COVID-19 and psychosocial and economic aspects in the brazilian population

COVID-19 e aspectos psicossociais e econômicos na população brasileira

COVID-19 y aspectos psicosociales y económicos en la población brasileña

Débora Rosana Alves Braga Silva Montagnoli[1], Carina Bandeira Bezerra[1], Maria Vieira de Lima Saintrain[1], Edla Helena Salles de Brito[1].

ABSTRACT

Objective: This study aimed to identify the psychosocial and economic characteristics of people affected by COVID-19 and their support network at the beginning of the pandemic. **Methods:** We conducted a cross-sectional study of 2,702 people aged 18 and over living in Brazil. Google® Forms were used to develop an online questionnaire containing open- and closed-ended questions about sociodemographic, economic and health characteristics. **Results:** People dissatisfied with their health and those who showed emotional changes were more likely to need support (PR=1.74; p<0.001 and PR=2.39; p<0.001). Support from family members stood out [536 (70.2%)]. Bivariate and multivariate analysis showed statistically significant associations of COVID-19 infection with sociodemographic and economic aspects, such as age (p<0.001); region of the country (p<0.001), marital status (p=0.003), number of people per household (p=0.003), employment status (p=0.012), holding a health insurance (p=0.014), needing some other type of support (p<0.001) and not being satisfied with current health status (p=0.043). **Conclusion:** The findings indicate that COVID-19 negatively affects satisfaction with health and influences the need to seek some type of social support.

Keywords: Pandemic, Covid-19, SARS-CoV-2, Socioecomic Aspects.

RESUMO

Objetivo: Identificar as características psicossociais e econômicas das pessoas acometidas pela covid-19 e sua rede de apoio no início da pandemia. **Métodos:** Foi realizado um estudo transversal com 2.702 pessoas com 18 anos ou mais residentes no Brasil. O Google® Forms foi usado para desenvolver um questionário on-line contendo perguntas sobre características sociodemográficas, econômicas e de saúde. **Resultados:** Pessoas insatisfeitas com sua saúde e aquelas que apresentaram alterações emocionais tiveram maior probabilidade de necessitar de apoio (RP=1,74; p<0,001 e PR=2,39; p<0,001). Destacou-se o apoio dos familiares [536 (70,2%)]. A análise bivariada e multivariada mostrou associações estatisticamente significativas da infecção por COVID-19 com aspectos sociodemográficos e econômicos, como idade (p<0,001); região do país (p<0,001), estado civil (p=0,003), número de pessoas por domicílio (p=0,003), situação profissional (p=0,012), possuir plano de saúde (p=0,014), necessitar de alguma outra tipo de apoio

[1] Universidade de Fortaleza (UNIFOR), Fortaleza - CE.

(p<0,001) e não estar satisfeito com o estado de saúde atual (p=0,043). **Conclusão:** Os achados indicam que a COVID-19 afeta negativamente a satisfação com a saúde e influencia a necessidade de buscar algum tipo de apoio social.

Palavras-chave: Pandemia, Covid-19, SARS-CoV-2, Aspectos Socioeconômicos.

RESUMEN

Objetivo: Identificar las características psicosociales y económicas de las personas afectadas por el Covid-19 y su red de apoyo al inicio de la pandemia. **Métodos:** Se realizó un estudio transversal con 2.702 personas de 18 años o más residentes en Brasil. Se utilizó Google® Forms para desarrollar un cuestionario en línea que contiene preguntas sobre características sociodemográficas, económicas y de salud. **Resultados:** Las personas insatisfechas con su salud y aquellas que presentaron cambios emocionales tuvieron mayor probabilidad de necesitar apoyo (RP=1,74; p<0,001 y RP=2,39; p<0,001). Destacó el apoyo de los familiares [536 (70,2%)]. El análisis bivariado y multivariado mostró asociaciones estadísticamente significativas entre la infección por COVID-19 y aspectos sociodemográficos y económicos, como la edad (p<0,001); región del país (p<0,001), estado civil (p=0,003), número de personas por hogar (p=0,003), situación profesional (p=0,012), tener seguro médico (p=0,014), necesitar algún otro tipo de apoyo (p<0,001) y no estar satisfecho con el estado de salud actual (p=0,043). **Conclusión:** Los hallazgos indican que el COVID-19 afecta negativamente la satisfacción con la salud e influye en la necesidad de buscar algún tipo de apoyo social.

Palabras clave: Pandemia, Covid-19, SARS-CoV-2, Aspectos Socioeconómicos.

INTRODUCTION

COVID-19 is an infectious disease caused by the new coronavirus SARS-CoV-2. Research has already shown that countries may face new challenges as prevention and control of diseases are beyond individual actions, i.e., the determinants of heath involve the macro level of social, political, and economic organization (KRAEMER MUG et al., 2020). Determinants of health include income and its relationship to wellbeing. People in poverty are at a higher risk of becoming ill and have poorer access to health care services. Furthermore, people with poor health are less likely to reach higher social strata and improve their lives (WHITTLE HJ, et al., 2017).

Thus, it is possible to discuss the direct and indirect impact of COVID-19 on people's lives. In socioeconomic relations, which are established as forms of illness, there is the impact of individual behavior that mismatches the collective needs and purposes for a healthier society (BROOKS SK, et al., 2020). In this context, the glaring social, economic, political, and cultural inequalities in the world show the direction of the COVID-19 pandemic. In Brazil, these inequalities become more visible at a time when the country needs greater investment in resources to face the disease (DOMINGUES EP, et al., 2020).

The most affected people are part of the historically more vulnerable and underestimated groups, whose sociodemographic characteristics include racial and gender issues – the older, the poor, the homeless and those living in more precarious areas (BOWLEG L, 2020). Part of this population does not have access to treated water, cleaning supplies and masks and is not able to practice social distancing, either because they are engaged in essential activities and/or because they live in households with many other people (BEZERRA ACV, et al., 2020).

The study of the relationships between determinants of health, including socioeconomic aspects, in the COVID-19 pandemic is extremely important to support health policies, especially those targeted at socially vulnerable people and/or people dependent on the public health system. Domingues EP, et al. (2020) projected that poorer Brazilian families would have their incomes affected by 20% more when compared to wealthier people. This leads to failure to comply with social distancing rules as these people need to keep working despite the risk of contagion. The option to stay at home, protected from the transmission of the disease, can lead to a shortage of resources to a greater extent than in other wealthier families.

In view of the multidimensional aspects that define health as physical, mental, and social wellbeing, this study aimed to identify the psychosocial and economic characteristics of people affected by COVID-19 and their support network.

METHODS

This is a descriptive and analytical quantitative study. People were invited to participate through the social networks WhatsApp and Instagram, in view of the pandemic state of COVID-19, in which social distancing was framed as one of the main protective measures.

The first confirmed cases in Brazil were mostly younger people, considered an expressive portion (32%) of the country's population, and of people with satisfactory socioeconomic status (SOUZA CDF, et al., 2020). Therefore, the choice of virtual tools and social networks for data collection is justified, in order to identify aspects related to the experience of the pandemic focusing on this part of the population. Other studies have indicated the potential value of using online survey as an indicator and predictor of the effects of COVID-19 (EFFENBERGER M, et al., 2020).

Data were collected using an online questionnaire developed in Google® Forms containing open- and closed-ended questions. The questionnaire included questions about sociodemographic variables (age, gender, education, marital status, number of people per household, employment status, family income, health insurance), harmful habits (smoking and drinking), economic variables (need for financial support) or other types of support during the pandemic, types of support needed), self-reported health problems (health conditions, history of COVID-19), psychosocial variables (emotional and behavioral aspects, social withdrawal), and satisfaction with current health (satisfied or dissatisfied).

A modified technique of the Respondent Drive Sampling (RDS) methodology was used for data collection, which consists of a chain sampling method starting with a part of the target population and this one distributes the questionnaire to other people until the sample size is reached (HECKATHORN DD, 2007). However, in this research, the sample was defined by the time of availability of the questionnaire on social networks and not by sample size.

Therefore, the study sample was composed of all people who completed the online questionnaire in a seven-day period - from June 24th to June 30th, 2020. This period, also known as the first wave, corresponds to the beginning of the pandemic in Brazil, since the first case of COVID-19 in the country was identified in February 2020, with the first death on March 12, 2020, in São Paulo.

Inclusion criteria were being 18 years of age or older, residing in Brazil, and completing the questionnaire. Data were analyzed using the software SPSS® version 24.0 IBM®, and absolute and relative frequencies of the study variables were calculated. Bivariate analysis of economic and psychosocial data was performed, while the association between variables was verified by the Chi-square test for the analysis of qualitative variables, with a significance level of 5%. Point and interval estimate of adjusted Prevalence Ratio (PR) were calculated by means of Poisson regression. The study met the ethical principles and standards of CNS/MS Resolutions 466/12 and 510/16 and was approved by the Research Ethics Committee (Approval No. 4.074.087 and CAAE 32332920.0.0000.5052).

RESULTS

A total of 2,702 people residing in Brazil responded to the online questionnaire. 77.9% lived in the Northeast region, 92.4% were between 18 and 59 years old, 72.6% were women, 55.7% had a college degree, and 56% were married or had a common-law marriage. Of the respondents, 61.8% lived with three to five other people, 28.3% were civil servants, 26.7% were self-employed, 26.4% were formally employed, and 13.2% were unemployed. As for family income, there was a greater distribution of people with incomes over 8 minimum wages (36.5%) and between 2 and 5 minimum wages (27.5%). In total, 74.6% of the respondents had health insurance. As for harmful habits, most respondents did not smoke (95.9%) or drink (94.1%). A total of 24.3% respondents had been diagnosed with COVID-19.

As for socioeconomic issues, 25.1% respondents reported that they needed financial support and 28.3% said they needed other types of support. Of these (n=764), 70.2% sought help from family members, 25.8% from private networks, 22.4% from neighbors and/or friends, and 19.1% from public networks. A total of 77.9% respondents reported emotional or behavioral reactions due to the pandemic, mainly anxiety (82.3%), fear (65.4%), and change in sleep pattern (59.1%). Overall, 76.3% respondents reported being satisfied with their current health (**Table 1**).

Table 1 - Descriptive analysis of the study respondents.

Variables	n	%
Age		
18 to 59 years	2496	92.4
60 years and older	206	7.6
Gender		
Women	1963	72.6
Men	739	27.4
Region		
North	16	.6
Midwest	79	2.9
Northeast	2106	77.9
Southeast	416	15.4
South	85	3.1
Education		
Complete or incomplete primary education	31	1.1
Complete or incomplete secondary education	215	8.0
Complete or incomplete higher education	949	35.1
Complete or incomplete graduate education	1506	55.7
Marital status		
Married/Common-law marriage	1514	56.0
Divorced	187	6.9
Single	978	36.2
Widowed	23	.9
Number of people per household		
Living alone	172	6.4
2	694	25.7
3-5	1671	61,8
More than 5	165	6,1
Employment status		
Retired/Pensioner	145	5.4
Self-employed	721	26.7

Variables	n	%
Unemployed	357	13.2
Formally employed	713	26.4
Civil servant	766	28,3
Household income		
Up to 1 minimum wage	102	3.8
1-2 minimum wages	431	16.0
2-5 minimum wages	742	27.5
5-8 minimum wages	442	16.4
More than 8 minimum wages	985	36.5
Holder of a health insurance		
Yes	2015	74.6
No	687	25.4
Smoking		
Yes	110	4.1
No	2592	95.9
Drinking		
Yes	159	5.9
No	2543	94.1
History of COVID-19		
Yes	656	24.3
No	2046	75.7
Need for financial support due to consequences of the pandemic		
Yes	677	25.1
No	2025	74.9
Need for other types of support due to the pandemic		
Yes	764	28.3
No	1938	71.7
If needed other types of support, what types were used (more than one response was allowed)? (n=622)		
Public network	146	19,1
Churches	74	9.7
Private network	197	25.8
Psychologist	20	2.6
Neighbor/Friends	171	22.4
Family members	536	70.2
Emotional or behavioral reaction due to the pandemic		

Variables	n	%
Yes	2106	77.9
No	596	22.1
If the answer to the previous question was "yes", then what reactions were experienced (more than one response was allowed)? (n=1,540)		
Fear	1378	65.4
Boredom	726	34.5
Loneliness	511	24.3
Anxiety	1733	82.3
Changes in sleep pattern	1245	59.1
Anger	501	23.8
Sadness	21	1.0
Are people where you live complying with social distancing measures?		
Many people are not complying with social distancing measures	1051	38.9
Yes, everyone is complying with social distancing measures	648	24.0
Only essential workers are not complying with social distancing measures	1003	37.1
Satisfaction with current health		
I am satisfied with my current health	2182	80.8
I am not satisfied with my current health	520	19.2

Source: Montagnoli DRABS, et al., 2023.

Table 2 shows that in the unadjusted multivariate analysis, people aged 18-59 were 1.78 times more likely to have had COVID-19 than people aged 60 or older (p=0.001). People living in the North and Northeast were 8.85 and 8.23 times more likely to have had the disease than people in the South (p<0.001). Married individuals were 1.23 times more likely to have had COVID-19 than unmarried individuals (p=0.003).

As for the effect of the number of people living in the same household, we found that people living with 3 to 5 people and those living with more than 5 people were, respectively, 1.86 and 1.82 more likely to have had COVID-19 compared to people living alone (p=0.006; p=0.037 respectively).

In addition, the self-employed and formally employed were, respectively, 1.2 and 1.3 times more likely to have had COVID-19 compared to civil servants (p=0.012). Those with private health insurance were 1.22 times more likely to have contracted the disease compared to those not covered by insurance (p=0.014).

Thus, despite the study's limited sampling, vulnerable groups from COVID-19 could be observed. Participants who needed other types of support were 2.39 times more likely to have had COVID-19 compared to those who did not use other types of support (p<0.001).

Respondents who were not satisfied with their own health were 1.18 times more likely to have had the disease than those who were satisfied with their health (p=0.043). In the adjusted analysis, there remained only age (p=0.001), marital status (p=0.013), number of people per household (p=0.037), employment status (0.013), need for support due to the COVID-19 pandemic (p<0.001) were more likely to have COVID-19.

Table 2 - Bivariate and Multivariate analysis of the association between COVID-19 infection and demographic and socioeconomic variables.

Variables	Total	Diagnosed COVID-19		Not diagnosed COVID-19		Crude PR (IC 95%)	p value	Adjusted PR (95% CI)	p value
		n	%	n	%				
Gender							0.657		
Women	1963	481	24.5	1482	75.5	1.03 (0.89 – 1.2)			
Men	739	175	23.7	564	76.3	1			
Age							<0.001		
18 to 59 years	2496	627	25.1	1869	74.9	1.78 (1.26 – 2.52)		1.90 (1.31 – 2.75)	**0.001**
60 or older	206	29	14.1	177	85.9	1		1	
Region							<0.001		
North	16	5	31.3	11	68.8	8.85 (2.35 – 33.41)			
Midwest	79	3	3.8	76	96.2	1.08 (0.22 – 5.18)			
Northeast	2106	612	29.1	1494	70.9	8.23 (2.7 – 25.07)			
Southeast	416	33	7,9	383	92.1	2.25 (0.71 – 7.16)			
South	85	3	3.5	82	96.5	1			
Education							0.468		
Complete or incomplete primary education	31	7	22.6	24	77.4	1			
Complete or incomplete secondary education	215	63	29.3	152	70.7	1.3 (0.65 – 2.57)			
Complete or incomplete higher education	949	225	23.7	724	76.3	1.05 (0.54 – 2.04)			
Complete or incomplete graduate education	1506	361	24.0	1145	76.0	1.06 (0.55 – 2.05)			
Marital status							0.003		
Married/Common-law marriage	1514	400	26.4	1114	73.6	1.23 (1.07 – 1.41)		1.19 (1.04 – 1.37)	**0.013**

Variables	Total	Diagnosed COVID-19		Not diagnosed COVID-19		Crude PR (IC 95%)	p value	Adjusted PR (95% CI)	p value
		n	%	n	%				
Single/Divorced/Widowed	1188	256	21.5	932	78.5	1		1	
Number of people per household							0.003		
More than 5 people	165		25.5	123	74.5	1.82 (1.16 – 2.87)		1.60 (1.03 – 2.48)	**0.037**
3-5 people	1671	434	26.0	1237	74.0	1.86 (1.27 – 2.72)		1.71 (1.17 – 2.48)	**0.006**
2 people	694	156	22.5	538	77.5	1.61 (1.08 – 2.39)		1.54 (1.04 – 2.28)	**0.030**
Living alone	172	24	14.0	148	86.0	1		1	
Employment status							0.012		
Retired/Pensioner	145	33	22.8	112	77.2	1.06 (0.76 – 1.47)		1.53 (1.09 – 2.14)	**0.013**
Self-employed	721	187	25.9	534	74.1	1.2 (1 – 1.45)		1.11 (0.93 – 1.32)	0.269
Unemployed	357	72	20,2	285	79,8	0,94 (0,73 - 1,2)		0.92 (0.72 – 1.18)	0.521
Formally employed	713	199	27,9	514	72,1	1,3 (1,08 - 1,55)		1.24 (1.05 – 1.47)	**0.014**
Civil servant	766	165	21,5	601	78,5	1		1	
Household Income							0.328		
Up to 1 minimum wage	102	19	18,6	83	81,4	1			
1-2 minimum wages	431	114	26,5	317	73,5	1,42 (0,92 - 2,19)			
2-5 minimum wages	742	180	24,3	562	75,7	1,3 (0,85 - 1,99)			
5-8 minimum wages	442	116	26,2	326	73.8	1.41 (0.91 – 2.18)			
More than 8 minimum wages	985	227	23,0	758	77.0	1.24 (0.81 – 1.89)			
Holder of a health insurance							0.014		
Yes	2015	513	25.5	1502	74.5	1.22 (1.04 – 1.44)			
No	687	143	20.8	544	79.2	1			
Smoking							0.539		
Yes	110	24	21.8	86	78.2	0.89 (0.62 – 1.28)			
No	2592	632	24.4	1960	75.6	1			
Drinking							0.492		
Yes	159	35	22.0	124	78.0	0.9 (0.67 – 1.22)			

Variables	Total	Diagnosed COVID-19		Not diagnosed COVID-19		Crude PR (IC 95%)	p value	Adjusted PR (95% CI)	p value
		n	%	n	%				
No	2543	621	24.4	1922	75.6	1			
Need for financial support due to consequences of the COVID-19 pandemic							**0.085**		
Yes	677	181	26.7	496	73.3	1.14 (0.98 – 1.32)			
No	2025	475	23.5	1550	76.5	1			
Need for other types of support due to the pandemic							**<0.001**		
Yes	764	318	41.6	446	58.4	2.39 (2.1 – 2.71)		2,39 (2.10 – 2.71)	**<0.001**
No	1938	338	17.4	1600	82.6	1		1	
Emotional or behavioral reaction due to the pandemic							**0.112**		
Yes	2106	526	25.0	1580	75.0	1.15 (0.97 – 1.36)			
No	596	130	21.8	466	78.2	1			
Are people where you live complying with social distancing measures?							**0.432**		
Many are not complying with social distancing measures	1051	244	23.2	807	76.8	0.97 (0.81 – 1.16)			
Only essential workers are not complying with social distancing measures	1003	257	25.6	746	74.4	1.07 (0.9 – 1.27)			
Yes, everyone is complying with social distancing measures	648	155	23.9	493	76.1	1			
Satisfaction with current health							**0.043**		
I am satisfied	2182	512	23.5	1670	76.5	1			
I am not satisfied	520	144	27.7	376	72.3	1.18 (1.01 – 1.38)			

Source: Montagnoli DRABS, et al., 2023.

Table 3 shows that people who were not satisfied with their health were 1.74 times more likely to need some other type of support due to COVID-19 than those who were satisfied with their current health (p<0.001). Those who showed emotional or behavioral changes due to the pandemic were 2.39 times more likely to use some type of support (p<0.001) when compared to those who reported no such emotional changes (p<0.001).

Table 3 - Need for support due to COVID-19 according to self-rated health.

Variables	Need for other types of support due to the COVID-19 pandemic				PR (95%CI)	p value
	Yes		No			
	n	%	N	%		
How do you feel about your current health?						**<0.001**
I am satisfied with it	540	24.7	1642	75.3	1	
I am not satisfied with it	224	43.1	296	56.9	1.74 (1.54 – 1.97)	
Emotional or behavioral reactions due to the pandemic						**<0.001**
Yes	683	32.4	1423	67.6	2.39 (1.93 – 2.95)	
No	81	13.6	515	86.4	1	

Source: Montagnoli DRABS, et al., 2023.

DISCUSSION

The results of this research are from a period depicting the beginning of the pandemic of COVID-19 in Brazil. Although many epidemiological changes have occurred since then, the study is relevant, because it brings important issues that need to be considered at other times that may arise other pandemics of communicable diseases. The pandemic of COVID-19 brought a serious health crisis, for being a highly transmissible disease with expressive mortality. At the same time, it added political, social, and economic crises. Thus, this study ratifies that in pandemic scenarios like COVID-19, there are urgent health demands, but it also points to the importance of psychosocial and economic support in the populations, since these are also fundamental elements as part of the social determinants of health.

Brazil was one of the countries with the highest numbers of cases and deaths and high estimated transmission rate (effective reproduction number [Rt] 1.44) (IMPERIAL COLLEGE LONDON, 2020). Added to this, it is a country with an extensive territorial area, a very diverse population and with expressive social inequality, especially between regions. And, in the pandemic of COVID-19, emerging economic crises in this period pointed to negative impacts in various social settings, including the UK and the US (BOWLEG L, 2020). Thus, Brazil is an interesting setting for studying the impact of COVID-19, in part because of the combination of the severity of the outbreak, the government's failure to implement non-pharmaceutical interventions and stance against stricter prevention measures, and the complex social structure of its huge population.

COVID-19 has negative effects on physical and mental health for periods not yet specified. However, these effects are sufficient to generate sequelae and worsen the general health status, causing losses of jobs and income, as well as the need for additional support. It should be noted that 70.2% of those who needed some type of support in the present study resorted to help from family members. Neighbors/friends, private and public network were also mentioned as sources of support. The fact that public network was identified as a resource is an interesting finding, indicating that public policies are needed and have an impact on the resolution of the issues presented here.

Furthermore, almost 80% of our study respondents reported emotional or behavioral reactions due to the pandemic, mainly anxiety (82.3%), fear (65.4%) and change in sleep patterns (59.1%), which can influence mental and general health. These respondents were 2.39 times more likely to need support. Thus, it is

important to highlight this problem and organize support networks to embrace those in need, otherwise, the COVID-19 may have much profounder outcomes and impact on peoples mental and general health, going beyond the already known sequelae.

The impact of COVID-19 is not shared equally. Areas with higher levels of unemployment tend to experience greater increases in suicide rates and inequalities in mental health, with people living in the poorest areas experiencing the greatest increases in psychiatric morbidity and self-harm. Increased stress weakens the immune system, thereby increasing susceptibility to a range of diseases and the likelihood of health-threatening behaviors (BROOKS SK, et al., 2020).

Thus, the effect of the social determinants of health and morbidity in the COVID-19 pandemic may still be underestimated. However, the great lesson of public health is that for centuries pandemics have disproportionately affected the poor and disadvantaged. Governments have implemented preventive and protective measures targeted at people with multiple comorbidities as they are considered the most vulnerable ones. However, this medical model of disease is at risk of ignoring social factors, which can increase exposure to and mortality from SARS-COV-2. Therefore, it is important to assess the influence of sociodemographic and economic factors on the outcome of COVID-19.

In our study, the participants who lived in the North and Northeast regions were, respectively, 8.85 and 8.23 times more likely to have had the disease compared to the ones who lived in the South. The North and Northeast regions have worse health indicators when compared to the South and Southeast regions considering aspects such as age, gender, diagnosis of at least one non-communicable disease, level of education or socioeconomic status (CHANG D, et al., 2020). The loss of healthy life is much greater among people living in less developed regions, especially among older adults. Regional inequality is even more pronounced both in relation to mortality and well-being (CHANG D, et al., 2020), and this situation may also explain the fact that the states in these regions are the ones with the highest rates of COVID-19 deaths (SOUZA CDF, et al., 2020).

In our study, people aged 18-59 were 1.90 times more likely to be affected by COVID-19 compared to older adults. This finding is supported by a Chinese study that showed that 58.9% of confirmed cases predominated in economically active individuals aged 30-39 years with a mean age of 34 years (CHENG ZJ and SHAN J, 2020). This age range was also predominant in our study (30.5%) and confirms that people of all ages can be infected and affected by the new coronavirus (LIMA DLF, et al., 2020). In Ceará, a state in Northeastern Brazil, people aged 20-39 years were at a higher risk of contamination (Khan MAS, et al., 2021). The same was found in Bangladesh, where 42% of the cases of COVID-19 were in people aged 21-50 years (MA Y, et al., 2020).

However, Cheng and Shan (2020) found that 72% of the confirmed cases of COVID-19 were in people aged 40 or over. It should also be noted that Chinese researchers found that the median age of asymptomatic patients was 23 years, which is below that of symptomatic patients (35.5 years) (ZHOU F, et al., 2020). Additionally, older adults are a matter of concern since advanced age is associated with the worsening of the disease and with death (DOWD JB, et al., 2020).

It should be noted that the mean age of people who tested positive for COVID-19 may vary across countries and regions. In Spain, the median age was 67 years, which was probably influenced by its population aging. People aged 65 and over represent about 50% of the Spanish population (ROZENFELD Y, et al., 2020). In our study, the number of people per household was associated with a positive test for SARS-CoV-2. Most of the respondents (61.8%) said they lived with other three to five people, and this group of people were 1.71 times more likely to be affected by the disease. It is suggested that the increase in population density helps in the transmission of viral infections of the respiratory tract and this may explain the association between the estimated family size and PCR positivity in cases of COVID-19 in a recent study (MCNAMARA CL, et al., 2017).

Income was not associated with COVID-19 infection (p=0.328). However, in the study conducted by Sannigrahi S, et al. (2020), income was strongly associated with COVID-19 cases across the European region. It is important to mention that Ceará, the state with the highest number of respondents (72.4%), was an

important port of entry to COVID-19. The metropolitan region of Fortaleza, its capital city, generates income and services and it is an important tourist hub with high demographic density and urban mobility. The airport of Fortaleza is also a powerful airline hub connecting flights from and to Europe. People who live in this region traveled abroad, where they probably got infected, which can explain the findings related to income and education. This set of factors can support the findings of present study as better socioeconomic conditions also facilitate the forms of intense viral circulation, transmissibility and worsening of the clinical manifestation of COVID-19. Additionally, the COVID-19 testing may also be influenced by those socioeconomic characteristics (e.g., economic and educational level), which needs to be considered as a possible bias to the COVID-19 positivity rate in the population (BAMBRA C, et al., 2020).

People in disadvantaged socioeconomic groups and with low levels of education are more likely to experience lack of testing, late treatment, worse prognosis, and increased chances of death (MA Y, et al., 2020). Furthermore, job losses due to the pandemic have particularly affected workers with lower levels of education, whether due to the economic crisis resulting from the closure of businesses or the infection of workers who needed to be quarantined because of COVID-19 (BAMBRA C, et al., 2020).

Regarding employment status, 26.7% of the study participants were self-employed and 26.4% were formally employed. These people were at a higher risk of COVID-19 infection. Research has shown that working during the pandemics a risk factor for COVID-19. Workers in the service sector (food, cleaning and delivery personnel and healthcare professionals) are designated as essential, so they are more exposed to the virus, especially those who use public transport to go to work. Researchers have shown that human mobility was a critical factor for the spread of COVID-19 in China as growth rates became stable or negative in some areas where strong mandatory control measures were implemented (KRAEMER MUG, et al., 2020). Studies suggests that barriers related to income play a role in the worsening of other health conditions. In a study carried out in the United States, low socioeconomic status was associated with reduced social distancing, mainly due to the need to continue working, which can lead to significant socioeconomic gradients in COVID-19 (ROZENFELD Y, et al., 2020).

Furthermore, 74.6% of the respondents said they held health insurance, and these were 1.22 times more likely to be affected by COVID-19. In contrast, a study has shown that access to health insurance is a protective factor in terms of mortality from COVID-19, but it is not significantly associated with the infection rate [25]. In Brazil, people who use supplementary healthcare services are mainly workers of companies that provide this benefit. Therefore, the study participants' access to health insurance may not be closely related to having high income, but to being formally employed, which guarantees such access. Furthermore, COVID-19 testing rates may to higher among those with supplementary healthcare services, thus interfering with the COVID-19 positivity rates.

Even in Brazil, where there is a public unified health system (*Sistema Único de Saúde – SUS*), it is possible to observe an unequal access to health services. Data from the 2013 National Health Survey indicate that among the poorest 20% of the population, 94.4% do not hold a health insurance and 10.9% rate their health as fair, poor or very poor and have not consulted a doctor in the previous year. Among the richest 20% of the population, these rates were only 35.7% and 2.2%, respectively (IBGE, 2014). These data suggest that, in the context of the COVID-19 pandemic, people in more precarious situations are the most affected and suffer from the lack of or poor access to health services. In the US, according to the New York Department of Health, low-income neighborhoods in the city are being severely hit by the COVID-19 epidemic, possibly because there is a higher incidence of chronic diseases associated with the most serious cases of COVID-19 among the poorest people (JORDAN RE, et al., 2020).

People dissatisfied with their health were 1.74 times more likely to seek some type of support compared to those satisfied with their health (p<0.001). Similarly, the risk of experiencing a severe manifestation of COVID-19 and death is greater among people with poor general health and poor nutritional status and among those with underlying chronic clinical conditions, such as cardiopulmonary diseases, diabetes, and cancer. The prevalence of these epidemiological conditions is inversely associated with socioeconomic status (JORDAN RE, et al., 2020).

The methodological bias regarding the sampling process used in the present study should be pointed out as a limitation since the questionnaire was distributed through social media, which may have influenced the sociodemographic profile of the study population. Nevertheless, vulnerable COVID-19 groups could be observed among the study population which reflect issues that need to be addressed when dealing with the COVID-19 pandemic and its sequelae.

CONCLUSION

The findings indicate that there are groups more vulnerable to COVID-19 and that the disease negatively affects satisfaction with one own's health status. The need to seek some type of support is within the socioeconomic aspects of people at higher risk for infection. Thus, the findings indicate that COVID-19 negatively affects satisfaction with health and influences the need to seek some type of support. Nevertheless, studies are still needed to better elucidate the relationship between the Covid-19 pandemic and the socioeconomic factors associated with the impacts on society's health. Spatial-temporal differences in COVID-19 infection across Brazilian regions may reflect social, economic, cultural, and structural inequalities. Therefore, the development of public policies should consider regional singularities.

REFERENCES

1. BAMBRA C, et al. The COVID-19 pandemic and health inequalities. Journal of Epidemiology and Community Health, 2020; 74(11): 964-968.
2. BEZERRA ACV, et al. Factors associated with people's behavior in social isolation during the COVID-19 pandemic. Revista Ciência & Saúde Coletiva, 25 (suppl 1): 2411-2421.
3. BOWLEG L. We're Not All in This Together: On COVID-19, intersectionality, and structural inequality. American Journal of Public Health, 2020;110 (7): 917.
4. BROOKS SK, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. The Lancet, 2020; 395(10227): 912-920.
5. CHANG D, et al. Epidemiologic and clinical characteristics of novel coronavirus infections involving 13 patients outside Wuhan, China. JAMA, 2020; 323 (11): 1092–1093.
6. CHENG ZJ e SHAN J. 2019 Novel coronavirus: where we are and what we know. Infection, 2020;48 (2): 155-163.
7. DOMINGUES EP, et al. Efeitos econômicos negativos da crise do Coronavírus tendem a afetar mais a renda dos mais pobres. Nota técnica Núcleo de Estudos de Modelagem Econômica Aplicada. CEDEPLAR-UFMG. Belo Horizonte, 2020. Disponível em: https://pesquisas.face.ufmg.br/nemea/wp-content/uploads/sites/20/2020/04/Crise-e-renda-familiar.pdf. Acessado em: 17 de julho de 2021.
8. DOWD JB, et al. Demographic science aids in understanding the spread and fatality rates of COVID-19. Proceedings of the National Academy of Sciences, 2020;117 (18) :9696-9698.
9. EFFENBERGER M, et al. Association of the COVID-19 pandemic with Internet Search Volumes: A Google Trends™ Analysis. International Journal of Infectious Diseases, 2020;95: 192-197.
10. HECKATHORN, DD. Extensions of respondent-driven sampling: analyzing continuous variables and controlling for differential recruitment. Sociological Methodology. 2007 37: 151-207.
11. IMPERIAL COLLEGE LONDON. 2020. In : COVID-19. Short-term forecasts of COVID-19 deaths in multiple countries. Disponível em: https://mrc-ide.github.io/covid19-short-term-forecasts/>. Acessado em: 20 de dezembro de 2020.
12. INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. 2014. In: Pesquisa nacional de saúde 2013: percepção do estado de saúde, estilos de vida e doenças crônicas. Disponível em: https://biblioteca.ibge.gov.br/index.php/bibliotecacatalogo?id=291110&view=detalhes. Acessado em: 13 de jullho de 2021.
13. JORDAN RE, et al. Covid-19: risk factors for severe disease and death. The BMJ, 2020; 368: m1198.
14. KHAN MAS, et al. Mental health of young people amidst COVID-19 pandemic in Bangladesh. Heliyon, 2021; 7 (6): e07173.

15. KRAEMER MUG, et al. The effect of human mobility and control measures on the COVID-19 epidemic in China. Science, 2020; 368(6490): 493-497.

16. LIMA DLF, et al. COVID-19 no estado do Ceará, Brasil: comportamentos e crenças na chegada da pandemia. Revista Ciência & Saúde Coletiva, 2020; 25 (5): 1575-1586.

17. MA Y, et al. Characteristics of asymptomatic patients with SARS-CoV-2 infection in Jinan, China. Microbes Infection, 2020;22 (4-5): 212-217.

18. MCNAMARA CL, et al. The contribution of housing and neighbourhood conditions to educational inequalities in non-communicable diseases in Europe: findings from the European Social Survey (2014) special module on the social determinants of health. European Journal of Public Health, 2017;27 (suppl 1): 102-106.

19. ROZENFELD Y, et al. A model of disparities: risk factors associated with COVID-19 infection. International Journal for Equity in Health, 2020; 19 (1): 126.

20. SANNIGRAHI S, et al. Examining the association between socio-demographic composition and COVID-19 fatalities in the European region using spatial regression approach. Sustainable Cities and Society, 2020; 62: 102418.

21. SOUZA CDF, et al. Spatiotemporal evolution of case fatality rates of COVID-19 in Brazil, 2020. Jornal Brasileiro de Pneumologia, 2020;46 (4): e20200208.

22. WHITTLE HJ, et al. "The land of the sick and the land of the healthy": Disability, bureaucracy, and stigma among people living with poverty and chronic illness in the United States. Social Science & Medicine, 2017; 190: 181-189.

23. ZHOU F, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet, 2020; 395 (10229): 1054-1062.