

ISSN: 2415-038X (Print)

ORIGINAL ARTICLE

Open Access

## Impact of COVID-19 on the Demand and Utilization of Physiotherapy Among Stroke Patients

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### Abstract

**To cite:** Chinyama C, Simpamba M, Shula H, Phiri PDC, Chiluba BC,. Impact of COVID-19 on the Demand and Utilization of Physiotherapy Services Among Stroke Patients. JPRM 2022, 4(1): 60-65. doi: 10.21617/jprm2022.410

**Background:** While it has been reported that the COVID-19 pandemic has wreaked havoc on the world's health care systems including rehabilitation services, little was known about its impact on the demand and utilization of physiotherapy services on stroke survivors in Zambia. This study investigated the demand for and use of physiotherapy among stroke survivors at a tertiary hospital in Zambia during the COVID-19 pandemic.

**Methods:** We carried out a cross sectional study on stroke patients who were referred for Physiotherapy between January 2019 and December 2020. Of the 185 stroke patients booked for Physiotherapy, 86 commenced Physiotherapy sessions while the rest did not show up for their appointments. We collected data on age, gender, year Physiotherapy was attended and frequency of sessions for the 86 stroke patients from the out-patient attendance register using a check list. The data was analyzed using SPSS version 16 with descriptive frequencies and histograms used to summaries data while associations between categorical variables were done using Chi-square tests.

**Results:** Of the 185 stroke patients who were referred for Physiotherapy between January 2019 and December, 2020, only 86 (46.49%) utilized physiotherapy services. Majority of stroke patients who utilized Physiotherapy services in 2019 attended two or more Physiotherapy sessions per week compared to those in 2020 who attended at least one session in two to four weeks ( $p < 0.001$ ).

**Conclusion:** The number of treatment sessions in 2020 dropped significantly for physiotherapy services. This implies that outcomes could have been negatively affected. It would therefore be important to explore other evidence-based strategies such as telerehabilitation and task-shifting using caregivers.

**Keywords:** *Physiotherapy; Telerehabilitation, Stroke, Zambia,*

## INTRODUCTION

The COVID-19 pandemic, which began in December 2019 in China and affected over 5 million individuals worldwide by May 24th, 2020, caused substantial disruptions in global health care systems [1]. According to a WHO rapid assessment of Covid-19's impact on non-communicable disease (NCD) services, 75% of countries across the globe experienced service disruptions, with rehabilitation services being among the most affected [2]. Some of the reasons for the service disruptions were lack of transportation due to imposed lockdowns, cancellation of elective care, insufficient staff, and hospital closures [2].

Stroke is the second leading cause of death worldwide after ischemic heart disease, accounting for about 5.5 million deaths in 2016 [3]. Low- and middle-income countries (LMICs) bear the largest burden of stroke, with about 70% of strokes and 80% of stroke related mortality and disability-adjusted life years occurring in these countries [4]. In South Africa, for example, out of the 75 000 strokes that occur each year, 25 000 stroke sufferers die within the first month [5]. Accurate data on the burden of stroke in Zambia may not be available but in a recent cross-sectional study on causes of adult mortality, cardiovascular diseases (stroke and ischaemic heart diseases) were ranked the third leading cause of mortality after HIV/AIDs and injury/accidents [6].

Stroke patients may require rehabilitation for persistent deficits related to physical function depending on the severity and nature of brain lesion. Despite comprehensive evidence on the efficacy of stroke rehabilitation in improving functional outcomes, rehabilitation services for stroke survivors in most LMICs face many obstacles which include the following: a dearth of research in the field, a shortage of stroke rehabilitation experts, a lack of specialized care, lack of Physician knowledge on the role of rehabilitation professionals, long time lapse between stroke onset and rehabilitation and poor financial support for rehabilitation services [7]. In addition, a study that was conducted in Ghana to explore the experiences of stroke patients in relation to accessing rehabilitation identified transport costs, long waiting times, forgetting about the appointments, lack of community support and poor communication with health care providers as barriers to Physiotherapy services [8]. With the outbreak of the COVID-19 pandemic in 2019, these challenges were expected to have

doubled in LMICs.

The focus of this study was the University Teaching Hospital (UTH), a Tertiary hospital in Lusaka, Zambia, which implemented some measures to avert the spread of COVID-19 infections among patients and staff. At the UTH physiotherapy department, these measures included reducing the number of patients accessing services at a particular time, reducing the number of sessions each patient attended in a week, limiting the number of caregivers accompanying each patient and the number of Physiotherapists and support staff reporting for work in a week. The impact of these measures on the utilization of Physiotherapy services among stroke patients at this institution have not been documented. Documenting the impact this pandemic has had on stroke rehabilitation will provide useful information to policy makers and Physiotherapists which they can use to improve rehabilitation services for stroke survivors in the country.

We therefore set out to investigate the demand and utilization of out-patient Physiotherapy services among stroke patients at the UTH in Zambia during the COVID-19 pandemic. Demand referred to all new stroke patients who presented to the Department of Physiotherapy after acute care to make the initial appointment, while utilization referred to those stroke patients who came back to start physiotherapy sessions after making the initial appointment.

## METHODS AND MATERIALS

A quantitative retrospective cross-sectional study was used to collect data on all stroke patients who were referred for out-patient physiotherapy services at UTH Department of Physiotherapy from January 2019 to December, 2020. University Teaching Hospital is the largest tertiary hospital located in Lusaka, Zambia, which is both a teaching and referral hospital. The study population consisted 185 stroke patients who were referred for out-patient physiotherapy services and were given subsequent appointments to commence physiotherapy services at UTH between January, 2019 and December, 2020. Out of the 185 stroke patients who were booked for physiotherapy treatment, only 86 patients returned to commence physiotherapy and hence these were the only ones with sufficient data required for analysis. We used a check list to collect data from the out-patient physiotherapy attendance register on demographic characteristics and frequency of physiotherapy

sessions for the 86 stroke patients who honored their appointments to commence Physiotherapy treatment. We compared the data that was collected for the year 2019 to that for the year 2020 to establish any similarities or differences in the proportion of stroke patients who utilized physiotherapy services.

### Data Analysis

The data was analyzed using Statistical Package for Social Sciences (SPSS) version 16 and the level of significance was set at 0.05. We used frequency tables to summarize data on age and gender while histograms were used to summarize data on the year the patient started physiotherapy and the frequency of physiotherapy sessions for the 86 patients who utilized physiotherapy services. Chi-square tests or otherwise Fisher's exact test were used to analyze associations between categorical variables.

## RESULTS

A total of 185 stroke patients were referred for Physiotherapy during the period January, 2019 to December, 2020. Out of a total of 185, only 86 (46.49%) stroke patients commenced physiotherapy treatment. We therefore, base our results on the 86 stroke patients who stayed for management and receiving care for physiotherapy treatment.

### Demographic characteristics

For the 86 stroke patients that received physiotherapy treatment, their demographic characteristics showed that majority of them for both 2019 and 2020 were between 51 to 70 years, representing 33.33% in 2019 and 52.63% in 2020 respectively. Results on gender showed that for both 2019 and 2020, there were 46 males and 40 females. Gender distribution per year shows that 62.5% (n=30) were males in 2019 while in 2020 males accounted for 42.11% (n=16) of the stroke patients (P=0.059). Table 1 shows the demographic characteristics for 2019 and 2020 and the significance differences of their distribution.

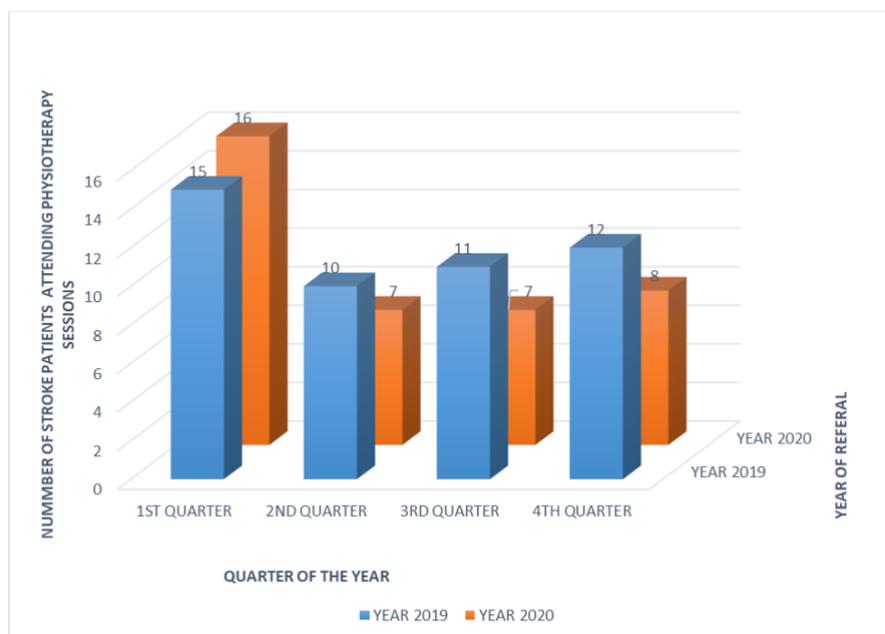
**Table 1: Demographic characteristics of stroke patients who attended Physiotherapy services at UTH during the study period (n=86)**

Variable	Characteristics	Frequency		Percentage (100%)		p-value
		2019 (n=48)	2020 (n=38)	2019	2020	
Year						
Age	15-30	5	1	10.41	2.63	0.192
	31-50	14	7	29.17	18.42	
	51-70	16	20	33.33	52.63	
	71-90	13	10	27.08	26.31	
Gender	Male	30	16	62.5	42.11	0.057
	Female	18	22	37.5	57.89	

### Utilization of physiotherapy services

Descriptive analysis on utilization of Physiotherapy services among patients who were referred for physiotherapy involved categorizing according to the quarters of the years and the frequency of physiotherapy sessions in a week, 2

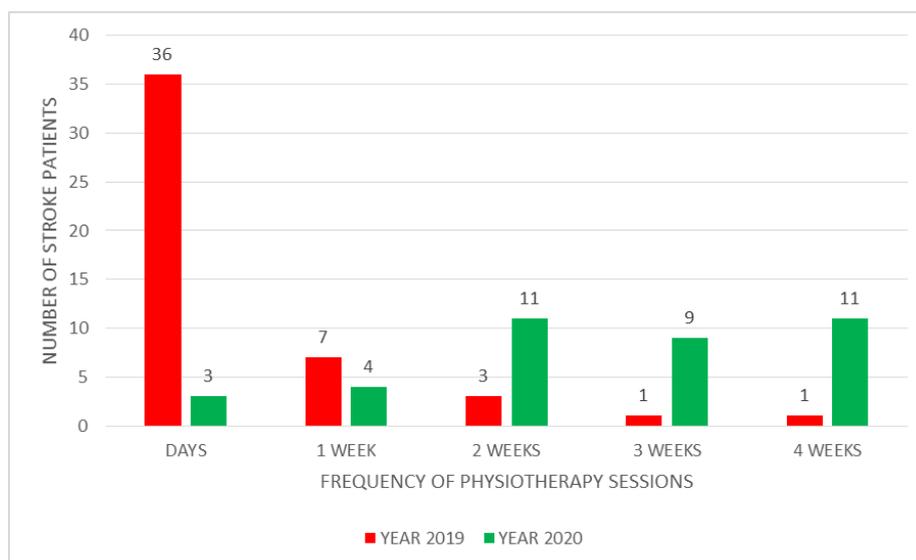
weeks, 3 weeks and 4 weeks. Figure 1 shows results of patients attending physiotherapy sessions according to the four (4) quarters of 2019 and 2020. Both years started with slightly more patients in the first quarter which dropped in the second quarter and remained constant for the rest of the year as shown in figure 1 (P=0.776).



**Figure 1: Number of patients attending physiotherapy sessions per quarter in each year**

Results on the frequency of physiotherapy sessions showed that in 2019, majority of patients (75%) attended at least 2 sessions in a week compared to only 6.25% in 2020. The frequency of physiotherapy sessions in 2020 were reduced as shown in Figure 2, where majority of patients attended

physiotherapy sessions at least once in two weeks (28.94%), or once in three weeks (23.68%) and once in four weeks (28.9%). The differences in the frequency of Physiotherapy sessions between 2019 and 2020 was statistically significant ( $P < 0.001$ ).



**Figure 2: Frequency of physiotherapy sessions for 2019 and 2020**

## DISCUSSION

This study set out to investigate the demand and utilization of physiotherapy services by stroke patients at the UTH during the COVID-19 pandemic

It is important to understand that the low utilization of physiotherapy services has existed even before the COVID-19 pandemic due an array of factors. Additionally, our study did not seek to understand those factors associated with low utilization of physiotherapy that existed before the pandemic and it is important to understand the results of our study understanding this premise, as COVID-19 compounded on an already existing problem [9, 10].

The low utilization of physiotherapy services among stroke patients that already exist in LMICs are due to multiple barriers which include lack of finances to cover transport and physiotherapy costs, patient migrating to a different location and patient living in a location far from the hospital [9, 10]. Other reasons of low utilization of physiotherapy services includes individual level barriers such as employment status, educational level, medication barriers and medication adherence [11].

Even though 185 stroke patients were referred for physiotherapy treatment, the discussion of our results is based on the 86 stroke patients who utilized physiotherapy services and of the 86 stroke patients who utilized physiotherapy services at UTH, majority were aged between 51 and 70 years in both 2019 and 2020 periods. Our findings are consistent with findings from other studies in the region which reported similar age ranges among stroke patients [12], Malawi [13], Kenya [14] and Zimbabwe [15]. Although LMICs are reported to have younger people affected by stroke, this age range corresponds to literature which suggests that the risk of stroke rises sharply after the age of 55 years, then doubles every decade thereafter [16]. Gender distribution in this study showed that there were more males in 2019 and more females in the 2020 cohort, the findings which were not statistically significant ( $P=0.057$ ). When compared with findings from other African countries, there were variations in gender distribution with some reporting more females [17, 18, 19] while others reported more males [12, 13, 20]. However, literature shows that men are more likely to suffer from ischemic stroke than women while there are no statistically significant gender differences with hemorrhagic stroke [21].

The COVID-19 pandemic related barriers to utilization of physiotherapy services could be due to COVID-19 containment measures which disrupted the health care workforce, fear and mistrust among patients and financial difficulties due to lockdowns [22]. According to an online survey on patients living with NCDs in LMICs, many patients feared catching COVID-19 infections from healthcare institutions [23]. We could also claim that the low utilization of Physiotherapy services in our study could be attributed to fear among stroke patients and their caregivers.

When it came to frequency of physiotherapy sessions attended by stroke patients who utilized physiotherapy services, our study established no significant differences in terms of number of patients attending physiotherapy in each quarter of 2019 and 2020. However, both years had more patients during the first quarter. There was, however, a significant difference in terms of frequency of physiotherapy attendance per week, with majority of patients in 2019 attending two or more sessions in a week compared to those in 2020 whose sessions were reduced to once in two to four weeks. The reduction in the frequency of physiotherapy attendance in 2020, was due to a decision made by the department to only consider fewer patients attending physiotherapy sessions as a measure for COVID-19 containment. These measures were required as per country guideline and are in line with COVID-19 regulations required globally. [24]. For instance, in Nigeria, the number of patients attending out-patient physiotherapy services per week were reduced to avoid congestion, with those who required to have two to three sessions per week being attended to only once in two to eight weeks [25]. In addition to reducing the number of patients attending physiotherapy treatment in a week, other measures put in place to decongest the physiotherapy department at UTH was reducing the number of staff by introducing weekly rotational work schedules which meant a reduction in the number of staff. This therefore meant only a limited number of patients could be allowed per week so as not to overwhelm the few physiotherapists working in a particular week.

Physiotherapy is an important aspect of stroke rehabilitation which has been reported to result in improvements in physical functioning and activities of daily living among stroke patients [26]. These improvements translate into improved health related quality of life and general wellbeing of our patients. It is therefore important to ensure that we find alternative methods to

deliver effective and efficient physiotherapy services to stroke survivors, irrespective of the COVID-19 pandemic.

### LIMITATIONS

This being a retrospective cross-sectional study, we anticipated a number of limitations including incomplete and missing data. Both the out-patient booking registers and attendance registers had some incomplete and missing data for some patients. However, we ensured that we limited our analysis to those patients who had complete data in the attendance registers, and hence remained with only 86 out of the 185 that were referred for physiotherapy.

### CONCLUSION

Our study revealed that while the demand for physiotherapy services among stroke patients was high, utilization of these services was very

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