Health Education and Care

Research Article ISSN: 2398-8517

Care process for stroke patients in kenya: mixed study

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Abstract

Background: Longer-term impairments and activity limitations secondary to stroke can cause inability to return to work, and decreased social participation. Upon stroke episode, patients follow a series of care pathways implemented by healthcare professionals. However, this pathway differs in developing and developed countries. The purpose of this study is to determine the physiotherapy stroke rehabilitation pathway in Kenya.

Methodology: This mixed methods study was conducted in 17 county referral hospitals in Kenya. Data was collected using semi-structured interviews, cross sectional descriptive survey and archival data. Qualitative data was collected from 12 purposively selected healthcare providers, patients and caregivers, quantitative data from 112 conveniently sampled physiotherapists, and archival data from 150 files. Interview guides, questionnaires and data extraction sheet were used for data collection. Content validity of the data extraction sheet was achieved through two experts in neuro rehabilitation, while a Pearson's correlation value of, $r(8) = 0.87$ was achieved for test-retest reliability. Trustworthiness was ensured through a sample that included various medical disciplines, Qualitative data was analyzed by thematic content approach while SPSS version 22 was used to capture and analyze quantitative data.

Results: Setting for stroke rehabilitation included Institutions (86.6%), home (28.9%), and Community13.4%. Healthcare providers (6) reported involvement in interdisciplinary approach in management of stroke patients. Family/carer involved (95.2%). Majority of the participants (9) reported that there was assessment, before treatment. Likewise the survey showed assessment of impairments 99.1%, activity limitation 94.6 %. Inpatient received physiotherapy 5 times a week (92.7%,) outpatient-received services 3 times a week (52.6%), while CBR was at (35.8%).

Contents of physiotherapy: Lower extremities gait training (100%), Upper extremities training (100%), re-education of balance (92.6%), management of; shoulder pain (62.5%), Spasticity (68.1%), Shoulder subluxation (70.2%), Fitness training (20.3%), Range of motion (80.7%), use of electrotherapy techniques (18.1%), management of pain (49.3%), neuromuscular stimulation (96.6%), and provision of orthotics and assistive devices (60.5%)

Conclusions: Stroke care process in Kenya includes assessment, & management of impairment, activity limitation, and participation at both inpatient and outpatient. However, the results show poor use of evidenced based outcome measure, and poor recording.

Background

Stroke is the third primary cause of death globally [1,2]. Approximately 6 million deaths are recorded globally resulting to stroke [3]. In Africa, stroke accounts for 3 million deaths every year. This figure is expected to rise to 5 million by 2020 [4,5].

Stroke is the third cause of disability globally [1]. Approximately 16 million people are disabled secondary to stroke.

Disability post stroke leads to impairment, activity limitation and participation restriction. The main impairments are motor-related (compromised muscle tone, coordination, sensation, poor balance, poor bladder control) affecting movement and suppleness [6]. Stroke related structural impairment eventually leads to physiological and psychological abnormalities that would affect almost every aspect of life [7]. Long-term impairments and activity limitations can result in the inability to return to work, and decreased social participation [8] hence increasing dependency and family burden [9,10].

Upon stroke episode, patients follow a series of care pathways implemented by healthcare professionals [9,11]. Studies have presented a standard care pathway from admission through to discharge [3]. Acute strokes are cogitated as an emergency managed in a hospital setting. Early rehabilitation occurs in a specialized stroke unit [12,7]. Rehabilitation involves services that endeavor to decrease impairment while enhancing restoration and adaptation to residue disabilities [13]. As asserted by Putaman [13], rehabilitation is a continuous course that includes identification of challenges and needs. Significantly, the authors indicated that International Classification of Functions (ICF) can be utilized to supervise rehabilitation from hospital to community reintegration. The course also encompasses the identification of individual and community obstacles in addition to the administration of rehabilitation interventions. Putaman [13] suggest that mobilization exercises, selective movement and balance exercises are among the domains that physiotherapists use during stroke rehabilitation. However, this pathway differs in developing and developed countries.

Rehabilitation outcome of stroke patient differs in developing and developed countries. Rhoda, found distinct recovery arrays for patients in developed against developing countries. The results demonstrated a substantial variance in favor of the German participants, for gross motor and upper limb recovery. Pertinently, two and six months post stroke, levels of arm function and performance in activity of daily living remained meaningfully higher for German sample, with the South African sample showing comparatively lower rates of recovery.

It is therefore imperative to determine the process of care for stroke patients in Kenya.

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Received: April 24, 2018; **Accepted:** May 08, 2018; **Published:** May 12, 2018

Method

Setting

The study aimed at determining stroke care process in Kenya. This mixed study was conducted in 17 county referral hospitals in Kenya. Interviews were hospital-based and were conducted in eight County Referral Hospitals. Interviews with the physiotherapists, the patients, and the caregivers were conducted at the physiotherapy departments, while interviews with the doctor; nurse and a counselor were conducted in the wards. Archival study was conducted in the medical registry of 17 County Referral Hospitals in health records departments while a survey was conducted in the physiotherapy department at 17 County Referral Hospitals.

Sampling

The target population for the interviews involved stroke patients, caregivers and healthcare providers involved in stroke management. A convenient sample of 12 participants was selected from eight referral hospitals. The sample included a doctor, a nurse, a counselor, three physiotherapists, three caregivers, and three stroke patients. Each of the eight hospitals represented one province in Kenya to ensure representativeness [14]. The retrospective archival study was conducted using the files of stroke patients admitted to the research setting from 1 January 2014 to 31 December 2014. The sample that met the inclusion criteria was 150 files, while 112 physiotherapists participated in the survey, due to the small number of the population. Data was collected using interview guides, data extraction sheet, and questionnaire [15].

Content validity of the data extraction sheet was achieved through two experts in neuro-rehabilitation, while a Pearson's correlation value of, r (8) = 0.87 was achieved for test-retest reliability. Trustworthiness was ensured through, a sample that included various medical disciplines, information was gathered until saturation, field notes taken, and member checking. A detailed description of the research methodology was given, with adequate information about participants, use of verbatim quotes, and data triangulation.

Four independent interview guides were used for the four groups of participants (stroke patients, caregivers, physiotherapists, and other service providers). The principal researcher conducted the interviews. Interviews were steered in English. Each interview lasted between 45 minutes and 1 hour and was audio-recorded. Saturation (point in data collection when no new or relevant information emerges) was reached with the 12th participants. Archival and the survey data was entered and cleansed using SPSS version 22 and Microsoft Excel. A double entry system was used for quality assurance.

Data analysis

Qualitative data was subjected to thematic content analysis, which involved identifying codes and categorizing patterns [16,17]. Following transcription, each interview was firstly read for accuracy and then reread to identify the predetermined themes and possible inconsistencies [18,19]. On conclusion of all the interviews, the entire sets of transcripts were read to gain a sense of the whole, as well as to produce a coding system based on issues identified from the data. The codes were then applied to the data to refine the coding development and to determine potential categories [18,19]. Thereafter, categories were established, and they aided to consolidate codes into meaningful clusters. Codes and categories were collapsed to evaluate emerging patterns and themes until the point was reached where no new information pertaining to the study question was generated [20]. Participants' transcripts were then reviewed to determine the proportion of participants whose answers corresponded to the major codes. Arbitrary initials were used to distinguish the participants whilst ensuring confidentiality. Descriptive data analysis using SPSS version 22 was performed for quantitative studies and presented in figures and tables.

Results

Social demographic characteristics of participants for interviews are presented in Tables 1 and 2 respectively.

The socio-demographic profiles of the patients' show that the patient that participated in the interviews were all male, while the caregivers were all female. Most of the caregivers had low levels of education, while majority of the patients had high levels of education.

The socio-demographic profiles of the service providers indicate that there were more physiotherapists than the other disciplines involved in stroke management. Likewise, most of the service providers were female.

Record review had more male than female patients. A large number of male patients' files, 63.5% (n=95) compared to female patient's files, 36.5 % (n=55) formed part of the study. The ages ranged from 20 years to 103 years. The mean age was 61.7 years and the median were 65 years. The standard deviation was 16.688 and IQR 65.

A total of 126 questionnaires were distributed among physiotherapists in 17 County Referral Hospitals in Kenya. 112 physiotherapists participated in the study, giving a response of 88.8%. Of this total, 51.8% were male and 48.2% were female. Their years of practice ranged from 2 years to 40 years with median of 13, mean of 15.86 and standard deviation of 10.96.

Settings for stroke rehabilitation

Institutional based rehabilitation

Participants highlighted that stroke patients are rehabilitated as in-patients during hospital stay. *(P3)*

"Rehabilitation is done throughout hospital stay for all stroke patient[s]"

Service providers reported that stroke patients were likewise rehabilitated in outpatient facilities after discharge. *(P1)*

"In most cases we discharge our patient[s] through physiotherapy outpatient[s]..."

Community based rehabilitation (CBR)

Service providers reported stroke cases that are discharged to continue with physiotherapy at the community level. Such referrals were prompted by inaccessibility to health facilities. The presence of Association of Physically Disabled of Kenya (APDK) clinics in such areas facilitates CBR. The Association for the Physically Disabled of Kenya is a non-governmental organization that offers mobile community-based rehabilitation services in Kenya). *(P2)*

"There are other cases where we refer patient to community based rehabilitation. Okay, this happens especially in areas that are attended to by APDK clinics"

Home Rehabilitation

It was noted that there were situations when patients were discharged through physiotherapy, but the family were not able to take

Table 1. Socio-demographic profiles of the patients and the caregivers.

Participants	County of origin	Age	Occupation	Gender	Marital status	Education level
P4	Nyeri	57	Patient	Male	Married	College
P5	Kitui	48	Patient	Male	Married	University
P6	Kericho	38	Patient	Male	Married	High School
P7	Bungoma	35	Caregiver	Female	Married	College
P8	Kitale	40	Caregiver	Female	Single	High School
P9	Kifili	48	Caregiver	Female	Married	High school
Key: P- Participant						

Table 2. Socio-demographic profiles of the Service providers.

Participants	County of origin	Age	Occupation	Gender	Education level	Years of experience with stroke
P1	Garisa	42	Physiotherapist	Male	College	8
P2	Uasingishu	52	Physiotherapist	Female	University	12
P3	Kisii	37	Physiotherapist	Female	College	4
P10	Lamu	32	Doctor	Female	University	4
P11	Nakuru	28	Nurse	Female	College	3
P12	Machakos	45	Counselor	Male	College	7
Key: P- Participant						

the patient to a physiotherapy outpatient clinic. In such cases, families would opt for home rehabilitation. *(P10)*

"…there are patients that prefer to have a physiotherapist go to their home and do rehabilitation of the patient at their homes"

Similarly, archival data indicated the various setting where stroke patients are rehabilitated. Approximately (86.6%) of the patients are referred to hospital/center-based settings, while (13.4%) are referred for community-based rehabilitation as illustrated in Figure 1.

Interdisciplinary team

Interviews established several health care providers involved in stroke rehabilitation. *(P7)*

"There were the doctors and the nurses. These were the first people that handled him".

Participants reported that the physiotherapist played a major role in management of motor impairment and re-education of the lost functional activities. *(P2)*

"As physiotherapists we re-educate functional activities such as sitting, standing, making a step, and so forth"

Additionally, there is the involvement of the occupational therapist. Occupational therapists work with clients to optimize participation and independence. *(P3)*

"The occupational therapists are involved a lot in fine motor rehabilitation, which the physiotherapists are responsible for - the gross motor"

The questionnaire determined the healthcare providers involved in stroke rehabilitation.

There was 94.6% involvement of the physiotherapists and 19.6% involvement of speech therapists (Figure 2).

Family support

Data indicates family involvement (98.2%) in the rehabilitation process, while community rehabilitation was at 38.2% as illustrated in Figure 3.

Assessment of stroke patient

Assessment was best classified in three categories; namely outcome measure, assessment and re-assessment.

Outcome measure tool

Majority of the participants reported the use of outcome measure tool as measures for baseline data, and to serve as a point of reference for review. *(P1)*

"…. you know, the use of outcome measure gives us the best baseline data; based on this data, we can be able to formulate our treatment plan."

However, participants reported that the high number of low trained physiotherapists hindered the use of the outcome measure. On the contrary, archival data showed low use of outcome measure. Of the 150 files reviewed, 39.3% (n=59) recorded use of outcome measure tools, while 60.7% (n=91) had no evidence use of outcome measure as summarized in Figure 4.

Furthermore, the study found the various outcome measure tools used by the physiotherapists for assessment of stroke patients, (51.2%) utilizes Ashworth Modified Scale, while a mere (1.2%) employs goniometry (Figure 5).

Assessment of impairment, activity limitation and participation restriction

Assessment of the impacts of stroke was done in the context of ICF. Data showed that 99.1% of the physiotherapists assess stroke patients based on muscle power, while 55.4% assess based on neglect (Figure 6 and 7).

Physiotherapy management

Physiotherapy management had lower extremities gait training (100%), while orthotics and assistive devices had (60.5%) as illustrated by Figure 8.

Start of rehabilitation

A total of 85.7% of physiotherapists reported starting physiotherapy management the same day, if the patient was stable, while 14.3% started physiotherapy at one week after admission.

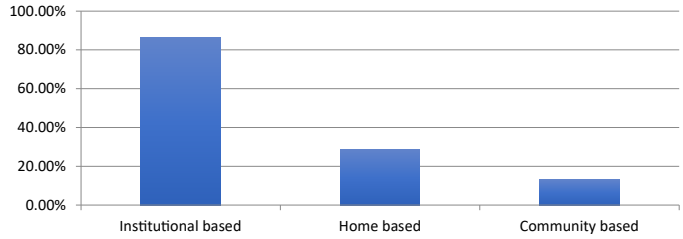

Figure 1. Referral Settings.

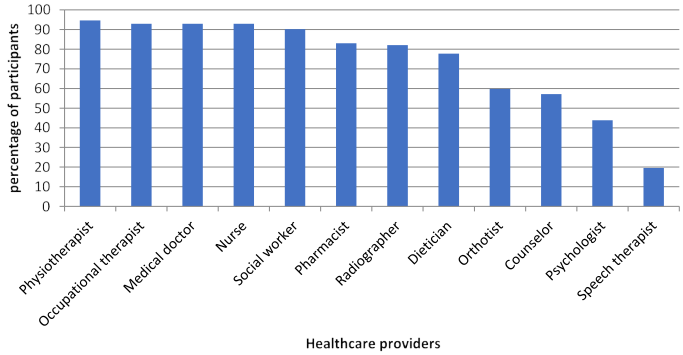

Figure 2. Healthcare providers.

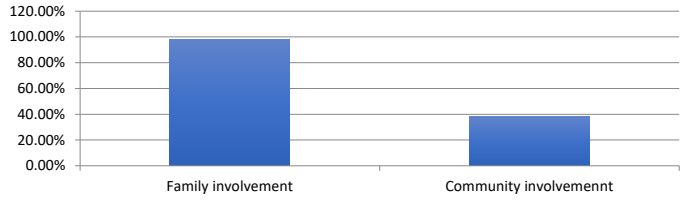

Figure 3. Support Systems.

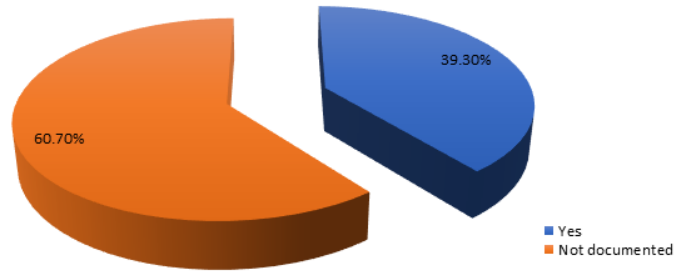

Figure 4. Outcome measure use (n=150).

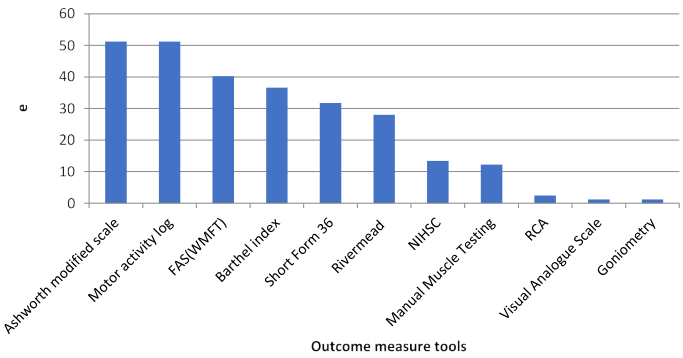

Figure 5. Outcome measure tools (n = 296). **Key:** RCA- Rehabilitation Conclusion Analysis

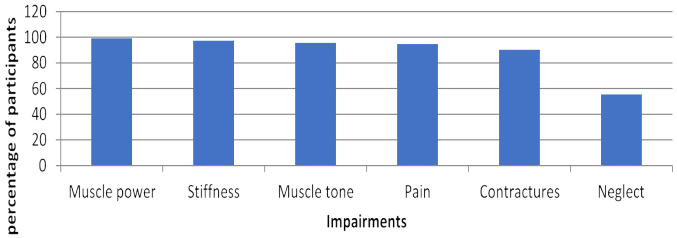

Figure 6. Impairment Assessment (n =112).

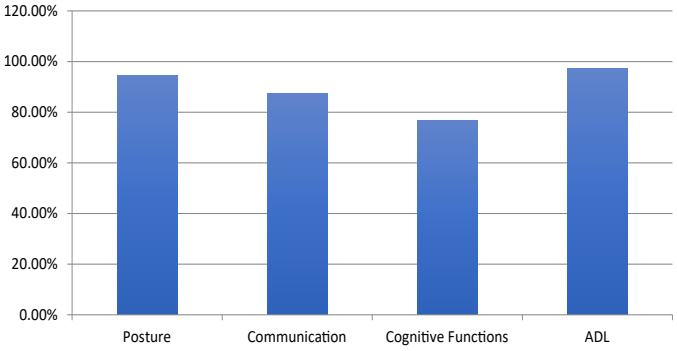

Figure 7. Activity limitation. **Key:** ADL-Activities of daily living.

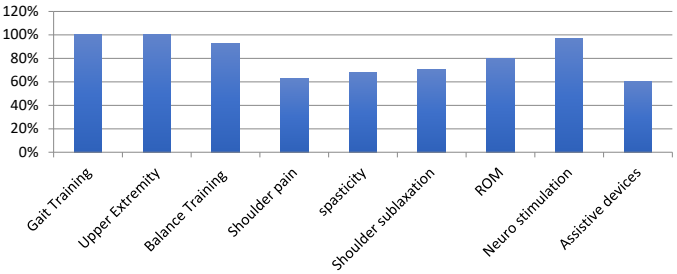

Figure 8. Impairment (n = 112). **Key:** ROM-Range of Motion.

Frequency

During in-patient rehabilitation 98.2% of physiotherapists have at least five sessions with the patients while only 5.4% have one session in a week (Table 3).

The study sorts the frequency of physiotherapy treatment in outpatients. A total of 47.3% of the physiotherapists have three sessions with the patients in a week, while just 0.9% of the physiotherapists treat patient four times in a week (Table 4).

Reassessment

A total of 81.3% of physiotherapists reported reassessing their patients every week, while 0.9% of physiotherapist reported reassessing their patients every two weeks as summarizes in Figure 9.

Discussion

Social demographic data of stroke patients in Kenya

A study by Desalu [21] reported the average age of stroke patients in Nigeria to be 68 years (-+12). Likewise, Saric [22] found an average age of stroke patients to be as 73 years. In the current study, the average age of the sample was 61.7 years. These results are consistent with a study by Jowi [23] in Nairobi, Kenya that reported a mean age of stroke occurrence as 61 years. The results compares well with average age of

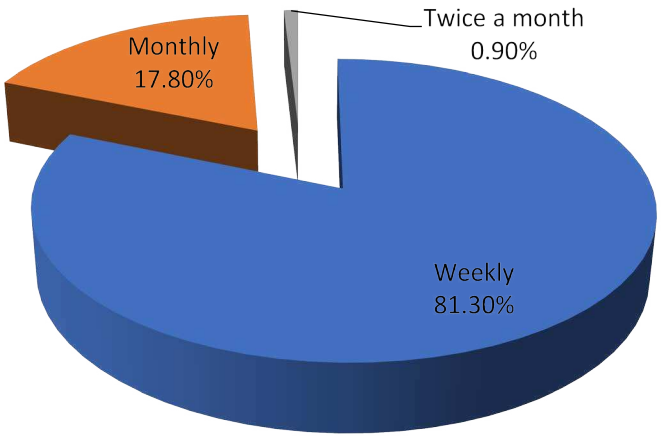

Figure 9. Re-assessment.

Table 3. In-patient Treatment sessions in a week.

	Frequency	%
1	6	5.4%
2	11	15.3%
3	17	30.6%
4	5	34.2%
>5	71	98.2%

Table 4. Number of physiotherapy sessions in a week (n=110).

	Frequency	%
1	18	16.4%
2	21	19.1%
3	52	47.3%
4	1	0.9%
>5	18	16.4%

stroke patients in China, shown to be 64 years by Li [24]. In Korea the average age is 64 years, according to Kim [25], and in the Arab Gulf countries 58.9 years, as shown by Deleu [26]. Alarmingly, the average age of the current study is considerably lower than the average age of stroke patients in studies mentioned previously.

In the current study there were more male stroke patients (63.5%) than female stroke patients (36.5 %), which is replicated in literature. A study by Appeglos [26] reported that men had a 33% higher incidence of stroke compared to women. In another study Spengos [27] found a ratio of 3:1 male to female from Athens Stroke Registry. In a previous study Li [24] studied 1913 consecutive hospital admission and reported more males (57%) than females (43%) in the sample. The difference could be attributed to reported gender difference in risk profiles between males and females. Males, in literature, are associated with smoking, heavy alcohol intake and higher risk of peripheral vascular diseases [28].

Rehabilitation settings

Stroke patients received rehabilitation during their stay in the hospital. Correspondingly, the patients were referred to various settings to continue with rehabilitation. Approximately 86.6% of the patients were referred to hospital/center-based settings to continue with physiotherapy. The results of the current study echo the study conducted by Cormier [29]. The authors reported that 73% of the older American stroke survivors receive institutional rehabilitation care. In a similar study Lee [30] recounted that 34% of stroke patients had been admitted to an in-patient rehabilitation institution to continue with therapy.

However, the current study revealed a disturbing finding, showing that of the 150 files reviewed, only 18.7% files were from outpatient physiotherapy. The percentage of patients who used this setting to continue with physiotherapy is noticeably low. A study conducted by the Centre for Disease Control and Prevention (2007); found that 30.7% of the stroke survivors in 21 districts in the US received care in outpatient settings. On the contrary, most outpatient physiotherapy services are available in urban centers in Kenya, whereas rural facilities offer the same services, but cover a very big catchment area. Therefore, patients have to travel long distance. These services are also not affordable to many Kenyans. The extra cost and effort of transporting the patient to an outpatient clinic may play a role in the decrease of utilization of outpatient rehabilitation.

Home-based care was not a preferred choice for many. The main reason for this is financial; as many people are unable to afford the cost of home therapy. This finding stresses the issue of affordability of the services. It further supports the findings of Padberg [31]. The second reason of not using home-based rehabilitation could have been the severity of stroke. The families of stroke survivors might probably have considered poor prognosis and decided the potential outcome was not worth the strain.

However, Pollock [32] emphasizes that home rehabilitation improves lower extremity functions, which affects mobility and consequently improves participation. Home-based rehabilitation is composed of family surroundings, home environment, efforts of caregivers and extensive care that can contribute to better stroke outcome, especially when the family members are empowered and the home environment is adapted.

Interdisciplinary team

The principal aspect of rehabilitation is the provision of a coordinated management by a specialized, interdisciplinary team of health professionals [33,34]. The interdisciplinary team includes various disciplines, and has diverse functions in rehabilitation. In the current study, there were various disciplines involved in stroke rehabilitation. The disciplines included; Medical doctors to coordinate comprehensive medical care [3], nurses, for comprehensive nursing assessments and patient care e.g. observations. The physiotherapist to develop, maintain and restore maximum function [33], while the occupational therapy, optimized participation and independence for all daily occupations, (self-care, leisure and productivity) [35]. (The social workers coordinated services needed after discharge, such as home adjustment. Speech therapist, assessed, diagnosed, treated and helped prevent speech, language, cognitive-communication, voice, swallowing, fluency and other related disorders [33,36].

Family involvement in stroke rehabilitation

Our data indicates family involvement (98.2%) in the rehabilitation process. Family members are motivated, available and an inexpensive source of rehabilitation. They provide services to the patient especially in cases where the cost of physiotherapy services is overwhelming. Therefore, rehabilitation is more available at home than in a health facility. This supports the finding of Holmqvist [37]. The outcomes of the study likewise sustain the findings of Tsouna-Hadjis [38]. who highlight the effect of social and family support in the process of recovery of stroke. The authors maintain that there is improved functional status, less depression and better social status of the stroke patient at six months after stroke.

On the contrary, Karla [39] found that family carer training was associated with less carer anxiety and stroke burden did not influence the stroke patient's ability as measured by the Barthel index at one year after stroke.

Assessment

Data of this study indicates that the physiotherapist used outcome measure tools for assessment. These results concur with the American Clinical Practice Guideline [33] which recommends the use of well-validated, standardized instruments in assessing stroke patients. The guidelines further emphasize that the instruments ensure consistent documentation of the patient's neurological condition, levels of disability, functional independence, family support, quality of life and progress over time. However, majority of the physiotherapist were not conversant with the use of outcome measures.

Physiotherapy rehabilitation of stroke patient

Rehabilitation is a proactive, person-centered and goal-oriented process that begins the first day after stroke. The aim is to improve function and/or prevent deterioration of function, as well as bringing about the highest possible level of independence, physically, psychologically, socially, and financially [34]. Rehabilitation is concerned not only with physical recovery, but also with reintegration of the person into the community. Furthermore, rehabilitation is a process that aims to maximize self-determination and optimize choices for those with stroke.

Current data indicate that physiotherapy managed the lower extremities gait training (100%), as well as orthotics and assistive devices had (60.5%) among other forms of management. In light of this, physiotherapists address recovery of sensorimotor functions in upper and lower limb, functional mobility ranging from bed transfers to community ambulation, treatment of musculoskeletal complications (e.g. shoulder pain). These results are in tandem with the findings of Putaman [13].

Majority of the physiotherapists (85.7%) reported starting physiotherapy management the same day, if the patient was stable, while 14.3% started physiotherapy at one week. These results mirror results from previous studies by Bernhardt [40-43]. In all these studies the authors recommend that stroke patients should be mobilized as early as possible, once medical stability is reached. The authors further affirm that the rehabilitation of stroke patients should start preferably within the first 24 hours of stroke symptoms onset, unless contraindicated.

Frequency, duration and intensity of therapy

During in-patient rehabilitation 98.2% of the patients received more than five sessions in a week, while 30.6% received three sessions in a week. In outpatient physiotherapy, 47.3% of the patients had three sessions of physiotherapy per week, while 16.4% had one session per a week.

The results of this study shows that patients admitted to the wards received more physiotherapy sessions in a week than patients being rehabilitated as outpatients. Most of the participants in this study were socio-economically deprived; therefore the extra cost of transporting the patient may play a role in the decrease of utilization of outpatient rehabilitation services.

A decrease in the frequency of physiotherapy sessions will ultimately decrease the intensity of physiotherapy and has a risk of affecting the outcome, as alluded to by Teasell [44]. The authors found that the intensity of physiotherapy on the functional outcome was signified by an improvement of stroke patient's gait. This finding was e supported by Kwakkel [45]. Sorbello [43] and Bernhardt [40] also stresses that stroke patients must be mobilized as frequently as possible.

Limitations of the study

The healthcare provider sample for the interviews included various members of the multi-disciplinary team, with good representation of those active in the patient journey. The interviews were relatively heterogeneous, however, not all healthcare disciplines involved in stroke rehabilitation were included, as some were hired on contract basis, notably the speech therapist. Generalizing findings to other populations is also limited.

The survey was conducted in 17 public healthcare facilities; most of the public health facilities operate with minimal resources, therefore the process of care factored in, may not give a clear reflection of the private facilities.

Conclusion

This study achieved its overall aim by understanding the process of care in stroke rehabilitation in Kenya. The results of this study shows that stroke care process in Kenya includes assessment, and management, at both inpatient and outpatient [46]. Assessment, involves impairment, activity limitation as well as participation. However, the results shows poor use of evidenced-based outcome measures, and poor recording is depicted. Management entails the aforementioned in an interdisciplinary context in addition to family/ care. Continuous education is recommended for physiotherapist in Kenya for optimal up to date assessment of stroke patient.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

NK Principal researcher- collected data and was a main contributor in writing the manuscript. AR analyzed and interpreted the patient data care process, while, ME analyzed and interpreted the patient data care process. All authors read and approved the final manuscript."

Acknowledgements

Professor A. Rhoda, Professor M. Elbadawi, and Professor N. Mlenzana for their extreme patience, motivation, support and guidance, Dr. Christer Andersson, Liz and Antoinette, and all the staff at the County Hospital visited.

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