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SPECIAL ARTICLE / *ARTIGO ESPECIAL*

Changes in Brazilians' socioeconomic and health conditions during the COVID-19 pandemic

Mudanças nas condições socioeconômicas e de saúde dos brasileiros durante a pandemia de COVID-19

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ABSTRACT: ***Objective:*** To describe changes in socioeconomic and health conditions of Brazilians during the COVID-19 pandemic. ***Methodology:*** Cross-sectional study with data from a web-based behavioral survey carried out from April 24 to May 24, 2020, with 45,161 participants recruited by the chain sampling method. A descriptive analysis of the survey topics was performed: adherence to social restriction measures, diagnosis of the new coronavirus, work situation and income, difficulties in routine activities, presence of comorbidities, psychological issues, and access to health services. Prevalence and respective 95% confidence intervals were estimated. ***Results:*** Approximately 74% of Brazilians adhered to social restrictions. As for flu symptoms, 28.1% reported having at least one flu symptom, but only 5.9% underwent testing for COVID-19. Regarding the socioeconomic impact, 55.1% reported a decrease in family income, and 7.0% were left without any income; 25.8% of the people lost their jobs, with the group of informal workers being the most affected (50.6%). As for health conditions, 29.4% reported worsening of health status; 45%, having sleep problems; 40% frequently presented feelings of sadness, and 52.5%, of anxiety; 21.7% sought health care, and, among them, 13.9% did not get care. ***Conclusion:*** The findings show the importance of controlling the COVID-19 pandemic in Brazil, to mitigate the adverse effects on the socioeconomic and health conditions related to social restriction measures.

Keywords: Pandemics. Coronavirus infections. Social isolation. Social change. Health evaluation. Brazil.

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RESUMO: ***Objetivo:*** Descrever as mudanças nas condições socioeconômicas e de saúde dos brasileiros durante a pandemia de COVID-19. ***Métodos:*** Estudo transversal com dados de pesquisa de comportamentos realizada pela internet de 24 de abril a 24 de maio de 2020 com 45.161 participantes recrutados por amostragem em cadeia. Foi feita uma análise descritiva de temas abordados na pesquisa: adesão às medidas de restrição social, diagnóstico do novo coronavírus, situação de trabalho e rendimentos, dificuldades nas atividades de rotina, presença de comorbidades, estado de ânimo e acesso aos serviços de saúde. Foram estimados as prevalências e os intervalos de 95% de confiança. ***Resultados:*** Aproximadamente 75% dos brasileiros aderiram à restrição social. Quanto aos sintomas de gripe, 28,1% relatou ter apresentado algum sintoma, mas apenas 5,9% realizou teste para COVID-19. Em relação à situação socioeconômica, 55,1% relatou diminuição do rendimento familiar, e 7% ficou sem rendimento; 25,8% dos indivíduos ficaram sem trabalhar, sendo o grupo de trabalhadores informais o mais afetado (50,6%). Quanto às condições de saúde, 29,4% avaliou que a sua saúde piorou; 45% teve problemas no sono, 40% apresentou, frequentemente, sentimento de tristeza e 52,5% de ansiedade/nervosismo; 21,7% procurou serviço de saúde e, entre estes, 13,9% não conseguiu atendimento. ***Conclusão:*** Os achados mostram a importância do controle da pandemia de COVID-19 no Brasil, para mitigar os efeitos adversos na situação socioeconômica e nas condições de saúde relacionados às medidas de restrição social.

Palavras-chave: Pandemias. Infecções por coronavírus. Isolamento social. Mudança social. Avaliação em saúde. Brasil.

INTRODUCTION

The occurrence of COVID-19 caused by a new strain of the coronavirus (Sars-CoV-2) was first reported in the city of Wuhan, in China, in December, 2019. On January 30, 2020, the World Health Organization (WHO) declared the COVID-19 outbreak as a public health international emergency, and, in less than three months, the disease had spread around the world, being declared as a pandemic on March 11, 2020[1-3].

In Brazil, the first confirmed case of COVID-19 was on February 26, 2020 and, in July, more than 2.5 million cases and 90 thousand deaths caused by Sars-CoV-2 had been confirmed. Three weeks after the first case was reported, all of the Brazilian states already presented at least one confirmed case of the disease[4].

Due to the absence of vaccines and efficient therapy for the treatment of COVID-19, a combination of public health measures has been recommended to mitigate the propagation of the virus, and to prevent the overload of health systems[5-7].

With the declaration of the pandemic and the fast growth in the number of cases and deaths in Brazil, public health measures in the field of control and prevention had to be established by governments, such as the closing of borders, restriction of on-site classes, prohibition of the functioning of commercial establishments, such as stores and restaurants, besides social distancing and suspension of public meetings and events[8].

Despite the unquestionable importance of the social restriction initiatives to contain the propagation of the disease, there are major consequences in society, with direct effects on the families' work and income, besides implications on the physical

and mental health of individuals. Besides, the uncertainty about the disease, the separation of beloved ones and the changes in daily activities also bring out relevant psychological issues[9,10].

This study aimed at describing the adherence to social restriction measures and changes in the work and income in routine activities, besides assessing the psychological issues of Brazilians during the COVID-19 pandemic.

METHODS

This study was based on data from the study *ConVid – Pesquisa de Comportamentos* (Behavioral Research), carried out from April 24 to May 24, 2020, with a web-based behavioral survey. The study was elaborated by Fundação Oswaldo Cruz (FIOCRUZ), in partnership with Universidade Federal de Minas Gerais (UFMG) and Universidade Estadual de Campinas (UNICAMP), and approved by the Research Ethics Committee of Escola Politécnica de Saúde Joaquim Venâncio (Report n. 3.980.277) for its national application.

The survey was elaborated in the Research Electronic Data Capture (RedCap) platform. All of the collected data were anonymous, with no possibility to identify the participants, and the survey was filled out by each individual using a cell phone, a computer or a tablet with access to the internet.

The survey approached several aspects, and the questions were related to sociodemographic aspects, infection by the new coronavirus, adherence to social restriction measures, health status, access to health services during the pandemic, psychological issues and lifestyle before and during the pandemic[11].

The study participants were recruited by the chain sampling method. First, we selected a group of researchers from different States to begin the chain of dissemination. Each one sent a research link to at least 20 people in their social networks, according to stratification by gender, age group and schooling, thus forming the second wave of the chain. Then, all individuals who received the link, regardless of the source, had the opportunity to answer the survey and share the link with other people in their social networks. More details about the research can be found in the official website of the study *ConVid – Pesquisa de Comportamentos* (https://convid.fiocruz.br/).

The study database was calibrated using the information from the National Household Sample Survey (PNAD), 2019, per Federation Unit, sex, age, race/ethnicity, and schooling, to obtain a sample whose distribution is similar to the Brazilian population. Before the beginning of the analyses, the data were assessed regarding the presence of duplicities (3.6%) and missing data (4.3%), and both were excluded from the database. The total sample was comprised of 45,161valid surveys.

This study aimed at analyzing part of the themes investigated in *ConVid – Pesquisa de Comportamentos* (Behavioral Research). Prevalence rates (%) were estimated with the respective 95% confidence intervals (95%CI), for each one of the following variables:

adherence to social restriction measures, report of flu symptoms, testing and infection by the new coronavirus, work and family income status, difficulties to perform activities of daily life, presence of risk comorbidities to aggravate COVID-19, health status, access to health services, and psychological issues of the individuals during the pandemic.

To assess the adherence to social restriction measures, the following question was used: during the new coronavirus pandemic, how often did you (or do you still) restrict contact with people? The options were: I did nothing and continued with my normal lifestyle; I tried to be careful and stay away from people, reducing contact and not visiting the elderly, but I kept working and going out; I stayed home, only going to the supermarket and the drugstore; I strictly stayed at home, and only left in case of health needs.

Regarding the presence of flu symptoms, the following question was considered: after the pandemic arrived in Brazil, did you present any flu symptoms?. And the answers were yes and no. The testing and test results were assessed by the following questions: did you take the test to know if you were infected?; and was the test positive?; with the following categories of analysis: did not take the test; took the test, with positive result; took the test, with negative result; took the test, but have not seen the results yet.

Besides these questions, the following question was include, with "yes" and "no" answers: did any relative, close friend or work colleague have a severe case of the disease caused by the new coronavirus, or die?

In the work status analysis before and during the pandemic, we used the following questions: before the beginning of the new coronavirus pandemic, what was your main work status? (server, or worked with a contract and registration; worked without a registration; was self-employed); how did the pandemic affect your occupation/job? (I did not work before and continued this way; I continued to work or started working during the pandemic; I lost my job/ I did not work); during the pandemic, how much did you work? (less than usual; the same as before; more than usual); and, during the pandemic, how difficult was it for you to perform your work activities? (not difficult at all/a little; moderately; intensively).

For the classes of household average income, we asked the following questions: before the beginning of the new coronavirus pandemic, what was the total income of the household?; and how many residents are there in your household? The mean per capita household income was calculated with the following categories, considering minimum wage (MW): up to ½ MW; ½ to 1 MW; one to two MW; two to four MW; four or more MW.

Besides, it was possible to assess the effect of the pandemic on the income of the families with the following question: how did the pandemic affect your family income?, with the alternatives: it remained the same/increased; it decreased a little; it decreased a lot; there was no income.

The intensity of household work was assessed by the following question: did the pandemic affect/change the amount and type of your household work? The answers were: it decreased/remained the same; it increased; it increased a lot.

To evaluate the effects of the pandemic on health status, the following question was considered: Do you think the pandemic caused changes in your health status? And the answers could be: it remained the same / improved; it got worse.

The presence of risk comorbidities for the aggravation of cases of COVID-19 was based on the report of previous diagnosis of noncommunicable chronic diseases (NCDs), such as diabetes, hypertension, asthma / emphysema / chronic respiratory disease or another lung condition, heart disease or cancer, according to the clinical management protocol of COVID-19 from the Ministry of Health[12].

The search and access to health services during the pandemic were analyzed using the questions: during the new coronavirus pandemic, did you look for health care with a physician, dentist or another health professional? (yes; no); what was the main reason for you to look for health care? (suspicion of COVID-19 or respiratory infection; continuing a treatment or therapy; dental problem; mental health issue; disease or another health problem); were you able to get care? (yes; no); during the pandemic, did you have any of these difficulties related to health care? (yes; no).

Regarding the psychological issues, the quality of sleep was assessed through the question: did the pandemic affect the quality of your sleep? (no / my sleeping problems decreased; I started having sleeping problems / my existing sleeping problems became worse). The frequency of loneliness, sadness or depression, anxiety or nervousness, respectively, was measured by the following questions: during the pandemic, how often did you feel isolated from family members or close friends? (never / a few times; many times / always); during the pandemic, how often did you feel sad or depressed? (never / a few times; many times / always); during the pandemic, how often did you feel anxious or nervous? (never / a few times; many times / always).

RESULTS

Table 1 presents the results that are directly related to COVID-19. Concerning the adherence to social restriction measures, 74.3% of the individuals adhered to the measures, leaving their houses only for essential activities, such as the need for health care, drugstores and supermarkets. As to the presence of any flu symptom after the pandemic began, 28.1% reported having had symptoms, and, of these, only 5.9% had taken the test to know if they were infected by the new coronavirus. Among the tested participants, 22.5% (95%CI 14.5 – 33.1) tested positive for the new coronavirus. It was also observed that 17% of the individuals had a relative or close friend with a severe case of the disease, or who died due to COVID-19.

The results of Table 2, about work status, show that 28.9% did not work before the pandemic and continued without working, whereas 50.5% continued to work or began a new job during the pandemic; however, 20.6% lost their jobs or did not work.

Among the individuals who were working in the analyzed period, 29.4% worked more than usual during the pandemic. The performance of household tasks also changed

Table 1. Adherence to social restriction measures, presence of symptoms and infection by the new coronavirus. *ConVid – Pesquisa de Comportamentos* (Behavioral Research), April 24 to May 24, 2020.

	%	95%CI
Adherence to social restriction measures during the pandemic		
I did nothing and continued with my normal lifestyle	1.5	1.2 – 2.0
I tried to be careful and stay away from people, reducing contact and not visiting the elderly, but I kept working and going out	24.2	23.0 – 25.5
I stayed home, only going to the supermarket and the drugstore	59.2	57.7 – 60.6
I strictly stayed at home, and only left in case of health needs	15.1	14.1 – 16.1
Report of flu symptoms during the pandemic		
Yes	28.1	26.8 – 29.4
No	71.9	70.6 – 73.2
Testing for COVID-19 among those who had flu symptoms		
Did not take the test	94.1	92.7 – 95.2
Took the test, and it was positive	1.3	0.8 – 2.1
Took the test, and it was negative	4.0	3.1 – 5.1
Took the test, but did not get the result	0.6	0.4 – 1.0
Any relative or close friend with a severe case of COVID-19 or who died because of it?		
Yes	17.0	15.9 – 18.0
No	83.0	82.0 – 84.1

95%CI: 95% confidence interval

Table 2. Indicators related to work and family income and difficulties to perform daily activities. *Convid – Pesquisa de Comportamentos* (Behavioral Research), April 24 to May 24, 2020.

	%	95%CI
Work situation during the pandemic		
Did not work before and continued this way	28.9	27.6 – 30.2
Continued to work or started working	50.5	49.0 – 51.9
Lost job / did not work	20.6	19.5 – 21.9
Work intensity during the pandemic		
Worked less than usual	43.2	41.0 – 45.4
Worked the same as usual	27.4	25.6 – 29.2
Worked more than usual	29.4	27.6 – 31.4
Level of difficulty to perform work activities during the pandemic		
Not difficult at all/a little	61.4	59.3 – 63.5
Moderately	22.2	20.5 – 24.0
Intensively	16.4	14.8 – 18.0
Family income during the pandemic		
Remained the same/increased	37.8	36.5 – 39.2
Decreased a little	30.3	29.0 – 31.7
Decreased a lot	24.8	23.5 – 26.2
Had no income	7.0	6.3 – 7.9
Intensity of household tasks during the pandemic		
Decreased/remained the same	38.3	36.9 – 39.8
Increased	41.5	40.1 – 42.9
Increased considerably	20.2	19.1 – 21.3

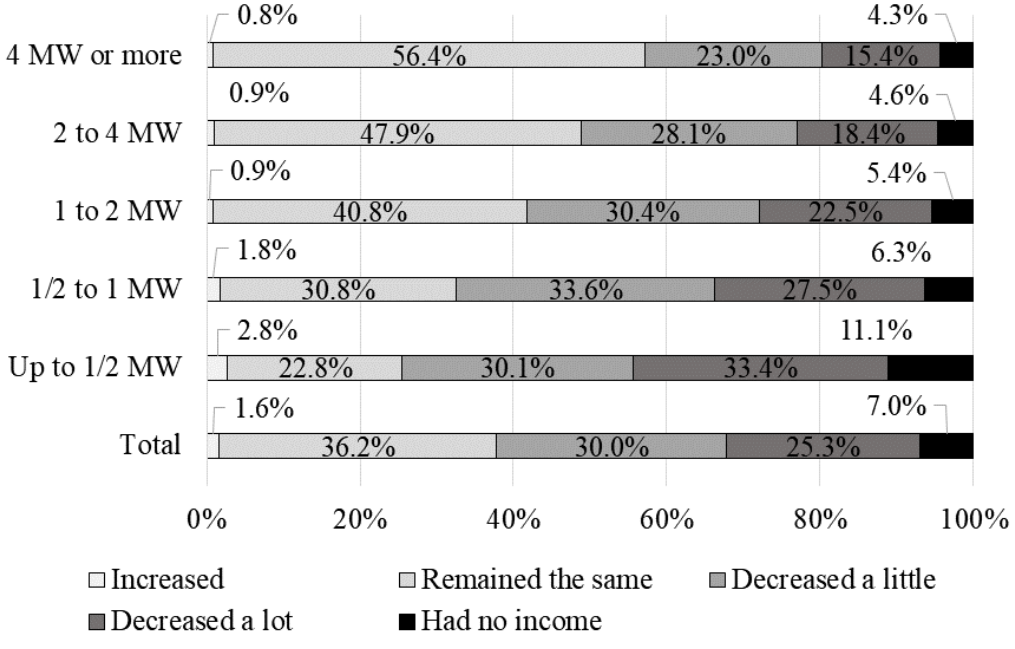
95%CI: 95% confidence interval

with the pandemic, and 61.7% of the population reported increase in the amount of such activities (Table 2).

Regarding family income, by comparing it with that of the period before the pandemic, 55.1% reported decreased income, and 7% remained without any income at all. The impact on the families' income can be equally observed in the data presented in Figure 1. In the evaluation of family income considering MW, among those with the lowest income (up to ½ MW per capita), 11.1% remained without any income, and 63.5% reported decreased income. In the superior category (four or more MW per capita), the percentage rates were 4.3% and 38.4%, respectively, with a gradient per income level: the higher the family income, the lower the reduction of income (Figure 1).

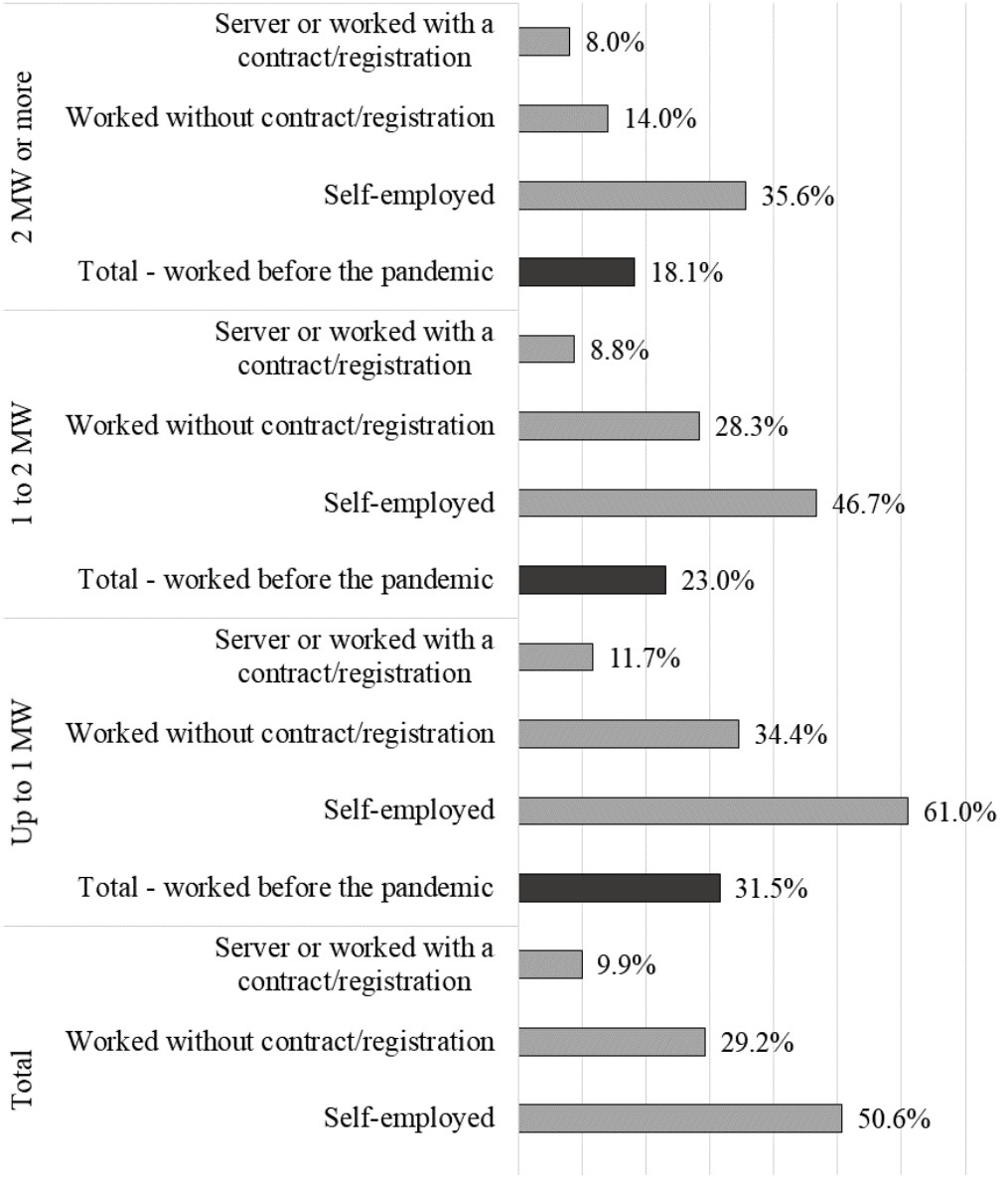
Besides, by comparing the proportion of people who lost their jobs after the pandemic, according to household per capita income (Figure 2), it was observed that informal workers (self-employed) in the lowest income classes were the most affected ones. In total, among those who worked before the pandemic, 25.8% could not work, whereas among informal workers this percentage was 50.6%. In the poorest income class, these percentage rates were 31.5 and 61%, respectively, and in the richest class, 18.1 and 35.6%.

As to the effects of the pandemic on health status, 29.4% of the individuals reported their health became worse during the pandemic. The presence of comorbidities associated with the aggravation of cases of COVID-19 was observed in 33.9% of the participants. About health care, 21.7% searched for medical or dental care. Among those



MW: minimum wage

Figure 1. Impact of the pandemic on the mean household per capita income. *ConVid – Pesquisa de Comportamentos* (Behavioral Research), April 24 to May 24, 2020.



MW: minimum wage

Figure 2. Proportion of individuals who worked before the pandemic and were left without work according to average household income per capita and occupation before the pandemic. *ConVid – Pesquisa de Comportamentos* (Behavioral Research), April 24 to May 24, 2020.

who did, 16.5% needed care due to symptoms related to COVID-19; 25.5%, to continue an ongoing treatment or therapy; 19.6%, due to dental problems; 3.4%, mental health issues; and 35.1%, due to disease or another health problem. About care, 38.3% reported having had some sort of difficulty to be medically assisted (Table 3).

Table 3. Effects on health status, access to health services and psychological issues. ConVid – Pesquisa de Comportamentos (Behavioral Research), April 24 to May 24, 2020.

	%	95%CI
Health status during the pandemic		
Evaluation of worsened health status	29.4	28.1 – 30.7
Presence of risk comorbidities for COVID-19*	33.9	32.5 – 35.3
Search for care	21.7	20.5 – 22.8
Reason to look for care (among those who looked for care)		
Symptoms of COVID-19 or respiratory infection	16.5	14.1 – 19.2
Continuing treatment or therapy	25.5	23.2 – 28.0
Dental problem	19.6	17.3 – 22.1
Mental health issues	3.4	2.6 – 4.3
Disease or another health problem	35.1	32.3 – 38.0
Access to health service (among those who looked for care)		
Got care	86.1	83.8 – 88.1
Had difficulties related to health care**	38.3	36.9 – 39.8
Psychological issues		
Began having sleeping problems or existing sleeping problems became worse	44.9	43.5 – 46.3
Often felt isolated	56.8	55.4 – 58.3
Often felt sad/depressed	40.2	38.8 – 41.7
Often felt anxious or nervous	52.5	51.1 – 54.0
None of these problems	22.8	21.6 – 24.1

95%CI: 95% confidence interval; *risk comorbidities for the aggravation of COVID-19: diabetes, hypertension, asthma/emphysema/chronic respiratory disease or another lung disease and cancer; **difficulties such as scheduling appointments, getting medication, taking examinations etc.

Regarding the psychological issues, 44% began having trouble sleeping, or reported worse quality of sleep after the pandemic. More than half (56.8%) reported feeling isolated from relatives and friends; 40% felt sad or depressed; and 52.5% often felt anxious or nervous during the COVID-19 pandemic (Table 3).

DISCUSSION

The study *ConVid – Pesquisa de Comportamentos* (Behavioral Research) aimed at describing the changes in the lives of adult Brazilians, in different aspects, during the COVID-19 pandemic. About the adherence to social restriction measures, it was possible to observe that approximately 75% of the participants did it, restricting contact with other people and only going out for essential activities. These findings corroborate the results from other national and international analyses, which show good adherence of

the measures from a large portion of the population[13,14]; the impact of social restriction on the reduction of transmission rates of the new coronavirus was visible[4,15-17].

The presentation of flu symptoms during the pandemic was reported by more than one fourth of individuals aged 18 years or more who answered the survey; however, among them, the proportion of people who were tested to know if they were infected by the new coronavirus was only 5.9%. This low testing percentage, especially in the beginning of the pandemic, was also observed in other countries[18]. In Brazil, this can be explained by the lack of tests and the management protocol of patients, which suggests mandatory testing only for severe cases, with symptoms that are suggestive of severe acute respiratory syndrome.

The COVID-19 pandemic brought several challenges to public health, and showed the vulnerabilities of the health system to face emergencies[1,19]. In this context, the availability of opportune information is a recurring challenge for decision makers[20-22]. In Brazil, the low diagnostic capacity had major implications on the notification of cases, which caused not only the underestimation of the prevalence in the population, but also the overestimation of lethality rates[23]. Besides, the fact that people with more severe symptoms presented higher chances of being tested compromised the analysis of the disease status and the monitoring of tendencies[24].

Testing all suspected cases is one of the WHO recommendations to face COVID-19, since it enables to track the contacts and control the propagation of the disease[25]. However, in May 2020, when the study was performed, there was still lack of diagnostic tests for the disease. Despite the investments to produce these tests and the amplification of reference centers, increasing the capacity of processing samples, the distribution of diagnostic kits and the availability of free tests were still deficient, and the prices charged to take the test in the private sector were, and still are, high.

In this analysis, among the individuals who presented with flu symptoms after the pandemic started and took the diagnostic test, the percentage of positive results for COVID-19 was 1.3%. A study carried out in Rio de Janeiro with blood donors who did not have symptoms or previous known history of COVID-19 estimated a 4% prevalence[26]. The first stage of Epicovid19, a study performed in Rio Grande do Sul, estimated a 4.8% prevalence rate, which considerably increased in the other stages of application. In the beginning of the pandemic, nine out of ten cases were not notified[23].

The positive effects of social restriction measures could be observed in the reduction tendency of daily growth rates in the number of accumulated cases in Brazil, from the first week of March to the last week of May, 2020[27]. These measures were essential to contain the dissemination of the disease and prevent the overload of the health system.

However, despite the importance of these measure, in this study it was possible to observe the adverse effects in work status and family income of individuals. Confinement in the household, as well as the closing of non-essential enterprises, led to dismissals and bankruptcy of establishments. Besides, due to changes in labor legislation[28], the

proportion of informal and self-employed workers – who were the most affected by social restriction measures – considerably increased. Considering that the reduction of income affected mostly families with precarious life conditions, it is possible to say that the pandemic has aggravated social inequalities.

The performance of work activities has also changed; one fourth of the workers started to work remotely. Therefore, work began to occupy and share room with other daily and household activities, and the time dedicated to resting has not always been sufficient for physical and mental rehabilitation[29].

Even though it is essential for the containment of the pandemic, social distancing brought relevant psychic disorders related to the feeling of loneliness and isolation from family and friends, changes in socioeconomic context, lack of control over one's own life and fear of getting sick[30,31]. In Brazil, we observed large proportions of individuals who often felt isolated, sad or depressed, anxious or nervous, as well as people who reported having trouble sleeping. Among the ones who presented with previous diagnosis of depression, these effects were more intense[32]. Such results are in accordance with findings from international studies, which assessed the mental health of individuals during the pandemic[32-36].

Regarding the self-evaluation of health, 29.4% reported worsened health status during the pandemic. Biological factors, such as the presence of COVID-19 symptoms and psychological issues, together with the context of socioeconomic losses, affected the health status of the Brazilian population[37].

The proportion of people at risk of aggravation of COVID-19 cases was estimated in 33.9% in this study, which is in agreement with the findings by Rezende *et al.*, based on the data from the National Health Survey carried out in 2013, which was equally based on the presence of NCDs. The authors considered other criteria, including obesity, smoking and presence of renal problems, which increased the estimation to more than half of the Brazilian adult population at risk (54.4%)[38].

Concerning the search for health care during the pandemic, most individuals in the study did not look for health services in the analyzed period. Among the individuals who reported a pre-existing NCD, 25.5% looked for care. The depletion of health services and the fear of being infected in health units led many people to cancel their appointments and to stop following-up their health problems[39]. Among those who sought care, 16.5% said the reason was the presence of symptoms related to COVID-19, and 38% mentioned difficulties to access the health service in the analyzed period.

In this study, some of the aspects investigated by *ConVid – Pesquisa de Comportamentos* were presented. The descriptive results of the study are available online, with free access for the population (https://convid.fiocruz.br/). The results were also publicized by the media, which allowed to guide the population to maintain healthy habits and look for telemedicine services to mitigate psychological disorders. Several articles showing changes in health conditions and lifestyle during the COVID-19 pandemic have been published or were approved for publication[27,32,37,40,41].

ConVid – Pesquisa de Comportamentos has some limitations referring to the chain sampling method using social media. Since this was a web-based survey, some population segments were underrepresented in the sample, such as people with low schooling, or with difficulties to handle cell phones and computers, or those without access to the internet, who had fewer chances of participating. Concerning the geographic distribution of the sample, the research reached all Federation Units and approximately 17,000 cities. For demographic variables (sex, age group and ethnicity), we obtained the necessary diversity to weigh the data, in order to obtain the representativeness of the Brazilian population. Despite the gap of people with low schooling, the large and comprehensive sample and the calibration of data using PNAD 2019 were essential for obtaining a sample distribution that was similar to the Brazilian population, and to generate the adequate estimations.

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