Mental violence: anxiety and depression during COVID-19 pandemic in Brazil

Violência mental: ansiedade e depressão durante a pandemia de COVID-19 no Brasil

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ABSTRACT

Anxiety and depression disorders are associated with professional and academic impairment and reduced life quality. Frequency of symptoms of anxiety and depression, and their association with health risk behaviors during the COVID-19 pandemic are evaluated. Cross-sectional study comprised 1,057 participants, 78% females, mean age 38±14 years, from 21 different Brazilian states. GAD-7 and PHQ-9 inventories were applied by Google Forms, with snowball sampling. Forty-two percent of the participants had a GAD-7 score $\geq$ 10, while 53% had a PHQ-9 score $\geq$ 10. Main risk factors comprised: being female, young, married or with partner, consuming alcoholic beverages, having previous psychiatric problems, taking sleeping pills, sleeping less than 8 hours, having a negative perception about COVID-19, staying isolated, having frequent nightmares and suicide thoughts. Brazil is a country featuring high levels of symptoms of anxiety and depression, significantly associated with suicide thoughts.

Keywords: Anxiety. COVID-19. Depression. Health personnel. Primary health care.

RESUMO

Buscou-se avaliar a frequência de ansiedade e depressão e seus fatores associados ao longo da pandemia de COVID-19. Estudo transversal exploratório envolvendo 1.057 participantes, sendo aplicados os questionários GAD-7 e PHQ-9, através de Plataforma *Google Forms*, com amostragem bola de neve. A média de idade foi de 38 ± 14 anos, sendo 78% mulheres, provindos de 21 Estados brasileiros. Quarenta e dois por cento dos participantes tiveram escore GAD-7 $\geq$ 10, cerca de 53% teve escore PHQ-9 $\geq$ 10. Principais fatores de risco incluíram: gênero feminino, ser jovem, casado ou com companheiro, consumir bebidas alcoólicas, problemas psiquiátricos prévios, utilizar medicação para dormir, dormir menos de 8 horas, percepção negativa sobre COVID-19, estar em isolamento social, pesadelos frequentes e ideação suicida. O Brasil mantém-se com altos níveis de ansiedade e depressão durante a pandemia em associação com ideação suicida.

Palavras-chave: Ansiedade. Atenção primária à saúde. COVID-19. Depressão. Profissional de saúde.

INTRODUCTION

The years 2020 and 2021 are characterized by the expansion of the Coronavirus Disease (Covid-19), a novel disease with high transmissibility and morbidity capacity, forcing all countries to implement extreme measures to limit its dissemination. It has produced deep changes in personal and labor relationships for millions of people [1,2].

It may be surmised that the experience of a pandemic, such as Covid-19, is producing a greater frequency of anxiety and depression symptoms in Brazil, with great harm to the population´s mental health. The reasons for such relationship are several: information spreading worldwide at incredible speed, its morbid content, the morbidity and mortality of the new disease without treatment, associated with the experience of physical distancing, economic uncertainty, interrupted education, changes in work modes and family relationships, the way food is obtained, and others[1,2].

In 2015, Brazil was already a country with the highest prevalence of anxiety worldwide (9.3%), with a rate three times higher than world indexes. The country had the highest rate of people with depression in Latin America[3]. During the pandemic, social isolation and quarantine measures were introduced in all Brazilian states, based on Federal Law 13,979/2020 which made mandatory the closure of activities in the country in the initial months of the COVID-19 pandemic. However, an intense ideological disparity between government organs and scientific authorities occurred which, in addition to multiculturalism and diversity, also reflect disagreement on measures to harness the pandemic, and possibly expanding the global context that has already caused so much suffering and fear[4].

It should be underscored that anxiety and depressive disorders may disrupt, at various levels, activities at work, school or in people´s daily life, with significant morbidity. One should not forget depression is also related to suicide risk[3,5]. Thus, COVID-19 pandemic has generated "a collective mental violence", with great emotional impact worldwide. In fact, Brazil has become even more exposed within this unprecedented context.

Current study is perhaps one of the first investigations to analyze symptoms of anxiety and depression during the COVID-19 pandemic in a Brazilian sample. It evaluates the impact on mental health of Brazilians during this unprecedented period of COVID-19 pandemic and assesses the frequency of anxiety and depression symptoms and their association with health risk behaviors and suicidal thought. It further aims at providing data to health organizations and policymakers, considering the need for innovative psychosocial interventions in the near future, especially in primary health care, and emphasizing the relevance of such threats to mental health.

METHODOLOGY

Current analysis was registered on Plataforma Brasil, no. 31799220.4.0000.0104 and has been approved by the Committee for Ethics and Research of the Universidade Estadual de Maringá, Maringá PR Brazil, approval n. 4.045.034 of May 22, 2020.

PARTICIPANTS AND PROCEDURES

Participants were invited to answer an online questionnaire, titled "Mental Violence: Covid-19 Nightmare", by virtual snowball sampling. Access link to the structured questionnaire and the term of free consent were placed on the social networks during seven days, between 25th May and 1st June 2020. Access link was launched for family groups, students, religious members, multidisciplinary health groups, teachers, teams of engineers, artists, parents' association in kindergartens and several other groups that accessed the link through Facebook and other social networks (Instagram and WhatsApp). The inclusion criterion was being 18 years old or over. The sample was calculated and made adequate for such analysis. Research included questions dealing with social and demographic characteristics, occupational status, behavior to health risks, clinical antecedents, plus the application of the Generalized Anxiety Disorder-7 (GAD-7) and the Patient Health Questionnaire-9 (PHQ-9). Participation was voluntary and anonymous through online Google Platforms. Participants could participate and invite others through individual or collective invitations (transmission groups).

STUDY DESIGN AND TOOLS

Current transversal and exploratory study included a structured research elaborated by the researchers and the application of questionnaires GAD-7 and PHQ-9, to determine moderate to severe anxiety and depression scores during the Covid-19 pandemic in the sample under analysis, through the analysis of associations between risk perception and self-protection measures. Research was structured according to the following sections: 1) social and demographic data – age, gender, ethnicity, civil state, residence and religion; 2) occupational situation and exposure to Covid-19 – profession, occupation, exposure and threats related to Covid-19, social isolation and the use of a face shield or mask; 3) personal and clinical antecedents – health risk behavior, sleep and previous medical and psychiatric conditions, including suicide thoughts related to the pandemic; 4) evaluation of questionnaires GAD-7 and PHQ-9 (score <10 points - ≥10 points), coupled to specific contents related to the Covid-19 pandemic.

DEPENDENT VARIABLES

GAD-7

GAD-7 comprises seven items; severity is estimated by the sum of scores of each item within a Likert-type scale from 0 to 3, varying between "Not once" (0) and "Almost every day" (3). Cross-point ≥10 characterized anxiety symptoms from moderate to severe.

PHQ-9

PHQ-9 comprises nine items of the depression module and evaluates criteria for greater depression of the Diagnostic and Statistical Manual of Mental Disorders (DSM). Severity is calculated by the sum of scores for each item within a Likert-type scale from 0 to 3, varying between "Not once" (0) and "Almost every day" (3). Cross-point ≥10 characterized depression symptoms from moderate to severe.

INDEPENDENT VARIABLES

Independent variables included health risk behavior, clinical antecedents and Covid-19-related variables. Participants were asked whether they kept social distancing and self-protection, for what period, whether it was necessary to isolate themselves from family members due to contamination risks or from interacting with work colleagues with high exposure risks with other infected people. They were asked on usual taking of alcoholic beverages and their quantity prior to pandemic, changes in consumption of alcoholic beverages during the pandemic, mean sleep duration during the previous month, the presence of nightmares, the ingestion of sleeping pills and previous psychiatric care for insomnia, depression or anxiety. Participants were also asked whether they had suicide thoughts or desire of dying during the pandemic.

STATISTICAL ANALYSIS

Descriptive statistics included absolute frequencies and percentages for categorical variables and means with standard deviation for continuous variables. The chi-square text was employed to compare proportions and test association between groups. Logistic regression models evaluated the association strength between independent variables and scores from the anxiety and depression questionnaires. Analyses were performed by IBM SPSS Statistics v. 25.

RESULTS

CHARACTERISTICS OF THE SAMPLE

Current study comprised 1,068 participants from 21 Brazilian states, mean age 38.1 ± 13.7 years old (18-79), of whom 78% were female, answered the questionnaires, with only 11 exclusions due to missing data. Most were white (77%), married (45%), hailing from the South (55%) or Southeast (36%) of Brazil, declaring to be Catholics (42%). More than a third of the interviewed people were health professionals (38%) and 42% of the participants showed moderate to severe symptoms of anxiety (score GAD-7 ≥ 10), whereas 53% revealed moderate to severe depression symptoms (score PHQ-9 ≥ 10). Tables 1 - 3 also show the absolute and relative frequency of each variable.

Table 1. Frequency of anxiety and depression symptoms by demographic characteristics

	N (%)	Score GAD-7		Chi- (value p)	Score PHQ-9		Chi- (value p)
		<10 (n=616)	≥10 (n=441)		<10 (n=493)	≥10 (n=564)	
Gender (N=1055)[1]							
Female	829 (78.2)	459 (55.3)	370 (44.7)	13.6 (<0.001)*	348 (41.9)	481 (58.1)	33.7 (<0.001)*
Male	226 (22.8)	156 (69)	70 (31)		144 (63.7)	82 (36.3)	
Age (N=1046)[2]							
<20	80 (7.6)	29 (36.2)	51 (63.8)		14 (17.5)	66 (82.5)	
21-29	261 (25)	134 (51.3)	127(48.7)		93 (35.6)	168 (64.4)	
30-39	278 (26.6)	145 (52.1)	133 (47.9)	76.2 (<0.001)*	110 (39.6)	168 (60.4)	125.4 (<0.001)*
40-49	194 (18.5)	117 (60.3)	77 (39.7)		98 (50.5)	96 (49.5)	
50-59	148 (14.1)	114 (77)	34 (23)		105 (70.9)	43 (29.1)	
60>	85 (8.2)	74 (87.1)	11 (12.9)		70 (82.4)	15 (17.6)	
Ethnicity (N=1057)							
White	817 (77.3)	479 (58.6)	338 (41.4)		390 (47.8)	427 (52.2)	
Brown	155 (14.7)	82 (52.9)	73 (47.1)	3.4 (0.328)	63 (40.6)	92 (59.4)	2.9 (0.394)
Black	39 (3.7)	26 (66.7)	13 (33.3)		17 (43.6)	22 (56.4)	
Other	46 (4.3)	29 (63)	17 (37)		23 (50)	23 (50)	
Civil status (N=1057)							
Single	406 (38.4)	217 (53.4)	189 (46.6)		138 (34)	268 (66)	
Married	477 (45.2)	302 (63.3)	175 (36.7)	17.8 (<0.001)*	270 (56.6)	207 (43.4)	59.9 (<0.001)*
With partner	87 (8.2)	39 (44.8)	48 (55.2)		30 (34.5)	57 (65.5)	
Other	87 (8.2)	58 (66.7)	29 (33.3)		55 (63.2)	32 (36.8)	
Regions in Brazil (N=1057)							
South	583 (55.1)	343 (58.8)	240 (41.2)		277 (47.5)	306 (52.5)	
Southeast	379 (35.8)	221 (58.3)	158 (41.7)		175 (46.2)	204 (53.8)	
Midwest	40 (3.8)	26 (65)	14 (35)	4.1 (0.388)	21 (52.5)	19 (47.5)	3.6 (0.454)
North	16 (1.5)	8 (50)	8 (50)		6 (37.5)	10 (62.5)	
Northeast	38 (3.8)	17 (44.7)	21 (55.3)		13 (34.2)	25 (65.8)	
Religion (N=1057)							
No religion	259 (24.5)	130 (50.2)	129 (49.8)		100 (38.6)	159 (61.4)	
Catholic	446 (42.2)	282 (63.2)	164 (36.8)		237 (53.1)	209 (46.9)	
Evangelical	167 (15.8)	102 (61)	65 (39)	19.7 (0.001)*	72 (43.1)	95 (56.9)	19.2 (0.002)*
Spiritism	127 (12)	76 (59.9)	51 (40.1)		63 (49.6)	64 (50.4)	
Afro-Brazilian	13 (1.2)	3 (23)	10 (77)		3 (23)	10 (77)	
Other	45 (4.3)	23 (51.1)	22 (48.9)		18 (40)	27 (60)	
Health professional (N=1057)							
No	648 (61.3)	364 (56.2)	284 (43.8)	3.1 (0.081)	290 (44.7)	358 (55.3)	2.4 (0.121)
Yes	409 (38.7)	252 (61.6)	157 (38.4)		203 (49.6)	206 (50.4)	

*Chi-square is significant at 0.05. [1]Two participants who declared to sexually binary were excluded for the chi-square test.[2]Eleven participants failed to answer and were excluded from chi-test

Table 1 reveal the associations between the sample´s characteristics and GAD-7 and PHQ-9 scores. Females had the highest frequency rates of moderate to severe symptoms of anxiety (45% scores GAD-7 ≥ 10) and depression (58% scores

PHQ-9 ≥ 10), when compared to males (31% scores GAD-7 ≥ 10 and 36% scores PHQ-9 ≥ 10). Moderate to severe anxiety and depressions symptoms were most frequent in young people and decreased significantly after middle age. Approximately less than half of single participants had moderate to severe symptoms of anxiety, whilst 2 in every 3 reported moderate to severe depression symptoms (Table 1). More than 49% of the participants who reported no religion had moderate to severe symptoms for anxiety, whereas 60% reported moderate to severe depression symptoms (Table 1).

HEALTH RISK BEHAVIOR AND CLINICAL ANTECEDENTS

More than 70% of passive smokers had moderate to severe symptoms of depression (Table 2), whilst participants who ingested five to seven doses of alcohol per week or who changed their alcohol-ingesting habits during the pandemic reported a greater frequency in moderate to severe symptoms of anxiety and depression (Table 2).

One in every 3 participants who reported previous psychiatric diseases had moderate to severe depression symptoms and more than one half revealed moderate to severe symptoms of anxiety (Table 2). More than 70% of participants taking sleeping pills had moderate to severe symptoms of depression and more than 60% had moderate to severe anxiety symptoms (Table 2).

People who slept less than 4 hours a day had high anxiety symptoms and particularly higher rates for moderate to severe depression symptoms. More than 75% of participants who reported frequent nightmares (once a week or more) had moderate to severe anxiety symptoms, whereas 8 in every 10 participants reported moderate to severe depression symptoms. Further, 94% of participants who reported suicide thoughts had moderate to severe depression symptoms and a high frequency rate of moderate to severe anxiety symptoms (Table 2).

Table 2. Frequency of anxiety and depression symptoms according to previous and current clinical reports

	N (%)	Score GAD-7		Chi-	Score PHQ-9		Chi-
		<10 (n=616)	≥10 (n=441)	(value p)	<10 (n=493)	≥10 (n=564)	(value p)
Smoking (N=1057)							
Never smoked	747	452 (60.5)	295 (39.5)		362 (48.5)	385 (51.5)	
Passive smoking	81 (7.7)	36 (44.4)	45 (55.6)	10.3	24 (29.6)	57 (70.4)	12.5
Ex-smoker >6m	145	86 (59.3)	59 (40.7)	(0.016)*	73 (50.3)	72(49.7)	(0.006)
Current smoker	84 (7.9)	42 (50)	42 (50)		34 (40.5)	50 (59.5)	
Frequency in alcohol beverages intake (N=1057)							
Never/rarely	277 (26.2)	171 (61.7)	106 (38.3)		144 (52)	133 (48)	
Occasionally	504 (47.7)	296 (58.7)	208 (41.3)	5.7	229 (45.4)	275 (54.6)	4.9
1-4 days/week	256 (24.2)	135 (52.7)	121 (47.3)	(0.123)	110 (43)	146 (57)	(0.175)
5-7 days/week	20 (1.9)	14 (70)	6 (30)		10 (50)	10 (50)	
Doses of alcohol beverage (N=1057)							
Without intake	288 (27.2)	181 (62.8)	107 (37.2)		157 (54.5)	131 (45.5)	
1-2 doses	428 (40.5)	276 (64.5)	152 (35.5)		220 (51.4)	208 (48.6)	
3-4 doses	220 (20.8)	105 (47.7)	115 (52.3)	34.3	83 (37.7)	137 (62.3)	37.1
5-7 doses	85 (8)	32 (37.6)	53 (62.4)	(<0.001)*	21 (24.7)	64 (75.3)	(<0.001)*
8 or more	36 (3.5)	22 (61.1)	14 (38.9)		12 (33.3)	24 (66.7)	
Changes in alcohol beverage intake during pandemic (N=1057)							
Without changes	659 (62.3)	419 (63.6)	240 (36.4)	20.6	361 (54.8)	298 (45.2)	46.6
Drinking less	212 (20)	108 (51)	104 (49)	(<0.001)*	70 (33)	142 (67)	(<0.001)*
Drinking more	186 (17.7)	89 (47.8)	97 (52.2)		62 (33.3)	124 (66.7)	
Previous psychiatric conditions (N=1057)							
No	493 (46.6)	363 (73.6)	130 (26.4)	89.5	317 (64.3)	176 (35.7)	115.8
Yes	564 (53.4)	253 (44.8)	311 (55.2)	(<0.001)*	176 (31.2)	388 (68.8)	(<0.001)*
Sleeping pills (N=1057)							
No	850 (80.4)	541 (63.6)	309 (36.4)	51.4	437 (51.4)	413 (48.6)	39.7
Yes	207 (19.6)	75 (36.2)	132 (63.8)	(<0.001)*	56 (27)	151 (73)	(<0.001)*
Duration of sleep (N=1057)							
Less than 4h	27 (2.5)	5 (18.5)	22 (81.5)		3 (11.1)	24 (88.9)	
4-6h	290 (27.4)	118 (40.7)	172 (59.3)	80.5	93 (32)	197 (68)	68.3
6-8h	576 (54.5)	396 (68.7)	180 (31.3)	(<0.001)*	331 (57.5)	245 (42.5)	(<0.001)*
More than 8h	164 (15.6)	97 (59.1)	67 (40.9)		66 (40.2)	98 (59.8)	
Suicide thoughts during pandemic (N=1057)							
No	917 (86.7)	593 (64.7)	324 (35.3)	116.3	484 (52.8)	433 (47.2)	104.9
Yes	140 (13.3)	23 (16.4)	117 (83.6)	(<0.001)*	9 (6.4)	131 (93.6)	(<0.001)*
Frequency of nightmares during pandemic (N=1057)							
No/<1x/week	787 (74.4)	680 (86.4)	237 (13.6)	232.2	452 (57.4)	335 (42.6)	218.6
>1x/week	270 (25.6)	66 (24.4)	204 (75.5)	(<0.001)*	41 (15.2)	229 (84.8)	(<0.001)*

* Chi-square significant at 0.05.

RISK PERCEPTION AND SELF-PROTECTION MEASURES DURING THE COVID-19 PANDEMIC

Table 3 reveals associations between GAD-7 and PHQ-9 scores and variables related to COVID-19. Considering Covid-19 as highly dangerous and considering oneself prone to catch the virus were associated with greater frequency for moderate to severe anxiety and depression symptoms (Table 3). Keeping at home was associated with a greater frequency of moderate to severe anxiety symptoms, especially when social isolation exceeded two months (Table 3).

Table 3. Frequency of anxiety and depression symptoms by variables related to the pandemic Covid-19

	N (%)	Score GAD-7		Chi-(value p)	Score PHQ-9		Chi-(value p)
		<10 (n=616)	≥10 (n=441)		<10 (n=493)	≥10 (n=564)	
COVID-19 positive (N=1057)							
Yes	16 (1.5)	9 (56.2)	7 (43.8)	0.3 (0.868)	7 (43.7)	9 (56.3)	0.1 (0.815)
No	1041 (98.5)	607 (58.3)	434 (41.7)		486 (46.7)	555 (53.3)	
Consider Covid-19 dangerous (N=1057)							
Slightly dangerous	22 (2)	14 (63.6)	8 (36.4)	8.8 (0.012)*	11 (50)	11 (50)	9.6 (0.008)*
Mildly dangerous	271 (25.6)	178 (65.7)	93 (34.3)		148 (54.6)	123 (45.4)	
Very dangerous	764 (72.4)	424 (55.5)	340 (44.5)		334 (43.7)	430 (56.3)	
Risk of being infected by COVID-19 (N=1057)							
No/low risk	214 (20.2)	147 (68.7)	67 (31.3)	15.4 (<0.001)*	116 (54.2)	98 (45.8)	10.5 (0.005)*
Mild risk	538 (50.9)	312 (58)	226 (42)		255 (47.4)	283 (52.6)	
High risk	305 (28.9)	157 (51.5)	148 (48.5)		122 (40)	183 (60)	
Possible contact with infected people (N=1057)							
Yes	357 (33.8)	206 (57.7)	151 (42.3)	0.1 (0.787)	166 (46.5)	191 (53.5)	0.0 (0.947)
No	700 (66.2)	410 (58.6)	290 (41.4)		327 (46.7)	373 (53.3)	
Compliance to social isolation measures (N=1057)							
Yes	813 (77)	466 (57.3)	347 (42.7)	1.3 (0.248)	380 (46.7)	433 (53.3)	0.0 (0.906)
No	244 (23)	150 (61.5)	94 (38.5)		113 (46.3)	131 (53.7)	
Isolation at home to avoid contamination of family members (N=1057)							
Yes	416 (39.3)	232 (55.8)	184 (44.2)	1.7 (0.183)	198 (47.6)	218 (52.4)	0.2 (0.616)
No	641 (60.4)	384 (59.9)	257 (40.1)		295 (46)	346 (54)	
Use mask outdoors during the last 4 weeks (N=1057)							
Yes	1000 (94.6)	586 (58.6)	414 (41.4)	8.3 (0.015)*	473 (47.3)	527 (52.7)	0.1 (0.195)
Staying at home	36 (3.4)	14 (38.9)	22 (61.1)		13 (36.1)	23 (63.9)	
No	21 (2)	16 (76.2)	5 (23.8)		7 (33.3)	14 (66.7)	
Period of social isolation (N=1057)							
No	41 (3.9)	23 (56)	18 (44)	8.9 (0.030)*	23 (56)	18 (44)	6.2 (0.103)
Less than 1 month	234 (22.1)	154 (65.8)	80 (34.2)		122 (52.1)	112 (47.9)	
1 to 2 months	318 (30)	188 (59.1)	130 (44.9)		146 (45.9)	172 (54.1)	
>2 months	464 (44)	251 (54)	213 (46)		202 (43.5)	564 (56.5)	

* Ch-square significant at 0.05.

LOGISTIC REGRESSION

In the analysis of multiple regression, the Backward Stepwise selection method was employed to retain variables. The following independent risk factors were described for the occurrence of moderate to severe anxiety scores during the pandemic: younger, married or with partner, consumption of alcoholic beverages, previous psychiatric problems, ingesting sleeping pills, sleeping less than 8 hours, having the perception of contracting high or moderate Covid-19, considering Covid-19 very dangerous, dispensing using a mask when outdoors, keeping at home during the last four weeks, having frequent nightmares (once a week or more) and having suicide thoughts (Table 4). The last item had strong effect since participants who reported suicide thoughts during the pandemic had 4.5 times more probability of having moderate to severe symptoms of anxiety (Table 4).

Table 4. Analysis of logistic regression of variables related to anxiety symptoms

	Anxiety symptoms (GAD-7 Score ≥10)		
	Value-p	**OR**	**95%IC**
Age	<0.001	0.95	(0.9 – 1.0)
Marital state			
Single	0.001	-	-
With partner	0.003	2.5	(1.3 – 4.4)
Married	<0.001	2.1	(1.4 – 3.2)
Other	0.108	1.7	(0.9 – 3.4)
Doses of alcoholic beverages			
No intake	0.004	-	-
1-2 doses	0.003	1.9	(1.2 – 2.9)
3-4 doses	0.018	2.0	(1.1 – 3.7)
5-7 doses	0.235	0.6	(0.2 – 1.4)
8 or more	0.386	1.2	(0.8 – 1.7)
With previous psychiatric diseases	<0.001	2.3	(1.7 – 3.2)
Intaking medicine to sleep	0.001	1.9	(1.3 – 2.9)
Duration of sleep			
More than 8h	<0.001	-	-
6-8h	0.011	4.8	(1.4 – 16.0)
4-6h	<0.001	2.9	(1.8 – 4.8)
Less than 4h	0.740	1.0	(0.7 – 1.7)
With suicidal thoughts during pandemic	<0.001	4.5	(2.6 – 7.7)
Considering Covid-19 as dangerous			
Slightly dangerous	0.058	-	-
Very dangerous	0.789	1.2	(0.4 – 3.6)
Mildly dangerous	0.019	0.6	(0.4 – 0.9)
Risk of being infected by Covid-19			
No risk/low risk	0.014	-	-
Mild risk	0.005	1.8	(1.2 – 2.7)
High risk	0.011	1.8	(1.1 – 2.8)
Use of mask every time one goes outdoor during the last 4 weeks			
Yes	0.036	-	-

Staying indoors	0.015	8.2	(1.5 – 45.2)
No	0.097	3.4	(0.8 – 14.9)
Frequency of nightmares during pandemic	<0.001	4.1	(2.8 – 5.9)
Constant	0.003	0.081	

Note: Backward stepwise models. Variables in stage 1 were: gender, age, etnicity, marital status, region of Brazil, religion, smoking, frequency of ingesting alcoholic beverages, doses, changes in alcohol consumption during, previous psychiatric conditions, sleeping pills, duration of sleep, suicide thoughts during pandemic, compliance to social isolation, positive Covid-19, contact with people who may be infected, consideration on COVID-19 danger, evaluation of infection risk, isolation at home to avoid contamination of family members, use of mask always one is outdoor during the last 4 weeks, isolation period, frequency of nightmares during pandemic. Model concluded at 13th stage.

The same Backward Stepwise method was also applied to retain variables and the following independent risk factors were described for the occurrence of moderate to severe scores during the pandemic: female, young people, with previous psychiatric problems, consumption of more or less alcoholic beverages during the pandemic when compared to intake amount prior to the pandemic, taking sleeping pills, sleeping less than 8 hours, keeping indoors during the last four weeks, not using face mask, perception of moderate to high risk in contracting covid-19, frequent nightmares (once a week or more) and having suicide thoughts (Table 5). The last item and evaluation of anxiety scores had stronger effects. In other words, people who reported suicide thoughts during the pandemic had a 6.3 more probability of having moderate to severe depression symptoms (Table 5).

Table 5. Analysis of logistic regression of variables related to depression symptoms

	Depression symptoms (PHQ-9 Score ≥10)		
	Value-p	**OR**	**95%IC**
Female	<0.001	2.5	(1.6 – 3.7)
Age	<0.001	0.9	(0.9 – 1.0)
Changes in alcoholic beverages intake during pandemic			
Without changes	0.001	-	-
More drinking	0.005	1.8	(1.2 – 2.8)
Less drinking	0.002	1.9	(1.2 – 2.8)
With previous psychiatric diseases	<0.001	2.8	(2.0 – 3.9)
Ingesting sleeping pills	0.009	1.8	(1.1 – 2.7)
Duration of sleep			
More than 8h	<0.001	-	-
6-8h	0.038	4.6	(1.1 – 19.8)
4-6h	0.036	1.7	(1.0 – 2.8)
Less than 4h	0.221	0.7	(0.5 – 1.2)
Suicide thoughts during pandemic	<0.001	6.3	(3.0 – 13.4)
Risk of being infected by Covid-19			

No/low risk	0.041	-	-
Mild risk	0.037	1.5	(1.0 – 2.3)
High risk	0.015	1.7	(1.1 – 2.8)
Use of mask every time when outdoors during the last 4 weeks			
Yes	0.031	-	-
Staying at home	0.012	4.6	(1.4 – 15.3)
No	0.402	1.5	(0.6 – 3.8)
Frequency of nightmares during pandemic once a week or more	<0.001	3.9	(2.5 – 5.9)
Constant	0.218	2.3	

Note: Models of logistic regression by backward stepwise models. Variables in stage 1 were: gender, age, ethnicity, marital status, region of Brazil, religion, smoking, frequency of ingesting alcoholic beverages, doses, changes in alcohol consumption during, previous psychiatric conditions, sleeping pills, duration of sleep, suicide thoughts during pandemic, compliance to social isolation, positive Covid-19, contact with people who may be infected, consideration on COVID-19 danger, evaluation of infection risk, isolation at home to avoid contamination of family members, use of mask always one is outdoor during the last 4 weeks, isolation period, frequency of nightmares during pandemic. Model concluded at 12th stage

ASSOCIATION BETWEEN GAD-7 AND PHQ-9

It may be said that 90% of participants who were prone to have moderate to severe anxiety symptoms also had a trend for score ≥ 10 in the depression scale. Only 27% of participants who were prone to moderate to severe depression symptoms lacked a trend for moderate to severe anxiety symptoms.

DISCUSSION

This is one of the very first studies to analyze symptoms of anxiety and depression during the Covid-19 pandemic in a Brazilian population. Current paper aims at assessing the impact of Covid-19 pandemic on the mental health of health professionals and of Brazilians in general. Main results comprised a) four in every ten participants had moderate to severe symptoms for anxiety and more than half of the participants reported moderate to severe depression symptoms; b) nine out of ten participants who reported symptoms had mixed symptoms for anxiety and depression, with no significant difference between health professionals and the general population; risk factors for anxiety were: being young, married or with partner, consuming alcoholic beverages, having previous psychiatric problems, intaking sleeping pills, sleeping less than 8 hours, not using mask outdoors, considering Covid-19 as very dangerous, having a high or moderate perception of being infected with the virus, keeping indoors during the last four weeks, having frequent nightmares and having suicide thoughts; d) risk factors for depression were: female, being young, changing consumption of alcoholic beverages during the pandemic, having previous psychiatric problems, taking sleeping pills, sleeping less than 8 hours,

not using mask outdoors, considering Covid-19 as very dangerous, having a high or moderate perception of being infected with the virus, staying indoors during the last four weeks, having frequent nightmares and having suicide thoughts;

According to the WHO, pre-pandemic studies have shown that Brazil is a country with a great prevalence of anxiety worldwide, with a pre-pandemic rate higher than mean world rate (9.3%). The country has with the highest depression rate in Latin America (5.8%). These numbers were taken prior to the onset of Covid-19 pandemic, or rather, in 2017[3]. Several other studies in the pre-pandemic period also revealed high levels of anxiety and depression symptoms in Brazilian samples [3,6]. Another study identified high levels of sadness and nervousness during current pandemic[7].

Prevalence of mental disorders has drastically increased in several countries during the Covid-19 pandemic and may vary according to different cultures[8-10]. The number of people with anxiety and depression symptoms in Brazil is high when compared to that in other countries and culture during the same period[9,10].

No differences were detected between moderate to severe anxiety and depression symptoms among health professional and the people at large. Results were contradictory among studies published during the pandemic period with regard to behavior of the general public and health professionals[11,12].

A possible explanation may be detected in the different conclusions

between health professionals and the general public and during the exposure period to the pandemic. On the other hand, the general population, albeit less exposed to Covid-19 patients, was equally or more exposed to social networks, previously associated with high levels of anxiety (OR = 1.72; IC 95%: 1.31 – 2.26), coupled to depression symptoms (OR = 1.91; IC 95%: 1.52 – 2.41)[13,14].

A 2.6-fold risk has been detected for moderate to severe depression symptoms in the case of being female. A high prevalence of anxiety (64%) and depression (82%) symptoms has been detected in young people less than 20 years old. Several studies on mental health during the Covid-19 pandemic show increased risk for anxiety and depression disorders in being female and young [10,14]. Being married or with partner also represents a greater risk for moderate to severe anxiety symptoms (OR = 2.1, IC95%: 1.4 – 3.2 and OR = 2.5, IC95%: 1.3 – 4.4), corroborating literature[14]. Further, high frequency of depression symptom rates among the general female population is expected[2]. However, a greater frequency among young people is a controversial issue. Confined at home, lacking social capital and missing sun exposure, this specific group may be at higher risks.

Studies have shown that being single is an anxiety risk[16]. A high prevalence of more severe depression rates has been well-documented in divorced people or widowers prior to the Covid-19 pandemic[17]. On the other hand, prevalence

of depression is influenced by age and gender[18]. However, a small number of widowers evaluated in current study may have negatively impacted results.

Results on one´s beliefs have shown that more than a half of the participants who stated they had no religion revealed moderate to severe anxiety symptoms and more than 60% were reported with moderate to severe depression symptoms. In fact, a systematic review with 850 scientific articles published in the 20th century on the relationship between religion and mental health concluded that high religious involvement levels are positively associated to indicators of psychological well-being and lower rates in depression, suicide thoughts and alcohol and drug abuse[19].

Another relevant result involves the consumption of alcoholic beverages. Intake of alcoholic beverages increase by almost twofold the risk of moderate to severe anxiety and depression symptoms. A systematic review of 63 articles on the effects of alcoholic beverages abuse on physical and mental symptoms detected an improvement in anxiety and depression symptoms with the reduction of alcohol ingestion[20]. In current study, active and passive smokers revealed high rates of anxiety and depression symptoms. A systematic review of 148 studies on smoking and mental diseases detected one third of the studies showing that exposure to smoking was associated with depression and anxiety even though the authors insisted on further studies on the theme[21].

There was an almost twofold increase in anxiety and depression symptoms between people who took sleeping pills. Several studies have shown similar results[15]. Further, insomnia and few sleeping hours are known risk factors symptoms for depression, especially when people are re-exposed to stress conditions[2]. Results also revealed that sleeping less than 8 hours a day has been associated with a fivefold risk for anxiety symptoms and with a higher risk of moderate to severe depression symptoms. Symptoms of insomnia and difficulties in starting and maintaining sleep may be associated with anxiety and depression symptoms[22]. The combination of these disorders or symptoms may decrease total sleeping period or vice-versa and suggests a bi-directional relationship. In fact, several studies reported a significant association between sleeping disorders and mental ones[23].

During current pandemic, staying indoors for the last four weeks had become a more than eightfold risk for anxiety symptoms and an increasing risk in depression symptoms. Several studies co-relate risk perception to Covid-19 and adhesion to isolation strategies to depression and anxiety symptoms of varied graduations [12,13,24]. Besides the effects of social isolation, the decrease in physical activities and lack of exposure to sun rays have also contributed towards these symptoms in people who complied with blockage policies[25].

Alarmingly, a more than fourfold risk in anxiety symptoms and a more than six-fold risk in depression symptoms were detected among participants that confessed suicide thoughts. As may be expected, an increase in moderate to severe anxiety and depression during the pandemic have also caused a relevant increase in suicide thoughts during the period. Several studies are being undertaken on the co-relationship between the pandemic period and an increase in the frequency of suicidal thought and the association with other psychiatric disorders[26].

CONCLUSION

Current study is one of the first to analyze anxiety and depression symptoms during the Covid-19 pandemic in a Brazilian sample population. Results show that there was a significant increase in the frequency of moderate to severe symptoms of anxiety and depression during the pandemic, in association with suicide thoughts and modifications in health risk behavior.

Limitations of current study may be due to selection bias. A non-probabilistic sample was described, mainly females who answered an online survey. It may be possible that males are underrepresented. However, the study comprised participants from 21 of the 26 Brazilian states. Another potential limitation is that the frequency of anxiety and depression symptoms has been evaluated at a single point in time, and future research may assess whether such

frequency changes during and after the pandemic.

Brazil is characterized as a country with high levels of anxiety and depression during the Covid-19 pandemic[3]. Symptoms of anxiety and depression should be investigated by health professionals with regard to patients in the health area, since they are highly associated with mental health morbidity. Innovative psychosocial interventions should be developed by the competent health authorities, especially in primary health care.

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