SEVEN
publicações acadêmicas

THE RELATIONSHIP BETWEEN SOCIAL ASPECTS, PSYCHOLOGICAL SYMPTOMS, AND SUBSTANCE USE DURING THE COVID-19 PANDEMIC

A RELAÇÃO ENTRE ASPECTOS SOCIAIS, SINTOMAS PSÍQUICOS E USO DE SUBSTANCIAS DURANTE A PANDEMIA DE COVID-19

LA RELACIÓN ENTRE LOS ASPECTOS SOCIALES, LOS SÍNTOMAS PSICOLÓGICOS Y EL CONSUMO DE SUSTANCIAS DURANTE LA PANDEMIA DE COVID-19

https://doi.org/10.56238/sevened2025.037-013

Thamiris de Christo Dorneles[1], Luciane Flores Jacobi[2], Vitor Crestani Calegaro[3]

ABSTRACT

In 2020, the World Health Organization (WHO) declared a public health emergency and a pandemic of COVID-19, a disease caused by a highly transmissible coronavirus with high morbidity and mortality. Control measures included social distancing and the use of masks, which impacted the population in terms of both mental health and social issues. The objective of this study was to analyze the relationship between social aspects, psychological symptoms, and substance use during the COVID-19 pandemic. This is a cross-sectional study, derived from a prospective cohort, in which electronic questionnaires were applied in four stages. The instruments used included a socioeconomic questionnaire, the AUDIT-C scale for assessing alcohol dependence, the DASS-21 scale for measuring symptoms of stress, anxiety, and depression, and the PCL-5 scale for assessing post-traumatic stress disorder. Data were analyzed using tables of absolute and relative frequencies. The study followed the ethical guidelines of CNS Resolution 466/2012 and was approved by the Research Ethics Committee under registration number CAAE: 30420620.5.0000.5346. Participants in all four stages of the study were individuals over 18 years of age who voluntarily responded to the survey; only those who did not provide a valid email address were excluded. Across all phases of the research, 6,100 individuals participated, predominantly under 35 years of age (61.1%), female (75.6%), single (57.3%), white (84.9%), and students (51%). Among the participants, 80.9% did not present a risk of COVID-19 infection, 88.6% had no comorbidities, and 93.1% had their daily activities interrupted by the pandemic. However, no significant changes in income were observed. Regarding substance use, alcohol consumption was predominantly classified as moderate, ranging from 1 to 4 drinks per month, and was more associated with males and depression. The risk of alcohol dependence was higher in the first phase of the study, and an increase in cigarette consumption was observed throughout the analyzed period. Regarding psychological symptoms, stress was more associated with women in the first phase of the research, with 26.3% of participants already presenting previous symptoms. In all phases of the study,

[1] Master of Science in Health Sciences. Universidade Federal de Santa Maria (UFSM).
E-mail: thamiriscd@gmail.com Orcid:0009-0006-8390-7565
Lattes: http://lattes.cnpq.br/1409061726159575
[2] Dr. in Agronomy. Universidade Federal de Santa Maria (UFSM). E-mail: luciane.jacobi@ufsm.br
Orcid:0000-0003-4622-9292 Lattes: http://lattes.cnpq.br/4372969575747920
[3] Dr. in Psychiatry and Behavioral Sciences. Universidade Federal do Rio Grande do Sul.
E-mail: vitor.calegaro@ufsm.com.br Orcid:0000-0001-8697-0267
Lattes: http://lattes.cnpq.br/7984754404665250

symptoms of stress, anxiety, and depression were identified, with a higher incidence in the first and second phases, ranging from moderate to severe intensity. Given the magnitude of the COVID-19 pandemic and the drastic changes imposed on the lives of the population, this study contributed to understanding the impact of the pandemic on substance use and mental health. The results highlight the need for continuous monitoring of these individuals and evaluation of the post-pandemic situation.

Keywords: Coronavirus. Pandemics. Drug Addiction. Stress. Anxiety and Depression.

RESUMO

Em 2020, a Organização Mundial da Saúde (OMS) declarou a emergência em saúde pública e a pandemia de COVID-19, doença causada por um coronavírus de alta transmissibilidade e elevada morbimortalidade. Como medidas de controle, foram adotados o distanciamento social e o uso de máscaras, os quais impactaram a população tanto em aspectos de saúde mental quanto em questões sociais. O objetivo deste estudo foi analisar a relação entre aspectos sociais, sintomas psíquicos e o uso de substâncias durante a pandemia de COVID-19. Trata-se de um estudo transversal, derivado de uma coorte prospectiva, no qual foram aplicados questionários eletrônicos em quatro etapas. Os instrumentos utilizados incluíram um questionário socioeconômico, a escala AUDIT-C para avaliação da dependência de álcool, a escala DASS-21 para mensuração dos sintomas de estresse, ansiedade e depressão, e a escala PCL-5 para avaliação do transtorno de estresse pós-traumático. Os dados foram analisados por meio de tabelas de frequências absolutas e relativas. O estudo seguiu os preceitos éticos da Resolução CNS 466/2012 e foi aprovado pelo Comitê de Ética em Pesquisa sob o número de registro CAAE: 30420620.5.0000.5346. Participaram das quatro etapas do estudo indivíduos maiores de 18 anos que responderam à pesquisa voluntariamente, sendo excluídos apenas aqueles que não apresentaram um endereço de e-mail válido. Em todas as fases da pesquisa, participaram 6.100 indivíduos, majoritariamente com idade inferior a 35 anos (61,1%), do sexo feminino (75,6%), solteiros (57,3%), brancos (84,9%) e estudantes (51%). Dentre os participantes, 80,9% não apresentavam risco de contaminação por COVID-19, 88,6% não tinham comorbidades e 93,1% tiveram suas atividades diárias interrompidas pela pandemia. No entanto, não foram observadas alterações expressivas na renda. Quanto ao uso de substâncias, o consumo de álcool foi predominantemente classificado como médio, variando de 1 a 4 doses mensais, sendo mais associado ao sexo masculino e à depressão. O risco de dependência de álcool foi maior na primeira etapa do estudo, e observou-se um aumento no consumo de cigarros ao longo do período analisado. Em relação aos sintomas psíquicos, o estresse esteve mais associado às mulheres na primeira etapa da pesquisa, sendo que 26,3% dos participantes já apresentavam sintomas prévios. Em todas as fases do estudo, sintomas de estresse, ansiedade e depressão foram identificados, com maior incidência na primeira e na segunda etapa, variando de intensidade moderada a grave. Diante da magnitude da pandemia de COVID-19 e das mudanças drásticas impostas à vida da população, este estudo contribuiu para a compreensão do impacto da pandemia no consumo de substâncias e na saúde mental. Os resultados ressaltam a necessidade de um acompanhamento contínuo desses indivíduos e da avaliação da situação pós-pandemia.

Palavras-chave: Coronavírus. Pandemias. Drogadição. Estresse. Ansiedade e Depressão.

RESUMEN
En 2020, la Organización Mundial de la Salud (OMS) declaró una emergencia de salud pública y una pandemia de COVID-19, enfermedad causada por un coronavirus altamente contagioso con elevada morbilidad y mortalidad. Las medidas de control incluyeron el distanciamiento social y el uso de mascarillas, lo que impactó a la población tanto en su salud mental como en aspectos sociales. El objetivo de este estudio fue analizar la relación entre los aspectos sociales, los síntomas psicológicos y el consumo de sustancias durante la pandemia de COVID-19. Se trata de un estudio transversal, derivado de una cohorte prospectiva, en el que se aplicaron cuestionarios electrónicos en cuatro etapas. Los instrumentos utilizados incluyeron un cuestionario socioeconómico, la escala AUDIT-C para evaluar la dependencia del alcohol, la escala DASS-21 para medir los síntomas de estrés, ansiedad y depresión, y la escala PCL-5 para evaluar el trastorno de estrés postraumático. Los datos se analizaron mediante tablas de frecuencias absolutas y relativas. El estudio se ajustó a las directrices éticas de la Resolución 466/2012 del CNS y fue aprobado por el Comité de Ética de la Investigación con el número de registro CAAE: 30420620.5.0000.5346. Los participantes en las cuatro fases del estudio fueron personas mayores de 18 años que respondieron voluntariamente a la encuesta; solo se excluyeron quienes no proporcionaron una dirección de correo electrónico válida. En total, participaron 6100 personas, en su mayoría menores de 35 años (61,1 %), mujeres (75,6 %), solteras (57,3 %), de raza blanca (84,9 %) y estudiantes (51 %). Entre los participantes, el 80,9 % no presentaba riesgo de infección por COVID-19, el 88,6 % no tenía comorbilidades y el 93,1 % sufrió interrupciones en sus actividades diarias debido a la pandemia. Sin embargo, no se observaron cambios significativos en los ingresos. En cuanto al consumo de sustancias, el consumo de alcohol se clasificó predominantemente como moderado, entre 1 y 4 bebidas al mes, y se asoció más con hombres y depresión. El riesgo de dependencia alcohólica fue mayor en la primera fase del estudio, y se observó un aumento en el consumo de cigarrillos durante todo el periodo analizado. Respecto a los síntomas psicológicos, el estrés se asoció más con las mujeres en la primera fase de la investigación, con un 26,3 % de participantes que ya presentaban síntomas previos. En todas las fases del estudio se identificaron síntomas de estrés, ansiedad y depresión, con una mayor incidencia en la primera y la segunda fase, con una intensidad que varió de moderada a grave. Dada la magnitud de la pandemia de COVID-19 y los drásticos cambios impuestos en la vida de la población, este estudio contribuyó a comprender el impacto de la pandemia en el consumo de sustancias y la salud mental. Los resultados subrayan la necesidad de un seguimiento continuo de estas personas y una evaluación de la situación pospandémica.

Palabras clave: Coronavirus. Pandemias. Adicción a las Drogas. Estrés. Ansiedad y Depresión.

1 INTRODUCTION

The COVID-19 pandemic has brought with it socioeconomic consequences worldwide, as well as an increase in the numbers of morbidity and mortality and mental health problems. The first case of a disease resulting from the coronavirus, COVID-19, appeared in 2019 in China, spreading rapidly across five continents, and in March of the same year the global pandemic of COVID-19 was declared (WORLD HEALTH ORGANIZATION, 2020; CALEGARO et.al., 2020). The pandemic has become a global public health emergency, as it has spread to 24 countries, in addition to China, initially infecting 38,558 people worldwide by February 2020 (GAO et al., 2020), and according to the Ministry of Health, in Brazil alone by the year 2024, there are 38,934,272 cases of COVID-19 and 713,510 deaths due to the disease.

Taking into account this scenario, the COVID-19 pandemic forced health authorities to make drastic decisions, due to the very high transmission rate, thus leading to social distancing measures. Bosi and Alves (2023) sought in their study to contextualize social distancing beyond the sanitary measure, considering the way of life and aspects of psychic suffering. Due to the magnitude of the COVID-19 outbreak, the psychological symptoms and stress of the population were expected (CALEGAO et al., 2020; SUN et al., 2021). According to Marques et al. (2020), the pandemic has revealed an impact on the community level of the ecological model, as it decreases social cohesion and access to public services and institutions that make up the social network of individuals.

In this context, the high occurrence of morbidity and mortality of the population, added to the economic losses resulting from the pandemic, brought as a consequence an enormous social risk that, consequently, generated an urgent demand for mental health care, including anxiety, depression, and stress (XIANG et al., 2020). It is noteworthy that in addition to panic and fear of contracting the disease, COVID-19 caused the population to feel insecure in the broadest aspects of life, from an individual or collective perspective, daily life, and changes in interpersonal relationships (LIMA et al., 2020).

Due to the uncertainties of the period, social isolation represented a crucial measure to combat the spread of the coronavirus and the development of COVID-19, also resulting in the interruption of social routines, family life of the population and in the economic situation that directly contributed to physical and mental health problems (GOMES et al., 2024).

In order to contribute to the current findings on the pandemic of COVID-19, this research investigates the relationship between psychic symptoms, physical activity, and

substance use during the COVID-19 pandemic. The COVID-19 pandemic, in addition to the high mortality rates and great repercussion of epidemiology in the world, brought with it great social, economic, and cultural impacts, becoming an unprecedented event. Behavioral changes, adoption of unhealthy lifestyles, lack of information and difficulties in accessing services were consequences related to measures to contain the advance of the disease, generating and aggravating mental health disorders. Therefore, it is justified to carry out this study in order to analyze these impacts on the population, seeking to understand the various situations imposed by the COVID-19 pandemic, enabling better analysis and understanding.

2 METHODOLOGY

2.1 DESIGN

This cross-sectional study was developed from a prospective cohort, with nine months of follow-up, during the COVID-19 pandemic, using a non-probabilistic convenience sample.

2.2 CONTEXTUALIZATION

These questionnaires are part of the COVIDPsiq survey, which began data collection (T0) two months after the confirmation of the first confirmed case, in April 2020. COVIDPsiq is a research carried out by the Federal University of Santa Maria (UFSM) in the Department of Neuropsychiatry. Developed from the beginning of the pandemic, aiming at the monitoring and evolution of symptoms with a focus on stress, anxiety and depression, Post-Traumatic Stress Disorder (PTSD) and alcoholism.

Participants over eighteen years of age were included in the study, who answered the questionnaires proposed in the research in a coherent manner, and those participants who did not provide a valid e-mail address were excluded. The questionnaires were collected on four occasions: the first stage called T0, which began approximately one month after the declaration of a public health emergency, that is, with community transmission from March to April 2020; second stage, T1 from May to July 2020 (one month after T0); third stage, Q2 from August to October 2020 (three months later); and fourth stage Q3 from November 2020 to February 2021 (six months later), in digital media, using the *snowball sampling*.

Sociodemographic data were collected and the depression, anxiety and stress scale (DASS-21) and the Alcohol Use Disorders Identification Test (AUDIT-C) were applied to verify substance and alcohol consumption. The research variables used in this study were: age, sex, education, income, ethnicity, marital status throughout the study, profession, social

distancing, comorbidities, previous psychiatric treatments, contact with or contracted COVID-19, sleep quality, alcohol consumption (quantity and frequency), levels of stress, anxiety, and depression.

There are some valid and available instruments in order to identify patients with excessive alcohol consumption and its dependence, but these do not always consider gender, do not meet all the questions necessary for evaluation or excessive number of questions, requiring a long time to complete, requiring greater financial support for research and requiring a trained professional to apply and identify the results (TAUFICK et al., 2014; MACIEL and VARGAS, 2020). Regarding alcohol consumption, the questionnaire was used *Alcohol Use Disorders Identification Test-C* (AUDIT-C) which is a shortened version of the Alcohol Use Disorders Identification Test (AUDIT) used to identify patients with recent binge drinking as well as alcohol dependence (BUSH et al., 1998).

Regarding stress, anxiety and depression, the DASS-21 was applied. This was used in the self-reported Likert scale model, with four scores and 21 items, to measure the severity of symptoms, considering symptoms of stress, anxiety and depression: mild, mild, moderate, severe, extremely severe. To assess the occurrence of trauma, the PCL-5 scale for the DSM-5 was used, which is also presented as a five-point, 20-item Likert scale, which considers a score ≥ 38 points, as possible PTSD.

2.3 PROCEDURES

The collection of digital questionnaires was carried out through the electronic platform *Survey-Monkey*, in order to respect the social isolation measures, and they were widely disseminated on social networks. For the assessment, the answers to the questionnaires were anonymous and it was necessary to sign a consent form. The questionnaires were collected in four stages, T0, T1, T2, T3, and in all stages, the research questionnaire, DASS-21 and AUDIT-C were applied.

2.4 DATA ANALYSIS

The data used in this study were collected through structured questionnaires and analyzed in the SPSS v. 23 software. The data were presented using absolute and relative frequency tables.

2.5 ETHICAL CONSIDERATIONS

This study was approved by the National Research Ethics Committee (CONEP) under the CAAE registration number: 30420620.5.0000.5346. All participants answered the questionnaires voluntarily, with consent from the informed consent, in case of emotional discomfort when participating in the study, the participants were instructed to seek help from the researchers, and links with guidelines and communication channels were also made available.

3 RESULTS AND DISCUSSION

3.1 SOCIAL CONTEXT

The study population consisted of 6,100 participants, considering all phases of the study. The same participant may have answered in only one of the stages or in multiple, including all four phases of the study. In the first stage (T0), 3,644 questionnaires were collected; in the second (T1), 3,468; in the third (T2), 2,238; and on Wednesday (T3), 2,162.

Most participants were under 35 years old (61.1%), female (75.6%) and single (57.3%), in addition to not having contracted COVID-19 throughout the study. There was also a predominance of self-declared white individuals (84.9%) and students (51.0%), as well as a high percentage of participants who had some of their activities interrupted during the quarantine (93.1%). These and other data regarding the characterization of the sample are presented in Table 1.

Table 1

Sample characterization

		N	%
Age range	18 to 29 years old	2967	50,5%
	30 to 39 years old	1254	21,3%
	40 to 49 years old	816	13,9%
	50 to 59 years old	582	9,9%
	Over 60 years	260	4,4%
Gender	Male	1487	24,4%
	Female	4595	75,6%
What gender do you fit	Female	3586	73,6%
Identifies?	Male	1234	25,3%
	Other	20	0,4%
	I prefer not to declare	34	0,7%

Ethnicity	White	5060	84,9%
	Black	193	3,2%
	Other	704	11,9%
Student	Yes	3112	51,0%
	No	2988	49,0%
Schooling	Elementary School	102	1,7%
	Middle school	2490	42,7%
	Higher education	1069	18,3%
	Postgraduate studies	2172	37,2%
Nationality	I'm Brazilian living abroad	43	0,8%
	I am Brazilian and I live in Brazil	5118	98,8%
	I am a foreigner living in Brazil	20	0,4%
Health professional	No	5209	85,4%
	Yes	891	14,6%
Worker - essential service	No	5594	91,7%
	Yes	506	8,3%
Was there a difference in income between the last stage of the study and the first?	Reduced a lot Reduced a little Didn't change Increased a little Increased a lot	24 95 796 198 23	2,1% 8,4% 70,1% 17,4% 2,0%
Did you have any of your activities interrupted during the quarantine?	No Yes	228 3080	6,9% 93,1%
In the first stage of the research: Do you undergo psychological or psychiatric treatment?	No I had my treatment interrupted during the pandemic Yes, I have online consultations Yes, I have face-to-face consultations	2287 522 398 181	67,5% 15,4% 11,7% 5,3%
In the third stage of the research: Currently, Are you undergoing psychological or psychiatric treatment?	I don't do it and I didn't do it before the pandemic I had my treatment interrupted during the pandemic Yes, I have online consultations Yes, I have face-to-face consultations	1250 265 424 260	56,8% 12,1% 19,3% 11,8%
Contact with COVID at work (the entire study)	No Yes	3488 994	77,8% 22,2%
I lived with a person who has COVID-19, or had the	No Yes	265 39	87,2% 12,8%

sickness			
I had to get away from close person who has COVID-19, or has had the disease	No Yes	276 28	90,8% 9,2%
When did you have confirmed COVID-19?	T0 - March to April T1 - May to July T2 - August to October T3 - November to January None	11 55 92 105 5538	0,2% 0,9% 1,6% 1,8% 95,5%
I lost someone close to me due to COVID-19	No Yes	282 22	92,8% 7,2%

Source: Prepared by the author (2025).

Although the majority (95.5%) of the study population did not have the disease, it is necessary to discuss some data. The impact of the COVID-19 pandemic brings with it the reflection that a broad and universal look at the situation is needed. In addition to fighting the virus, it was necessary to analyze biopsychosocial factors and establish relationships with other social markers, such as race, gender, social class, sexuality, territories, and social and economic dynamics, related to the spread and transmission of the virus (MATTA, *et al.*, 2021).

In this study, most of the participants were students. Regarding employment, 91.7% did not work in essential services, 2.9% were retired and only 1.5% had no occupation. Aiming to analyze the protective and stressors of the pandemic in the mental health of the population through an integrative review of several studies, Meirelles and Teixeira (2021) revealed that individuals were vulnerable to mental health problems during the COVID-19 pandemic and that income and occupation are stressors.

In the first stage of the study, 80.9% of the participants reported that they were at risk of contracting COVID-19 in their professional practice. Also 67.2% reported having all the Personal Protective Equipment (PPE) to perform their duties, 81.8% of these reported that they had sufficient knowledge about the pandemic, 40.3% did not feel overloaded at work and that 45.2% of these were satisfied with their remuneration.

The family income reported throughout the study ranged from 1.5 to 6.5 minimum wages (approximately R$ 2,000.00 to R$ 8,000.00), with no significant changes between the

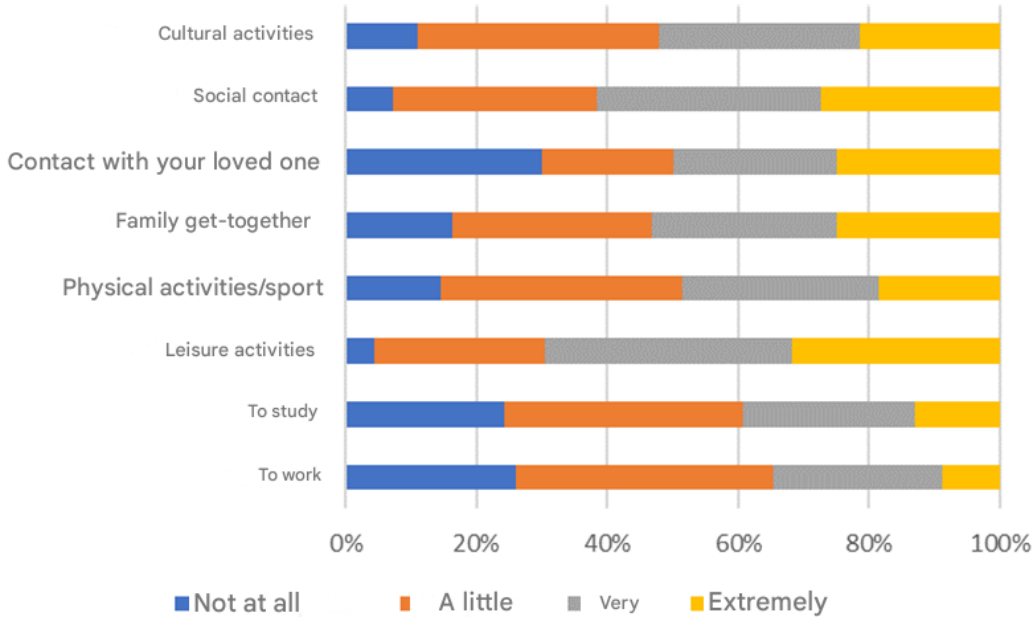
first and last stages of the survey. This result may be related to the socioeconomic profile of the study population, characterized by a high income and access to consumer goods, which suggests a higher level of education. However, most participants (62.5%) reported the possibility of indebtedness or financial losses during the isolation period, a factor that may be directly associated with mental health, acting as a potential stressor.

Quarantine was necessary in order to control the spread of the virus and although it was a control measure, there were negative impacts, as it caused serious psychological, emotional and financial problems on people's mental health, configuring factors that caused stress throughout the pandemic, especially the first stage of the pandemic (BROOKS *et al.*, 2020; Rajkumar *et al.*, 2022). Biopsychosocial aspects related to social isolation during the COVID-19 pandemic were evaluated by Ficanha *et al*., (2020), observed that quarantine or social isolation, despite being an effective control measure, which can be voluntary, caused, in addition to losses in the financial sector, increased anxiety, stress, low sleep quality, and overload of frontline professionals.

Among the stressors analyzed, quarantine stands out, a measure to control the transmission of the virus that required radical distancing from non-essential activities. In the first stage of the study, 93.1% of the participants reported the interruption of their daily activities. In addition, when asked about the emotional impact of quarantine, especially in relation to anguish or sadness due to the absence of certain activities, 31.8% said they felt extremely affected by the lack of leisure, and 27.3%, by the reduction of social contact. On the other hand, 30.1% reported not having felt distressed or sad with the absence of contact with their loved one, and 26.4% did not demonstrate an emotional impact in relation to work (Figure 1).

Figure 1

How distressed or sad you are by missing the following activities during quarantine (first stage of research)



Source: Prepared by the author (2025).

It is observed that leisure activities and social contact are highlighted, which the population feels more distressed by their absence. Despite the benefits of quarantine, due to the containment of the disease, it implies, according to Faro *et al*., (2020), often the experience of unpleasant situations that can impact the mental health of those involved due to factors such as distancing from family members, uncertainties and fear.

Regarding quarantine, in the first stage of the study, when asked if the individual was being treated by a psychologist or psychiatrist, 67.5% answered no, 15.4% answered yes, but had to interrupt the follow-up and 17% answered yes, maintaining either remotely or in person. The pandemic, according to Santos *et al.* (2024), due to its crisis characteristic, the need to protect the population and the imminent reduction in face-to-face service offerings, fostered new modalities of care such as teleservice to emerge, both in relation to mental health demands and health in general.

Due to the measures to contain the virus, Minervino *et al*. (2020) reported that it was necessary to incorporate new care modalities, such as telecare, prioritizing those patients at higher risk of exposure (age/comorbidities) to COVID-19. According to the Brazilian Association of Psychiatry (2020), in a survey carried out internally with its members, it

revealed that there was an increase in the demand for care and especially for patients who had never had previous psychiatric symptoms.

Regarding the distancing of activities, in general there was a change to remote work/study, which is a significant change for all participants, who reported that they did not usually carry out their remote activities. The National Household Sample Survey (PNAD) COVID-19, carried out in May 2020, explained that in Brazil, 77.5% of Brazilians were not away from work; Among these, 13.3% (8.7 million) were working remotely and among those away from work, approximately 9.7 million were unpaid, making up 51.1% of the persons away from work or 11.5% of the total employed.

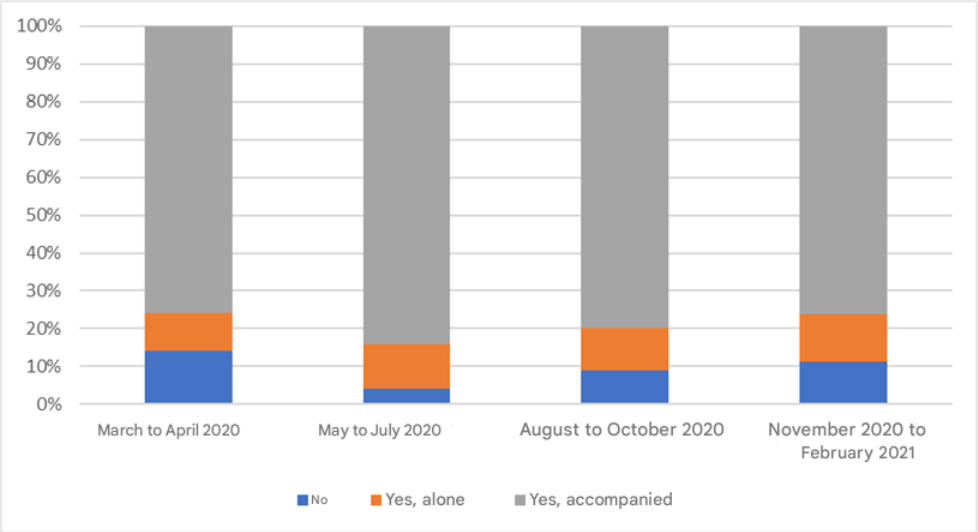
Corroborating the question about the pattern of activities during the pandemic, both quarantine and social isolation were inserted abruptly due to the urgency of COVID-19, without any structure, which caused many problems and a source of stress in households and family life. The changes on remote work, according to Araújo and Lua (2021), occurred at a time marked by social distancing measures and in which negative economic consequences, unprecedented recession, economic decline, layoffs, and increased unemployment were expected, factors that can arouse fear and anxiety about the future and affect the quality of remote work and people's lives.

In a technical note, the Institute for Applied Economic Research (IPEA), through the Directorate of Studies and International Economic and Political Relations, launched in June 2020, mentions an important observation, which consists of the decentralization of social distancing, that is, there was a variation in relation to the adoption, by states and municipalities, of this measure (MORAES, 2020). Due to the magnitude of the pandemic as well as the rapid infection and community transmission, it led health authorities to take unprecedented measures such as the isolation of the population, it is estimated that more than a third of the world's population has carried out isolation, with the closure of schools, public institutions and others (MAIA and DIAS, 2021).

In this sense, regarding social distancing throughout the study, it can be observed that with the increase in cases of the disease throughout the pandemic, there was greater distancing, especially in relation to the first and second stages. The analysis of this distance in relation to being alone or accompanied, in all stages of the study, showed that the participants were accompanied, according to the data presented in Figure 2.

Figure 2

Profile of distancing throughout the study



Source: Prepared by the author (2025).

It should be noted that due to the great ignorance and uncertainties that the pandemic brought with it, as well as the lack of a standard global response, many hypotheses were disseminated in order to contain and monitor cases of the disease. Worldwide, one of the control measures adopted by the various countries was the *Lockdown*, this measure is nothing more than the total or partial isolation of non-essential activities that occurred in the first months of the pandemic. According to Houvèssou, Souza and Silveira (2020), the countries that have implemented *Lockdown* had a decrease in the daily incidence of COVID-19 in the period of three weeks and that in Brazil and the United States, countries that have not implemented *Lockdown*, did not show a significant decrease.

Due to social isolation and the need to stop many activities, a large part of the population had to live together more intensely. From the perspective of family structuring and its peers, the marital issue brings with it good levels of relationship, it is necessary to consider variables around the relationship, experience of origin, educational, cultural and economic level, as well as psychological factors such as emotional self-regulation (FALCÃO, NUNES and BUCHER-MALUSCHKE, 2020).

It is known that in the present study there were no significant changes in the marital relationship. After the quarantine period, in the second stage of the study, when asked "during the pandemic, was there a change in your marital relationship?", 91.2% reported no changes, 4.7% got married, and 4.1% went through divorce proceedings. The same can be observed

about the fact that there is no change in who lives with whom they live, 92.6% without changes. In view of the pandemic scenario, Souza, Almeida and Gomes (2022), carried out a study in order to understand the reflections of the process of intense coexistence, caused by social isolation, sudden change in day-to-day life and uncertainties both financial and mental health, which demonstrated that many couples were able at this time, to look inside the relationship that in some cases culminated in the separation and others with the possibility of reinventing themselves and strengthening the union.

Regarding interpersonal relationships, it is necessary to think about other factors that cause stress, such as occupation, employment or lack of it, and income. The International Labor Organization (ILO), in 2020, signaled that impacts due to COVID-19 could occur in relation to three situations: the number of jobs (with a sudden increase in both unemployment and underemployment); the quality of employment (fall in income and level of social protection); and inequality (more severe effects on specific groups that are more vulnerable to retractions in employment and income levels) (ILO, 2020).

It is known that the pandemic situation has changed the population's lifestyles, not only due to the fear of contracting the disease, but also due to the need for isolation and social distancing, a situation that has become a perfect niche for generating stress, whether from internal conflicts or related to coexistence and consequently increasing the rates of domestic violence (BOTH *et al*., 2021; BROOKS *et al*., 2020). With all these life changes, it is worth analyzing the situation regarding comorbidities associated with the study population, as it is necessary to consider that in addition to all insecurity, fear, stress and anxiety, these comorbidities may have been aggravated by the new lifestyle, such as eating patterns, substance consumption and inactivity. It is essential to determine the main risk groups for any disease, according to Feitosa *et al.* (2020), and that in the face of the pandemic scenario, this identification is even more decisive for the decision-making of professionals in the face of diagnosis, prognosis and treatment and that chronic diseases such as heart disease, hypertension, respiratory problems and diabetes accelerate a worse prognosis in the evolution of the disease caused by the Coronavirus.

It can be observed that of the total sample, 88.6% did not have respiratory problems (asthma, chronic bronchitis, emphysema or other chronic disease), 98.7% did not have cancer, hematological or immunosuppressive problems (leukemia, lymphoma, myeloma, anemia, etc.), 98.2% did not have cardiovascular problems (infarction, stroke, ischemia, thrombosis, etc.), 97.8% did not have diabetes and 88.8% were not obese.

In order to investigate changes in lifestyle and health conditions during the COVID-19 pandemic, researchers from the Oswaldo Cruz Foundation in partnership with universities, conducted the CONVID survey. This was carried out through an electronic questionnaire via WEB between April and May 2020, totaling 44,062 adult participants, of which 66.1% did not have chronic non-communicable diseases (NCDs), and most of those who had NCDs (diabetes, hypertension, lung diseases, heart diseases and depression) reported that this condition remained the same or worsened slightly.

A study on the clinical/epidemiological characteristics of patients who died in urgent and emergency services in Spain was carried out by Vázquez-Garcia *et al.* (2020), relating comorbidities presented and their results indicated that these patients had high rates of associated comorbidities (chronic diseases). About 20% to 51% of COVID-19 patients have been detected with some disease. Not only from a biological point of view, but also from a drug x cure point of view, it is necessary to think about psychiatric patients, since due to the pandemic situation, withdrawal from most activities and great social vulnerability, greater attention is needed to the mental health of the population, which can aggravate the underlying disease and the emergence of both psychiatric comorbidities and worsen chronic health conditions (MINERVINO *et al.*, 2020).

3.2 SUBSTANCE USE

The highest frequency of alcohol consumption found was approximately two to four times a week, as well as never consumed, considering all stages, and there was a significant reduction in the frequency of consumption between the first and last stages of the study. When analyzing the amount in doses they usually drink, most reported consuming one or two drinks and never or less than once a month the frequency of consumption of six drinks or more. This information can be seen in Table 2.

When we analyze the frequency of alcohol consumption in relation to gender in the initial phase of the research, 33.1% of men consumed it two or more times a week and at the end of the research this number increased to 37.8% and the reduction or lower occurrence with women. Therefore, it is believed that dependence may have occurred due to the high frequency of weekly consumption among men.

Table 2

Alcohol use during the COVID-19 pandemic

Frequency of alcohol consumption	T0	T1	T2	T3
Never	1322(39,0%)	486(17,5%)	381(18,8%)	326(17,4%)
Monthly or less	373(11,0%)	715(25,8%)	598(29,5%)	488(26,1%)
2 to 4 times a month	893(26,4%)	843(30,4%)	544(26,8%)	547(29,2%)
2 to 4 times a week	657(19,4%)	569(20,5%)	395(19,5%)	416(22,2%)
4 or more times per week	143(4,2%)	162(5,8%)	109(5,4%)	94(5,0%)
Amount in doses usually drinks				
1 or 2	2209(65,2%)	1847(66,6%)	1412(69,7%)	1239(66,2%)
3 or 4	741(21,9%)	621(22,4%)	416(20,5%)	424(22,7%)
5 or 6	296(8,7%)	206(7,4%)	141(7,0%)	142(7,6%)
7, 8 or 9	84(2,5%)	57(2,1%)	39(1,9%)	43(2,3%)
10 or more	58(1,7%)	44(1,6%)	19(0,9%)	23(1,2%)
Frequency of use of more than 6 doses				
Never	2051(60,5%)	1601(57,7)	1266(62,5%)	1122(60,0%)
Less than once a month	835(24,6%)	798(28,8%)	531(26,2%)	491(26,2%)
Monthly	322(9,5%)	235(8,5%)	125(6,2%)	139(7,4%)
Weekly	169(5,0%)	128(4,6%)	99(4,9%)	108(5,8%)
Every day or almost every day	11(0,3%)	13(0,5%)	6(0,3%)	11(0,6%)

Source: Prepared by the author (2025).

The pandemic brought with it some aspects related to fear and insecurity about the future, which generated great discomfort, anxiety and stress, aggravated by the need for social distancing and the decrease in human relationships, situations that directly impact mental health and consequently lead to substance consumption or even increase the beginning or increase in consumption (PORTELLA, *et al*., 2022; DIETZE and PEACOCK, 2020). Alcohol is the most consumed drug in the world and during social distancing it can be associated with negative feelings, being used as a way to ease or reduce the tensions produced by the pandemic, which consequently can lead to an increased risk of dependence (OLIVEIRA *et al.,* 2021).

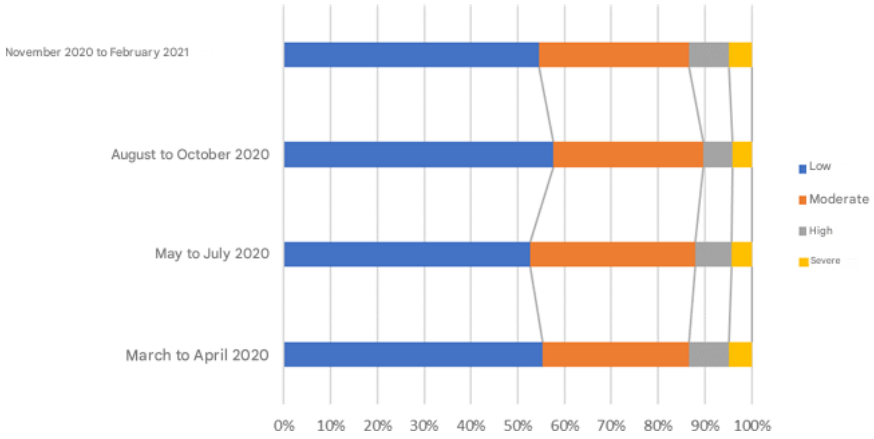
It is necessary to think of several possibilities for the analysis of substances during the COVID-19 pandemic. When conducting an analysis on alcohol consumption during the pandemic, Rehm *et al.,* (2020) proposed that in a pandemic scenario, crisis, quarantine and social distancing, it should be taken into account that at first there is a forecast of an increase

in alcohol consumption and that later there is a decrease in consumption, due to factors such as physical and financial availability for acquisition, which in the short term leads to suffering. Oliveira's findings *et al*. (2021) prove that there was a significant increase in the consumption of alcoholic beverages during the pandemic in relation to the period of social distancing, which they did not consume before and after isolation they started to consume and those who already consumed started to drink more beverages, and the results had a positive association for young women.

For Garcia and Sanchez (2020), alcohol is a psychoactive substance and depressant of the nervous system, and its consumption is associated with mental disorders and that, added to the pandemic, isolation and the increase in the amount of regular use, can also potentiate and exacerbate depressive and anxiety episodes, as well as increase tolerance and dependence. This same author reveals that the use of alcohol in stressful situations such as the pandemic, mistakenly leads to the feeling of relaxation, as mentioned above, with alcohol being a depressant of the central nervous system (CNS), which can cause domestic accidents, increasing the possibility of exposure to COVID-19, as well as the increase in domestic and family violence, response to isolation and grief. During the study, the AUDIT-C score was calculated to assess the risk of alcohol dependence in the population. Stability in risk levels was observed throughout the stages, remaining predominantly at low levels (Figure 3).

Figure 3

Risk of alcohol dependence (AUDIT-C)



Source: Prepared by the author (2025).

When the amount of alcohol consumption was analyzed, in the first stage (T0), individuals who had extreme depression had higher consumption. Analyzing all the stages of the study in relation to stress and anxiety levels, it was observed that in the fourth stage (T3),

for stress and extreme anxiety symptoms, there was a significant increase in the number of doses ingested (5 or more doses).

In the analysis of the risk of dependence, it was found that, only in the first stage (T0), individuals with severe depressive symptoms showed a greater association with high or severe risk, with no significant relationship with anxiety or stress. In the subsequent stages, the risk of addiction remained low for all psychological symptoms. However, among those who adopted social distancing at T0, the risk was classified as moderate. To determine the increase in alcohol consumption during the pandemic, Ayyala- Somayajula *et al*. (2024) carried out a study comparing the year 2018, before the pandemic, whether there was a persistence of alcohol consumption until 2022, the post-pandemic period. As the main result, it was possible to see that there was an increase in alcohol consumption both in 2020 and 2022, when compared to 2018, indicating that the increase in alcohol consumption continued to grow throughout the pandemic. According to the authors, this behavior is due to the stress arising from the pandemic, changes in habits, and difficulties in accessing health services.

During the quarantine, an increase in the consumption of alcoholic beverages and substances can be observed. These data are validated in the Malta study *et al*. (2020), that during the period of social restriction the increase in alcohol consumption was observed mainly for the young adult population (17.6%), without gender differentiation and that 34% of smokers increased their cigarette consumption, proving the behavioral change that the pandemic represents.

In this sense, the misuse or exacerbation of alcohol is one of the most important causes of preventable and preventable deaths. Its prolonged use can evolve into a serious disorder and in this pandemic context, added to the stress of days of uncertainty, fears, economic loss and isolation, it can lead to continued use and even serve as relapses for addicts (CLAY and PARKER, 2020).

Evaluating the consequence of drug use and mental health in the population during the COVID-19 pandemic, Heidrich (2024) showed that changes have occurred in social distancing. The main findings revealed that those who practiced greater social distancing also reduced the consumption of alcohol, tobacco, marijuana, amphetamines, inhalants, and cocaine, which were associated with depression. Those who distanced themselves less demonstrated the opposite and that these had symptoms of anxiety reported; Young men, with less education, low income and less social distancing, have higher drug consumption, but with the passage of the pandemic drug consumption has been reduced.

The use of substances can individually and collectively impact a population, in general the use weakens the immune system, so in relation to COVID-19, people who consume "drugs" tend to become in the risk group for more severe conditions of the disease (BARBOSA *et al.*, 2020). In this sense, it can be seen in Table 3 data on the consumption of psychoactive substances in the population of this study.

Within the consumption of substances, we have smoking. At all times of the study, most participants were not smokers, but there was a reduction in the number of smokers between the first and last stages. When the number of cigarettes consumed was asked to smoke, the individuals reported consuming 10 to 20 cigarettes per day at all stages. Some studies reinforce that five to seven months after the event of social isolation or quarantine, there was an increase in cigarette consumption, which went to 20 more cigarettes per day. In addition, the increase in ecstasy and cocaine use in the second half of 2021 may be linked to the relaxation of isolation measures (MALTA *et al.*, 2020; SCHRAM, DAL COL and BORTOLI, 2022).

Table 3

Use of psychoactive substances during the COVID-19 pandemic

Over-the-counter stimulant medications	T0	T1	T2	T3
Never	3303(97,5%)	2666(96,1%)	1971(97,2%)	1813(96,9%)
At most once a month	61(1,8%)	66(2,4%)	33(1,6%)	40(2,1%)
More than once a month	24(0,7%)	43(1,6%)	23(1,1%)	18(1,0%)
Over-the-counter "calming" drugs				
Never	3112(91,9%)	2456(88,5%)	1816(89,6%)	1672(89,4%)
At most once a month	164(4,8%)	157(5,7%)	124(6,1%)	97(5,2%)
More than once a month	112(3,3%)	162(5,8%)	87(4,3%)	102(5,4%)
Over-the-counter morphine and derivatives				
Never	3239(95,6%)	2608(94,0%)	1935(95,5%)	1785(95,4%)
At most once a month	94(2,8%)	84(3,0%)	47(2,3%)	59(3,2%)
More than once a month	55(1,6%)	83(3,0%)	45(2,2%)	27(1,5%)
Marijuana or hashish				
Never	2935(86,6%)	2421(87,2%)	1824(90,0%)	1647(88,0%)
At most once a month	267(7,9%)	197(7,1%)	107(5,3%)	133(7,1%)
More than once a month	186(5,5%)	157(5,7%)	96(4,7%)	91(4,9%)
Cocaine or crack				

Never	3342(98,6%)	2760(99,5%)	2013(99,3%)	1854(99,0%)
At most once a month	30(0,9%)	9(0,3%)	9(0,5%)	13(0,7%)
More than once a month	16(0,5%)	6(0,2%)	5(0,2%)	4(0,3%)
Ecstasy (MDMA, bullet) or other stimulant				
Never	3260(96,2%)	2712(97,7%)	2000(98,7%)	1838(98,2%)
At most once a month	127(3,7%)	60(2,2%)	26(1,3%)	30(1,6%)
More than once a month	1(0,0%)	3(0,1%)	1(0,0%)	3(0,2%)
LSD (lysergic acid, "sweet") or other hallucinogen				
Never	3300(97,4%)	2720(98,0%)	2000(98,7%)	1836(98,1%)
At most once a month	87(2,6%)	50(1,8%)	22(1,1%)	30(1,6%)
More than once a month	1(0,0%)	5(0,2%)	5(0,2%)	5(0,3%)
Do you smoke cigarettes?				
Yes, I smoke these days	279(8,2%)	189(6,8%)	153(7,5%)	140(7,5%)
I've never been a smoker	2649(78,3%)	2215(79,8%)	1633(80,6%)	1478(79,0%)
No, I quit smoking (ex-smoker)	456(13,5%)	371(13,4%)	241(11,9%)	253(13,5%)

Source: Prepared by the author (2025).

Within the consumption of substances, we have smoking. At all times of the study, most participants were not smokers, but there was a reduction in the number of smokers between the first and last stages. When the number of cigarettes consumed was asked to smoke, the individuals reported consuming 10 to 20 cigarettes per day at all stages.

Some studies reinforce that five to seven months after the event of social isolation or quarantine, there was an increase in cigarette consumption, which went to 20 more cigarettes per day. In addition, the increase in ecstasy and cocaine use in the second half of 2021 may be linked to the relaxation of isolation measures (MALTA *et al.*, 2020; SCHRAM, DAL COL and BORTOLI, 2022).

COVID-19 and smoking are negatively associated, as both compromise the immune system, and can result in multiple clinical manifestations and a worsened prognosis. There is a consensus that smokers are more likely to develop severe forms of COVID-19 infection (SOARES *et al.,* 2020).

In addition to immune compromise, the act of putting your hand to your mouth when smoking increases the risk of infection. Social isolation also influences smoking, since the stress and anxiety generated during this period can intensify the need and urgency to smoke. This behavior, in addition to impacting the smoker's health, can expose their family members

to greater risks (DIEHL, PILLON, and SANTOS, 2021; SOARES et al., 2020). Still on the behavioral issue, it is necessary to talk about another aspect, the psychological issue involving smoking. According to the Ministry of Health (2019), smoking has multifactorial determinants, psychological dependence has an important participation in the lives of those who smoke, the sensation attributed to cigarette use and the ability to offer the smoker a feeling of momentary comfort or relaxation, being an escape valve to deal with stressful situations, since studies prove that smokers have higher rates of anxiety and depression. Therefore, the pandemic period fits in all senses for smokers to consume more tobacco due to the great period of uncertainty, emphasizing quarantine (BRASIL, 2019; MENICHELLI, FREITAS and GONZAGA, 2021).

The 2021 World Drug Report, organized by the United Nations Office on Drugs and Crime (UNODC) points out that the main psychoactive substance (drug) consumed in the world is cannabis and that there was an increase in its consumption during the pandemic. In the same 2024 report, cannabis remains the most consumed drug in the world, followed by opioids, amphetamines, cocaine and ecstasy, especially in women. Regarding psychoactive substances related to pharmaceutical products, in addition to easy access, the market is broad, which enhances their use.

In order to understand this pattern of substance use, it was verified by Menichelli, Freitas, and Gonzaga (2021), who carried out a detailed search in 39 other studies and concluded that most of these had changes in the patterns of psychoactive substance use. In Brazil, there was a 13.1% increase in the consumption of alcoholic beverages, while the number of daily cigarettes consumed by smokers increased, the consumption of benzodiazepine-type drugs rose 12.7% since the beginning of the pandemic, and there was an increase of almost 14% in the sale of antidepressants and mood stabilizers.

Taking into account that in the pandemic, in general, there was a reduction in social contact and consequently difficulties in accessing treatments or even their continuity, as discussed earlier. However, in this context, the symptoms of stress, anxiety and depression are more exacerbated, which, in some cases, makes the consumption of some substances more frequent. When we talk about medications, we could verify in our study that although most of them did not use stimulant medications without a medical prescription, there was an increase in monthly consumption and that the same also occurred in relation to calming medications and even when the frequency occurred, there was also an increase, from 2 to 4 times a week or more.

The profile of medication dispensing related to mental health was described by Barros and Silva (2023), who analyzed the before and after the pandemic, found that there was an increase in the consumption of psychotropic drugs, especially clonazepam, diazepam, lithium carbonate, fluoxetine, and haloperidol. In a very similar way, Correia *et al.* (2023) carried out their study and were able to observe that there was an increase in the consumption of psychotropic drugs in 2021, especially antidepressants and anxiolytics, which may be linked to new dispensing rules, as well as the inclusion of new patients due to the pandemic.

Regarding the use of illicit drugs, marijuana is the most consumed drug, followed by stimulants and hallucinogens. It can be observed in the present study that when analyzing consumption data throughout the pandemic, there is a decrease in the consumption of stimulants and hallucinogens, due to the issue of ways to obtain due social isolation. Evaluating the use of medicines during the pandemic, Calegaro *et al.* (2022) on the same issue reveal that the use of benzodiazepines without medical supervision predicted symptoms of stress, anxiety, and depression, and cannabis PTSD on depression.

The United Nations Office on Drugs and Crime (UNODC) has shown that people who use more drugs are more vulnerable and have greater consequences related to the virus. In addition, in the time analysis, that is, in the first phase of the pandemic, there was an increase in the consumption of alcohol and other drugs, especially people with clinical anxiety and depression and those suffering from stress related to COVID-19. In general, the use of alcohol and other drugs is associated with an increase in situations and behaviors that generate stress, which are responsible for part of avoidable deaths and accidents (AROS *et al.,* 2022).

3.3 STRESS, ANXIETY, AND DEPRESSION

The present study evaluated stress, anxiety, and depression in all its stages. Regarding gender and stress levels, the highest prevalence was observed in women and more specifically in the T0 stage, with 49.9% of women reporting moderate to extremely severe stress. On levels of stress, depression and anxiety symptoms, Santos *et al.* (2022) found that during the pandemic all of them had altered levels above average and were mainly associated with women, that is, anxiety and stress had mild changes, while depression, moderate changes. Modern life forces us to live at a fast pace, in which, in addition to social issues, stress, anxiety and depression are present in the daily lives of many people.

These factors, added to the COVID-19 pandemic, which generated fear and insecurity, resulted in a great overload on people's mental health, also generating a significant increase in these symptoms, often caused by the need for social isolation.

Dividing into pre-crisis, intra-crisis and post-crisis period, Faro *et al.,* (2020) made an analysis regarding the pandemic. In the pre-crisis period, it is essential to plan, recommend social distancing and disseminate correct information, in order to reduce anxiety and stimulate attitudes and behaviors that should be adapted, which often occurred the opposite, a lot of diffuse and confusing information, without the veracity of facts. This phase is characterized by acute stress, more related to the female sex and to younger women. In the intra-crisis, it is where the seriousness of the situation and the risk of contagion are verified, characterized by the large number of suspected and confirmed cases, overload of health services and the presence of deaths, with a vertiginous increase in symptoms of anxiety, panic disorder, fear and depression, determining that the pandemic is not just a biological situation. The post-crisis period concerns social reconstruction, decline in cases, relaxation of social isolation, resumption of economic activities and the reduction of virus transmission.

The pandemic worked as an accelerator of trends, placing distance learning, remote work, digital and mental acceleration, and availability to work without the right to disconnect. The same is true of mental health, with an exponential increase in symptoms such as anxiety, depression, and stress, both for those infected and for those who had to carry out social isolation, became unemployed, experienced grief, insecurity, increased alcohol consumption, and overwork for those on the "front line" (CORBANEZI, 2023).

Regarding the psychological symptoms related to the work environment, it is relevant to highlight that, in the T0 phase of this study, 51% of the participants pointed to salary/income as the main source of concern and stress. On the other hand, other factors – such as professional recognition, job stability, security, relationships with colleagues, bosses or customers, workload and possible COVID-19 infection – were evaluated as secondary sources of stress. Results similar to those of the present study were observed by Barbosa *et al*. (2021), who investigated the frequency of anxiety, stress, and depression in Brazilians during the COVID-19 pandemic. The study, conducted with 1,775 participants through an electronic questionnaire on mental health, revealed that 78% were women, single, actively employed and already undergoing psychiatric follow-up before the pandemic, presenting moderate symptoms of mental health impairment. Similarly, Maia and Dias (2021) evaluated 619 university students and compared their levels of anxiety, depression, and stress before

and during the pandemic. The results indicated a significant increase in psychological disturbance among young people, especially among women, suggesting the negative impact of the pandemic on the mental health of this population.

It can be observed that 26.3% of the population in this study had some symptom of anxiety prior to the pandemic and 27% had depression. In the first stage of the T0 survey, in which the pandemic began and there was quarantine, 67.5% of the participants did not undergo treatment with a psychologist and/or psychiatrist. In the second phase of the study, with the pandemic more active, an increase in the number of cases and many uncertainties, the number of people who did not undergo psychological or psychiatric treatment decreases; The number of people who had their treatment interrupted by the pandemic also reduces and there is an increase in people who are having online and face-to-face consultations. This pattern was maintained in the third stage of the study, when the question about maintaining online and face-to-face consultations between the second and third stages increased from 22.3% to 31.1% (Table 7).

In this sense, it can be observed that the pandemic in general is not only associated with the pathological agent, that is, attention must also be paid to mental health implications, since the measures adopted to reduce contagion are also directly linked to psychological symptoms and consequently to negative consequences that in the long term can be long-lasting and chronic (Ornell *et al.,* 2020; SCHMIDT *et al.,* 2020). Calegaro et al. (2022) conducted a study in order to compare predictors of symptoms of stress, anxiety, and depression and post-traumatic stress disorders (PTSD) in Brazilians one month after the adoption of social isolation, using the COVIDpsiq survey, the source of the present study, that is, in the first stage (T0). The findings point to a positive association between stress and depression in females, which in relation to occupation, as in the present study, most students were also associated with greater suffering and depressive symptoms; the lower family income, the higher levels of anxiety and depression were reported; having a chronic disease with a risk factor for COVID-19 represented greater anxiety, stress, and PTSD symptoms; about abuse and violence that occurred mainly in quarantine, directly affected all symptoms; social distancing was related to all symptoms, with the exception of complying with distancing alone, which was not associated with anxiety; the current diagnosis of symptoms was higher than that of previous diagnosis and treatments that were paused due to social distancing due to the pandemic, had associated symptoms of PTSD.

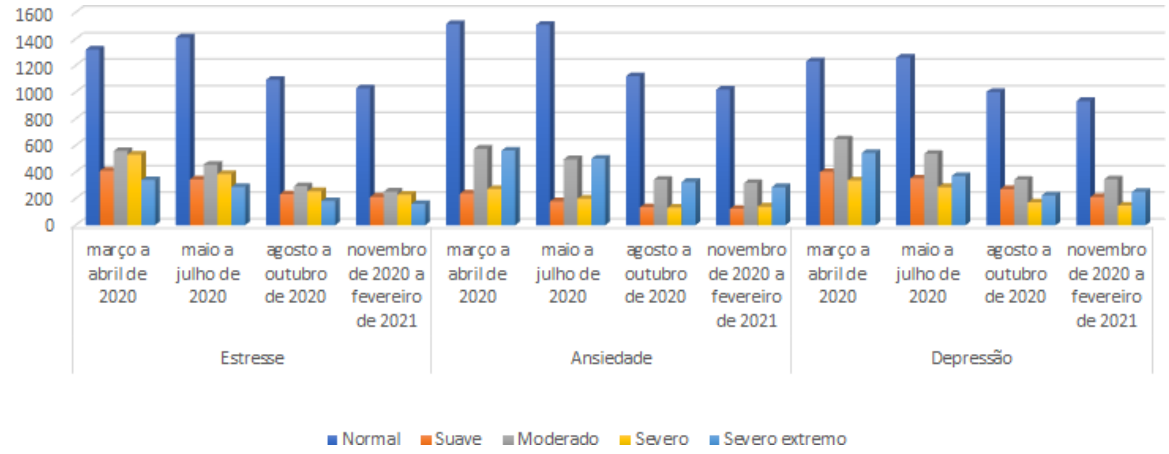
Throughout the research, most participants reported an average sleep time between 6 and 8 hours per day, with 59.2% in the T0 phase, 62% in T1 and 67.5% in T2. Regarding the time needed to fall asleep, in the T0 phase, 30.3% of the participants took less than 20 minutes, 47.7% between 20 minutes and one hour, and 22% more than one hour. At T1, these percentages were 26.9%, 50.9%, and 22.3%, respectively, while at T2, 28.3% of the participants took less than 20 minutes, 53.8% between 20 minutes and one hour, and 17.9% more than one hour to fall asleep. In addition, a relevant aspect analyzed was the difficulty in maintaining enthusiasm to perform usual activities. At T1, 88.5% of the participants reported some difficulty in this aspect, a percentage that remained high at T2 (85.4%). In a study to analyze sleep behavior during the pandemic and relate it to mental health, Neculicioiu *et al.* (2022) found reports of longer sleep durations, but with low quality, generating difficulties in daily life. The authors point out that changes in sleep patterns can consequently alter mood, bring daily sleepiness and even cognitive impairment. Therefore, it is essential to analyze the relationship between sleep and mental health, since both are interconnected. During the pandemic, the high prevalence of symptoms of impaired mental health may have contributed to the occurrence of sleep disorders.

A study carried out in the southern region of Brazil, with 327 participants, evaluating the impact of the pandemic and sleep quality, showed that most participants were female (74.4%), had completed higher education (87.1%), experienced stressful situations during the pandemic (59.3%), practiced social isolation (55.4%) and most had no previous psychiatric disorder (59.3%). Of these, 41.6% had moderate to severe depressive symptoms, 45.9% moderate to severe anxiety, 44.6% moderate to severe stress, and 73.5% reported sleep quality disturbances. Symptoms of stress, anxiety, and depression were associated with age, stressful situations, and sleep dysfunction (BÜCKER, ROSA, and CZEPIELEWSKI, 2022). Read *et al*., (2020) reports that there was a significant increase in people who developed insomnia or sleep disorders during the pandemic and worsening of symptoms in those who already had insomnia.

In view of the above, it is possible to say that the COVID-19 pandemic represented a great mental health challenge, due to the increase in situations of stress, anxiety, and depression. The levels of stress, anxiety and depression measured in the study are shown in Figure 4.

Figure 4

Levels of stress, anxiety, and depression during the COVID-19 pandemic



Source: Prepared by the author (2025).

It can be observed in all stages of the research that there were symptoms of anxiety, stress and depression. All symptoms present with more levels of severity at T0 and T1, which can be justified by the fact that these stages were carried out in the first months of the pandemic, a phase in which many changes occurred in the lives of the population. If we analyze the sociodemographic profile added to the *lockdown*, quarantine, closure of non-essential activities, for many it meant the loss of their routine, increased family life, but it was also a time to evaluate possibilities, seek reorganization, prioritize some faces of life. A decline in symptoms can be observed over time, showing adaptation of the population to the "new", with the relaxation of restrictive measures, better and more qualified guidelines for the population and the need to resume daily life, demonstrating the timeline and evolution of the pandemic.

A study conducted in China, in order to understand the psychological impacts, and especially stress, anxiety, and depression in the first stage of the COVID-19 pandemic, revealed that 53% of respondents rated the psychological impact as moderate to severe. Of these, 16.5% had moderate to severe depressive symptoms; 28.8% showed moderate to severe anxiety symptoms and about 8.1% moderate to severe stress levels and these were associated more strongly with females and students, indicating negative impacts on mental health (WANG *et al.,* 2020; MAIA and DIAS, 2020).

Some authors state that for people who already had associated psychological symptoms, social distancing measures contribute to the worsening of symptoms, which

represents a worsening of mental health and that financial difficulties worsen both anxiety, depression and stress (RODRIGUES *et al.,* 2020; BAPTISTA *et al.,* 2022).

In general, due to the social distancing caused during the pandemic and also the pandemic itself, due to the threat to life in its broad magnitude (aspects of coexistence, social, economic and well-being), they caused great impacts in the field of mental health. At T0, 24.3% had the possibility of PTSD, at T1 31.5%, T2 25.2% and T3 26.3% of the sample. By evaluating the literature on the psychological effects of COVID-19 on the population and associated risk factors, Xiong *et al.* (2020) verified the presence of psychological distress, such as stress, anxiety, depression, and PTSD. All are directly associated with women, young people, students, with the presence of chronic and psychiatric diseases.

Screening for PTSD is of paramount importance, as in the long term, its consequences can be worrisome. In a study to track symptoms of anxiety and depression in COVID-19 survivors, Mazza *et al.*, (2020) found that 28% of participants had PTSD, 31% depression, 42% anxiety, and 40% insomnia. Analyzing a Brazilian cohort, Damiano *et al.* (2022) found that 8% had symptoms of depression, 15.5% generalized anxiety disorder and 13.6% post-traumatic stress disorder, the first two were compared to the year before the pandemic, which represented 2.56% and 8.14% of the population respectively.

5 CONCLUSION

In general, it can be observed that the pandemic negatively affected the lives of the population, as it is a new and unknown disease, which at first, proved to be a disease with no prospect of cure, without coherent and concrete guidelines for the spread of the virus and that only after almost six months of pandemic, it was proven that distancing was the best way to contain the spread of COVID-19. COVID-19 has brought with it numerous reflections, from the need to better prepare health systems to act in crisis situations, to the need for mental health care. It has been proven that social isolation, quarantine, restriction of social contact and use of masks have reduced the spread of the coronavirus and consequently the spread of the disease, but in the context of people's health, these measures have represented an increase or appearance of symptoms such as stress, anxiety, depression, negatively affecting the structuring of life.

Everything that goes beyond people's routine generates discomfort and frustration. These mental health symptoms were mainly triggered by distancing, but factors such as some reduction in income, changes in family dynamics, remote work, and lack of

leisure activities contributed to the worsening of these symptoms, which led to increased substance consumption (medications and/or drugs), onset and/or increased cigarette consumption, and increased alcohol consumption.

One consideration to be made about the study is that the part of the population studied showed few changes in relation to income and unemployment, since a large part of the study population was represented by students as a source of regular income. There were many negative impacts related to social inequalities during the pandemic and these are still reflected today in the lives of the population, such as the closure of regular activities and the increase in informal work, which can directly contribute to people's mental health.

Currently, actions beyond social distancing have already been implemented, such as immunization and improvement in the quality of correct information for the treatment and containment of the virus. However, there is still much to do in relation to the knowledge and continuity f mental health care for the population.

REFERENCES

Araújo, T. M., & Lua, I. (2021). O trabalho mudou-se para casa: Trabalho remoto no contexto da pandemia de COVID-19. *Revista Brasileira de Saúde Ocupacional*, *46*, Article e27. https://doi.org/10.1590/2317-6369000030720

Aros, M. S., Capello, F. M., Campos, G. R., & Mendes, I. Z. (2022). Abuso de álcool na pandemia da Covid-19. *Revista Eletrônica Acervo Saúde*, *15*(7), Article e10556. https://doi.org/10.25248/reas.e10556.2022

Ayyala-Somayajula, D., [et al.]. (2025). Trends in alcohol use after the COVID-19 pandemic: A national cross-sectional study. *Annals of Internal Medicine*, *178*(1), 139–142. https://doi.org/10.7326/ANNALS-24-02157

Baptista, J. C., [et al.]. (2022). COVID-19 e saúde mental: Fatores associados à depressão, ansiedade e estresse em uma comunidade universitária. *Psico*, *53*(1), Article e41359. https://doi.org/10.15448/1980-8623.2022.1.41359

Barbosa, L. N. F., [et al.]. (2021). Brazilian's frequency of anxiety, depression and stress symptoms in the COVID-19 pandemic. *Revista Brasileira de Saúde Materno Infantil*, *21*, 413–419. https://doi.org/10.1590/1806-9304202100S200005

Barros, J. C., & Silva, S. N. (2023). Use of psychotropic drugs during the COVID-19 pandemic in Minas Gerais, Brazil. *Revista Brasileira de Epidemiologia*, *26*, Article e230059. https://doi.org/10.1590/1980-549720230059

Brasil. (2020). Lei n. 13.979, de 6 de fevereiro de 2020. Dispõe sobre as medidas para enfrentamento da emergência de saúde pública de importância internacional decorrente

do coronavírus responsável pelo surto de 2019. *Diário Oficial da República Federativa do Brasil* de 7 fev. 2020.

Brasil. (2019). *Saúde Brasil: Seu vício no cigarro pode estar encobrindo o quê?* https://saudebrasil.saude.gov.br/eu-quero-parar-de-fumar/seu-vicio-no-cigarro-pode-estar-encobrindo-o-que

Brasil. (2020). *Ministério da Saúde declara transmissão comunitária nacional*. https://www.saude.gov.br/noticias/agencia-saude/46568-ministerio-da-saude-declaratransmissao-comunitaria-nacional

Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Análise em Saúde e Vigilância de Doenças Não Transmissíveis. (2022). *Saúde Brasil 2020/2021: Uma análise da situação de saúde diante da pandemia de COVID-19, doença causada pelo coronavírus SARS-CoV-2* (pp. 18–32).

Brooks, S. K., [et al.]. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, *395*, 912–920.

Bosi, M. L. M., & Alves, E. D. (2023). Distanciamento social em contextos urbanos na pandemia de Covid-19: Desafios para o campo da saúde mental. *Physis: Revista de Saúde Coletiva*, *33*, Article e33007. https://doi.org/10.1590/S0103-7331202333007

Both, L. M., [et al.]. (2021). Violent situations during the COVID-19 pandemic. *Revista Brasileira de Psicoterapia*, *23*(1), 91–106. https://doi.org/10.5935/2318-0404.20210008

Bücker, J., Rosa, A. R., & Czepielewski, L. S. (2022). Impact of the COVID-19 pandemic on mental health among local residents in South of Brazil: During pandemic times, youth sleep matters. *Trends in Psychiatry and Psychotherapy*, *44*, Article e20210225. https://doi.org/10.47626/2237-6089-2021-0225

Bush, K., Kivlahan, D. R., McDonell, M. B., [et al.]. (1998). The AUDIT alcohol consumption questions (AUDIT-C): An effective brief screening test for problem drinking. *Archives of Internal Medicine*, *158*, 1789–1795. https://doi.org/10.1001/archinte.158.16.1789

Calegaro, V. C., [et al.]. (2020). Monitoring the evolution of posttraumatic symptomatology, depression and anxiety during the COVID-19 pandemic in Brazilians (COVIDPsiq). *Protocols Exchange*. https://doi.org/10.21203/rs.3.pex-945/v2

Calegaro, V. C., Motta, J., Fernandes, M. A., Bertão, S. V. R., Castralli, H. A., Missau, A. F., [et al.]. (2021). I Fórum Latino-Americano de Saúde Mental na Pandemia: Desafios, panorama atual e perspectivas futuras. *Revista Brasileira de Psicoterapia*, *23*(1), 13–29.

Calegaro, V. C., Ramos-Lima, L. F., Hoffmann, M. S., Zoratto, G., Kerber, N., Costa, F. C. D., [et al.]. (2022). Closed doors: Predictors of stress, anxiety, depression, and PTSD during the onset of COVID-19 pandemic in Brazil. *Journal of Affective Disorders*, *310*, 441–451. https://doi.org/10.1016/j.jad.2022.05.052

Camozzato, A., [et al.]. (2020). *Saúde mental e atenção psicossocial na pandemia COVID-19: Psicofármacos na Covid-19*.

Castro-de-Araújo, L. F. S., & Machado, D. B. (2020). Impacto do Covid-19 na saúde mental em um país de baixa e média renda. *Ciência & Saúde Coletiva*, *25*, 2457–2460. https://doi.org/10.1590/1413-81232020256.1.10932020

Corbanezi, E. (2023). Saúde mental, pandemia, precariedades: Subjetivações neoliberais. *Sociedade e Estado*, *38*(2), Article e46061. https://doi.org/10.1590/s0102-6992-202338020004

Correia, R. de M., [et al.]. (2023). Análise comparativa do uso de psicofármacos nos períodos pré e pós-pandemia do Coronavirus Disease (Covid-19). *Revista de Ciências Médicas e Biológicas*, *22*(4), 641–650. https://doi.org/10.9771/cmbio.v22i4.53478

Costa, A. M., [et al.]. (2022). Ainda tem pandemia, mas há esperança. *Saúde em Debate*, *46*(supl. 1), 5–14. https://doi.org/10.1590/0103-11042022E100

Costa, X. T., Diez Liebana, M. J., & Pimentel, M. H. (2023). Consumo das principais substâncias psicoativas em tempos de pandemia COVID-19 nos estudantes do ensino superior. *Revista de Enfermagem Referência*, *ser. VI*(2, supl. 1), Article e22031. https://doi.org/10.12707/rvi22031

Clay, J. M., & Parker, M. O. (2020). Alcohol use and misuse during the COVID-19 pandemic: A potential public health crisis? *The Lancet Public Health*, *5*, e259. https://doi.org/10.1016/S2468-2667(20)30088-8

Damiano, R. F., Caruso, M. J. G., Cincoto, A. V., [et al.]. (2022). Post-COVID-19 psychiatric and cognitive morbidity: Preliminary findings from a Brazilian cohort study. *General Hospital Psychiatry*, *75*, 38–45. https://doi.org/10.1016/j.genhosppsych.2022.01.002

Diehl, A., Pillon, S. C., & Santos, M. dos. (2021). Consumo de álcool, outras substâncias e a pandemia da COVID-19: Implicações para a pesquisa e para a prática clínica. *Revista Brasileira de Psicoterapia*, *23*(1), 239–248. https://doi.org/10.5935/2318-0404.20210017

Dietze, P. M., & Peacock, A. (2020). Illicit drug use and harms in Australia in the context of COVID-19 and associated restrictions: Anticipated consequences and initial responses. *Drug and Alcohol Review*. https://doi.org/10.1111/dar.13079

Duarte, M. de Q., [et al.]. (2020). COVID-19 e os impactos na saúde mental: Uma amostra do Rio Grande do Sul, Brasil. *Ciência & Saúde Coletiva*, *25*, 3401–3411. https://doi.org/10.1590/1413-81232020259.16472020

Falcão, D. V. da S., Nunes, E. C. R. C., & Bucher-Maluschke, J. S. N. F. (2020). COVID-19: Repercussões nas relações conjugais, familiares e sociais de casais idosos em distanciamento social. *Revista Kairós-Gerontologia*, *23*(esp. 28), 531–556. https://doi.org/10.23925/2176-901X.2020v23iEspecial28p531-556

Faro, A., [et al.]. (2020). COVID-19 e saúde mental: A emergência do cuidado. *Estudos de Psicologia (Campinas)*, *37*, Article e200074. https://doi.org/10.1590/1982-0275202037e200074

Feitosa, T. M. O., [et al.]. (2020). Comorbidades e COVID-19: Uma revisão integrativa. *Revista Interfaces*, *8*(3).

Ficanha, E. E., Silva, E. V., Rocha, V. M. P., Badke, M. R., Cogo, S. B., Silva, E. V., & Jacobi, L. F. (2020). Aspectos biopsicossociais relacionados ao isolamento social durante a pandemia de Covid-19: Uma revisão integrativa. *Research, Society and Development*, *9*, Article e709986410. https://doi.org/10.33448/rsd-v9i8.6410

Frank, D., DeBenedetti, A. F., [et al.]. (2008). Effectiveness of the AUDIT-C as a screening test for alcohol misuse in three race/ethnic groups. *Journal of General Internal Medicine*, *23*(6), 781–787. https://doi.org/10.1007/s11606-008-0594-0

Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., [et al.]. (2020). Mental health problems and social media exposure during COVID-19 outbreak. *PLoS One*, *15*(1), 1–10. https://doi.org/10.1371/journal.pone.0231924

Galvão, M. T. M., & Dellalibera-Joviliano, R. (2023). Percepções do impacto social resultantes da pandemia da COVID-19. *Brazilian Journal of Health Review*, *6*(5), 26137–26148. https://doi.org/10.34119/bjhrv6n5-593

Guzzo, R. S. L., Souza, V. L. T., & Ferreira, Á. L. M. C. de M. (2022). A pandemia na vida cotidiana: Reflexões sobre os impactos sociais e psicológicos à luz da perspectiva crítica. *Estudos de Psicologia (Campinas)*, *39*, Article e210100. https://doi.org/10.1590/1982-0275202239e210100

Gomes, L. B. R., [et al.]. (2024). Efeitos da pandemia de COVID-19 na saúde mental da população: Uma revisão integrativa. *Brazilian Journal of Health Review*, *7*(2), 1–15. https://doi.org/10.34119/bjhrv7n2-284

Garcia, L. P., & Sanchez, Z. M. (2020). Consumo de álcool durante a pandemia da COVID-19: Uma reflexão necessária para o enfrentamento da situação. *Cadernos de Saúde Pública*, *36*(10), Article e00124520. https://doi.org/10.1590/0102-311X00124520

Houvessou, G. M., Souza, T. P. de, & Silveira, M. F. da. (2021). Medidas de contenção de tipo lockdown para prevenção e controle da COVID-19: Estudo ecológico descritivo, com dados da África do Sul, Alemanha, Brasil, Espanha, Estados Unidos, Itália e Nova Zelândia, fevereiro a agosto de 2020. *Epidemiologia e Serviços de Saúde*, *30*(1), Article e2020513. https://doi.org/10.1590/s1679-49742021000100025

Heidrich, N. (2024). *Abuso de drogas, saúde mental e isolamento social durante e após a pandemia de Covid-19 no Brasil* [Tese de doutorado, Universidade Federal de Ciências da Saúde de Porto Alegre]. https://repositorio.ufcspa.edu.br/

Hubner, J. F., Vescovi, S. C., Amorim, L. R. de, [et al.]. (2024). Perfil da utilização de drogas lícitas e ilícitas entre universitários durante a pandemia da COVID-19. *Revista Recien – Revista Científica de Enfermagem*, *14*(42), 455–464. https://doi.org/10.24276/rrecien2024.14.42.455464

International Labour Organization. (2020). *COVID-19 and the world of work: Impact and policy responses* (ILO Monitor, 1ª ed.). https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_738753.pdf

Li, Y., Qin, Q., Sun, Q., Sanford, L. D., Vgontzas, A. N., & Tang, X. (2020). Insomnia and psychological reactions during the COVID-19 outbreak in China. *Journal of Clinical Sleep Medicine*, *16*(8), 1417–1418. https://doi.org/10.5664/jcsm.8524

Lima, C. K. T., Carvalho, P. M. de M., Lima, I. A. A. S., [et al.]. (2020). The emotional impact of coronavirus 2019-nCoV (new Coronavirus Disease). *Psychiatry Research*, *287*, Article e112915. https://doi.org/10.1016/j.psychres.2020.112915

Machado, A. V., Ferreira, W. E., Vitória, M. A. de Á., [et al.]. (2023). COVID-19 e os sistemas de saúde do Brasil e do mundo: Repercussões das condições de trabalho e de saúde dos profissionais de saúde. *Ciência & Saúde Coletiva*, *28*(10), 2965–2978. https://doi.org/10.1590/1413-812320232810.10102023

Maciel, M. E. D., & Vargas, D. de. (2020). Criterion validity of the Key Question for screening at-risk alcohol use in primary healthcare. *Revista da Escola de Enfermagem da USP*, *54*, Article e03553. https://doi.org/10.1590/S1980-220X2018032503553

Maia, B. R., & Dias, P. C. (2020). Ansiedade, depressão e estresse em estudantes universitários: O impacto da COVID-19. *Estudos de Psicologia (Campinas)*, *37*, Article e200067. https://doi.org/10.1590/1982-0275202037e200067

Malta, D. C., Szwarcwald, C. L., Barros, M. B. de A., [et al.]. (2020). A pandemia da COVID-19 e as mudanças no estilo de vida dos brasileiros adultos: Um estudo transversal, 2020. *Epidemiologia e Serviços de Saúde*, *29*(4), Article e2020407. https://doi.org/10.1590/S1679-49742020000400026

American Psychiatric Association. (2000). *Manual diagnóstico e estatístico de transtornos mentais: DSM-IV-TR* (4ª ed.).

Marques, E. S., Moraes, C. L. de, Hasselmann, M. H., Deslandes, S. F., & Reichenheim, M. E. (2020). A violência contra mulheres, crianças e adolescentes em tempos de pandemia pela COVID-19: Panorama, motivações e formas de enfrentamento. *Cadernos de Saúde Pública*, *36*(4), Article e00074420. https://doi.org/10.1590/0102-311X00074420

Matta, G. C., Rego, S., Souto, E. P., & Segata, J. (2021). *Os impactos sociais da Covid-19 no Brasil: Populações vulnerabilizadas e respostas à pandemia*. Editora Fiocruz. https://doi.org/10.7476/9786557080320

Mazza, M. G., De Lorenzo, R., Conte, C., [et al.]. (2020). Anxiety and depression in COVID-19 survivors: Role of inflammatory and clinical predictors. *Brain, Behavior, and Immunity*, *89*, 594–600. https://doi.org/10.1016/j.bbi.2020.07.037

Meirelles, T. V. da S., & Teixeira, M. B. (2021). Fatores estressores e protetores da pandemia da Covid-19 na saúde mental da população mundial: Uma revisão integrativa. *Saúde em Debate*, *45*(spe2), 156–170. https://doi.org/10.1590/0103-11042021E211

Menichelli, L. G., Freitas, L. R., & Gonzaga, R. V. (2021). Consumo de psicoativos lícitos durante a pandemia de Covid-19. *Revista Brasileira de Ciências Biomédicas*, *2*.

Minervino, A. J., Oliveira, M. B. de, Cunha, K. A. L. da, & Bereza, Y. T. A. (2020). Desafios em saúde mental durante a pandemia: Relato de experiência. *Revista Bioética*, *28*(4), 647–654. https://doi.org/10.1590/1983-80422020284428

Moraes, R. F. (2020). *Covid-19 e medidas legais de distanciamento social: Isolamento social, gravidade da epidemia e análise do período de 25 de maio a 7 de junho de 2020* (Nota Técnica n. 22 DINTE). Ipea. https://repositorio.ipea.gov.br/handle/11058/10073

Neculicioiu, V. S., Colosi, I. A., Costache, C., Sevastre-Berghian, A., & Clichici, S. (2022). Time to sleep? A review of the impact of the COVID-19 pandemic on sleep and mental health. *International Journal of Environmental Research and Public Health*, *19*(6), Article 3497. https://doi.org/10.3390/ijerph19063497

Oliveira, W. K. de, Duarte, E., França, G. V. A. de, & Garcia, L. P. (2020). Como o Brasil pode deter a COVID-19. *Epidemiologia e Serviços de Saúde*, *29*(2), Article e2020044. https://doi.org/10.5123/S1679-49742020000200023

Oliveira, L. dos S., Liberali, B. M., Neves, S. C. M. das, & Campos, T. (2021). Consumo de álcool durante a pandemia da Covid-19. *Revista da Sociedade Brasileira de Clínica Médica*, *19*(4), 225–229.

Ornell, F., Schuch, J. B., Sordi, A. O., & Kessler, F. H. P. (2020). “Pandemic fear” and COVID-19: Mental health burden and strategies. *Brazilian Journal of Psychiatry*, *42*(3), 232–235. https://doi.org/10.1590/1516-4446-2020-0008

Portela, J. M. G., Mello, A. de L., Freitas, E. de O., Silva, R. M., Carmo, D. R. P. do, & Siqueira, D. F. (2022). Uso de substâncias psicoativas e saúde mental de estudantes universitários durante a pandemia da COVID-19. *REME – Revista Mineira de Enfermagem*, *26*. https://doi.org/10.35699/2316-9389.2022.37251

Rajkumar, E., Rajan, A. M., Daniel, M., [et al.]. (2022). The psychological impact of quarantine due to COVID-19: A systematic review of risk, protective factors and interventions using socio-ecological model framework. *Heliyon*, *8*(6), Article e09765. https://doi.org/10.1016/j.heliyon.2022.e09765

Dubugra, M. T. B., & Maia, L. M. B. de F. (Orgs.). (2023). *Reflexões sobre a pandemia de COVID-19 na perspectiva da Saúde Única* (pp. 27–50). Instituto de Saúde.

Rio Grande do Sul. (2020). Decreto Estadual n° 55.118, de 16 de março de 2020. Estabelece medidas complementares de prevenção ao contágio pelo COVID-19 (novo Coronavírus) no âmbito do Estado. *Diário Oficial do Estado do Rio Grande do Sul* de 16 mar. 2020.

Rehm, J., Kilian, C., Ferreira-Borges, C., [et al.]. (2020). Alcohol use in times of the COVID-19: Implications for monitoring and policy. *Drug and Alcohol Review*, *39*(4), 301–304. https://doi.org/10.1111/dar.13074