

## REHABILITATION SERVICES AMONG STROKE PATIENTS IN KOTA BHARU DISTRICT

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### ABSTRACT

**Background:** Rehabilitation is a crucial component of the continuum of care, which ensures stroke patients have access to the most appropriate health services, when and where they need them. This study describes the different types of dependency levels and rehabilitation services received by stroke patients in after being discharged from hospitals.

**Materials and Methods:** A cross sectional study was conducted among randomly selected 330 stroke patients admitted between January 2014 and December 2015. Patient information sheets were used to extract information on sociodemographic data, clinical characteristics and rehabilitation service received from patients' medical record. Descriptive analysis was applied using R software.

**Result:** Majority of stroke patients (79%) were referred to primary healthcare team for further rehabilitation at the community level. All bedridden stroke patients received home-based rehabilitation services. Seventy nine (23.9%) patients received domiciliary care services, whereas others received either nursing care visit 121 (36.7%) or outpatient service 130 (39%).

**Conclusion:** All of the stroke patients were equitably managed considering the limitation in resources, practicability, and requirement based on the patients' dependency levels. Further research is required to explore service outcome such as patients' satisfaction towards those provided rehabilitation services in guiding the current service provision.

**Keywords:** Rehabilitation, Post-stroke, Stroke, Post-stroke rehabilitation

## 1.0 Introduction

Stroke is a clinical syndrome characterised by rapid development of clinical symptoms and/or signs of cerebral function loss (Ministry of Health Malaysia, 2012). The stroke prevalence rate has increased in Malaysia for both ischaemic and haemorrhagic type (Aziz et al., 2015). Stroke has also become one of the major contributors of disease burden with its complex short-term or long-term disabilities which lead to significant socioeconomic loss especially among young stroke patients. The young stroke patients frequently live longer with several disabilities and experience a greater loss in salary earnings over a longer period. Those disability or activity limitations that developed after a stroke may improve with further management and care such as attending or receiving intensified stroke rehabilitation services.

Stroke survivors who are left with some degree of physical or cognitive impairment need a proper post-stroke management called rehabilitation. The goal of stroke rehabilitation is to help them relearn movements or skills that have been lost (Scottish Intercollegiate Guideline Network, 2010). Stroke rehabilitation help the patient regain independence and improve their quality of life. The severity of stroke complications and each person's ability to recover varies. Early recovery and rehabilitation can improve functions and sometimes remarkable recoveries for stroke patients. Stroke patients will be managed by multidisciplinary team approach for neurorehabilitation. The management include proper positioning, early mobilisation, physiotherapy, occupational therapy, speech therapy, treat spasticity, and treat depression together with educations for both patients and their caregivers (Ministry of Health Malaysia, 2012). Rehabilitation constitute of interventions to achieve disability reduction and to optimise functioning in individuals furthermore engage with their environment and increase in participation. However, rehabilitation is not restricted to only stroke patients but also relevant to other disability limitations related to ageing, injury or other conditions (Krug & Cieza, 2017).

Rehabilitation services are the primary mechanism by which functional recovery and the achievement of independence are promoted in patients with acute or chronic stroke. Rehabilitation is most effective as a multidisciplinary activity including social work, occupational therapy, specialist nurse support, family care worker, mental health worker and case management (Young & Forster, 2007). It is part of universal health coverage and should be integrated into the package of fundamental primary health care services, along with prevention, promotion, treatment and palliation. Rehabilitation reduces the costs related to ongoing treatment, care, and support and may accelerate the ability to return to education or employment among those stroke patients. While, neurorehabilitation will improve physical performance and psychosocial functioning of stroke patients. Furthermore, engaging in long term rehabilitation based on needs continue to show functional improvement. Studies also showed that failed to engage in rehabilitation service was associated with functional deterioration, frequent hospitalisation and reduction in quality of life (Dobkin 2005; Paolucci et al., 2000).

Throughout the post-stroke care, home-based services is one of the most important elements. A home based services are designed to provide continuous care and assistance to people with disabilities to live independently in their community. Rehabilitation services targeted at selected patients resident together with providing knowledge to the caregiver in the community will improve the ability to undertake activities of daily living and reduce risk of deterioration (Legg & Langhorne, 2004; Sit, Wong, Clinton, Li, & Fong, 2004). Increased number of patients has led to the patient being discharge earlier. The hospital can't afford to wait until maximum recovery level of patient or to wait until the caregiver were 100% ready to take the patient home. Being discharge does not equally signify that patient has been recovered from stroke. Therefore the term "transfer of care" is more suitable to use in describing and emphasizing the need to arrange a continuity with rehabilitation services in the community (Young & Forster, 2007). This study was aimed to describe the different types of dependency levels and rehabilitation services received by stroke patients in after being discharged from hospitals.

## 2.0 Materials and Methods

A cross sectional study was done from November 2016 till March 2017 in two hospitals that offer neurology and rehabilitation services. These hospitals are two hospitals located in Kota Bharu and served as referral hospitals for Kelantan as well as Terengganu patients. The retrospective record review activity was done at record office of both hospitals. All patient admitted from January 2014 until December 2015 with stroke diagnosis and stayed in Kota Bharu district for their long term post hospitalisation care were included and any record of patient with no documented Barthel's index and modified Rankin Scale (mRS) score were excluded from this study.

A list of patients' name and diagnosis was obtained and 335 records were randomly selected as study sample. Patients' name were selected from the identified list of stroke patient admitted to both hospitals. Patient medical records were traced by identification numbers from record unit. Retrospective record review was done using the patient information sheet. Stroke patient was defined as patient admitted to with diagnosis of cerebrovascular disease or stroke (both ischemic & haemorrhagic) documented as 'Main Diagnosis' in Admission/Discharge Form upon discharge based on International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10)-WHO Version for ; 2016 Chapter IX - Diseases of the circulatory system, Cerebrovascular diseases.

Descriptive statistics was used to summarise the sociodemographic characteristics of subjects. Numerical data was presented as mean (SD) or median (IQR) based on their normality distribution. Categorical data was presented as frequency (percentage). Descriptive analysis was

applied and performed in R version 3.4.3 (R Development Core Team, 2018), using the R Studio environment version 1.0.143 (RStudio Team, 2016).

### 3.0 Result

There were 330 out of 335 (98.5%) of stroke patients' medical records were reviewed in this study. The sociodemographic and clinical characteristic of stroke patients were described in Table 1.

**Table 1:** Sociodemographic and clinical characteristic of stroke patients (n=330).

Variables	Mean (SD)	n (%)
<b>Sociodemographic</b>		
Age	56.74 (12.41)	
Gender		
Male		183 (55.5)
Female		147 (44.5)
Race		
Malay		299 (90.6)
Non-Malay		31 (9.4)
Educational level		
No formal education		20 (6.1)
Primary level		137 (41.5)
Secondary level		161 (48.8)
Tertiary level		12 (3.6)
Marital status		
Single		43 (13.0)
Married		287 (87.0)
Source of financial support (n=200) <sup>a,b</sup>		
Welfare		159 (79.5)
Zakat		30 (15.0)
Insurance		21 (10.5)
NGO		20 (10.0)
Others		79 (39.5)
Household income <sup>a</sup>	1500.00 (1500.00) <sup>c</sup>	
<b>Clinical</b>		
Type of stroke		
Ischaemic stroke		236 (71.5)
Haemorrhagic stroke		94 (28.5)

Duration of stroke diagnosis (year)	3.89 (1.09)
Comorbidity <sup>b</sup>	
Arthritis	179 (54.2)
Respiratory disease	165 (50.0)
Hypertension	160 (48.5)
Diabetes mellitus	116 (35.2)
Renal diseases	99 (30.0)
Heart disease	48 (14.5)

<sup>a</sup>Missing records for financial supports and household income

<sup>b</sup>Patient can have more than one source of financial support, and comorbidity.

<sup>c</sup>Median (IQR)

Majority of patients were Malay, married male and had received some form of financial support. Their age was ranged from 26 to 82 years old. Most of the patients had ischaemic stroke with mean Barthel index upon discharge was 54.24 (28.32). Further description of patients' dependency level were described in Table 2.

**Table 2:** Dependency level of stroke patients (n=330).

Variables	n (%)
Modified Rankin Scale score	
1 - 3	130 (39.4)
4 & 5	200 (60.6)
Modified Barthel Index	
Minimal dependency	53 (16.1)
Mild dependency	61 (18.5)
Moderate dependency	54 (16.4)
Severe dependency	85 (25.8)
Total dependency	77 (23.3)

Majority of stroke patients (79%) were referred to primary healthcare team for further rehabilitation at the community level. There were 79 (24%) of the stroke patients received domiciliary care services, whereas most of them received either nursing care visit 121 (37%) by primary healthcare team or outpatient service 130 (39%) either at hospital or health clinic for their post stroke rehabilitation services.

## 4.0 Discussion

The current improvement in management of stroke increase the likelihood of people to survive from stroke. However, morbidity associated with stroke poses substantial burden to patients, their caregivers, healthcare systems and providers. The main contribution to morbidity is functional disability. National Health Morbidity Survey in 2015 reported that non-communicable diseases contributed to an estimated 73% of total deaths in Malaysia, with the biggest contributor being cardiovascular diseases that include heart attacks and strokes (Institute for Public Health, 2015). This indicates that current post stroke rehabilitation to handle related disability becomes more demanding and challenging. Different approaches have been used to provide comprehensive post stroke management specifically targeted to the needs of stroke patients and their caregivers. Previous reported approaches to provide stroke care include evidence-based or guideline-based management program together with multidisciplinary integrated post stroke care and rehabilitations (Kwan, 2007; Sulch, Melbourn, Perez, & Kalra, 2002; Western Australia, 2012).

Both institutions practice quite similar clinical pathway as both hospitals were equipped with their own teams and expertise in general medicine, neurology, neurosurgical, and rehabilitation medicine. Once diagnosed with stroke, all patient need to be referred to multidisciplinary stroke rehabilitation team for further post stroke care. The team will communicate with the patients, family members, or the caregivers regarding the impact of the stroke on the patients, family, and/or caregivers, treatment planning or available services after discharge, and identifying the sources of support (Ministry of Health Malaysia, 2012). The team will also advice and guide on several available resources such as private nursing service, financial aids, social services, and the voluntary sector that can help to support the needs and priorities of the person with stroke, their family members, and their caregiver. The current services are available and offered in both hospital includes medical, neurology, or rehabilitation outpatient clinic, medical rehabilitation therapy (i.e. hearing, speech, occupational therapy, physiotherapy, and psychotherapy), pharmacist service, dietetic services, and medical social services, if necessary. All of the above services are also provided by the government primary healthcare team except for hearing and speech therapy as these services are only available at referral hospital, and outpatient health clinic which will be managed by family medicine specialist.

All patients should receive similar services including neurorehabilitation care regardless of their disability after being discharge from hospital. However in view of several technical constraints, the patient will be assessed on the needs or requirements prior to discharge either they can be manage as outpatient basis in the hospital setting, or need to be referred to the government primary healthcare team for further management at the community level. In addition to the community level services provided by the primary healthcare team, those patients and their identified caregivers will be further assess either they will receive standard nursing care visits or the caregiver will be equipped with caregiving skills when receiving domiciliary care services (Ministry of Health Malaysia, 2014). Nearly half of the patients are having further follow up as



the outpatient basis and the remaining are managed by the primary healthcare team at the community level. There are similarities between the findings in this study and those described by previous literature in utilisation of post stroke outpatient rehabilitation services (Jan et al., 2013). They found that the utilisation of outpatient rehabilitation services ranged from 50% to 20% in the one, six and 12 months post stroke. The utilisation of rehabilitation services were associated with the amount of assistance needed by patients in activities of daily living. Their findings indicated that the rehabilitation services are being served according to the patients' dependency level which is similar to our practice.

Other developed country provide comprehensive community-based rehabilitation care services to their elderly and disable patients regardless of dependency level (Jan et al., 2013; Young & Forster, 2007). Majority of patients who referred for either domiciliary care services or nursing care visit by the primary healthcare team in this study are severely dependent. This substantiates finding in the literature by Dutta, Thornton, and Bowen (2017) where nearly half of severely dependent stroke patients are provided with early supported discharge or generic community rehabilitation teams services for continuing rehabilitation at home. The remaining were discharged homes with usual nursing or residential visits for their long-term care. Resources constrain such as time limitations, staffing issues, staff training, therapy prioritisation, and team functioning in the current setting limits the distribution of domiciliary care services to be expanded for all range of dependency level in our setting (Ministry of Health Malaysia, 2014). Therefore, more independent patients are advised to seek treatment and care as outpatient basis either at outpatient specialist clinic in the hospitals or nearby health clinic. Although this can be seen as one of the limitations in service distribution, it's indirectly encourages stroke patients to become more mobilise, socialise with the community, increase participations thus further improve their quality of life (Jan et al., 2013).

Tooth, McKenna, Barnett, Prescott, and Murphy (2005) showed lower proportion in patients receiving community-based services among stroke patients after being discharged from hospital. This contradictory findings may be due to moderate dependency level of stroke patients in present study as compared to their reported patients who are having modified independence (require device with no assistance needed) as a result of improvement after in-patient rehabilitation. Hussain, Abdullah, Esa, Mustapha, and Yusoff (2014) also reported that less than 10% of stroke patients stay engaged with post stroke rehabilitation by hospital. These differences might be explained by the effect of improvement and more comprehensive management for stroke patients thus our patients had lesser degree of disability, or better coordination in patients' referral in line with improvement of the system. There is not much difference in the distribution of rehabilitation services or treatment plan for stroke patients after being discharged from ward as compared to the practice in other places (Hillier, 2010; Kwan, 2007; Western Australia, 2012).

Some limitations should be considered when interpreting the results. The study participants were from a homogenous ethnic group. The ethnicity distribution of the population in study populations is majority made up of Malays. Less than 10% of study samples were non Malay.

Although the possibility of selection bias was reduced by selecting a random sample during retrospective record review, the imbalance showed in this study might not portray the multi ethnic composition of the general population in Malaysia. Future studies are suggested to use population-based representative sample, and culturally diverse populations.

## 5.0 Conclusion and recommendation

All of the stroke patients are equitably managed considering the limitation in availability of resources, practicability (affordable and accessible for the patients), and requirement based on the dependency levels. This research has thrown up many questions in need of further investigation. This study can be expanded to a wider range of dependency level not only for stroke patients, but also other patients who required rehabilitation services to enhance the quality of post stroke rehabilitation service's provision. Improvement in access to care are recommended to improve utilisation of rehabilitation services, reduce the long-term complications of stroke and for better post-stroke care. More research is required to explore service outcome or the aspects of patients' satisfaction towards those provided rehabilitation services and further guide the future practices.

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## Declaration

The authors declare that they have no conflict of interests.

## Authors contribution

NAME: Study design, data collection, data analysis, and writing of draft manuscript, NAY and MHH: Study design, review of draft, and final manuscript, NAAH and MHAA: Study design and data collection.



## Ethics approval and consent to participate

Ethical approval to conduct this study was obtained from the Universiti Sains Malaysia Human Research Ethics Committee (Reference code: USM/JEPeM/16100390) and Ministry of Health, Medical Research and Ethics Committee (Reference code: NMRR-16-1893-32866 IIR). Additional approval from both hospital were also acquired following those previous approvals.

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