

Original Research Article

Factors Influencing Physiotherapy Attendance among Stroke Patients during the COVID-19 Era

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Abstract: Background: Stroke can greatly impact both physical capabilities and overall quality of life (An and Shaughnessy, 2011, Bártlová *et al.*, 2022). While the 2019 novel Coronavirus (COVID-19) significantly impacted various sectors including access to healthcare services, access to routine stroke rehabilitation were not well documented in referral hospitals of Lusaka. **Objectives:** To assess factors affecting routine rehabilitation of stroke survivors during COVID-19 in referral hospital settings of Lusaka. **Method:** This was a cross-sectional study involving 26 stroke survivors who were present before and during the COVID-19 pandemic lockdown. All respondents were from 5 referral hospitals in Lusaka. Data was collected using researcher-administered structured questionnaires and analyzed using SPSS v27.0. Bivariate analysis was carried out using chi-squared and Fishers exact test of association. **Results:** There was an overall higher stroke patient response rate from females (57.7%, n=15) than males (42.3%, n=11). The outcome variable was significantly associated with only two intrinsic factors namely fear (mean rank of 1.69) seconded by patients' perception of physiotherapist's attitude (mean rank of 2.50). An overall decline in physiotherapy attendance from 2-3 times a week (69.2%, n=18) to once in a week (54%, n=14) was observed. **Conclusion:** A notable shift inclination towards home-based rehabilitation raises important considerations for healthcare practitioners and policymakers. It prompts a critical examination of the potential consequences of this shift on the quality and effectiveness of rehabilitation. **Clinical implications:** The identified barriers, particularly fear, highlight the need for targeted interventions. The study serves as a reminder of the complexities inherent in balancing patient needs, safety considerations, and healthcare system capacities.

Keywords: Stroke, disruption, rehabilitation, survivors, physiotherapy, COVID-19, pandemic and access.

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INTRODUCTION

Stroke rehabilitation is imperative for individuals recovering from stroke, playing a pivotal role in their journey to recovery (Adu *et al.*, 2020, Nava-Bringas *et al.*, 2021). However, numerous factors can impede or facilitate access to rehabilitation services. The COVID-19 epidemic had a major effect on various sectors, including healthcare access, employment, education, and entertainment (Scheiber *et al.*, 2021). In Zambia, the prevalence of stroke at the University Teaching Hospital (UTH) was reported to be 43% of all neurological admissions. Due to the effect on primary health care service provision and delivery, the COVID-19 pandemic led to a rise in the implementation of

various approaches to handle acute Cerebrovascular Diseases (CVDs) such as Stroke (McCabe *et al.*, 2020). Stroke presents with different challenges and its management has evolved to accommodate the rising needs. However, in different studies, researchers observed that fewer stroke patients accessed physiotherapy services in various health institutions. Adversely, this might have affected the perceived care and outcome of acute stroke patients (D'Souza and Rebello, 2021, Pedersini *et al.*, 2021, Vyas *et al.*, 2021, Zhao *et al.*, 2020). It is reported that due to various COVID-19 changes, patients requiring physiotherapy services had their sessional dates adjusted to fewer sessions per week. Additionally, others were advised to

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continue on home exercise programmes (Dean *et al.*, 2020).

McCabe *et al.*, (2020) found that stopping or reducing rehabilitation for stroke patients can greatly harm their health outcomes, resulting in more functional impairments and higher mortality rates among this group. The authors emphasize the crucial need of maintaining uninterrupted access to rehabilitation for stroke patients throughout the whole course of the outbreak in order to alleviate the negative consequences linked with the discontinuation of their care. On various studies claiming disruptions in stroke rehabilitation services, Haines and Berney (2020) recommended utilizing platforms such as telehealth. These platforms enable clients have access to monitored physiotherapy sessions. However, the Zambia National Health policy of 2012 highlighted that despite the use of Information and Communication Technology (ICT) increasingly spreading, initiatives and innovations such as 'Teledoctor' were not well coordinated and thus not optimally used. Other scholars (Kalicki *et al.*, 2021, Marwaa *et al.*, 2023, Li and Zheng, 2021) also reported the use of telerehabilitation as one of the barriers to accessing health services. Telerehabilitation seems to be the great awakening in this era of the COVID-19 pandemic and China is one such country that has been successful in preventing infection spread using telehealth (McCabe *et al.*, 2020). However, despite the numerous studies, Thelwall (2020) claims that there is limited evidence on how the African region is prepared the pandemic. Interestingly, remarkable amongst many studies was that all emphasized on continuation of stroke rehabilitation. In addition, because physiotherapy was inaccessible during pandemics Thelwall (2020) and (Wang *et al.*, 2023) emphasize that using sensory stimulation such as TENS and mirror therapy can be good options for home-based rehabilitation for stroke survivors. Authors claimed that this was to maintain muscle strength, physical balance, reduce spasticity, maintain and optimize function (Policy, 2012).

Despite various methods used to ensure continuity of stroke rehabilitation, perceptions and experiences of patients had not been well documented. While the use of telehealth and home exercises were being prescribed, understanding their effectiveness would make a more significant relevance to the physiotherapy discipline. Since COVID-19 was not yet over, this study therefore set out to investigate what factors affected rehabilitation access and the perceptions and experiences of stroke patients towards Stroke rehabilitation. It was also necessary to determine the extent to which the COVID-19 pandemic had with regards to routine physiotherapy care in stroke patients.

At the time of this study, there was a scarcity of studies covering what factors affected routine physiotherapy services. Findings from this study would therefore add to the scientific body of knowledge and

provide a valuable reference with regards stroke, routine physiotherapy care and COVID-19. The results of this study would provide critical evaluation of how COVID-19 had affected the routine physiotherapy care. Recommendations on how to improve service delivery within the physiotherapy discipline would also be generated. This is because research is important for the development of physiotherapy practice (Yokobori *et al.*, 2020).

Background theories such as the Social Representation Theory, Stress Theory, and Implicit Theories of Health offer crucial understanding of the underlying mechanisms of individuals' behaviors during pandemics. They broaden our understanding of the multifaceted challenges faced by stroke survivors and rehabilitation professionals. The findings from this study hold the potential to develop effective interventions aimed at promoting and enhancing positive behaviors, providing valuable guidance in navigating the complexities of stroke rehabilitation during unprecedented global health crises.

Social Representation Theory: According to Howarth (2006), this theory initially formulated by Serge Moscovici, this theory delves into how collective perspectives and societal norms are shaped through social interaction. As observed by Lahlou *et al.*, (2021) and D'Souza *et al.*, (2021), this study revealed that the pandemic led to significant changes in societal norms and values, impacting individuals' perspectives on healthcare access and socialization. Fear of contracting the virus prompted stroke survivors to voluntarily avoid seeking healthcare, resulting in a disruption of routine physiotherapy services.

Stress Theory: Hans Selye's stress theory outlines the psychological and emotional responses to external stimuli (Tan and Yip, 2018). The overwhelming stress and psychological disorders experienced by patients during the pandemic contributed to negative perceptions of healthcare utility and led to absconding from hospital settings similar to what was observed by Demeco *et al.*, (2020). Additionally, changes in hospital schedules and the stage of stroke illness significantly influenced access to rehabilitation services for stroke survivors.

Implicit Theories of Health: Carol Dweck's theory delves into individuals' implicit understanding and mindset regarding their health, predicting their engagement in health-promoting behaviors (Hearst *et al.*, 2021). The fear of contracting the infection led individuals to avoid accessing healthcare services during the pandemic, further disrupting routine stroke rehabilitation.

Aims and Objectives:

The main aim of this study was to ascertain factors that affected routine rehabilitation of stroke

survivors during COVID-19 in referral hospital settings of Lusaka as well as to determine the Perceptions and Experiences of stroke survivors in Referral Hospital settings of Lusaka.

RESEARCH METHODS AND DESIGN

Study design: This study utilized a cross-sectional design and quantitative methodology to investigate the factors that affected access to stroke rehabilitation during the COVID-19 pandemic in referral hospitals of Lusaka. The research incorporated philosophical underpinnings, including ontological, epistemological, and axiological approaches, to guide the participants in expressing their assumptions, knowledge, and values influenced by the pandemic.

Setting: The study was conducted at the University Teaching Hospital (UTH) in Lusaka, Zambia, supported by four Level 1 hospitals – Chilenje, Chawama, Kanyama, and Chipata. UTH, as the country's highest

referral hospital, with a significant bed capacity and catchment population, served as an ideal setting for ensuring objectivity and external validity of the study.

Study population and sampling strategy: This study conducted between August and September 2023 included 308 stroke patients across the designated health institutions. However, the population of interest consisted of 40 stroke patients who had had the stroke 3 years prior to the study and were still accessing rehabilitation services. A multistage sampling technique was used which comprised of different sampling techniques to select province, hospital and patients. All the sampling techniques used was probability sampling technique. Sample size calculation was performed according to proportion-to-size, ensuring a robust representation of the study population. Table 1 shows the proportion-to-size calculation while Figure 1 shows the flowchart of population sample and sampling strategy.

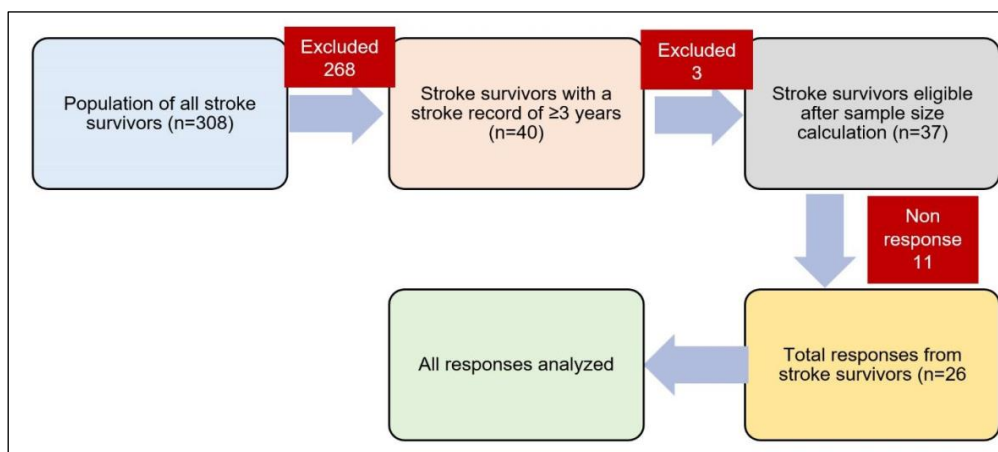


Figure 1. Flowchart of population and sample size of stroke survivors.

Table 1: Proportion-to-size calculation of independent hospitals for stroke patient sample size

Hospital	Calculation to proportion	Total Number of stroke patients for the study
UTH	(1 / 40) 36	0.9~1
Chilenje	(15 / 40) 36	14
Kanyama	(5 / 40) 36	5
Chawama	(18 / 40) 36	16
Chipata	(1 / 40) 36	0.9~1
		37 Total Number of Eligible stroke patients

Data collection: Data was collected using researcher-administered structured questionnaires.

Data analysis: Data analysis process involved coding, entering, cleaning, and analyzing data using SPSS for Windows version 27.0. It included simple frequency distribution and univariate analysis for demographic characteristics, presenting continuous data as mean and standard deviation, and categorical data as frequencies and percentages. Bivariate analysis was performed using chi-squared and Fisher's exact test of association to assess the significance of associations between

independent variables and computed composites. Data was presented using frequency tables and histograms. Additionally, a pilot study for validation and reliability was conducted with adherence to ethical considerations and institutional approvals.

Ethical Considerations:

The study was conducted in accordance with the Declaration of Helsinki, and approved by the ERES Converge Institutional Review Board (approval no. 2023-Sep-008) as well as from the Zambia National Health Research Authority (approval no.

NHRA001/13/07/2023). The research approval was also sought from the Heads of Institution at the University Teaching Hospital, Chilenje, Chipata, Kanyama and Chawama hospitals. Participants voluntarily signed the Nyanja and English versions of informed consent forms. In the event where the potential participants were unable to sign, but consented to participate in our study, any family member of their choice was allowed to sign on their behalf.

RESULTS

The study examined the factors that affected routine physiotherapy attendance in Lusaka during the COVID-19 era. The study included 26 stroke survivors,

with 57.7% female and 42.3% male participants. The average age was 51.12 years, with a range from 27 to 88 years. Education level varied, with 26.9% having primary education, 50% with secondary education, 15.4% with tertiary education, and 7.7% with no formal education. In terms of employment, 42.3% were in informal employment, 26.9% in formal employment, and 30.8% had no occupation. The majority rated their home environment as high density (53.8%), followed by medium density (38.5%) and low density (7.7%). Most participants (69.2%) had been living with stroke for 3 to 4 years, while 30.8% reported having had a stroke for 5 years or more. Table 2 shows the demographic characteristics of participating stroke survivors (n=26).

Table 2. Demographic characteristics of participating stroke survivors (n=26)

Characteristic	Value (n,SD/%)
Patients with stroke	
Age (year), Mean \pm SD	52.12 \pm 15.754
Sex, Female, n (%)	57.7 (15)
Mild/Moderate/Severe level, n	6/11/9
Education level	
Primary	7 (26.9%)
Secondary	13 (50%)
Tertiary	4 (15.4%)
None	2 (7.7%)
Employment status	
Formal employment	7 (16.9%)
Informal employment	11 (42.3%)
None	8 (30.8%)
Years with stroke	
3 to 4 years	18 (69.2%)
5 years or more	8 (30.8%)
Home environment	
Low density	2 (7.7%)
Medium density	10 (38.5%)
High density	14 (53.8%)
Duration on physiotherapy	
3 to 4 years	18 (69.2%)
5 years or more	8 (30.8%)
COVID vaccination	
Yes	10 (38.5%)
No	16 (61.5%)

*Mean (SD) 51.12years (\pm 15.754).

Trends in Physiotherapy Attendance and venue Preferences:

The study findings demonstrate significant changes in the frequency of physiotherapy visits for stroke survivors before and during the COVID-19 pandemic. Specifically, before the pandemic, 7.7% (n=2) of respondents were visiting the hospital daily, while this number decreased to 3.9% (n=1) during the pandemic. Furthermore, the number of people visiting the hospital once a week increased from 15.4% (n=4) before the pandemic to 57.4% (n=15) during the pandemic, reflecting a reduction in overall hospital visits for physiotherapy. In terms of planned sessions, there was a

notable increase in the number of patients visiting the hospital only when there was an appointment, rising from 3.9% (n=1) before the pandemic to 30.9% (n=8) during the pandemic. This suggests a shift in the delivery of physiotherapy services, potentially influenced by changes within the hospital environment due to the pandemic.

The duration of physiotherapy sessions also decreased during the pandemic, further indicating changes in the rehabilitation services provided. Additionally, the study highlighted shifts in patient preferences for treatment venues, showing a reduction in

the preference for hospital-based physiotherapy sessions and a significant increase in the preference for home-based sessions during the pandemic. This shift in preference may be attributed to concerns about contracting COVID-19. Notably, the Fisher's exact test

confirmed the statistical significance of these findings, suggesting that the pandemic had a substantial impact on the frequency of physiotherapy visits by stroke patients. Figure 2 depicts the frequency of physiotherapy sessions.

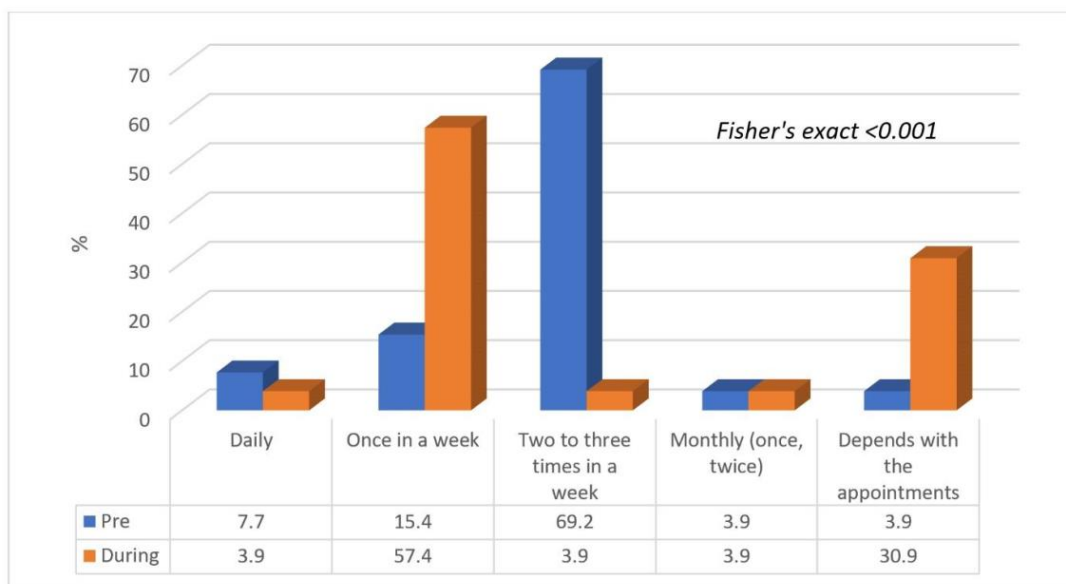


Figure 1. Frequency of physiotherapy visits pre and amidst COVID-19 pandemic

Intrinsic Factors Affecting Physiotherapy Attendance:

The findings of the study revealed the prominent factors influencing physiotherapy attendance by stroke patients. Fear of contracting diseases, particularly COVID-19, emerged as the most prioritized factor affecting attendance, intensifying the pervasive impact of the pandemic on patient behavior. These findings were in consistent with Opoku *et al.*, (2020) in a study in Ghana, where it was noted that coupled with the stroke, patients had psychological disruptions and disruptions to their social identity. These symptoms worsened by withdrawing themselves from the general public (social distancing) as well as reduced access to physiotherapy sessions. Moreover, the attitudes of physiotherapists and the severity of the stroke were identified as significant factors influencing attendance which reportedly presents a bad prognosis for patients

with stroke (Smythe *et al.*, 2022). Interestingly, patient perceptions and experiences within the referral hospital settings during the pandemic were multifaceted. A substantial proportion of patients strongly agreed that their encounters within the hospitals were significantly affected by COVID-19.

Moreover, factors such as trust in therapy, curfew constraints, and transportation challenges also played substantial roles in shaping patient attendance preferences. Notably, the study demonstrated a high level of agreement among respondents in ranking these factors, indicating a strong consensus on the critical challenges faced by stroke patients in accessing physiotherapy services during these challenging times. Table 3 summarizes the results of Kendall's coefficient of concordance.

Table 3. Results of Kendall's coefficient of concordance

Factors	Mean Rank	Rank
Fear of disease contraction	1.69	1st
Physiotherapists' attitude	2.50	2 nd
Severity	3.23	3 rd
Trust in therapy	4.54	4 th
Curfew	4.58	5 th
Transportation	5.88	6 th
Inadequate hospital equipment	6.62	7 th
Distance	7.88	8 th
Therapy cost	8.73	9 th
Extra physio attendance	9.35	10 th

N = 26; Kendall's *W* = 0.760; Chi-Square = 177.936; Sig. = 0.000.

Psycho-sociodemographic Factors Affecting Service Modification:

The impact of sociodemographic factors on service modification among stroke patients during the COVID-19 pandemic was extensive and complex. While gender (p -value 0.543), occupation (p -value 0.205) and stroke severity (p -value 0.105) did not show a statistically significant relationship with service modification, similar to results obtained by other scholars (Mlambo and Hlongwana, 2020, Hunt *et al.*, 2011, McLean *et al.*, 2017), there was a higher propensity for females to seek modifications, indicating gender-specific considerations in healthcare decision-making. Patient's age (p -value 0.049), education level (p -value 0.023) and home environment (p -value 0.026) were found to be pivotal determinants of service modification (Vollmer *et al.*, 2021, Christensen *et al.*, 2019), highlighting the nuanced interplay of personal and situational factors in patient choices. The study underlines the intricate dynamics of age-related concerns and educational backgrounds in shaping patient decision-making, reflecting the diverse and evolving needs of stroke patients amidst the challenges posed by the pandemic. Additionally, the significance of the home environment (p -value 0.026) in shaping patient behavior was highlighted, with those residing in medium-density environments exhibiting a higher probability of therapy modifications. These findings emphasize the complex interplay of sociodemographic, environmental, and social support factors in influencing patient decision-making during the pandemic.

Factors Affecting Stroke Rehabilitation Access:

Amid the pandemic, stroke patients have encountered unique challenges that have significantly influenced their access to physiotherapy services such as fewer rehabilitation interventions being performed (Lima *et al.*, 2020). Fear of contracting diseases, particularly COVID-19, emerged as the most prioritized factor impacting attendance, reflecting the pervasive impact of the pandemic on patient decision-making. Additionally, the attitudes of physiotherapists and the severity of the stroke had been identified as key influencers, reinforcing the intricate web of considerations shaping rehabilitation access. The high level of consensus among respondents on these influential factors highlights the urgency in addressing the diverse and interconnected challenges faced by stroke patients in navigating rehabilitation services during these unprecedented times.

Understanding the multifaceted factors influencing stroke rehabilitation access during the COVID-19 era is vital for informed decision-making and targeted intervention strategies. By recognizing the interwoven nature of patient preferences and sociodemographic influences, healthcare providers and policymakers can develop adaptive and resilient strategies to address the evolving needs of stroke survivors amid the ongoing public health crisis. These

insights expose the critical importance of fostering an inclusive and responsive approach to stroke rehabilitation, grounded in a thorough understanding of the diverse and intricate factors at play.

DISCUSSION

Within the context of the COVID-19 pandemic, stroke survivors in Zambia faced unprecedented disruptions in their routine rehabilitation, necessitating a comprehensive understanding of the multifaceted factors influencing their access to essential physiotherapy services. This article delves into the distinctive demographic and socioeconomic characteristics of stroke survivors and the implications of the pandemic on their rehabilitation experiences. Through a comprehensive analysis of their perceptions and behaviors, this study sheds light on the complex interplay of factors affecting stroke rehabilitation during the ongoing public health crisis.

The study revealed a distinct female predominance among stroke survivors, reflecting Zambia's demographic dynamics. This observation aligns with existing research highlighting gender disparities in healthcare utilization and survival ratios (Hunt *et al.*, 2011, McLean *et al.*, 2017). The trend of increased healthcare visits among females is a global phenomenon, potentially influenced by factors such as motivation, social support, and self-efficacy. Additionally, the role of age, education, and home environment emerged as influential determinants of service modification, underscoring the complex interplay of sociodemographic factors in shaping stroke survivors' rehabilitation experiences.

The COVID-19 pandemic precipitated significant changes in the landscape of stroke rehabilitation, leading to disruptions in routine physiotherapy attendance. Fear of contracting COVID-19 emerged as a major limitation, impacting individuals' willingness to seek hospital-based therapy. The severity of stroke and potential exposure risks further influenced attendance patterns. Moreover, the imposition of a curfew and perceived transportation challenges contributed to logistical barriers, affecting accessibility to essential rehabilitation services.

In addition, the observed decline in hospital attendance during the pandemic reveals the multifaceted nature of patient decision-making and the subtle interplay of safety considerations, logistical barriers, and patient adherence. Furthermore, the shift in patient preferences from hospital-based to home-based rehabilitation emphasized the evolving dynamics of patient choices amid the pandemic.

The fear of contracting COVID-19 in healthcare facilities during the pandemic led to a reduction in accessing necessary physiotherapy services for stroke survivors. This resulted in a decrease in the frequency of

physiotherapy sessions and a notable shift in preference from institution-based to home-based rehabilitation. The pandemic and lockdown measures significantly impacted overall healthcare utilization and affected the mental, physiological, and psychological well-being of stroke survivors. This disruption highlighted the need for alternative methods such as home-based rehabilitation and telehealth services to mitigate the pandemic's impact on stroke survivors' access to essential physiotherapy services. The study's findings emphasize the challenges faced by stroke survivors and the necessity for adaptive strategies and patient-tailored rehabilitation approaches to ensure continuity of care in future pandemics.

CONCLUSION

It is apparent that the COVID-19 pandemic led to profound disruptions in routine stroke rehabilitation, influenced by a myriad of factors. Understanding these multifaceted influences is crucial in formulating targeted interventions to mitigate the impact of the pandemic on stroke survivors and optimize their access to essential rehabilitation services. The study serves as a reminder of the complexities inherent in balancing patient needs, safety considerations, and healthcare system capacities.

Declaration of Interest: The authors declare no conflict of interest.

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Highlights

- Intrinsic factors were statistically associated with disruption of rehabilitation.
- Physiotherapy utilization was less affected by transportation costs.
- Demographics did statistically influence disruption of stroke rehabilitation.

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