Impacto da Pandemia de COVID-19 na Reabilitação Ambulatorial Pós-AVC num Centro de Reabilitação da Área Mediterranica

Impact of the COVID-19 Pandemic on Post-Stroke Outpatient Rehabilitation at a Mediterranean Rehabilitation Center

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Resumo

Introdução: O acidente vascular cerebral (AVC) é uma das principais causas de morte e incapacidade adquirida em todo o mundo. A interrupção temporária dos programas de reabilitação em regime de ambulatório devido à pandemia da COVID-19 apresentou impacto negativo nos doentes pós-AVC.

O nosso objetivo foi avaliar o impacto da interrupção de programas de reabilitação em regime de ambulatório nos doentes com AVC e seus cuidadores durante o confinamento.

Material e Métodos: Realizamos um estudo observacional num Centro Europeu de Reabilitação. Selecionamos doentes que suspenderam o tratamento de reabilitação em regime de ambulatório de março a maio de 2020, devido à pandemia de COVID-19. Um questionário telefónico foi aplicado durante junho de 2020 para avaliar a força muscular, espasticidade, dor, nível de independência, ansiedade, depressão, sobrecarga do cuidador, ausência ao trabalho e preocupações financeiras.

Resultados: Noventa cinco doentes foram incluídos no estudo. A idade média foi de 59 ± 13,1 anos e 57 eram do sexo masculino. Durante o confinamento, 94,7% dos participantes não realizaram reabilitação e 83,2% relataram que a pandemia COVID-19 prejudicou sua autonomia. Dos cuidadores, 71,1% relataram níveis mais elevados de sobrecarga de assistência ao doente. Os doentes mais autónomos (FIM≥80) apresentaram maior repercussão na deambulação e subir escadas (p<0,05) enquanto os doentes mais dependentes (FIM<80) apresentaram maior repercussões na alimentação e nas transferências (p <0,05).

Conclusão: A interrupção da reabilitação em regime de ambulatório provou ser prejudicial, tanto para os sobreviventes de AVC como para os seus cuidadores. Este estudo reforça a importância da reabilitação intensiva e acompanhamento individualizado dos doentes com AVC em ambulatório, mesmo após a fase pós-aguda. Novas estratégias, como a telereabilitação, podem prevenir limitações futuras no acesso à reabilitação.

Palavras-chave: COVID-19; Inquéritos e Questionários; Reabilitação do Acidente Vascular Cerebral

Abstract

Introduction: *Stroke is one of the most common causes of death and acquired disability worldwide. Temporary interruptions to outpatient rehabilitation programs due to the COVID-19 pandemic have negatively impacted stroke patients.*

Our objective was to evaluate the impact of outpatient

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Data de submissão: julho 2021
Data de aceitação: fevereiro de 2023
Data de publicação: março 2023

rehabilitation programs interruption on stroke patients and their caregivers during the lockdown.

Methods: *An observational study was conducted at a European Rehabilitation Center. We selected patients that suspended outpatient treatments from March to May 2020, due to the COVID-19 pandemic. A telephone questionnaire was applied in June 2020 evaluating muscle strength, spasticity, pain, independence level, anxiety, depression, caregiver burden, absenteeism, and financial concerns.*

Results: *Ninety five patients were included in the study. The mean age was 59±13.1 years, and 57 were male. During the lockdown, 94.7% of participants did not receive rehabilitation, and 83.2% of respondents reported that the COVID-19 pandemic harmed their independence. A percentage of 71.1% of caregivers reported higher levels of burden assistance to the patient. The more autonomous patients (FIM≥80) had greater repercussions on walking and climbing stairs ($p<0.05$), while more dependent patients (FIM<80) showed greater repercussions in feeding and transfers ($p<0.05$).*

Conclusion: *The interruption of outpatient rehabilitation was detrimental both to stroke survivors and caregivers. This study highlights the need for intensive rehabilitation and tailored follow-up of stroke patients on outpatient, even after the post-acute phase. New strategies, such as telerehabilitation, might prevent future limitations in access to rehabilitation.*

Keywords: *COVID-19; Stroke Rehabilitation; Surveys and Questionnaires*

Introduction

Stroke is one of the most common causes of death and acquired disability worldwide.[1] According to the American Heart Association/American Stroke Association guidelines, more than two-thirds of stroke survivors access some form of rehabilitation on discharge from acute services. Rehabilitation programs are often lengthy and intensive, and recovery is often slow and incomplete.[2,3] Rehabilitation programs in post-stroke patients aim to maximize functional independence, reduce disability, and maintain/improve acquired skills.[2,4]

The World Health Organization declared the Coronavirus disease 2019 (COVID-19) a pandemic on March 11, 2020.[5] In Portugal, the State of Emergency was declared on March 19, extending until May 2, and during this period, outpatient rehabilitation healthcare has been nationally interrupted.[6,7]

The restrictions imposed by the COVID-19 pandemic to contain the spread of infection have limited access to many health services, including outpatient and home-based rehabilitation.[8-11] According to the European scientific societies (ESPMR and UEMS-PMR), up to 2.2 million people in Europe interrupted rehabilitation treatments due to the pandemic.[12] We suppose that the temporary interruption to outpatient rehabilitation programs in decisive moments of post-stroke recovery would impair patient recovery, however, we did not know which aspects would be more affected.[12,13]

The purpose of this study was to assess the impact of the interruption of outpatient rehabilitation programs, both in stroke patients and caregivers during the lockdown, motivated by the COVID-19 pandemic.

Material and Methods

Study design and settings

An observational cohort study and questionnaire-based were conducted at a European Rehabilitation Center. Patients' data were obtained from clinical registries and a telephone questionnaire specifically designed for stroke patients and their caregivers. The instrument was applied in June 2020.

Patients recruited were recovering from stroke sequelae in the outpatient facilities of our Rehabilitation Center. His treatments were suspended, from March to May 2020, due to the COVID-19 pandemic.

A questionnaire was applied by a physiatrist directly to the patient, the caregiver, or both, using a phone call. All participants were fully informed about the study and provided informed consent to participate. All interviews were conducted in Portuguese.

Participants

Inclusion criteria were caregivers and adult patients (≥18 years old) who had stopped outpatient rehabilitation for stroke sequelae because of the COVID-19 quarantine and agreed to participate in the study by verbal informed consent.

Exclusion criteria were comorbidities that might affect pain, spasticity, and functionality in addition to stroke. Patients who refused to participate in the study were also excluded.

If patients were unable to communicate because of severe aphasia or dysarthria, the questionnaire was answered by the caregiver.

From the total number of 101 eligible patients, 4 were excluded due to significant comorbidities (other than stroke), and 2 patients refused to participate.

The study protocol was approved by the local ethics committee and respects the Declaration of Helsinki.

Questionnaire

The authors create a questionnaire to study the impact of rehabilitation suspension on stroke patients due to the

COVID-19 pandemic. It consists of 21 questions: Likert-type responses and dichotomous "yes/no" questions and is adapted for phone call answers. It is designed to take 20 minutes to complete, although there is no time limit for answering.

Although the questionnaire is not yet validated, the authors created it based on different instruments commonly used for the Portuguese population. To measure the patient's level of independence in different activities such as feeding, hygiene, dressing, continence, transfers, and ambulation, the authors based on FIM. Questions on depression and anxiety for both patients and caregivers were based on the Hospital Anxiety and Depression Scale (HADS) and the Generalized Anxiety Disorder Scale (GAD-7). Caregivers were assessed for caregiver burden, absenteeism, and financial concerns.

Data analysis

Statistical analysis was performed with SPSS version 26.0 (IBM Corp., released 2018. IBM SPSS Statistics for Windows, version 26.0, Armonk, NY, USA). Comparisons in univariate analysis were performed using chi-2 and Fisher's tests for categorical variables and Student's t-Test for continuous variables. A p value < 0.05 was considered statistically significant. Quantitative variables were reported as mean ± standard deviation. Ordinal variables were reported with median.

Results

Sociodemographic and clinical characteristics (see Table 1)

A total of 95 patients were included in our study and answered the questionnaire. The sample mean age was 59 ± 13.1 years and 57 were males (60%). In this cohort, 3 patients had a professional caregiver (3%), 86 had an informal caregiver (91%), and 6 patients did not have a caregiver (6%). Of the 95 questionnaires applied, 71 (74.7%) were answered by the patient and the caregiver, and 24 (25.3%) were responded solely by the caregiver because of the patient's severe aphasia or dysarthria. Regarding the education level, 24 (25.3%) of the patients had only attended primary school and 19 (20%) obtained a college degree.

The most common type of stroke was ischemic stroke (70.5%), followed by hemorrhagic (29.5%). Twenty nine patients (30.5%) had some type of aphasia and 60 (63.1%) had dysarthria. Left hemiparesis was found in 44 patients (46.3%), right hemiparesis in 36 (37.9%), bilateral involvement was reported in 15,8% and 2.1% reported ataxia.

Regarding ambulation, ambulatory assistive devices were needed in 41% of patients, 26.5% were wheelchair users, 26.3% had no locomotion ability and 6% walked independently without assistance. Patients' functionality assessed with the FIM tool was obtained from the clinical registries at discharge from inpatient rehabilitation.

Table 1 - Demographic and clinical characteristics of participants

Characteristic	**Statistic *n* = 95**
Age	59.1 ± 13.673
Gender	
Female	38 (40)
Male	57 (60)
Education level	
1-4th grade	24 (25.3)
5-9th grade	29 (30.5)
10-12th grade	23 (24.2)
College degree	19 (20)
Stroke	
Ischemic	67 (70.5)
Hemorrhagic	28 (29.5)
Language	
Aphasia	29 (30.5)
Unaffected	66 (69.5)
Neuromotor	
Hemiparesis left	44(46.3)
Hemiparesis right	36 (37.9)
Double hemiparesis	13(15.8)
Ataxia	2 (2.1)
Dysphagia	41 (43.2)
Hemineglect	41 (43.2)
Locomotion	
Independent walking	6 (6)
Use of an orthosis for locomotion	39 (41)
Wheelchair	25 (26.5)
Total dependence	25 (26.3)
MIF at discharge (median, IQR)	94 (77-105)
Caregiver	
Unformal	86 (91)
Professional	3 (3)
Without caregiver	6 (6)

Impact of rehabilitation interruption due to the COVID-19 pandemic on daily life and level of independence (see Table 2)

All the participants included in the study reported rehabilitation before the quarantine began (physiotherapy, speech therapy, or occupational therapy). A total of 69 stroke patients (76.7%) reported rehabilitation treatments 2-3 days/week before the pandemic. During the lockdown, 94.7% (n=90) of participants ceased rehabilitation, and 83.2% (n=79) reported that the COVID-19 pandemic harmed their overall condition. Only 13.7% of patients enrolled in telerehabilitation or home-based rehabilitation during this period.

With the rehabilitation treatments interruption, 57.9% (n=55) of the patients reported a decrease in muscle strength on the paretic side, 55.8% (n = 53) reported an increase in spasticity, and 41.9% (n = 39) reported increased pain. Of them, 79% of patients presented moderate to severe pain. Regarding patients unable to communicate, pain was assessed by the caregiver through indirect signs, such as facial discomfort during daily living activities. The discontinuation of rehabilitation treatments during the period of the quarantine was associated with a worsening of independence levels (62.4%, n=58) (Fig. 1), and the most affected areas were ambulation (73%), transfers (40.3%), and dressing (36.1% in the lower half and 31.7% in the upper half) (Fig. 2).

Increased anxiety levels reported by patients and caregivers were observed in 46.3% of the patients, with 16.8% reporting anxiety all the time and 29.5% most of the time. A total of 20% of the patients needed anxiolytic drugs or dose increases to control the symptoms. Greater anxiety levels were motivated by the uncertainty regarding the recommencement of rehabilitation treatments, with half of the patients presenting very worried about this situation.

Rehabilitation treatment interruption imposed more burden assistance on the caregivers, with 71.1% (n=59) reporting moderate to extreme levels. The reasons were higher levels of absenteeism to take care of the patient, observed in 29.4% of the caregivers, and financial concerns observed in 50.6% of cases. There was a general increase in anxiety levels of the caregiver linked to the fear of the patient overall condition deterioration during this period.

We observed that the repercussion in walking and climbing stairs was higher in more autonomous patients (FIM≥80) ($p<0.05$) while more dependent patients (FIM<80) presented essentially repercussions in feeding and transfers ($p<0.05$) and higher levels of burden on the caregiver ($p<0.05$).

Table 2 - Descriptive statistics of questionnaire

	n (%)
Q1. Have you considered that the pandemic COVID-19 had an impact on your current health status?	
Yes	79 (83.2)
No	16 (16.8)
Q2. What impact did the pandemic COVID-19 have on your rehabilitation treatments (physiotherapy, occupational therapy or speech therapy)?	
interruption of rehabilitation treatments	90 (94.7)
did not get to start rehabilitation treatments	5 (5.3)
Q3. How often did you use rehabilitation treatments before the pandemic COVID-19?	
< 2 days/week	1 (1.1)
2 days/week	28 (31.1)
3 days/week	41 (45.6)
> 3 days/week	20 (22.2)
Q4. Did you have access to an alternative to minimize the impact of interrupting your rehabilitation treatments?	
Yes	24 (25.26)
No	71 (74.74)

Q5. What kind of alternative?	
Telerehabilitation	9 (9.47)
Home rehabilitation with professionals	4 (4.21)
Teleconsultation	4 (4.21)
Informative brochures with exercises	7 (7.37)
Q6. With the interruption of rehabilitation treatments, the muscular strength of stroke affected limbs was:	
Much worse	4 (4.2)
Worst	51 (53.7)
Equal	35 (36.8)
Better	5 (5.3)
Q7. Was there an increase in stiffness in the limbs affected by the stroke?	
Yes	76 (80)
No	19 (20)
Q8. Regarding the feeling of stiffness of the limbs affected by the stroke, do you think with the suspension of the treatments, the stiffness was?	
Much worse	10 (10.9)
Worst	43 (44.89)
Equal	22 (23.16)
Better	1 (1.05)
Q9. Do you have pain in the affected limbs since the stroke?	
Yes	93 (97.89)
No	2 (2.11)
Q10. Regarding the pain on the side of the body affected by the stroke, with the interruption of treatments, the pain was:	
Much worse	7 (7.5)
Worst	32 (34.4)
Equal	23 (24.7)
Better	31 (33.3)
Q11. How do you classify the pain you currently feel according to the numerical pain scale?	
Without pain (0)	6 (9.5)
Slight pain (1-2-3)	7 (11.1)
Moderate pain (4-5-6)	35 (55.6)
Severe pain (7-8-9)	15 (23.8)
Maximum pain (10)	0
Q12. How was your autonomy in activities of daily living after the interruption of rehabilitation treatment?	
Much worse	9 (9.7)
Worst	49 (52.7)
Equal	30 (32.3)
Better	5 (5.4)

Q13. Have you noticed an aggravation of the following aspects	
Q13.1. Feeding	
Yes	8 (13.1)
No	53 (86.9)
Q13.2 Hygiene	
Yes	14 (23)
No	47 (77)
Q13.3 Dressing upper half	
Yes	19 (31.7)
No	41 (68.3)
Q13.4 Dressing lower half	
Yes	22 (36.1)
No	39 (63.9)
Q13.5 Continence	
Yes	4 (6.6)
No	57 (93.4)
Q13.6 Transfers	
Yes	25 (40.3)
No	37 (59.7)
Q13.7 Ambulation	
Yes	46 (73)
No	17 (27)
Q13.8 Stairs	
Yes	18 (29.5)
No	43 (70.5)
Q14. How often have you been anxious or nervous since the pandemic began COVID-19?	
All the time	16 (16.8)
Most of the time	28 (29.5)
Occasionally	27 (28.4)
Rarely	13 (13.7)
Never	11 (11.6)
Q15. Was it necessary to start medication or, if already taking medication, to increase the dose to control anxiety and depression?	
Yes	18 (20)
No	72 (80)
Q16. Do you have a prospect of when you will return to rehabilitation treatments?	
Yes	15 (17.2)
No	72 (82.8)

Q17. Did that cause you to be more concerned?	
Extremely	8 (9.2)
Enough	33 (37.9)
Moderately	29 (33.3)
Slightly	8 (9.2)
No	9 (10.3)
Caregiver QuestionsQ18. Do you think the COVID-19 pandemic has burdened your caregiver work?	
Extremely	14 (16.9)
Enough	24 (28.9)
Moderately	21 (25.3)
Slightly	7 (8.4)
No	17 (20.5)
Q19. Did you have to limit your work activities during the pandemic COVID -19 to care for the patient?	
Yes	20 (29.4)
No	48 (70.6)
Q20. During the COVID-19 pandemic, did you feel more anxious about the ability to care for the patient?	
All time	17 (20.7)
Most of the time	21 (25.6)
Occasionally	25 (30.5)
Rarely	11 (13.4)
Never	8 (9.8)
Q21. Did you worry during the pandemic COVID-19 that you would not be able to fund the patient's care and other needs?	
All time	12 (14.5)
Most of the time	10 (12)
Occasionally	20 (24.1)
Rarely	12 (14.5)
Never	29 (34.9)

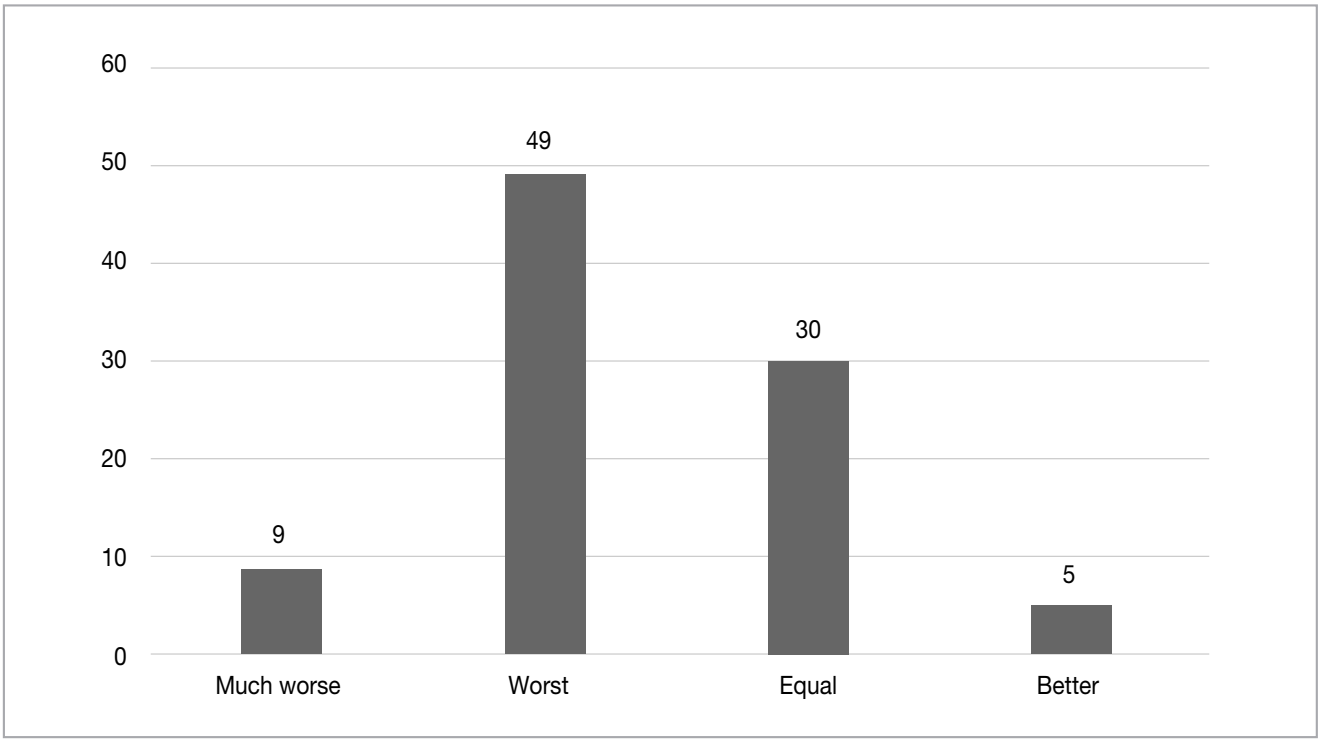

Figure 1 - How was your autonomy in activities of daily living after the interruption of rehabilitation treatment?

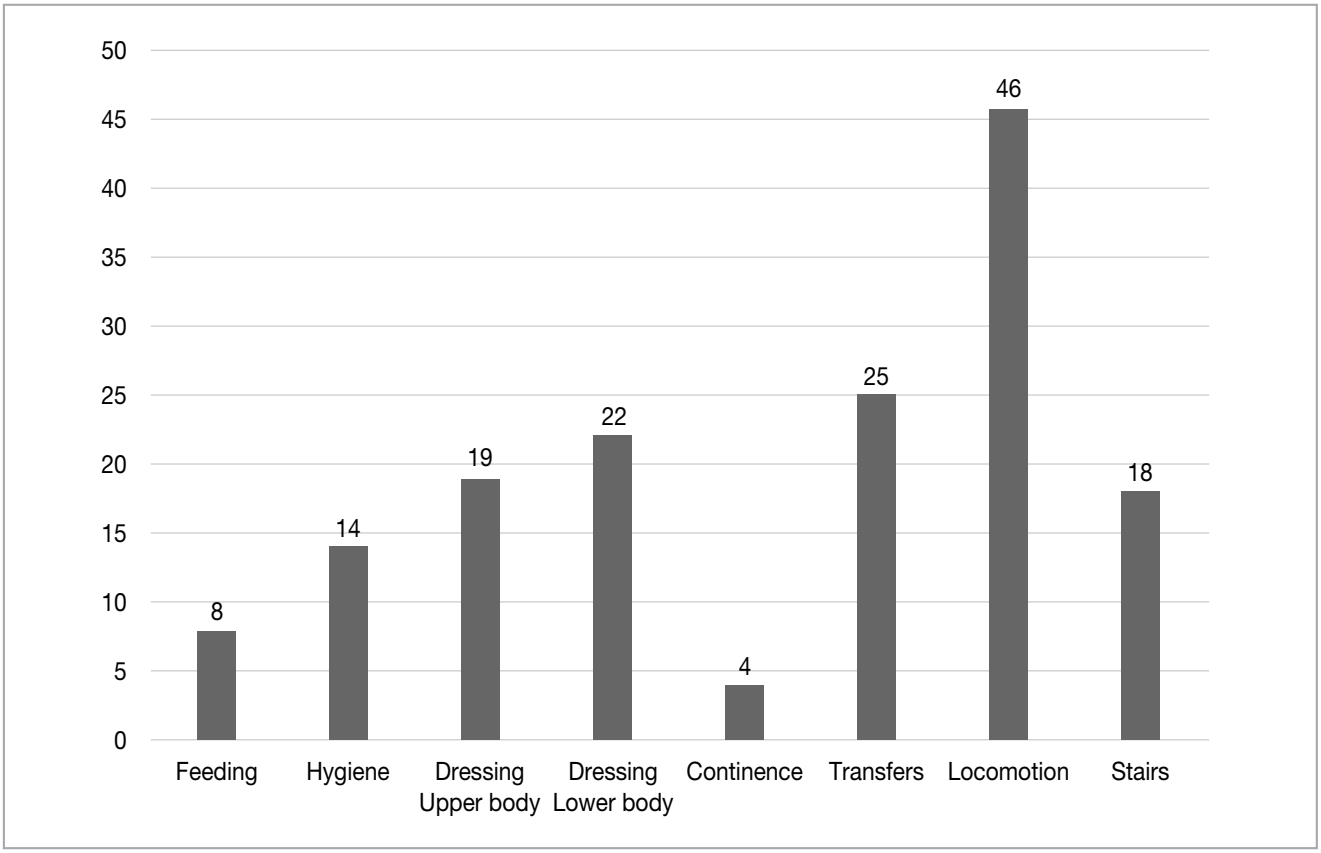

Figure 2 - Have you experienced any worsening of the following aspects?

Discussion

The COVID-19 pandemic imposed constraints on healthcare access worldwide, and the rehabilitation area was one of the most severely affected.[6,7] All the participants in the study were under rehabilitation treatments but the lockdown forced its suspension or reduction. Our results suggest that rehabilitation interruption impacts patients' independence and quality of life and the need for caregiver assistance.

These results are consistent with the previous literature, emphasizing the vulnerability of stroke survivors in times of pandemic.[14,15] Telerehabilitation programs and home-based rehabilitation are the best options to grant access to recovery for these patients, and several studies have reported comparable results to outpatient rehabilitation in terms of motor, language, and cognitive function improvement.[16-19] In Portugal, telerehabilitation is not yet very diffused because of a lack of financial support,[17,18] and this study highlights the need for more research, particularly focusing on functional outcomes and future investments in these areas.[18]

Another factor that might have contributed to diminished autonomy and functionality in these patients was the confinement that imposed restrictions on mobility with a negative impact on patients with gait ability and the loss of medical follow-up (access to consultations and complementary exams).

As expected, the demand for caregivers' assistance was higher in patients with worse overall conditions and increased levels of dependence.[14,20,21] More dependent patients presented higher repercussions in less complex activities such as feeding and transfers and more autonomous patients in tasks such as walking and climbing stairs, underlining progressive skills acquisition during rehabilitation.[20,21]

About 50% of stroke patients developed symptoms of depression and anxiety.[23] Additionally, psychiatric conditions could be worsened with community isolation, stressing the need for psychological evaluation of patients and caregivers during pandemic times.[22-24]

We observed that caregiver's anxiety levels were related to the risk of the patient's overall health status decline.

Our results revealed that rehabilitation interruption in crucial times might worsen several motor and non-motor functions in post-stroke patients, such as loss of muscle strength, increased spasticity, pain, depression, and anxiety.[2,12]

After the first wave of the COVID-19 pandemic, access to outpatient rehabilitation was scarcer than before because of the readaptation of rehabilitation centers and limitations in the patients' admission to prevent contagion.[11,12] There is an urgency for rethinking the future and considering alternative options for rehabilitation care (i.e., remote consultation and telerehabilitation). Rehabilitation institutions should be supported to implement new technologies in every level of care to make it more accessible and efficient. Reimbursement issues for telerehabilitation might be critical to improving patient adherence to these programs.

Since we used a transversal sample, this might have added some limitations in quality data. Our population was quite specific from a rehabilitation center and might limit the generalization of results to other realities. The authors believe that the sample size was adequate to report a snapshot of the COVID-19 pandemic's impact on these patients. Even though our survey has depicted the COVID-19 pandemic's impact on post-stroke outpatient rehabilitation, there is a need for the proposed questionnaire validation in future studies.

Conclusion

The interruption of outpatient rehabilitation was perceived, by stroke survivors and their caregivers, as harmful in several domains. This study highlights the critical role of intensive rehabilitation and tailored follow-up of stroke patients in the outpatient setting, even after the post-acute phase. The impact of the first wave of the pandemic on stroke patients could be mitigated by the general use of remote monitoring and telerehabilitation strategies. To protect stroke patients from the indirect effects of COVID-19 and improve their prognosis, the authors suggest a telerehabilitation-based strategy as a useful approach for stroke patients.

Conflitos de Interesse: Os autores declaram a inexistência de conflitos de interesse na realização do presente trabalho. Fontes de Financiamento: Não existiram fontes externas de financiamento para a realização deste artigo. Confidencialidade dos Dados: Os autores declaram ter seguido os protocolos da sua instituição acerca da publicação dos dados de doentes. Proteção de Pessoas e Animais: Os autores declaram que os procedimentos seguidos estavam de acordo com os regulamentos estabelecidos pela Comissão de Ética responsável e de acordo com a Declaração de Helsínquia revista em 2013 e da Associação Médica Mundial.

Conflicts of Interest: The authors have no conflicts of interest to declare. Financing Support: This work has not received any contribution, grant or scholarship. Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of data from patients. Protection of Human and Animal Subjects: The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki as revised in 2013).

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