


Research Article

Transition of Care for Post-COVID-19 Patients: Sociodemographic and Clinical Profile and Associated Factors

Diego J. L. Arrais,¹ Mateus C. Gomes,¹ Carlos L. F. da Cunha,¹ Fernando Riegel,² Maria F. B. N. A. da Costa,³ Cintia Y. U. P. Aben-Athar,¹ Aline M. C. Ramos,¹ Andressa T. Parente,¹ Diego P. Rodrigues,¹ and Fabianne J. D. de Sousa ¹

¹Nursing Department, School of Nursing, Universidade Federal do Pará, Belém, Brazil

²Department of Medical-Surgical Nursing, School of Nursing, Universidade Federal do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil

³Nursing Department, School of Nursing, Universidade Federal de Santa Catarina, Santa Catarina, Brazil

Correspondence should be addressed to Fabianne J. D. de Sousa; fabiannesousa@hotmail.com

Received 20 October 2022; Revised 28 November 2022; Accepted 2 December 2022; Published 8 February 2023

Academic Editor: Nabeel Al-Yateem

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This study aimed to identify sociodemographic and clinical characteristics and factors associated with care transition in patients recovered from COVID-19. Cross-sectional study of quantitative approach with 49 patients and/or caregivers who were discharged from hospital to home in a university hospital. Three instruments were used to evaluate the transition of care: the sociodemographic questionnaire, the clinical questionnaire, and the Care Transition Measure. The analysis was performed using SPSS software, and the Mann–Whitney test was applied, with a significance level of $p \leq 0.005$. Of the 49 participants, with a mean age of 50 years, the majority were males (59.2%), with more than 10 years of education. The main symptoms of COVID-19 were dyspnea (79.6%), followed by fatigue (75.5%) and fever (69.4%). The most prevalent comorbidity was hypertension (32.7%). There was an association between care transition and comorbidities (diabetes mellitus, obesity, and cancer) ($p < 0.005$). The study found that the transition of care for patients recovered with COVID-19 from hospital discharge to home was successful. However, the need for public policy implementation after hospital discharge in a pandemic setting is emphasized.

1. Introduction

Transition of care (TC) is defined as a set of actions aimed at ensuring continuity and coordination of care for patients transferred between different services or levels of health care. It consists of strategies such as discharge planning, advance care planning, patient education, promotion of self-management, safe medication use, complete communication of information, and outpatient follow-up [1].

TC has been the focus of research in Europe, especially in countries such as Portugal and Spain, where research is being conducted on the transition of health professional care with an emphasis on nurses' work [2].

In Brazil, the theme is insipid since few studies address the CT both in pandemics and in nonpandemic contexts. A

national study addressed the activities performed by nurses in the transition of care for patients discharged from the hospital, the activities focused on patient discharge orientations, discharge planning by the multiprofessional team, written discharge plan, articulation between services, and patient counter-referral, which could be further developed by professionals [3]. In this direction, it can be stated that the transition of care is a process under construction and adaptation that requires investigation, especially in Latin American countries such as Brazil [4].

COVID-19 was declared a pandemic by the World Health Organization (WHO) [5] on March 11, 2020. Although the clinical characteristics and short-term outcomes of patients hospitalized with COVID-19 are relatively well described in the worldwide literature, patients discharged

from the hospital often require follow-up for new conditions diagnosed during admission and following the care plan for discharge planning by the multiprofessional team [6, 7]. In the face of continued prescription of isolation, lack of face-to-face health services, and reduced clinical hours, patients with COVID-19 represent a contingent of user concern within the Unified Health System, as they may present unique needs after hospital discharge [8].

Due to the circumstances of the effectiveness of quality care transition during the pandemic, postdischarge health services must adapt to the specific needs and limitations identified for the care of patients with COVID-19 [8]. Given the above, the guiding question of this study was: what is the sociodemographic and clinical profile and associated factors that may interfere in the transition of care after hospital discharge and require special care at home and in the health care network?

This study aimed to identify the sociodemographic and clinical characteristics and factors associated with the transition of care in patients recovered from COVID-19.

2. Materials and Methods

This is a cross-sectional study with a quantitative approach following the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) [9] and is part of the multicenter project entitled "Evaluation of Nursing Care Provided to Patients with COVID-19 in Brazilian University Hospitals."

For data collection, a list of patients discharged from the public teaching hospital was made available. The researchers then contacted by telephone patients recovering from COVID-19 and/or their caregivers who were discharged home from the hospital in the period between May and December 2021. The sample consisted of 49 patients and/or caregivers discharged from a teaching hospital.

The inclusion criteria were as follows: patients aged 18 years or older; COVID-19 diagnosis; caregivers or persons responsible for home care; fluency in Brazilian Portuguese; a minimum of 72 hours of hospitalization before the questionnaire was applied, as this is considered a reasonable period for the patient to get to know the institution and answer the questionnaire items; and hospital discharge between 7 and 30 days.

Patients unable to consent to participate in the study (for example, due to neurological or psychiatric alterations, advanced disease, or under sedation) were excluded. Patients who agreed to participate in the research, but were unable to respond to the study due to their clinical picture (due to respiratory distress, pain, or immediate postoperative period); hospital discharge longer than 31 days, as recommended by the authors of the instrument.

For the sample calculation, the WinPepi program, version 11.65, was used, thus considering a confidence level of 95%, a margin of error of 4 points, a standard deviation of 17.1, and an initial sample size of 73 patients.

It is important to emphasize that, during the research, there was a decrease in beds for infected patients until the hospital was discredited by the Municipal Health Secretariat

of the city of Belém; consequently, a decrease until the extinction of care resulting in the reduction of the sample. There were also deaths of patients recovered due to some complication inherent to the study, others, due to weakened health conditions, were unable to answer the study questions, and others due to the difficulty of telephone contact (more than 5 missed calls).

For data collection, three instruments were used: a sociodemographic questionnaire with 5 questions (origin, respondent, gender, age, and education), a clinical questionnaire with 17 questions addressing COVID-19 symptoms, comorbidities, and use of invasive mechanical ventilation), and the Care Transition Measure (CTM-15) to assess the quality of care transition of the Brazilian version [3]. The CTM-15 is composed of 15 items, with response options on a 4-point Likert scale ("strongly disagree = 1," "disagree = 2," "agree = 3," "strongly agree = 4," and "do not know/do not remember/not applicable = 0"). Thus, the higher the score, the higher the quality of the care transition. The items of the instrument are organized in four factors: Factor 1: "health management preparation" (items 4 to 6 and 8 to 11), Factor 2: "understanding of medication" (items 13 to 15), Factor 3: "important preferences" (items 1 to 3), and Factor 4: "care plan" (items 7 and 12). The final score of the CTM-15 was calculated using a formula with the averages of the scores obtained, converting them into a linear scale from zero to 100 points, which is each individual's score $EC = [E/3] * 100$, where E is the individual's original score and EC is the standardized score, as recommended by the authors of the instrument.

The CTM-15 does not have a cutoff point to define the level of satisfaction, only establishing that lower values indicate a lower level of satisfaction and higher values indicate a higher level of satisfaction with continuity of care. However, to calculate the overall value of the survey, the authors advised measuring the responses and passing them on a scale of 0 to 100; consequently, values above 51 would indicate an acceptable level of satisfaction [1]. Therefore, in this study, values above 51 were considered a good or acceptable level of satisfaction, and for values less than or equal to 50, there would be a low level of satisfaction.

For data analysis, the Microsoft Office Excel® 2016 program was used in the tabulation stage, audited in its entirety by a second assistant researcher to ensure the correct insertion of the answers, and analyzed by the Statistical Package for the Social Sciences (SPSS) software version 25.0 for Windows.

Categorical variables were represented as absolute and relative frequencies for statistical analysis of the data obtained. Quantitative variables were represented as the mean and standard deviation. For the scores of the CTM-15, the Shapiro–Wilk normality test was initially performed. Since these distributions were asymmetric, nonparametric tests were used. In addition, Spearman's correlation was used to verify the degree of relationship between the quantitative variables and the CTM-15 factor scores, and the nonparametric Mann–Whitney and Kruskal–Wallis statistical tests were used for data with a two-group normal distribution. A significance level of 0.05 was adopted.

The study followed the recommendations of Resolution Nos. 466/2012 and 510/2016 of the National Health Council (CNS in Portuguese). As it was a multicenter research, the study was submitted and approved by the Research Ethics Committee of the Federal University of Santa Catarina and the Federal University of Pará, under opinion nos. 4,347,463 and 4,464,829 between October and December 2020, respectively. As data collection was carried out through telephone contact, consent was recorded, and a copy of the informed consent form (ICF) was sent to the participants by electronic message (email requested at the time of the interview).

3. Results

The sociodemographic profile of the research participants is presented in Table 1.

Of the participants, 59.2% were male, with a mean age of 50 years. Regarding education, the average was 10 years of study, coming from the city of Belém and/or the metropolitan region of Belém. Table 2 shows the clinical variables of patients with COVID-19 who were discharged home.

Among the clinical variables were the prevalence of dyspnea, fever, and muscle weakness. Systemic arterial hypertension was the most common comorbidity, affecting 32.7% of the participants. During the period of stay in the intensive care unit, 91.8% of the participants did not use invasive mechanical ventilation (IMV).

Table 3 shows the mean and standard deviation obtained for each item of the CTM-15 instrument. The items with the highest scores were 13 and 14, which belong to the “understanding of medication” factor. The lowest mean score was item 7, belonging to the “care plan” factor.

Table 4 presents the evaluation of the association between factors of the CTM-15 and the variables of interest. There was a significant association between diabetes mellitus and Factor 1 (0.023), obesity and Factors 1, 2, 3, and 4 (0.002, 0.007, 0.026, and 0.037, respectively), and cancer and Factor 3 (0.051).

Table 5 shows the mean total score of the instrument and factors of the CTM-15. The mean value of the total score was 87.4 (± 16.1). On the other hand, Factor 1 (self-management training) had a mean score of 82.6 (± 14.8), Factor 2 (understanding medication) had that of 86.6 (± 15.0), Factor 3 (preferences respected) had that of 82.0 (± 16.7), and Factor 4 (care plan) had that of 81.2 (± 18.2).

4. Discussion

In this study, the majority of patients were males and the mean age was 50 years. The results are similar to those found in national and international studies [7, 8, 10]. Regarding schooling, the mean was 10 years of study, a result that differs from a study carried out on patients admitted to a university hospital in Porto Alegre, which showed up to 9 years of schooling in interviewees [10]. Regarding origin, because it is a university hospital located in the same city and metropolitan region of Belém (RMB in Portuguese), the interviewees, in general, facilitated access to health services,

reflecting the greater adherence of respondents to participate in this study.

A relevant finding was the low incidence of comorbidities presented by research participants. However, among the comorbidities observed, systemic arterial hypertension (SAH) was the most common, followed by diabetes mellitus (DM), correlating with a study conducted in Atlanta (USA) with patients who were discharged after COVID-19, which revealed the prevalence of the comorbidities SAH and DM [8]. In Brazil, SAH affects about 32.3% of adults, contributing directly or indirectly to 50% of deaths from cardiovascular disease (CVD) [11].

Furthermore, studies pointed out that the prevalence of SAH and DM2 is significantly associated with the age group over 60 years due to progressive stiffening and loss of compliance of the arteries as well as the increased mortality and morbidity of patients with COVID-19 [12, 13]. In this research, there was no significant association between age and comorbidities.

Dyspnea was the predominant symptom reported by interviewees, corroborating the literature findings that the symptom resulting from acute respiratory failure is the main cause of hospitalization of patients with COVID-19, which can evolve to acute respiratory distress syndrome (ARDS) [14]. In this context, invasive mechanical ventilation (IMV) is the main treatment for these patients. In this study, most respondents did not use IMV, diverging from a study in Italy that showed that most patients with COVID-19 required IMV [15].

Regarding the items of the CTM-15, this study showed that the items with the highest scores were 13 and 14, belonging to the factor “understanding of medication,” revealing that the patient and/or their caregiver understand the care that should be taken when taking medication. This can probably be explained by the respondent’s level of education above 10 years; studies pointed out that the higher the level of education, the better the understanding of care and health issues [16].

The item with the lowest mean score was 7, belonging to the “care plan” factor. This result conforms to the study conducted in Tokyo (Japan) during the pandemic of COVID-19, which showed that many hospitals restricted family visits to minimize the spread of the virus, resulting in poor care practice after patient discharge. Thus, the nurse should perform transition care planning, guiding the patient and/or their caregivers.

As for the analysis of associations, sociodemographic variables showed no significant association; however it should be noted that education obtained high scores of the factors CTM-15 similar to the study conducted in Seoul (Korea) with patients discharged after COVID-19 [16]. Thus, high education helps patients and/or their caregivers understand more clearly orientations given by professionals regarding health care after hospital discharge.

On the other hand, there was an association between TC factors and comorbidities (DM, obesity, and cancer). Such comorbidities are complex and fragmented care, directly influencing patient care. Thus, TC in a structured manner at hospital discharge is a practice with positive associations in

TABLE 1: Sociodemographic profile of participants according to research variables (Belém, Brazil, 2021 ($n = 49$)).

Variable	<i>F</i>	(%)	<i>p</i> value
Gender			0.000*
Male	29	59.2	
Female	20	40.8	
Age range (years)			0.000*
21–29	7	14.2	
30–39	5	10.2	
40–49	9	18.3	
50–59	12	24.4	
60–69	11	22.4	
≥70	5	10.2	
Average (\pm SD) schooling (years)	50.4 years (\pm 16.1)		<0.005*
0–1	4	8.2	
4–9	21	42.9	
≥10	24	49.0	
Origin			<0.005*
Belém and RMB**	35	76.0	
Interior of the state	14	24.0	
Interviewee			0.0322*
Patient	41	83.7	
Caregiver	8	16.3	

*Kruskal-Wallis test; **RMB-Belém metropolitan region. Source: survey data, 2021.

TABLE 2: Clinical profile of participants according to clinical variables of the research (Belém, Brazil, 2021 ($n = 49$)).

Variables	<i>f</i>	%
Fever		
No	15	30.6
Yes	34	69.4
Fatigue		
No	12	24.5
Yes	37	75.5
Dyspnea		
No	10	20.4
Yes	39	79.6
Cough		
No	18	36.7
Yes	31	63.3
Loss of smell and taste		
No	27	55.1
Yes	22	44.9
Headache		
No	20	40.8
Yes	29	59.2
Muscle weakness		
No	19	38.8
Yes	30	61.2
Nausea and/or vomiting		
No	34	69.4
Yes	15	30.6
Diarrhea		
No	30	61.2
Yes	19	38.8
Comorbidities		
Chronic respiratory disease		
No	45	91.8
Yes	4	8.2
Systemic arterial hypertension		
No	33	67.3

TABLE 2: Continued.

Variables	<i>f</i>	%
Yes	16	32.7
Cardiovascular diseases		
No	46	93.9
Yes	3	6.1
Diabetes mellitus		
No	39	79.6
Yes	10	20.4
Kidney disease		
No	46	93.9
Yes	3	6.1
Obesity		
No	43	87.8
Yes	6	12.2
Cancer		
No	43	87.8
Yes	6	12.2
Invasive ventilatory support		
No	45	91.8
Yes	4	8.2

Source: survey data, 2021.

TABLE 3: Distribution of the mean and standard deviation (SD) per item of the CTM-15 (Belém, Brazil, 2021).

Item	Factor	CTM-15	Average	(±SD)
1	3	Before I left the hospital, the healthcare team and I agreed on goals for my health and how they would be achieved	86.2	(±14.4)
2	3	The hospital staff considered my preferences and those of my family or caregivers when deciding what my health needs would be after I left the hospital	86.2	(±14.4)
3	3	The hospital staff considered my preferences and those of my family or caregivers when deciding where my health needs would be met after I left the hospital	87.2	(±14.5)
4	1	When I left the hospital, I had all the information I needed to be able to take care of myself	86.7	(±16.2)
5	1	When I left the hospital, I clearly understood how to take care of my health	88.0	(±16.3)
6	1	When I left the hospital, I clearly understood the warning signs and symptoms I should look for to monitor my health condition	84.6	(±15.1)
7	4	When I left the hospital, I received a written, readable, easy-to-understand plan that described how all of my health needs would be met	84.6	(±15.9)
8	1	When I left the hospital, I had a good understanding of my health condition and what might make it better or worse	89.2	(±14.4)
9	1	When I left the hospital, I had a good understanding of what my responsibility was to take care of my health	86.7	(±13.6)
10	1	When I left the hospital, I felt confident that I knew what to do and how to take care of my health	86.2	(±14.4)
11	1	When I left the hospital, I felt confident that I would be able to do the things necessary to take care of my health	87.2	(±14.5)
12	4	When I left the hospital, I received a written, readable, easy-to-understand list of appointments or tests that I needed to have in the next few weeks	88.3	(±15.5)
13	2	When I left the hospital, I clearly understood the reason for taking each of my medications	90.5	(±12.2)
14	2	When I left the hospital, I clearly understood how to take each of my medications, including the amount and times	92.2	(±11.7)
15	2	When I left the hospital, I clearly understood the possible side effects of each of my medications	87.2	(±16.5)

Source: survey data, 2021.

TABLE 4: Association between the scores per factor of the CTM-15 and the variables of interest (Belém, Brazil, 2021 ($n = 49$)).

Variables	N	Factor1 average (\pm SD)	Factor 2 average (\pm SD)	Factor 3 average (\pm SD)	Factor 4 average (\pm SD)
Gender					
Male	29	82.1 (\pm 15.6)	85.5 (\pm 15.3)	81.6 (\pm 18.4)	78.7 (\pm 0.4)
Female	20	83.3 (\pm 14.0)	88.3 (\pm 15.0)	82.8 (\pm 14.6)	85.0 (\pm 14.2)
<i>p</i> value		0.805	0.483	0.907	0.336
Schooling (years)					
0-1	4	78.6 (\pm 22.8)	88.9 (\pm 19.2)	75.0 (\pm 16.7)	75.0 (\pm 28.9)
4-9	21	82.5 (\pm 14.6)	85.6 (\pm 16.9)	78.3 (\pm 18.7)	80.2 (\pm 18.7)
\geq 10	24	83.3 (\pm 14.3)	87.4 (\pm 13.4)	86.6 (\pm 14.3)	83.3 (\pm 16.3)
<i>p</i> value		0.945	0.921	0.169	0.789
IMV usage*					
No	45	81.2 (\pm 16.7)	80.7 (\pm 18.4)	81.2 (\pm 16.7)	80.7 (\pm 18.4)
Yes	4	91.7 (\pm 16.7)	87.5 (\pm 16.0)	91.7 (\pm 16.7)	87.5 (\pm 16.0)
<i>p</i> value		0.246	0.537	0.246	0.537
Comorbidities (respiratory disease)					
No	45	82.7 (\pm 16.7)	81.5 (\pm 18.2)	81.1 (\pm 17.2)	80.3 (\pm 18.8)
Yes	4	75.0 (\pm 19.0)	79.2 (\pm 21.0)	84.0 (\pm 16.2)	83.3 (\pm 17.2)
<i>p</i> value		0.406	0.819	0.585	0.638
SAH**					
No	33	81.5 (\pm 14.6)	87.0 (\pm 14.6)	81.1 (\pm 17.2)	80.3 (\pm 18.8)
Yes	16	84.8 (\pm 15.6)	85.9 (\pm 16.5)	84.0 (\pm 16.2)	83.3 (\pm 17.2)
<i>p</i> value		0.478	0.969	0.585	0.638
Cardiovascular diseases					
No	46	83.3 (\pm 14.3)	86.8 (\pm 15.0)	82.6 (\pm 16.5)	81.9 (\pm 17.9)
Yes	3	71.4 (\pm 21.8)	83.3 (\pm 23.6)	74.1 (\pm 23.1)	72.2 (\pm 25.5)
<i>p</i> value		0.265	0.808	0.411	0.460
Diabetes mellitus					
No	39	80.6 (\pm 14.0)	84.9 (\pm 15.3)	80.9 (\pm 16.9)	79.5 (\pm 18.1)
Yes	10	90.5 (\pm 16.0)	93.8 (\pm 12.6)	86.7 (\pm 16.4)	88.3 (\pm 17.7)
<i>p</i> value		0.023	0.110	0.345	0.171
Renal diseases					
No	46	82.7 (\pm 15.2)	86.5 (\pm 15.0)	83.1 (\pm 16.8)	80.8 (\pm 18.6)
Yes	3	81.0 (\pm 8.2)	88.9 (\pm 19.2)	66.7 (\pm 0.0)	88.9 (\pm 9.6)
<i>p</i> value		0.708	0.708	0.085	0.565
Obesity					
No	43	85.0 (\pm 14.0)	88.9 (\pm 14.5)	84.0 (\pm 16.1)	83.3 (\pm 17.8)
Yes	6	65.1 (\pm 7.2)	68.9 (\pm 5.0)	68.5 (\pm 16.4)	66.7 (\pm 14.9)
<i>p</i> value		0.002	0.007	0.026	0.037
Cancer					
No	43	83.9 (\pm 14.2)	87.5 (\pm 14.7)	83.7 (\pm 16.9)	82.9 (\pm 17.6)
Yes	6	73.0 (\pm 16.9)	80.0 (\pm 18.3)	70.4 (\pm 11.5)	69.4 (\pm 19.5)
<i>p</i> value		0.134	0.388	0.051	0.111

*IMV: invasive mechanical ventilation; **HAS systemic arterial hypertension; Mann-Whitney test. Source: Survey data, 2021.

reducing hospitalizations and patient satisfaction with quality of care 18 years.

In this study, the factor “health management preparation” was associated with DM; it is known that patients affected by some chronic noncommunicable diseases (CNCDS) report difficulties understanding medications, as well as postdischarge care [3]. In this context, hospital discharge should be planned by the multiprofessional team during hospitalization, identifying the patient’s understanding of his health and implementing goals for home health care.

Obesity was the comorbidity that showed association with all care transition factors. Obesity is a risk factor for respiratory failure that is associated with greater severity in the context of COVID-19 and is also an independent risk factor for SAH [17, 18].

Cancer, which is another comorbidity, was associated with the factor “important preferences.” It is known that cancer TC (Transition Care) is crossed by numerous obstacles, namely: the possibility of controlling the disease in the face of different systemic treatments for cancer; barriers arising from cultural, linguistic, religious differences, among others [19]. In this study, the results indicate that communication was essential for effective TC; thus, it is expected that individuals and their families are responsible for their health, taking greater responsibility for it, and being partners in transition care decisions [20].

It is noteworthy that in the study, TC performed by nurses was high, and all factors of the CTM-15 were higher than 87.4 points in a total score of 100 points, as mentioned earlier. Thus, it can be stated that transitional care intervention is initiated in the hospital and coordinated by

TABLE 5: Distribution of the mean and standard deviation (\pm SD) of the CTM-15 instrument and its factors (Belém, Brazil, 2021 ($n = 49$)).

Rating score	Average	(\pm SD)
Total transition	87.4	(\pm 16.1)
Factors		
Factor 1: health management preparation	82.6	(\pm 14.8)
Factor 2: medication understanding	86.6	(\pm 15.0)
Factor 3: important preferences	82.0	(\pm 16.7)
Factor 4: care plan	81.2	(\pm 18.2)

nurses based on collaboration between acute care hospitals and community health centers, resulting in better hypertension control and reduced readmissions with comorbidities and other conditions. Chronic conditions, which can result in low hospital readmission rates. Coordinated health care between hospitals and primary health care (PHC) 23-24 may contribute to strengthening the PHC approach and supporting self-management of comorbidities such as hypertension, diabetes, and other health conditions associated with patients with COVID-19.

In this study, the results obtained allowed measuring the quality of the TC of patients who were discharged from hospital to their homes, with a mean score of 87.4, indicating high quality, corroborating studies [4–9] that evaluated the quality of the transition of care that pointed to a high score, and although the instrument does not have a predefined cutoff point, this mean can be considered high. These results contribute to guiding professionals in actions which are aimed at improving the care transition process [5], especially in the context of the COVID-19 pandemic.

5. Conclusions

The study contributed to the mapping and diagnosis of the sociodemographic and clinical profile and factors associated with the transition of care, allowing health professionals, especially nurses, to make a more reliable evaluation of the transition of care and qualify the actions of hospital discharge to home.

The limitation of the study refers to the difficulty of telephone contact with interviewees as the interview dealt with personal issues, causing discomfort in answering by telephone.

The implementation of the transition of care is essential because it is a strategy that aims to qualify the patient's postdischarge follow-up, reducing the rates of complications and readmissions, thereby increasing hospital costs, which burden the Brazilian health system.

Data Availability

Data are available from the corresponding author upon request.

Disclosure

It is worth noting that a preprint was previously published by Arrais et al. [21] which is available at <https://doi.org/10.1590/SciELOPreprints.4216>.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

Acknowledgments

The work was supported by MCTIC/CNPq/FNDCT/MS/SCTIE/Deceit, No. 07/2020, Research to Face COVID-19, Its Consequences, and Other Severe acute Respiratory Syndromes (process no. 402392/2020-5).

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