Cogitare Enfermagem

ORIGINAL ARTICLE

Social determinants of health: a cross-sectional study of a population affected by Post-COVID-19 Syndrome

HIGHLIGHTS

1. Women of reproductive age experience more symptoms of post-COVID-19 syndrome.
2. Most surveyed subjects do not engage in regular physical activity.
3. Most of those who tested positive exhibited one or more symptoms.
4. The main symptoms identified included difficulty concentrating and anxiety.

Matheus de Carvalho Pontes Silva [1]
Débora Raquel Soares Guedes Trigueiro [2]
Vagna Cristina Leite da Silva Pereira [2]
Francilene Jane Rodrigues Pereira [3]
Cleyton Cézar Souto Silva [4]

ABSTRACT

Objective: To identify the social determinants of health and prevalent symptoms in people with Post-COVID-19 syndrome. **Method:** Using a semi-structured questionnaire, a cross-sectional study was carried out with 270 people between April and June 2022 in João Pessoa/PB, Brazil. The data was analyzed using descriptive and inferential statistics. **Results:** Women have more hair loss than men, and the elderly have less hair loss than young people. People with mental disorders reported more symptoms of hair loss, palpitations, and/or nausea. Hospital stays in intensive care are linked to more depression. Social determinants such as a sedentary lifestyle and the use of alcohol or tobacco affect concentration and hair loss. **Conclusion:** Psychic and physical symptoms were frequent in the study population, but the non-representative sample and the high incidence of cases limited generalization. Further studies should analyze the evolution of symptoms, include different demographic groups, and evaluate interventions.

DESCRIPTORS: Post-Acute COVID-19 Syndrome; Mental Health; Quality of Life; Physical Activity; Health.

[1] Faculdades Nova Esperança, Departamento de Enfermagem, João Pessoa, PB, Brasil.
[2] Faculdades Nova Esperança, Programa de Pós-graduação em Saúde da Família, João Pessoa, PB, Brasil.
[3] Universidade Federal da Paraíba, Hospital Universitário Lauro Wanderley, Empresa Brasileira de Serviços Hospitalares, João Pessoa, PB, Brasil.
[4] Universidade Federal da Paraíba, Departamento de Enfermagem Clínica, João Pessoa, PB, Brasil.

INTRODUCTION

In December 2019, an outbreak of atypical pneumonia broke out in Wuhan, China, linked to the local seafood market. Investigations identified a new virus from the Coronaviridae family named SARS-CoV-2 in January.20201 A month later, the World Health Organization called the disease associated with the virus COVID-19. By September 28, 2021, more than 231 million infections and approximately 4.7 million deaths had been reported globally, with common symptoms including fever, cough, shortness of breath, muscle pain, altered senses, and, in severe cases, respiratory, cardiovascular, and kidney complications[2].

Although the lethality rate of COVID-19 in Brazil was about 2.8% in mid-2021, a significant number of people who overcome the acute phase of the disease experience symptoms that persist for months, even among those who were not hospitalized. Various terms refer to this set of symptoms, including Chronic COVID Syndrome, Post-Acute COVID, Long COVID, and Post-COVID-19 Syndrome (PCS), which pertain to individuals experiencing symptoms for 12 weeks or more after the onset of acute symptoms without any alternative explanation for these signs.

PCS encompasses various manifestations that can affect different systems of the body[7]. Impairments can include the respiratory, cardiovascular, hematological, urinary, digestive, neurological, and metabolic systems and psychiatric alterations[4]. In this context, a cohort study carried out at Jin Yin-tan Hospital in Wuhan, involving 1. 733 adults with an average age of 57, revealed that six months after the acute phase of the infection, 26% of patients had difficulty sleeping, 23% showed signs of anxiety or depression, and 63% reported fatigue and muscle weakness, as well as cognitive problems and post-traumatic symptoms, suggesting that psychiatric manifestations may have a multifactorial origin, influenced by the viral infection, exacerbated immune response, use of corticosteroids, social isolation and experience in the Intensive Care Unit[8].

Thus, the COVID-19 pandemic continues to affect economies globally, resulting in costs in trillions of dollars, especially in low- and middle-income countries, where the impacts are more pronounced[9]. The adverse consequences of the pandemic on the most vulnerable sectors are related to the Social Determinants of Health (SDH). These determinants reflect how socioeconomic, cultural, psychological factors, working conditions, and behavioral characteristics of different groups and individuals affect their health conditions[10].

In this context, SDH significantly impacted the population's quality of life during the COVID-19 pandemic. Vulnerable groups, especially the poorest, faced greater exposure to risk factors related to the disease and difficulties in accessing health services, which increased both mortality and the number of cases of Post-COVID-19 Syndrome. During this period, the Northeast region of Brazil recorded the second-highest incidence and mortality rate associated with the disease[11].

These factors, as well as the proposal of this study, maybe more relevant in countries like Brazil, which has substantial social inequality, with large numbers of people living below the poverty line and in locations without basic sanitation. These inequalities are also amplified by regional disparities in access to health care since the concentration of health professionals and intensive care unit (ICU) beds is better in urban centers with better socioeconomic indicators. Furthermore, Brazil is among the three countries with the highest number of confirmed cases and deaths, as stated by the COVID-19

Dashboard of the Center for Systems Science and Engineering (CSSE) at *John Hopkins University* (JHU)[12].

Given the marked social inequalities afflicting Brazilian society, combined with the strong political, economic, and social instability that has marked the New Coronavirus pandemic, the crisis has further worsened the living conditions of countless families. Its effects are devastating in the poorest regions, states, and municipalities[13]. This article, therefore, aims to identify the prevalent SDH and symptoms in the population affected by PCS.

METHOD

This is a cross-sectional, descriptive study with a quantitative approach. The researchers prepared a semi-structured questionnaire and sent it via social networks and Google Forms. The questionnaire was collected between April and June 2022. The inclusion criteria were people aged 18 or over who had presented with Post-COVID-19 Syndrome in the last 24 months. The exclusion criteria were people who tested positive for COVID-19 but had pre-existing conditions that could explain the symptoms of PCS.

The sample size was calculated using Cochran's formula for a finite population, based on 107,000 people recovered from COVID-19 by December 2021 in the municipality of João Pessoa[14]. Considering a confidence level of 95%, a maximum proportion of 50%, and a margin of error of 5%, the number of participants was 383. However, several factors made it difficult to reach this number, such as logistical limitations, low participant adherence, and restrictions imposed by the previously established collection period. As a result, we obtained a sample of 270 people, which increased the margin of error to 6%, a figure very close to that defined in the initial calculation, which keeps the sample satisfactory for the study.

Although the sample calculation was based on Simple Random *Sampling*, the collection used the non-probabilistic Respondent-Driven *Sampling* (RDS) technique to ensure greater rigor and reduce selection bias. Initially, the seed population was chosen at a school clinic that treated patients with symptoms compatible with PCS, and from there, we began sending out the *online* questionnaire. Through their contact networks and characteristics of interest, these people forwarded the questionnaire, mainly via *WhatsApp*, thus expanding data collection.

The questionnaire included fields for filling in the socio-demographic profile, grouped according to the layers of the SDH, and fields relating to COVID-19 and PCS to achieve the research objectives. The field relating to people's profiles was drawn up according to the theoretical model proposed by Dahlgren and Whitehead, which is widely used in studies on the subject. The model covers 5 layers, from individual determinants to the general socio-economic conditions surrounding society[15]. In addition, questions related to COVID-19 and PCS were included, constructed after a broad review of the literature on the subject, which ensured that the questions reflected the main symptoms and aspects associated with the condition1[6-17]. So, as you know, the questionnaire was not subjected to a psychometric validation process and was only used in an exploratory way in this descriptive study.

To check for differences between the proportions of frequencies of symptoms of PCS, we used Pearson's chi-square (χ^2) test of independence. If an assumption is

violated, we use Fisher's exact test. In addition, we carried out a post-hoc analysis of the tests, as proposed by MacDonald and Gardner, to correct the α value according to the number of cells, identifying significant associations based on the adjusted residuals and the corrected p-values[18].

Finally, the data obtained was processed using the Microsoft Excel 2019 multiplatform program and statistically analyzed using IBM® Statistical Package for the Social Sciences—SPSS Statistics, version 24. The results were then presented using descriptive and inferential statistics in tables, and a posteriori was discussed based on the most relevant scientific literature. The research was approved by the Research Ethics Committee (CEP) of the Nova Esperança Faculties under approval protocol no. 76/2022.

RESULTS

Table 1 shows the sociodemographic profile of the participants, showing a predominance of females (65.6%) and an average age of 23.6 years, with a prevalence in the 18-30 age group (48.8%). Regarding color/race, most participants declared themselves brown (46.7%). As for schooling, 37.2% reported having between 6 and 12 years of regular study. Most participants (59.3%) reported a family income of between 1 and 2 minimum wages, and 51.6% said they were single. The most frequently mentioned religion was Catholicism, with 46.7%.

As expected, most of the socio-demographic variables were associated with at least one of the symptoms characterizing the syndrome. The *post hoc analysis* indicated that females had more hair loss, and elderly people (>60 years) had less hair loss than younger populations.

Regarding the race/color variable, although black people reported less hair loss, the residuals showed no difference between the observed and expected values. As for schooling, individuals with up to five years of education had more forgetfulness and less hair loss.

Regarding family income, individuals earning between 1 and 2 minimum wages reported less hair loss, while those earning less than 1 minimum wage had a higher prevalence of palpitations. Among divorced people, there was a higher prevalence of nausea, and the variable was also associated with difficulty concentrating, fatigue, hair loss, and loss of taste; however, the adjusted residuals indicated significance only for nausea.

Table 1 – Sociodemographic characterization of participants infected with SARS-CoV-2. João Pessoa, PB, Brazil, 2024

	Variables	n(%)	Associated symptom	*p-value*[1]
Gender identity	Female Male Other	164(60,7) 104(38,5) 2(0,7)	Hair loss	<0,001
Age groups	18 to 30 31 to 45 46 to 60 >60	120(44,4) 71(26,3) 45(16,7) 34(12,6)	Hair loss	0,002
Color or race/ethnicity	Brown Black White Indigenous	126(46,7) 71(26,3) 71(26,3) 2(0,7)	Hair loss	0,012
Education	Did not attend Up to 5 years Up to 12 years Up to 20 years >20 years	13(4,8) 72(26,7) 93(34,4) 58(21,5) 34(12,6)	Forgetfulness Hair loss	0,038 0,001
Income	<1,5 MW* 1 a 2 MW 3 a 4 MW >4	14(5,2) 164(60,7) 50(18,5) 42(15,6)	Hair loss Palpitations	0,019 0,035
Marital status	Single Married Separated Widowed Divorced	123(45,6) 108(40,0) 17(6,3) 14(5,2) 8(3,0)	Nausea Difficulty concentrating Fatigue Hair loss Loss of taste	0,014 0,018 0,004 0,018 0,038
Religion	Catholic Believes in something higher Evangelical Attends more than one Spiritist None mentioned Umbanda Atheist/Agnostic Candomblé	137(50,7) 44(16,3) 43(15,9) 14(5,2) 10(3,7) 9(3,3) 7(2,6) 4(1,5) 2(0,7)	There is no association with symptoms	>0,05

* MW: minimum wage in force in 2022
[1] For Chi-Square (χ^2), p-value <0.05 indicates association with some symptom of PCS.
Source: The authors (2024)

    Table 2 shows data on the habits and behaviors of the group investigated. We found that 49.3% of the participants reported not exercising at least three times a week for at least half an hour. In addition, 46.7% said they ate a balanced diet every day, while 44.8% said they occasionally smoked and/or drank alcohol. Finally, 50.0% of the participants reported sleeping up to 8 hours a night.

Although an association was found between exercise and hair loss, the adjusted residuals were below the corrected critical value, indicating no significant impact of this variable on the prevalence of the symptom.

Regarding eating a balanced daily diet, individuals who reported regularly eating an adequate diet had a higher prevalence of hair loss than those who answered "sometimes," who had a lower frequency of this symptom. On the other hand, those who said they didn't eat a balanced diet reported a higher incidence of palpitations.

In terms of the consumption of tobacco and/or alcoholic beverages, people who used them regularly reported a lower frequency of difficulty concentrating. In contrast, those who used them socially had a higher prevalence of this symptom. In addition, regular users also had a lower prevalence of hair loss compared to those who did not smoke and/or drink. Finally, in the context of daily sleep, sleeping up to 4 hours a night was associated with a higher frequency of symptoms of depression and forgetfulness.

Table 2 – Distribution of data related to the habits and behaviors of people affected by SARS-CoV-2. João Pessoa, PB, Brazil, 2024

Variables		n(%)	Associated symptom	p-value[1]
Exercise at least 3x/week	Yes	43(15,9)	Hair loss	0,014
	No	133(49,3)		
	Sometimes	94(34,8)		
Eat fruit, vegetables, and protein every day	Yes	126(46,7)	Hair loss	0,006
	No	28(10,4)	Palpitations	0,021
	Sometimes	116(43,0)		
Regular use of tobacco and/or alcoholic beverages	Yes	42(15,6)	Difficulty concentrating	<0,001
	No	107(39,6)		<0,001
	Occasionally	121(44,8)	Hair loss	
Sleeping time/night	4h	13(4,8)	Depression	0,040
	6h	109(40,4)		
	8h	135(50,0)	Forgetfulness	0,003
	>8h	13(4,8)		

[1] For chi-square (χ^2) or Fisher's exact test, p-value <0.05 indicates association with some CPS symptom.
Source: The authors (2024)

Table 3 shows the clinical and epidemiological profiles of the survey participants. It was observed that 95.2% had undergone some tests to confirm infection, while 44.1% reported having detected the infection between 6 and 12 months before data collection.

Regarding vaccination, 50.4% reported receiving at least three doses of the immunizer. As for nutritional status, 56.7% said they were at the ideal weight for their weight-height ratio.

In addition, 90.7% of the participants had not been hospitalized, and only 1.9% of those hospitalized required ICU admission. Regarding health history, 5.2% reported a previous diagnosis of a mental disorder before the infection, and 13.3% reported having been diagnosed with a chronic illness previously. Finally, it was found that around 66% had used medication in an attempt to combat the symptoms and/or the virus itself.

Not being tested before the survey was associated with a lower prevalence of stress and difficulty concentrating. On the other hand, forgetfulness was more frequent among those who tested closer to the time of data collection. Loss of smell and taste was more prevalent among those who had tested more than 12 months previously.

Individuals who received four doses of the immunizer had a lower prevalence of anxiety. Perceived body weight was associated with symptoms such as anxiety and nausea, but the adjusted residuals showed no significant differences. Among those hospitalized, there was a higher prevalence of forgetfulness, while those who required ICU admission had a higher prevalence of depression and palpitations.

People with previous mental disorders reported more symptoms of hair loss, palpitations, and nausea. Previous chronic medical conditions were associated with fatigue. The use of medication was associated with less difficulty concentrating but also with a higher prevalence of palpitations.

Re-infection was associated with a higher frequency of concentration difficulties, forgetfulness, and auditory tinnitus. On the other hand, those who had not been reinfected reported more weight loss, while those who did not know about reinfection had a higher prevalence of fatigue.

Table 3 – Clinical and epidemiological characterization of people affected by SARS-CoV-2. João Pessoa, PB, Brazil, 2024

(continue)

Variables		n(%)	Associated symptom	p-value[1]
Tests to detect SARS-CoV-2	RT-PCR	197(73,0)	Not measured	-
	Rapid test	72(26,7)		
	PCR-Lamp/RT-Lamp	53(19,6)		
	Serological test	20(7,4)		
	Did not do or did others	13(4,8)		
Time since detection	<3 months	3(1,1)	Forgetfulness	0,027
	Between 3 and 6 months	37(13,7)	Loss of sense of smell	0,003
	Between 6 and 12 months	119(44,1)	Loss of taste	0,001
	>12 months	98(36,3)		
	Not Tested	13(4,8)		
Number of doses of vaccine	Zero	-	Anxiety	0,034
	One	-		
	Two	115(42.6)		
	Three	136(50.4)		
	Four	19(7.0)		
Weight perception	Underweight	11(4,1)	Anxiety	0,043
	Ideal weight	153(56,7)	Nausea	0,013
	Overweight	95(35,2)		
	Obesity	11(4,1)		
Hospitalization for COVID-19	Yes	25(9,3)	Forgetfulness	0,031
	No	245(90,7)		
ICU hospitalization	Yes	5(1,9)	Depression	0,016
	No	20(7,4)	Palpitations	0,040

Table 3 – Clinical and epidemiological characterization of people affected by SARS-CoV-2. João Pessoa, PB, Brazil, 2024

(conclusion)

Variáveis		n(%)	Sintoma associado	p-value[1]
Previous mental illness	Yes	14(5,2)	Hair loss	0,001
	No	256(94,8)	Palpitations	0,009
			Nausea	0,049
Previous chronic illness	Yes	36(13,3)	Fatigue	0,025
	No	234(86,7)	Hair loss	0,035
People with HIV/ AIDS	Yes	1(0,4)	No association	>0,05
	No	269(99,6)		
Use of medication in an attempt to combat symptoms and/or the virus	Yes	92(34,1)	Difficulty concentrating	0,029
	No	178(65,9)	Palpitations	0,006
Reinfection	Yes	77(28,5)	Difficulty concentrating	0,003
	No	143(53,0)	Forgetfulness	0,002
	Did not test/did not know how to answer	50(18,5)	Tinnitus	0,009
			Weight loss	0,036
			Fatigue	0,017

[1] for Chi-square (χ^2) or Fisher's exact test. p-value <0.05 indicates association with some CPS symptom.
Source: The authors (2024)

DISCUSSION

Social profile and Post-COVID Syndrome

In terms of the socio-demographic and economic profile of those affected by COVID-19, young women of reproductive age have subsequently shown symptoms associated with Post-COVID-19 Syndrome. However, men have shown a poorer prognosis in the acute phase of the disease, with a higher risk of developing a more serious condition and requiring hospitalization. However, women develop more symptoms with considerably greater severity during the syndrome[13].

Analyzing the young age group, it is noted that this group represents most of the research participants. Although they did not face the severity of the disease as intensely, they had a higher infection rate. This situation can be explained by factors such as greater exposure to the virus, working activities, the need to use public transport, lack of adherence to social distancing, and social habits that involve attending parties and going to crowded bars during peaks of infection[19].

With specific regard to color or race/ethnicity, most of the sample is made up of brown people, who, according to data from the Brazilian Institute of Geography and Statistics, represent the most significant portion of the Brazilian population, followed by black people. These characteristics are also highlighted in the report by the *Black Coalition Against* COVID, which points out that this group is the most affected by the symptoms of Post-COVID Syndrome (PCS) today[19-20].

A study revealed a correlation between the level of schooling and mortality from COVID-19, indicating that individuals with no schooling are up to three times more likely to die than those with higher education. Thus, it can be concluded that the higher the level of schooling, the lower the lethality associated with health conditions[21].

The relationship between education and mortality from COVID-19 is inverse. This is because individuals with lower levels of education tend to have lower incomes, which limits their access to essential health services. This economic and educational disparity culminates in unequal access to health services, negatively affecting both the diagnosis and treatment of health conditions[10].

Social Determinants of Health and Post-COVID Syndrome

Regarding habits and behaviors, regular physical activity is associated with a lower likelihood of developing severe COVID-19 due to its immunomodulatory effect. On the other hand, lack of exercise is correlated with the worsening of the disease, as it contributes to the persistence of inflammatory factors in the body. This inflammation is also observed in obese individuals, those with chronic kidney disease, and diabetics, which not only facilitates viral infection but also hyperinflammation, which plays a crucial role in the severity of the disease[22].

It is evident that these conditions favor the spread and contamination of the virus, highlighting the importance of the immune system, which is strengthened by regular physical activity, in the progression and more favorable clinical prognosis of COVID-19[23]. Participation in light to moderate physical activity can effectively modulate the inflammatory responses triggered by the virus since these activities help regulate the immune system, contributing to the prevention and/or reduction of the long-term effects of COVID-19[24].

According to research carried out, the pandemic has had an impact on diet, regular physical activity, and other healthy habits, and overweight individuals may have suffered more severe consequences concerning the effects of the infection. Those who are overweight, including those who are obese, have an increased risk of developing chronic and infectious diseases, such as COVID-1924. Another study indicated that the increased risk of disease severity is related to the release of pro-inflammatory cytokines. In addition, the virus can infiltrate adipocytes, thus circumventing the immune system's defenses[25].

It is also known that social determinants of health such as age, gender, genetic factors, individual behaviors and lifestyles, family support, good working conditions, nutrition, and economic, cultural, and environmental conditions directly impact access to viral detection tests and adherence to vaccination, among other variables[12].

Despite the regular use of addictive substances such as alcohol, tobacco, benzodiazepines, marijuana, cocaine, etc., the use of these types of chemical substances causes changes at different levels of the organ systems, making the symptoms of COVID-19 and PCS even more varied, severe and long-lasting[26].

During social isolation, the consumption of alcohol and other drugs has increased considerably. The use of these substances weakens the immune system and can cause damage to various organs. This causes this group to develop more severe forms and, consequently, to suffer more from the symptoms of PCS. Smoking drugs such as cigarettes and crack dramatically increases the risk of the disease developing into a severe form, as the virus can be on contaminated fingers and cigarettes, increasing the transmission of the virus from hand to mouth[26].

On the other hand, alcohol consumption is associated with the various crises brought on by the pandemic, such as a reduction in income for a large part of the population. The financial crisis and social isolation are behind the increase in alcohol consumption. Alcohol also can alter the balance of lung tissue, favoring cases of community-acquired pneumonia and thus further aggravating cases of COVID-19[26].

With more data being generated on Post-COVID-19 Syndrome, the evidence to help understand this dynamic syndrome is becoming more apparent. Symptoms can be classified into two main categories: physical and psychological. Concerning the frequency of symptoms, referred to as COVID-Long, the most common psychological symptoms include anxiety, difficulty concentrating, and stress. In contrast, the most prevalent physical symptoms are fatigue, hair loss, and altered sense of smell[27].

Although the mechanisms that trigger PCS manifestations can be divided into direct effects of the viral infection and indirect impacts on mental health due to social isolation and socio-economic factors such as job loss, the pandemic has been especially damaging for vulnerable groups. This includes people living in extreme poverty, the elderly, people with disabilities, young people, and indigenous people. Evidence indicates that the economic and health impacts are disproportionately borne by the most disadvantaged, such as the homeless, who face unsafe living conditions and are highly exposed to various viral infections. Those without access to basic hygiene conditions, predominantly black and poor people, suffer from both the effects of the pandemic and the difficulties arising from their circumstances[28].

Recommendations for Post-COVID Syndrome

Recommendations and practical suggestions for vulnerable groups affected by Post-COVID-19 Syndrome, based on the findings of the study, may include[29]:

• Promoting Physical Activity: Encourage regular physical exercise and offer accessible programs adapted to the needs of vulnerable groups to improve physical and mental health.

• Psychological Support: implement mental health services that address symptoms such as anxiety and difficulty concentrating, especially for women of reproductive age, who have been identified as most affected.

• Health Education: develop awareness campaigns about Post-COVID-19 Syndrome and its symptoms, focusing on vulnerable groups so that they can recognize and seek help for their conditions.

• Access to Health Care and Integrative Practices: Ensure that vulnerable groups have access to quality health services, including the Integrative Practices of the National Policy, such as Chinese Medicine and body practices, such as Yoga and Meditation, among others, for cases of anxiety, stress, fatigue, weight loss, and others.

• Public Policies: Formulate policies that address social and economic inequalities that affect health, such as access to adequate housing, safe working conditions, and essential hygiene services.

• Social and Community Support: Foster community support networks that help mitigate the effects of social isolation and promote social inclusion, especially for those facing financial difficulties.

These recommendations aim to treat the symptoms of post-COVID-19 syndrome and address the social determinants that impact the health and quality of life of vulnerable groups[1,10].

In this sense, implementing effective health rehabilitation programs that encourage physical activity has emerged as a strategy to reduce the number of complications related to inflammatory pathologies such as COVID-19. Various modalities can be offered to attract different audiences, including gymnastics groups, body activities, walking, stretching, dancing, traditional Chinese medicine techniques such as tai chi Chuan and Qi Gong, and specific activities for people with sequelae, encompassing both individual and collective practices, among other options.

It is important to note that simply offering physical activities does not guarantee their effectiveness. It is essential to consider the factors that influence adherence, i.e., elements that keep the practitioner motivated to engage in these practices, whether individual or environmental. In this context, integrative and complementary health practices (ICPs) are an attractive alternative that adapts to the different needs of individuals. These practices can include more comprehensive care and social support strategies, among other approaches that promote continuity of activities among participants[30].

The study acknowledges limitations, such as the non-representative sample and the high incidence of cases, which prevents the results from being generalized to the entire population. However, the purpose of this study was achieved, with a profile drawn of people with PCS or Long COVID and contributing to future implications for formulating strategies or public policies to minimize the damage to the lives of those affected.

CONCLUSION

It was possible to verify that the group of people who developed the infection manifested symptoms similar to PCS, with the most common being psychological and physical symptoms.

Based on the results and limitations identified in this study on Post-COVID-19 Syndrome and the social determinants of health, several directions for further studies can be considered, such as carrying out longitudinal studies to follow the evolution of Post-COVID-19 Syndrome symptoms over time; investigations into the differences in symptoms and quality of life between different demographic groups; evaluations of the effectiveness of specific mental health interventions for people who have suffered from Post-COVID-19 Syndrome, such as the use of Integrative and Complementary Practices.

REFERENCES

1.   Wu F, Zhao S, Yu B, Chen YM, Wang W, Song ZG, et al. A new coronavirus associated with human respiratory disease in China. Nature [Internet]. 2020 [cited 2021 Sept 20];579:265-9. Available from: https://doi.org/10.1038/s41586-020-2008-

2.   World Health Organization (WHO) [Internet]. Genebra: WHO; 2020. WHO Director-general's remarks

at the media briefing on 2019-nCoV on 11 February 2020; 2020 Feb 11 [cited 2021 Sept 20]. Available from: https://www.who.int/director-general/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020

3.   Groff D, Sun A, Ssentongo AE, Ba DM, Parsons N, Poudel GR, et al. Short-term and long-term rates of postacute sequelae of SARS-CoV-2 infection: a systematic review. JAMA Netw Open [Internet] 2021 [cited 2021 Oct 1];4(10):e2128568. Available from: https://doi.org/10.1001/jamanetworkopen.2021.28568

4.   Dennis A, Wamil M, Alberts J, Oben J, Cuthbertson DJ, Wootton D, et al. Multiorgan impairment in low-risk individuals with post-covid-19 syndrome: a prospective, community-based study. BMJ Open [Internet] 2021 [cited 2021 Oct 1];11(3):e048391. Available from: https://bmjopen.bmj.com/content/11/3/e048391

5.   Lopez-Leon S, Wegman-Ostrosky T, Perelman C, Sepulveda R, Rebolledo PA, Cuapio A, et al. More than 50 long-term effects of covid-19: a systematic review and meta-analysis. Sci Rep [Internet] 2021 [cited 2021 Aug 9];11:16144. Available from: https://doi.org/10.1038/s41598-021-95565-8

6.   Venkatesan P. NICE guideline on long covid. Lancet Respir Med [Internet] 2021 [cited 2021 Aug 9];9(2):129. Available from: https://doi.org/10.1016/S2213-2600(21)00031-X

7.   National Health Service (NHS) [Internet]. Londres: NHS; [2021?]. Long-term effects of COVID-19 (long COVID); [cited 2021 Sept 29]. Available From: https://www.nhs.uk/conditions/coronavirus-covid-19/long-term-effects-of-coronavirus-long-covid/

8.   Huang C, Huang L, Wang Y, Li X, Ren L, Gu X, et al. 6-month consequences of covid-19 in patients discharged from hospital: a cohort study [Retracted]. The Lancet [Internet]. 2021 [cited 2021 Sept 29];397(10270):220-32. Available From: https://doi.org/10.1016/s0140-6736(20)32656-8

9.   Laborde D, Martins W, Vos R. Poverty and food insecurity could grow dramatically as COVID-19 spreads [Internet]. International Food Policy Research Institute; 2021 [cited 2021 Sept 30]. Available From: https://www.ifpri.org/blog/poverty-and-food-insecurity-could-grow-dramatically-covid-19-spreads

10. Buss PM, Pellegrini Filho A. Health and its social determinants. Physis [Internet]. 2007 [cited 2021 Sept 29];17(1):77-93. Available From: https://doi.org/10.1590/S0103-73312007000100006

11. Santana JM, Lana CNA, Souza GB, de Souza LMS. Determinantes sociais da saúde e óbitos por covid-19 nos estados da Região Nordeste do Brasil. Rev Bras Saúde Func [Internet]. 2020 [cited 2024 Nov 22];11(1):18-29. Available from: http://dwcenter.com.br/ojs3/index.php/RBSF/article/view/1305

12. de Figueiredo AM, de Figueiredo DCMM, Gomes LB, Massuda A, Gil-García E, Vianna RPT, et al. Social determinants of health and COVID-19 infection in Brazil: an analysis of the pandemic. Rev Bras Enferm [Internet]. 2020 [cited 2021 Sept 30];73(Suppl 2):e20200673. Available from: https://doi.org/10.1590/0034-7167-2020-0673

13. Pelà G, Goldoni M, Solinas E, Cavalli C, Tagliaferri S, Ranzieri S, et al. Sex-related differences in long-COVID-19 syndrome. J Womens Health [Internet]. 2022 [cited 2022 May 1];31(5):620-30. Available from: https://doi.org/0.1089/jwh.2021.0411

14. Cochran WG. Sampling thechniques. 3th ed. New York: John Wiley & Sons; 1977. 428p.

15. Dahlgren G, Whitehead M. Policies and strategies to promote social equity in health. Stockholm: Institute for Future Studies; 1991.66p.

16. Iqbal FM, Lam K, Sounderajah V, Clarke JM, Ashrafian H, Darzi A. Characteristics and predictors of acute and chronic post-COVID syndrome: a systematic review and meta-analysis. EClinicalMedicine [Internet]. 2021 [cited 2022 May 1];36:100899. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2589537021001796

17. Cénat JM, Blais-Rochette C, Kokou-Kpolou CK, Noorishad PG, Mukunzi JN, McIntee SE, et al. Prevalence of symptoms of depression, anxiety, insomnia, posttraumatic stress disorder, and psychological distress among populations affected by the COVID-19 pandemic: a systematic review and meta-analysis. Psychiatry Res [Internet]. 2021 [cited 2022 May 1];295:113599. Available from: https://doi.org/10.1016/j.psychres.2020.113599

18. MacDonald PL, Gardner RC. Type I error rate comparisons of post hoc procedures for I j Chi-Square tables. Educ Psychol Meas [Internet]. 2000 [cited 2022 May 1];60(5):735-54. Available from: https://journals.sagepub.com/doi/10.1177/00131640021970871

19. Fonseca P. Com aumento de casos entre jovens, festas do fim de ano podem provocar explosão de covid-19. Reuters [Internet]. 2022 Dec 4 [cited 2022 May 25]; [about 4 screens]. Available from: https://www.reuters.com/article/saude-corona-jovens-idLTAKBN28E2ZQ

20. 20. Instituto Brasileiro de Geografia e Estatística (IBGE). Desigualdades sociais por cor ou raça no Brasil : notas técnicas [Internet]. 2ed. Rio de Janeiro: IBGE; 2022 [cited 2022 Dec 5]. 35p. Available from: https://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?view=detalhes&id=2101972

21. Oladele CR, Mckinney TL,Tolliver D, Tuckson R, Dawes D, Nunez-Smith M. The state of black America and COVID-19 a two-year assessment. Black Coalition Against COVID [Internet]. 2021 [cited 2021 Dec 5]. Resources:[about 7 screens] Available from: https://blackcoalitionagainstcovid.org/the-state-of-black-america-and-covid-19/

22. Lemgruber J, Lerer R, supervisors. Coronavírus nas favelas: a desigualdade e o racismo sem máscaras [Internet]. Rio de Janeiro: Movimentos; 2022 [cited 2022 Dec 5]. 42 p. Available from: https://cesecseguranca.com.br/wp-content/uploads/2021/10/MOV_relato_covid_1908-1.pdf

23. Nabavi N. Long covid: how to define it and how to manage it. BMJ [Internet]. 2020 [cited 2022 Dec 5];370:m3489. Available from: https://doi.org/10.1136/bmj.m3489

24. Lisboa V. Covid-19: moradores de favelas precisam de ações de prevenção. Agência Brasil [Internet]. 2022 Mar 19 [cited 2022 Dec 5]; Saúde:[about 4 screens] Available from: https://agenciabrasil.ebc.com.br/saude/noticia/2020-03/covid-19-moradores-de-favelas-precisam-de-acoes-de-prevencao

25. Robinson E, Boyland E, Chisholm A, Harrold J, Maloney NG, Marty L, et al. Obesity, eating behavior and physical activity during COVID-19 lockdown: a study of UK adults. Appetite [Internet]. 2021 [cited 2022 Dec 5];156:104853. Available from: https://doi.org/10.1016/j.appet.2020.104853

26. Silverio R, Gonçalvez DC, Andrade MF, Seelaender M. Coronavirus Disease 2019 (COVID-19) and nutritional status: the missing link? Adv Nutr [Internet]. 2021 [cited 2022 Dec 5];12(3):682-92. Available from: https://doi.org/10.1093/advances/nmaa125

27. Barbosa DJ, Gomes MP, Gomes AMT, de Souza FBA. Relationship between Psychoactive Drug Consumption and COVID-19: synthesis of evidence. J Manag Prim Health Care [Internet]. 2020 [cited 2022 Dec 5];12:e31. Available from: https://doi.org/10.14295/jmphc.v12.1000

28. Carfì A, Bernabei R, Landi F. Persistent symptoms in patients after acute COVID-19. JAMA [Internet]. 2020 [cited 2022 Dec 5];324(6):603-5. Available from: https://doi.org/10.1001/jama.2020.12603

29. da Silva MCP, de Queiroz VC, Andrade SSC, Silva CCS, Pereira VCLS. Mental illness among health professionals during the COVID-19 pandemic. Enferm Glob [Internet]. 2024 [cited 2024 Dec 2];23(1):240-55. Available from: https://doi.org/10.6018/eglobal.569741

30. Silva CCS, dos Santos GM, Pereira VCLS, Dantas DV, Barbosa MHPA, Freire RP, et al. Mental health and pandemic: association between stress, work and COVID-19 in medical professionals. Res Soc and Dev [Internet]. 2022 [cited 2024 Dec 2];11(8):e41111831314. Available from: https://doi.org/10.33448/rsd-v11i8.31314

Corresponding author:
Cleyton Cézar Souto Silva
Universidade Federal da Paraíba
Campus I Lot. Cidade Universitária, PB, 58051-900
E-mail: cleyton.souto@academico.ufpb.br

Role of Authors:

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **Silva MCP, Pereira VCLS.** Drafting the work or revising it critically for important intellectual content - **Silva MCP, Trigueiro DRSG, Pereira VCLS, Pereira FJR, Silva CCS.** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **Silva MCP, Pereira VCLS, Silva CCS.** All authors approved the final version of the text.