, when suitable	α	Anxious N (%)	p	Depressed N (%)	p	Bad Sleeper N (%)	p
Does not provide direct care to anybody	2,590	100			1,450 (56.0)		1,177 (45.4)		1,260 (48.6)	

Table 2c - Statistical analysis of different groups, by financial characteristics (α - adjusted p after Bonferroni correction, * - $p < \alpha$; ** - $p < 0.001$; † - 100% for each subset, NS – chi square test was non-significant, hence post-hoc analysis was not performed in this category)

Condition	N	%	subsets, when suitable	α	Anxious N (%)	p	Depressed N (%)	p	Bad Sleeper N (%)	p
Total population	2,695	100		--	1,523 (56.5)	--	1,243 (46.1)	--	1,326 (49.2)	--

C - FINANTIAL STATUS

Family Income										
Less than R\$ 1,200/mo	102	100		.006	77 (75.5)	<.001**	62 (60.8)	.004*	56 (54.9)	.271
R\$ 1,200 – 3,000/mo	498	100			320 (64.3)	<.001**	288 (57.8)	<.001**	276 (55.4)	.004*
R\$ 3,001 – 10,000/mo	1,021	100			600 (58.8)	.110	484 (47.4)	.617	513 (50.2)	.689
Above R\$ 10,000/mo	768	100			361 (47.0)	<.001**	284 (37.0)	<.001**	343 (44.7)	<.001**
Change in family income										
Income did not drop	993	100†	Income has improved	.005	19 (54.3)	.764	11 (31.4)	.072	14 (40.0)	.271
			Income hasn't changed		489 (51.0)	<.001**	405 (42.3)	.003*	466 (48.6)	.689
Income dropped	1,702	100†	Up to 25% drop		475 (55.0)	.271	386 (44.7)	.317	403 (46.7)	.072
			25 – 50% drop		357 (63.0)	<.001**	287 (50.6)	.016	288 (50.8)	.368
			More than 50% drop		183 (67.3)	<.001**	154 (56.6)	<.001**	155 (57.0)	.007
Provider of family income										
Responder is the main provider	726	100†	Is the sole provider	.006	147 (51.9)	.110	124 (43.8)	.424	141 (49.8)	NS
			Other members contribute with a lesser proportion		225 (50.8)	.007	172 (38.8)	.001*	218 (49.2)	
Responder is not the main provider	1,969	100†	Responder contributes with some amount		476 (55.5)	.484	408 (47.6)	.317	398 (46.4)	
			Responder does not contribute at all		675 (60.8)	<.001**	539 (48.5)	.360	569 (51.2)	

Table 2d -Statistical analysis of different groups, by physical characteristics, comorbidities, habits and behaviors (α - adjusted p after Bonferroni correction, * - $p < \alpha$; ** - $p < 0.001$ † - 100% for each subset, NS – chi square test was non-significant, hence post-hoc analysis was not performed in this category)

Condition	N	%	subsets, when suitable	α	Anxious N (%)	p	Depressed N (%)	p	Bad Sleeper N (%)	p
Total population	2,695	100		--	1,523 (56.5)	--	1,243 (46.1)	--	1,326 (49.2)	--
D - PHYSICAL CONDITIONS, COMORBIDITIES, HABITS AND BEHAVIORS										
BMI										
Normal weight	1,500	100		.05	863 (57.5)	NS	686 (45.7)	NS	779 (51.9)	NS
Overweight	771	100			415 (53.8)		345 (44.7)		390 (50.6)	
Obese	2,695	100			244 (58.0)		210 (49.9)		199 (47.3)	
# of Comorbidities/person										
No comorbidities	1,959	100		.006	1,098 (56.0)	NS	885 (45.8)	NS	926 (47.3)	.001*
1 comorbidity	580	100			334 (57.6)		277 (47.8)		311 (53.6)	.016
2 comorbidities	120	100			69 (57.5)		65 (54.2)		65 (54.2)	.271
3 or more comorbidities	36	100			22 (61.1)		16 (44.4)		24 (66.7)	.036
Smoker										
No	2,507	100		.008	1,400 (55.8)	.009	1,148 (45.8)	NS	1,198 (47.8)	<.001**
Yes	188	100†	Up to 10 cigarettes/day		83 (64.8)	.057	66 (51.6)		84 (65.6)	<.001**
			More than 10 cig./day		40 (66.7)	.110	29 (48.3)		44 (73.3)	<.001**
Alcohol intake										
No	1,523	100		.005	866 (56.9)	NS	755 (49.6)	<.001**	727 (47.7)	NS
Yes	1,172	100†	Up to twice/week, no nocturnal consumption		52 (50.5)		46 (44.7)	.764	47 (45.6)	
			More than twice/week, no nocturnal consumption		8 (57.1)		5 (35.7)	.424	6 (42.9)	
			Up to twice/week, with nocturnal consumption		430 (55.3)		317 (40.8)	<.001**	387 (49.8)	
			More than twice/week, with nocturnal consumption		167 (60.1)		120 (43.2)	.317	156 (56.1)	
Nocturnal Alcohol Intake, regardless of frequency (for those who took alcohol, N =1,172)										
No nocturnal intake	880	100		.05	192 (55.2)	NS	148 (42.5)	NS	182 (52.3)	NS
With nocturnal intake	292	100			465 (56.4)		340 (41.3)		417 (50.6)	
Symptoms of COVID-19										
No symptoms	2,296	100		.006	1,253 (54.6)	<.001**	1,019 (44.4)	<.001**	1,095 (47.7)	<.001**

Condition	N	%	subsets, when suitable	α	Anxious N (%)	p	Depressed N (%)	p	Bad Sleeper N (%)	p
Had symptoms	399	100 [†]	COVID-19 test was negative		39 (51.3)	.368	35 (46.1)	1.0	36 (47.4)	.764
			Test results still waiting, or did not test for COVID-19		213 (72.2)	<.001**	173 (58.6)	<.001**	179 (60.7)	<.001**
			COVID-19 test was positive		18 (64.3)	.423	16 (57.1)	.230	16 (57.1)	.423
Fear of contracting COVID-19										
Has already contracted	28	100		.006	18 (64.3)	.424	15 (53.6)	.424	15 (53.6)	.617
Did not contract to the date	2,667	100 [†]	Not or little worried		165 (36.4)	<.001**	143 (31.6)	<.001**	178 (39.3)	<.001**
			Moderately worried		733 (52.2)	<.001**	596 (42.4)	<.001**	662 (47.1)	.021
			Very much worried		607 (75.0)	<.001**	489 (60.4)	<.001**	471 (58.2)	<.001**
Time spent gathering news about COVID-19 on TV and other media										
Does not follow news	134	100		.006	76 (56.7)	1	60 (44.8)	.764	64 (47.8)	.764
Follows the news	2,561	100 [†]	Up to one hour/day		775 (51.2)	<.001**	640 (42.2)	<.001**	692 (45.7)	<.001**
			1-3 hours/day		462 (62.3)	<.001**	382(51.5)	.001*	389 (52.4)	.036
			More than 3 hours/day		210 (69.1)	<.001**	161(53.0)	.012	181 (59.5)	<.001**
Time spent with Physical Activity, compared to before COVID-19										
Exercising less than before the pandemic	1,556	100 [†]	Much less		660 (60.8)	<.001**	544 (50.1)	<.001**	578 (53.2)	<.001**
			Somewhat less		252 (53.7)	.194	193 (41.2)	.016	201 (42.9)	.003*
Exercising equal or more than before the pandemic	1,139	100 [†]	Equal than before		282 (51.0)	.004*	243 (43.9)	.230	247 (44.7)	.016
			Somewhat more		177 (52.8)	.134	146 (43.6)	.317	160 (47.8)	.549
			Much more		152 (60.3)	.194	117 (46.4)	.920	140 (55.6)	.036
Frequency of Practice of Physical Activity (current and compared to before COVID-19)										
Did not practice before the pandemic	960	100 [†]	Remains sedentary		477 (64.9)	<.001**	378 (51.4)	<.001**	397 (54.0)	.424
			Started practicing		134 (59.6)	<.001**	108 (48.0)	<.001**	129 (57.3)	.002*
Practiced before the pandemic	1,735	100 [†]	Is not practicing now		450 (62.3)	.317	401 (55.5)	.549	364 (50.4)	.012
			Still practices, less than 3x/week		210 (50.1)	.004*	152(36.3)	<.001**	196 (46.8)	.271
			Still practices, 3+ times/week		252(42.4)	<.001**	204 (34.3)	<.001**	240 (40.4)	<.001**
Time preferred for practice of exercises (for those currently practicing, N = 1,487)										
Morning	380	100		.006	168 (44.2)	NS	126 (33.2)	.003*	156 (41.1)	NS
Afternoon	361	100			189 (52.4)		149 (41.3)	.484	177 (49.0)	
Evening	415	100			214 (51.6)		183 (44.1)	.036	191 (46.0)	

Condition	N	%	subsets, when suitable	α	Anxious N (%)	p	Depressed N (%)	p	Bad Sleeper N (%)	p
Variable	331	100			173 (52.3)		133 (40.2)	.841	156 (47.1)	
Time spent on social activities (SA) - phone or video calls/conferences, personal relations etc.										
Less social interactions than before the pandemic	512	100		.05	314 (61.3)	.015*	286 (55.9)	<.001**	304 (59.4)	<.001**
Equal or more social interactions than before the pandemic	2,183	100			1,209 (55.4)		957 (43.8)		1,022 (46.8)	
Time spent in instrumental activities (IA) - care of offspring, parents or other relatives, pet sitting, cleaning the house and other household chores, religious activities etc.										
Less instrumental activities than before the pandemic	260	100		.05	176 (67.7)	<.001**	149 (57.1)	<.001**	161 (61.7)	<.001**
Equal or more instrumental activities than before the pandemic	2,435	100			1,347 (55.3)		1,094 (44.9)		1,165 (47.9)	

Table 3 – Univariate logistic regression Odds Ratio (OR) and Confidence Interval (CI) among groups and subsets compared. When more than two subsets were present, the subset used as reference is the one with OR = 1

Condition	Anxious OR	CI 95%	Depressed OR	CI 95%	Bad Sleeper OR	CI 95%
A - DEMOGRAPHICS						
<i>AGE - Compared to the 4th quartile</i>						
1 st quartile (18-22)	2.54	2.05—3.15	2.02	1.63—2.50	1.40	1.13—1.72
2 nd quartile (23-27)	2.12	1.69—2.66	1.66	1.32—2.09	1.18	0.94—1.47
3 rd quartile (28-38)	1.86	1.49—2.31	1.59	1.27—1.98	1.14	0.92—1.42
4 th quartile (39-79)	1	--	1	--	1	--
SEX						
Women (cis or trans)	2.19	1.83—2.63	1.75	1.46—2.10	1.54	1.29—1.85
Men (cis or trans)	1	--	1	--	1	--
<i>Race (auto declaration) - Other races compared to "Whites"</i>						
White	1	--	1	--	1	--
Mestizos	1.36	1.12—1.66	1.50	1.24—1.82	0.99	0.81—1.20
Black	1.21	0.83—1.77	1.48	1.02—2.16	0.89	0.62—1.30
Asian	0.82	0.46—1.46	1.19	0.67—2.10	.74	0.41—1.31
Indigenous	2.88	0.60—13.91	0.65	0.16—2.58	3.60	0.75—17.38
# People living together during the pandemic						
Responder lives alone	1	--	1	--	1	--
Lives with more people	1.29	0.96—1.75	1.23	0.91—1.67	0.94	0.70—1.27
B - EDUCATION/OCCUPATION						
<i>Schooling - All compared to "Completed postgraduation"</i>						
Incomplete Elementary/ Middle	4.07	0.45—36.55	2.13	0.35—12.83	5.00	0.56—44.98
Completed Middle, never started	1.66	0.78—3.57	1.16	0.55—2.44	1.34	0.64—2.82
High School						
Incomplete High School	1.45	0.55—3.86	2.03	0.76—5.39	0.88	0.33—2.33
Completed High School (may have started	1.71	1.42—2.06	1.48	1.23—1.78	1.40	1.17—1.69
University but did not complete)						
Completed graduation	1.15	0.94—1.41	1.06	0.86—1.30	1.15	0.94—1.42
Completed postgraduation	1	--	1	--	1	--
Is the person currently a student?						

Condition	Anxious OR	CI 95%	Depressed OR	CI 95%	Bad Sleeper OR	CI 95%
Yes, person is currently a student	1.60	1.38—1.88	1.45	1.25—1.69	1.26	1.08—1.47
No, person is not currently a student	1	--	1	--	1	--
Unemployed vs Others						
Unemployed	1.53	1.05—2.24	1.55	1.07—2.22	1.31	0.91—1.89
Employed/Student/Retired	1	--	1	--	1	--
Occupation in Health management						
Non-health worker	1	--	1	--	1	--
Healthcare worker/student	0.94	0.79—1.12	0.87	0.73—1.04	0.80	0.68—0.93
Caregiving						
Not a caregiver	1	--	1	--	1	--
Caregiver	1.79	1.18—1.74	2.03	1.36—3.04	1.79	1.19—2.67
C – FINANTIAL STATUS						
<i>Family Income - All compared to "Above R\$ 10,000/month"</i>						
Less than R\$ 1,200/month	3.47	2.16—5.57	2.64	1.73—4.04	1.51	1.00—2.29
R\$ 1,200 – 3,000/month	2.03	1.61—2.56	2.34	1.86—2.94	1.54	1.23—1.93
R\$ 3,001 – 10,000/month	1.61	1.33—1.94	1.54	1.27—1.86	1.25	1.04—1.51
Above R\$ 10,000/month	1	--	1	--	1	--
Change of family income						
Income did not drop	1	--	1	--	1	--
Income dropped	1.41	1.21—1.65	1.31	1.12—1.54	1.06	0.90—1.24
Provider of family income						
Responder is main provider	1	--	1	--	1	--
Responder is not main provider	1.34	1.13—1.59	1.35	1.13—1.60	0.99	0.83—1.17
D – PHYSICAL CONDITIONS, COMORBIDITIES, HABITS AND BEHAVIORS						
BMI						
Normal	1	--	1	--	1	--
Overweight/Obese	1.05	0.90 – 1.23	1.01	0.86—1.17	.98	0.84—1.14

Condition	Anxious OR	CI 95%	Depressed OR	CI 95%	Bad Sleeper OR	CI 95%
Comorbidities or other health conditions						
No comorbidities	1	--	1	--	1	--
With comorbidity(s)	1.07	0.90—1.27	1.15	0.97—1.36	1.33	1.12—1.57
Smoker						
No	1	--	1	--	1	--
Yes	1.50	1.10—2.04	1.21	0.90—1.63	2.33	1.70—3.20
Alcohol intake						
No	1	--	1	--	1	--
Yes	0.96	0.83—1.13	0.73	0.63—0.85	1.15	0.97—1.34
Symptoms of COVID-19						
No symptoms or COVID-19 was ruled out	1	--	1	--	1	--
Had symptoms, COVID-19 diagnosed or tests not ready	2.10	1.63—2.71	1.76	1.39—2.23	1.67	1.32—2.12
Fear of contracting COVID-19 (excluded people who contracted) OBS: compared to "little worried"						
Did not contract to the date						
- Not or little worried	1	--	1	--	1	--
- Moderately worried	1.90	1.53—2.37	1.60	1.28—2.00	1.38	1.11—1.71
- Very much worried	5.24	4.08—6.71	3.31	2.60—4.22	2.16	1.70—2.72
Time spent gathering news about COVID-19 on any media OBS: compared to not following news						
Does not follow news	1	--	1	--	1	--
Follows the news						
- Up to one hour/day	0.80	0.56—1.14	0.90	0.63—1.29	0.92	0.65—1.31
- 1-3 hours/day	1.26	0.87—1.83	1.31	0.90—1.89	1.21	0.83—1.74
- More than 3 hours/day	1.71	1.12—2.59	1.39	0.92—2.09	1.61	1.07—2.42
Practice of Exercises OBS: All compared to "practiced before, still practices > 3 times/week"						
Did not practice before the pandemic						
- Remains sedentary	2.51	2.01—3.13	2.02	1.62—2.53	1.73	1.39—2.16
- Started practicing	2.00	1.46—2.73	1.77	1.29—2.41	1.98	1.45—2.71

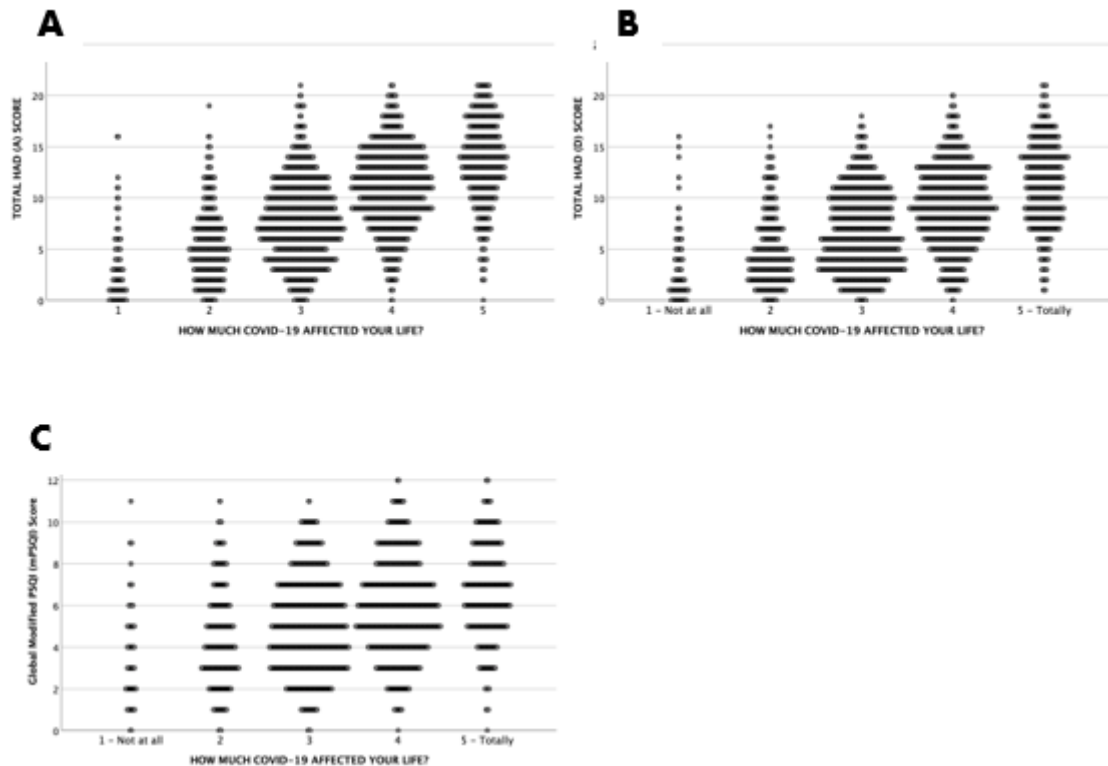
Condition	Anxious OR	CI 95%	Depressed OR	CI 95%	Bad Sleeper OR	CI 95%
Practiced before the pandemic						
- Is not practicing now	2.25	1.80—2.80	2.39	1.91—2.99	1.50	1.20—1.87
- Still practices, less than 3x/week	1.36	1.06—1.75	1.09	0.84—1.41	1.30	1.01—1.67
- Still practices, 3+ times/week	1	--	1	--	1	--
Time preferred for practice of exercises (for those currently practicing)						
Prefers morning	1	--	1	--	1	--
Prefers afternoon	1.39	1.04—1.85	1.42	1.05—1.91	1.38	1.03—1.85
Prefers evening	1.34	1.02—1.78	1.59	1.19—2.12	1.22	0.92—1.62
Varies/no preference	1.38	1.03—1.86	1.35	0.99—1.84	1.28	0.95—1.72
Time spent on social activities (SA)						
Less than before the pandemic	1.28	1.05—1.56	1.62	1.34—1.97	1.66	1.37—2.02
Equal/more than before the pandemic	1	--	1	--	1	--
Time spent in instrumental activities (IA)						
Less than before the pandemic	1.67	1.27—2.19	1.63	1.26—2.11	1.75	1.35—2.28
Equal/more than before the pandemic	1	--	1	--	1	--

Table 4 – Two-tailed Spearman Correlation index among HAD (A) and (D) Scores, modified PSQI (mPSQI) Score, Fear of Contracting COVID-19 and Likert-scale grade (1 to 5) for How much COVID-19 was perceived to affect responder’s life, in general.

Spearman 2-tailed Correlation index (ρ)	Total HAD (A) Score	Total HAD (D) Score	Global mPSQI Score	Fear of Contracting COVID-19	How much COVID-19 affected Life (1 - lowest to 5 - highest)
Total HAD (A) Score	1	.677**	.448**	.327*	.576**
Total HAD (D) Score	.677**	1	.426**	.238*	.493**
Global mPSQI Score	.448**	.426**	1	.150*	.314*
Fear of Contracting COVID-19	.327*	.238*	.150*	1	.268*
How much COVID-19 affected Life (1 - lowest to 5 - highest)	.576**	.493**	.314*	.268*	1

* $p < 0.001$, WEAK correlation $\rho < 0.40$
 ** $p < 0.001$, MODERATE correlation $0.40 \leq \rho < 0.70$

Graph 1 – Cumulative dispersion of the Likert-scale grade for how much COVID-19 was perceived to affect responder’s life versus HAD (A) Score in A, HAD (D) Score in B and Global modified PSQI in C



4 DISCUSSION

In this survey, we found global rates of 56.5% for possible anxiety, 46.1% for possible depression and 49.2% for bad sleep quality.

A meta-analysis conducted by Salari et. al²⁷ found, among 17 studies conducted in 2020, anxiety rates varying between 6.33% and 50.9% (mean of 32.9% for Asian and 23.8% for European studies) and depression rates from 17.17% to 53.5% (mean of 35.3% for Asian and 32.4% for European studies). Assessment for those conditions was heterogeneous. The most frequent used instruments were the DASS-21 - Depression, Anxiety and Stress Scale²⁸, the GAD-7 – Generalized Anxiety Disorder 7-item²⁹, and the PHQ-9 – Patient Health Questionnaire³⁰.

Rates of anxiety and depression in our survey were higher than the averages of the aforementioned meta-analysis, however some factors must be bore in mind: first, none of those studies used the HAD scale for anxiety and depression, adopted in this study. Secondly, and in particular regarding anxiety rate, studies that used the DASS-21 scale also assessed stress levels. Some of the stress questions are of resemblance with anxiety questions of the HAD scale - for instance: “I found it hard to wind down” is accounted

for stress in DASS-21, and “I feel tense or 'wound up’“ is accounted for anxiety in HAD. This raises a possibility that, in studies based on the DASS-21, anxiety rates were lower due to a split caused by the stress group. Thirdly, none of those studies included were from Latin-American countries. Another Brazilian study³¹, with 45,161 participants, intended to evaluate sadness/depression, anxiety/nervousness and sleep problems.

Data was collected online between April 24th and May 24th, 2020, a time window very much similar to ours. Although using a much simpler form, consisting of a few questions – i.e., not using standardized, validated questionnaires, this survey found rates of 52.6% of anxiety/nervousness, 43.5% of sadness/ depression and 43.5% of an onset of sleep issues, percentages that resemble ours.

Studies conducted out of a pandemic scenario shows lower rates of the same disturbances. A Brazilian, multicenter survey of 2014³², was conducted with data from 1,857 participants who were assessed when using primary healthcare, from four Brazilian cities. This study also used the HAD scale as instrument to assess mental disorders. Anxiety rates oscillated from 35.4% to 43%, and depression rates ranged between 21.4% and 31%. In our survey, anxiety and depression rates (see **Tables 2a-d**) are higher. Another study³³ estimated, by analysis of 12,000 people that responded to the 2011 National Health and Wellness Survey in Brazil, the prevalence of Major Depression to be 10.2%, again much lower than what we found.

Our data shows that younger, females, students, people with lower familiar monthly income or a significant drop of income during the epidemic, unemployed, people following more hours per day of news concerning COVID-19, people engaging less in exercising and in social and instrumental activities were groups associated with greater odds of being possibly anxious, depressed and/or bad sleeper. Younger age and more time following news were also associated with higher levels of mental and sleep issues in a Chinese survey of 7,236 volunteers, conducted by Huang and Zhao⁸, corroborating our findings for these groups.

Mestizos were more likely to be possibly depressed. Although rates of one or both disturbances were also higher in blacks and native Brazilians (indigenous), this did not reach statistical significance, possibly due to low sampling. The disproportional high rate of whites (74.1%) and low rates of mestizos (19.4%), blacks (4.4%) and other ethnicities responding (latest Brazilian census shows 47.5% of auto-declared whites, 43.2% of mestizos and 7.5% of blacks³⁴) are clear evidence of the social and economic inequality in our local reality³⁵.

BMI did not influence rates of anxiety, depression and bad sleep, while the absence of comorbidities was a protective factor for better sleep quality, but not for anxiety and depression. Sedentary people (regardless of being or not active before the pandemic) were more prone all those conditions, and those who already practiced before and kept practicing more than 3 times a week showed the least tendency to mental and sleep disturbances, showing that exercising played a role in preventing worsening of mental and sleep status in our sample. Also, of note, people that preferred to exercise early were less depressed. That could be due a bidirectional relationship, as depression is commonly linked with morning fatigue and unwillingness to engage in energetic activities³⁶.

Curiously enough, those who did not consume alcohol had a significant higher rate of depression than alcohol consumers. We do not propose a logical explanation, but researchers should pay attention to forthcoming articles, to see if this pattern replicates, or if it could be merely coincidental. Conversely, despite not reaching significant differences, but towards what is traditionally more expected, alcohol consumers, especially those with nocturnal consumption, had higher rates of anxiety and bad sleep quality. Smokers had greater incidence of bad sleep quality, especially those who smoked more than 10 cigarettes per day. This is expected, as smoking is known to be disruptive to good sleep³⁷.

Also relevant is the observation that, in most of the similar studies we found so far, where snowball recruiting was performed - therefore sampling was not randomized but rather by convenience, younger adults (up to the fourth decade of life) and females were the most solicitous. Female participation was majoritarian in most studies conducted worldwide, with encountered proportions of 51%¹² 53.8%¹⁷, 54.6%⁸, 64.7%¹⁵, 66%¹⁰, 76.1%¹⁶, 76.3% (our data) and 81.1%⁹. Females were the minority in two studies, with proportions of 41.6%¹¹ and 45.5%¹³. Mean ages, for papers that provided this asset, were of 31.7 (our data), 33¹¹, and 35.3⁸. Other papers provided age ranges: one study disclosed that 56.5% of participants were from 18 to 25 years-old⁹, in another 77% of participants were from 18 to 40 years-old¹⁰, and yet in other 47.3% were aged between 18-35 years, and an additional 33.8% were from 36 to 45 years-old¹⁷. While youth is naturally expected to outweigh middle agers and seniors, due to easiness of interaction with digital technology, the more participation of females could be multifactorial.

Apart from snowball sampling, there were other limitations. By lowering by 7 points the maximum punctuation possible of the PSQI, the authors acknowledge that sensitivity might have been diminished for detection of bad sleepers, but a necessary cost, given the facts already explained in methodology. Nonetheless, we consider that the specificity of the diagnosis of bad sleep remained unharmed, and the high proportion of bad sleepers, with the mPSQI, is by itself a fact worthy of consideration.

5 CONCLUSION

The DEGAS-CoV study, in accordance to many published papers so far, showed high rates of anxiety (56.5%), depression (46.1%) and bad sleep quality (49.2%). These rates reflect the time of data collection, in the second trimester of 2020, in the Brazilian population.

Some groups were more prone to those disturbances, such as: younger people, women, mestizos, people with lesser years of education, of lower income or whose income dropped significantly during the pandemic, unemployed, caregivers, people who followed more hours of news of COVID-19, sedentary or those who engaged less in physical activity, and those less engaged in social and instrumental activities. More studies, especially longitudinal, could provide more information on if the prevalence of mental and sleep issues remains constant during the pandemic crisis or suffer changes related to different aspects, like adaptation to the situation, social restriction relaxation and improved treatments or vaccines. We also intend to conduct further sub-analyses of our data, in search of more significant statistical findings.

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