

**STATUS OF UPPER LIMB ACTIVITIES OF DAILY LIVING  
AMONG STROKE PATIENTS**

**By**

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## **SUPERVISOR'S STATEMENT**

As the supervisor of Ms Jyoti Karanjit's thesis work, I certify that I consider her thesis "Status of Upper Limb Activities of Daily Living among stroke patients" to be suitable for examination.

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## DECLARATION

- This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidature for any degree.
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## **ABBREVIATIONS**

|             |                                                |
|-------------|------------------------------------------------|
| <b>ADL</b>  | Activities of Daily Living                     |
| <b>BHPI</b> | Bangladesh Health Professions Institute        |
| <b>BI</b>   | Barthel Index                                  |
| <b>CRP</b>  | Centre for the Rehabilitation of the Paralyzed |
| <b>CVA</b>  | Cerebro-vascular Accident                      |
| <b>CVD</b>  | Cardio Vascular Disorders                      |
| <b>FIM</b>  | Functional Independence Measure                |
| <b>IRB</b>  | Institutional Review Board                     |
| <b>MAL</b>  | Motor Activity Log                             |
| <b>SPSS</b> | Statistical Package for social science         |
| <b>UE</b>   | Upper Extremity                                |
| <b>UL</b>   | Upper Limb                                     |
| <b>WHO</b>  | World Health Organization                      |

## **ABSTRACT**

**Introduction:** Stroke is one of the major causes of chronic illness worldwide and is third leading cause of death in Bangladesh. Upper limb impairment is known to be the most common motor disability which affects the use of upper limb and hence restrict the patient from leading an independent life. Moreover, it was seen that avoiding the use of affected side of the hand causes patient to be functionally dependent on Activities of Daily Living.

**Objective:** To determine the status of Upper Limb Activities of Daily Living among stroke patient. Also to compare the use of affected dominant and non-dominant hand in day to day activities.

**Methods:** A cross-sectional descriptive study design was used and 65 data were collected from the Centre of Rehabilitation of the Paralyzed. Socio-demographic data, medical information were collected. Motor Activity Log was used to identify the amount of use and quality of movement of Upper Limb among the stroke patients. Modified Barthel Index was used to identify the level of dependency in Activities of Daily Living of stroke patients. The data was collected using face to face interview from the patients.

**Results:** The mean age of the patient was  $49 \pm 10.47$ . The difference between use of dominant upper limb showed statistically significant result ( $p=0.007$ ). The relationship between age and level of dependency showed negative correlation ( $p=0.023$ ). The association between amount of hand use and level of dependency showed positive correlation ( $p=0.001$ ) and relationship between quality of movement of upper limb and level of dependency showed positive correlation ( $p=0.002$ ). Likewise, the result showed there is no significance difference between gender and type of stroke with level of dependency respectively ( $p=0.135$ ,  $p=0.337$ ).

**Conclusions:** The affected upper limb use and the level of dependency of patient with stroke were positively associated. Similarly the study found that the dominance of hand has an impact on the use of affected upper limb. Age was found to be an associative factor for dependency among stroke patient while gender and type of stroke did not show any significance on level of dependency after stroke.

**Keywords:** Stroke, Upper Limb use, Level of dependency.

## 1.1 Background

Stroke as defined in Feigin, Lawes, Bennett, Barker-Collo, & Parag in 2009 is known as medical signs that develop progressively such as alteration in brain function which stayed for more than one day or these symptoms resulted in death caused by only vascular origin. It is evident that among the entire deaths, the death occurred due to stroke is considered to be the most familiar. However, it was seen that 85% of all deaths in Western countries as well as in developing countries are due to Stroke (Shaik, Loo, & Gan, 2012).

According to Stroke Statistics, 2018, it was seen that around 15 million of total population of the world experience stroke, out of which the total death is 5 million and rest 5 million become totally unable to continue normal lifestyle as before stroke. Among the risk factors rise in blood pressure is known to cause around 12.7 million strokes. The Asian continent constitutes more than half of the world's population. As, Asian countries are developing countries the burden of stroke is expected to increase due to demographic changes and urbanization (Mehndiratta, Khan, Mehndiratta, & Wasay, 2014). Hence, the incidence of stroke can increase in future (Miah et al., 2012).

It is seen that South Asia accounts for more than 40% of global mortality due to stroke and is considered highest contributor of stroke mortality in the world. The mortality rate of stroke and coronary artery disease is almost same in this region and it occurs 10 years earlier on average in comparison to other parts of the world (Wasay, Khatri, & Kaul, 2014). It is also reported that the number of stroke due to haemorrhage (19–46%) in many Asian countries are known to be higher than European countries (Wasay, Khatri, & Kaul, 2014). Hence, reducing deaths caused due to stroke is challenging to reduce without intervention in Asia (Prasad, Vibha, & Meenakshi, 2012).

Stroke is documented as third common cause of death in Bangladesh that holds a record of 5.71% among all the health condition. It is ranked as fifth leading cause of disability accounting to 2.55% of total disability (Islam et al., 2012; Miah et al., 2012). According to World Health Organization (WHO) ranking, Bangladesh is ranked 34 in the world for

deaths due to stroke (World Health Ranking, 2017), which is 108.3 per 100,000 people (Basri et al., 2013). A study conducted in 2012, reported that in Bangladesh the prevalence of stroke is 0.3% with male suffering more than females with the ratio of 3.44: 2.41. However, there is no data on incidence of stroke till date in Bangladesh (Islam et al., 2012) but, the occurrence of stroke is rising in comparison to developed nations. According, another study prevalence of stroke in older people above age 40 is 370/100000. The study also revealed that it even though stroke is known as a disease of elderly it is mostly seen in population aged 50-60 in Bangladesh. Similarly, study found incidence of stroke is more among younger people who were less than 40 years of age in community (Mohammad, 2014). The causes of stroke at younger age might be because of various non health related risk factors like drinking pipe water, eating food which has high ghee contents, chewing tobacco and various type of infections (Wasay, Khatri, & Kaul, 2014).

From the total incidence of stroke, ischemic stroke accounts for 63% and hemorrhagic accounts 37% worldwide (Shaik, Loo, & Gan, 2012). However, in Bangladesh high occurrence of hemorrhagic stroke is reported (Wasay, Khatri, & Kaul, 2014). The main influencing factors for stroke include hypertension, cigarette smoking, alcohol consumption, and diabetes (Shaik, Loo, & Gan, 2012). Hospital based studies has found hypertension to be the major reason for all types of stroke i.e. ischaemic and haemorrhagic. It was noted that Bangladesh's economy is vaguely affected by stroke due to disability caused by it (485 per 10 000 people). Though, non-profitable organizations are working on the prevention of stroke in primary level the incidence has increased considerably in past decades due to limited number of specialized hospital and neurologist (Islam et al., 2012). According, Miah et al., 2012, among the total number of all stroke 70% of it may be preventable by informing patients about the risk factors of the stroke.

Stroke may have wide range of consequences which may arise in areas such as sensation, motor, perception or deficit in thinking which may have impacts on day to day functioning due to disabilities (Mercier et al., 2001). Motor impairment caused by either ischemic or hemorrhagic stroke is the most common impairment among stroke which affects function in muscle movement or mobility. It affects patient's capacity to conduct

daily activities which hampers social participation. Although the majority of stroke patient overcome primary injury, the major problem faced by patient is frequently due to prolong impairment, activity limitation and social participation. It affects about 80% of patients which usually affects the ability of the patient to move one side of face, upper and lower limb (Langhorne, Coupar, & Pollock, 2009).

Moreover, the most widespread motor disability after occurrence stroke is considered upper limb function impairment. In the United States, out of 600,000 new diagnosed cases of stroke every year 80% have acute upper limb paresis (Beebe & Lang, 2009). It has huge influence on functional and social independency of patient. In addition, it is also noted that the recovery of upper extremity function is often slower than that of the lower extremity (Yen, Wang, Chen, & Hong, 2005). Hence, they have direct impact on the ability to do daily activities (Mercier et al., 2001).

ADL are day to day tasks which are important for independent living and also for self-care and self-maintenance which includes dressing, grooming, eating and doing chores (Harris & Eng, 2007; James, Ziviani, & Boyd, 2013). These tasks can be performed by only one hand or may need both hands (Yen et al., 2005). ADLs are usually categorized as personal ADL or instrumental ADL tasks. Personal ADL focuses mainly towards self-care such as bathing, grooming while instrumental ADL tasks helps an individual to become independent (James, Ziviani, & Boyd, 2013).

In elderly population stroke is known to be a major source of functional disabilities as stated in a study conducted by Mercier et al., 2001. Though, stroke recovery varies from individual to individual, it is likely that almost all the stroke survivors are in continuous assistance and mostly dependent on caregivers in ADL after stroke (Shaik, Loo, & Gan, 2012; Veerbeek, Kwakkel, Van Wegen, Ket, & Heymans, 2011). In addition, it is also evident that in one-fifth of stroke survivors, the functional activity is not recovered in both the arms. Besides, half of patient does not achieve significant function of affected arm who initially suffered severe paresis (Thrane, Emaus, Askim, & Anke, 2011). While, after hemiplegic stroke, the affected arm is usually used less than actual use. As individual with UL impairment are encouraged to use the unaffected arm for ADL, avoiding use of affected arm which is reason behind lack of recovery of function of affected arm (Wu et al., 2007; Thrane et al., 2011).

## **1.2 Justification**

Stroke is a serious health condition which is a major reason of disability in adults. Though, individuals overcome the early illness after stroke, it causes adverse effects on long run to the patient as well as the family (Harris & Eng, 2006).

Motor impairment is the most commonly known consequence caused by stroke. Motor impairment is caused by ischaemic or haemorrhagic stroke which affects patients day to day activities. It affects about 80% of patients and among that most patients sustain Upper Extremity (UE) impairment (Harris & Eng, 2006; Langhorne, Coupar, & Pollock, 2009). Similarly, UL function is difficult to gain though the patients regain independent ambulation (Barreca, Wolf, Fasoli, & Bohannon, 2003).

Among stroke patients, 80% face hemiparesis and of those individual who initially sustain upper limb paresis have 70% residual impairment. UL impairment includes increased pain, loss of sensation, reduced strength and altered dexterity and in-coordination. The upper limb contributes to most ADL and hence impairment causes hindrance in many essential and useful tasks of ADL (Harris & Eng, 2007).

The recovery after incidence of stroke depends on the character of the condition and severity of primary illness. Similarly, after around half a year of incidence of stroke, approximately 65% of patients do not use the hemiplegic arm in the regular works. Reduced UE improvements can be usual when there is hemispheric infarction with significant damage to corticospinal tract. It is seen that by the end of first 3 month patient who survived stroke have less physical disability. Although patient who do not need any help may not use the hand affected by stroke and hence only 25% of patient return to previous level ADL activities (Dobkin, 2005).

A study conducted by Raghavan, 2007 has described that hand motor impairment is the common and major cause of disability. However, it was not able to describe relationship between hand impairment and function as most improvement in function occurs due to compensation instead of true recovery of impairment.

In a study conducted by Harris and Eng (2006), found that when an individual's dominant arm is affected prior to stroke individual gets more motivation to use it for daily tasks. On other hand, if the arm affected by stroke is non dominant, individual may



show less desire to use it for activities of daily living hence it may be hard to use non dominant UL in treatment (Harris & Eng, 2006).

Usually healthy individual without any neurologic condition uses their both UE for about 8-9 hours per day for various activities. Whereas, during the study done by Lang wet al., it was detected that the arm affected by stroke was used less at the therapy centre (Lang et al., 2007).

There are comparatively very less literatures which have studied the association of UL impairments like alteration in muscle tone and weakness in muscles and hand role in ADL. Although, UL impairment is a major factor for an individual's ability to use UE, it may not be associated with activities. Because an individual in the chronic stage of stroke may have adaptation and can do trick movements to complete the activities (Harris & Eng, 2007).

Therefore, this study will be a new insight for the relationship between UL use in ADL and functional dependency of the patient which will include sub-acute and chronic stages of stroke.

### **1.3 Research Question**

To examine the status of hemiplegic upper limb use in activities of daily living among stroke patients.

### **1.4 Operational Definitions**

**Stroke:**

The term “Stroke” is synonymous with cerebro-vascular accident (CVA) which shows abrupt or slow onset of neurological signs which may be caused due to reduce in blood supply in brain. Among the consequences, the common manifestation of CVA is hemiparesis or hemiplegia which may affect the same or the opposite side of CVA. The symptoms may vary according to the area of the brain which has been affected.

**UL function:** UL function can be considered as activities done by UL in daily living.

**ADL:** ADL refers to day to day activities which are needed for independent living and also activities related to taking care of yourselves and self maintenance like eating, dressing, grooming, combing etc.

**Functional Dependency:** The state of being dependent on functional activities such as ADL.

## **1.5 Outline of Thesis**

The upcoming chapter of the thesis is outlined as follows. **Chapter II** includes prevalence and incidence of stroke of developed, Asian countries as well as Bangladesh. It includes information about stroke, its risk factors and common consequences. It also gives insight about the literature which has performed similar studies in the past. **Chapter III** provides information about the methodology which was followed in conducting this research. It shows the techniques which were used for sampling, data collection, data analysis. **Chapter IV** shows the results of status of Upper limb activities of daily living among stroke patient. This chapter also presents the relationship and differences between variables. **Chapter V** highlights the information about how the findings of this study agree or disagrees with other studies. **Chapter VI** provides the conclusion of the study, recommendations and limitations of the study. Likewise, it also provides recommendation for future research.

## 2.1 Overview

Literature review is known as exploring and evaluating the literature which is available for a topic. This section states and evaluates the literature selected in the current study. **Section 2.2** gives the information about the incidence and prevalence of Stroke in developing countries and Asian countries. **Section 2.3** gives the overview of stroke in Bangladesh; it highlights the types, risk factors and common impairments seen in patients after stroke in Bangladesh. **Section 2.4** gives the explanation about the motor impairments after a stroke and its consequences in upper limb use and independence after stroke. **Section 2.5** gives a review about the similar studies in the past which involves upper limb use and level of dependency.

## 2.2 Incidence and Prevalence of Stroke worldwide

According to American Heart Association, nearly 500,000 new strokes occur every year, with estimated three million survivors (Raghavan, 2007). Likewise, another study conducted by Shaik, Loo & Gan, 2012 stated that there are around 15 million individuals who has experienced stroke in a year. Among which one third of them dies and other one third suffer permanent disability. Hence, stroke along with other disease such as cardiovascular disease (CVD) causes negative effect on health of the individuals as well it adds to economic burden worldwide (Benjamin et al., 2017).

The highest incidence of stroke mortality in the world is considered to be in South Asia, with 40% deaths worldwide (Wasay, Khatri, & Kaul, 2014).

In India, the estimated prevalence of stroke vary from 44 to 843 per million while Bangladesh has 500–2000 of stroke per million. Pakistan shows prevalence of 218/100,000 whereas, Sri Lanka's estimated prevalence is 1000/100,000 (Prasad, Vibha, & Meenakshi, 2012). Among South Asian countries, Nepal does not have any documented data regarding stroke prevalence (Prasad, Vibha, & Meenakshi, 2012). However, Jaya Stroke Foundation in Nepal stated that an average of 50,000 people suffer

from stroke annually, with 15,000 deaths (Pandit et al., 2006). It was also noted that considerably more people suffer from stroke in a young age in Nepal than in developed countries (Shrestha et al., 2011). In comparison to Western countries, hemorrhagic stroke has higher presentation that is (19–46%) in south Asian countries, and is especially high in young patients aged 15-45 years.

Stroke results in severe impact to the patient as well as the members of the family and is comparatively not common in patients who are young aged. However, the recovery in younger individuals is much faster than older patients (Miah, Hoque, Tarafder, Romel, & Hassan, 2008). Studies also showed young stroke incidence in India, which is about 10-15% of stroke and usually age below 40 years (Mehndiratta, Khan, Mehndiratta, & Wasay, 2014; Wasay, Khatri, & Kaul, 2014). Even though women are at high risk, it is least reported among women. Hence, stroke has high severity and it is major reason of mortality in ladies with the age of 60 years and above (Bhalla, Marin, & Preux, 2009; Vibha & Laskar, 2011).

The incidence of Stroke is seen to be rising in developing countries as the life styles are changing rapidly. It is also seen that people are continuously seeking opportunities for coping with the developing and rapid change. Stroke also rises with the age and after the age of 55; it is seen to be increasing quicker with every decade (Ovbiagele & Nguyen-Huynh, 2011). The incidence is estimated to be between 30 and 120 per 100,000 populations every year for the age group 35 to 44 while for the age group 65 to 74 the incidence increases and it is 670-970 per 100,000 every year. The incidence of Stroke among children is significantly low which is estimated to be 1-2.5 per 100,000 per year, where most of it occurs due to hemorrhage. In general, around 795,000 individuals suffer from new or recurring stroke. Among all strokes, ischemic stroke is the highest occurring stroke which is 87%, intra-cerebral hemorrhagic accounts for 10% and subarachnoid hemorrhage is the least occurring with 3% of all strokes (Roger et al., 2012).

### **2.3 Overview of Stroke in Bangladesh**

Bangladesh is a developing country with the population of 162,000,000 and is considered country with low income. Stroke is known as the common cause of mortality in Bangladesh and is ranked 3<sup>rd</sup> chief cause of death. The death rate has risen significantly

from 2006 to 2011 from 6% to 8.57% which is significantly higher compared to South East Asia region (Basri et al., 2013; Islam et al., 2012).

In Bangladesh there are no recorded data on incidence of stroke till date while the recorded prevalence was 0.3%. It was recorded that male were affected more than females with the ratio 3.44: 2.41 (Islam et al., 2012). In another study, it was stated that the prevalence is more among males due to their smoking habits and estrogen hormones which helps to defend ischemic stroke. In females hypertension was stated to be the cause of stroke of same age group (Basri et al., 2013).

The stroke is mainly of two natures. Ischemic Stroke is the most occurring which is defined as event caused by focal cerebral, spinal and retinal infarction which finally leads to neurological malfunction (Sacco et al., 2013). Hemorrhagic stroke is not common as ischemic stroke yet it has higher consequences on public health as the morbidity and mortality rate is higher than other type (Sacco et al., 2013; Andersen, Olsen, Dehlendorff, & Kammersgaard, 2009). Intra-cerebral hemorrhage and subarachnoid hemorrhage are the type of hemorrhagic stroke. In intra-cerebral the clinical signs develops hastily which cause neurological dysfunction. The cause of this is not traumatic but due to locally collected blood in the parenchyma of brain. Subarachnoid hemorrhage is caused due to bleeding to subarachnoid space which consequently results to neurological dysfunction (Sacco et al., 2013).

There are a variety of risk factor for stroke which includes modifiable and non modifiable factors like age of the individual and sex of people, smoking habits, alcohol, obesity, lack of exercises and other conditions like hypertension, Diabetes mellitus, dyslipidemia, ischemic heart disease and other reasons. The non-modifiable factors are age and gender of an individual. Additionally, systemic hypertension is also known to be one of the chief predisposing agents for (Deoke, Deoke, Saoji, & Hajare, 2012). Similarly another study conducted in 2010 by O'Donnell et al., declared that high blood pressure is considered essential risk factor which is responsible for every type of stroke. Also, it was noted that hemorrhagic stroke occurrence due to hypertension was more in number than ischemic stroke mainly in younger adults. According to a study done on 2010, it was stated that high alcohol consumption caused higher rate of both ischemic and hemorrhagic stroke

(Patra et al., 2010). While smoking was related to higher number of ischemic stroke (O'Donnell et al., 2010).

## **2.4 Motor Impairment**

Motor disabilities are most common among stroke patients with over 50% individual suffering from it. UL function impairment is the most common among motor disabilities as the recovery of UE is which usually slower than lower extremity. Hence, it affects individuals' function and dependency (Yen et al., 2005). Additionally, according to Faria-Fortini, Michaelsen, Cassiano, & Teixeira-Salmela, 2011, UL impairment is familiar in a patient with stroke and it may include features like altered tone, low muscle tone, contracture in muscles, reduced strength, reduced movements which may also show reduced speed in doing movements, accuracy and coordination.

In the study conducted among 1259 registered stroke patients it was found that, the most noticed impairment after stroke were recognized to be weakness in upper and lower limb, urinary symptoms, problem swallowing, altered conscious level and reduced thinking capacity. Patients suffering from UL weakness were more than lower limb weakness which was 77% and 72% respectively (Lawerence et al., 2001)

It was stated that by the end of 3 months, patient who suffered stroke regain their function and have less physical disability. In addition, scores in Barthel Index (BI) and Functional Independence Measure (FIM) show very steady improvement by three to four months, showing very least improvement. Even though patients do not need any assistance and are independent they do not seem to use the affected hand for the day to day activities. Among the stroke survivors only 25% of patients returned to the level of daily functioning (Lai, Studenski, Duncan, & Perera, 2002).

## **2.5 Upper Limb Function and Dependency in ADL**

According to a study conducted by Akbari, Ashayeri, Fahimi, & Lyden, 2011, the limited independence in ADL among stroke patient is due to motor impairment. It was seen that the physical symptoms after a stroke impacts the independence of the patient higher than other type of symptoms for example cognitive impairment.

Findings from Thrane et al., (2011) determined that there is association between affected lower limb and dependency. However, they could not find relationship between arm use and arm impairment with self-care dependency.

A study conducted by Harris & Eng (2007) found a significant connection between variables of UL impairment and ADL. Also, strong association of paretic UL strength and ADL was noted. In addition, grip strength and sensation were also considered a factor for UL performance in ADL. Whereas, increased tone and UL performance had least association. In the other hand, a study conducted by Filiatrault, Arsenault, Dutil, & Bourbonnais, found that motor functions of hand and dependency in basic ADL are poorly related.

A study conducted by Harris and Eng in 2006, found that after stroke the patient with the dominant side of the body affected showed low level of impairment than people with dominant side affected. But stated that dominance of hand does not have effect on the use of the hand in ADL (Harris & Eng, 2006).

According to a study done conducted on 2006, it was found that when dominant UL is affected by stroke, in many cases it shows less physical disability as well as patients are likely to gain more self confidence and stimulus to use the affected hand. Furthermore, patients do not get motivated when their non-dominant hand is affected after stroke making it hard to involve that limb in the treatment (Harris & Eng, 2006).

Lang et al., (2007) during their study determined that the use of unaffected UE was less in hemiparetic group compared to normal individual. However, it also stated that there is no difference between use of affected and unaffected UE in hemiparetic group. Hence, it was seen that when there is no significant difference between the use of unaffected UL and the affected hand. In context of FIM scores, the relationship was found to be high between UE use and FIM motor and FIM UE scores. Therefore, UE use was used more with individual having greater independence, mobility and self-care.



### 3.1 Introduction

Research methodology is the methods which are used to collect data from population to solve a problem. This chapter describes the procedures for conducting the study. **Section 3.2** illustrates the conceptual framework and the variables used. **Section 3.3** highlights the objectives of the study. **Section 3.4, 3.5, 3.6, 3.7** describes the study design, study population, study site and study period respectively. **Section 3.8** shows the appropriate sample size calculation and hence gives the sample size for the study. **Section 3.9** explains the inclusion and exclusion criteria of the study. Sampling technique is described in **Section 3.10**; convenience sampling technique was used in this study. Likewise, **Section 3.11** describes the data collection tools used and **Section 3.12** states the data collection techniques used in the study. **Section 3.13** describes the data management and analysis of this study. Here, analysis used in the study is explained with proper reasoning. **Section 3.14** provides the information about the quality control and quality assurance of the data. This chapter ends with **Section 3.15** in which information about the ethical consideration are described.

## 3.2 Conceptual Framework

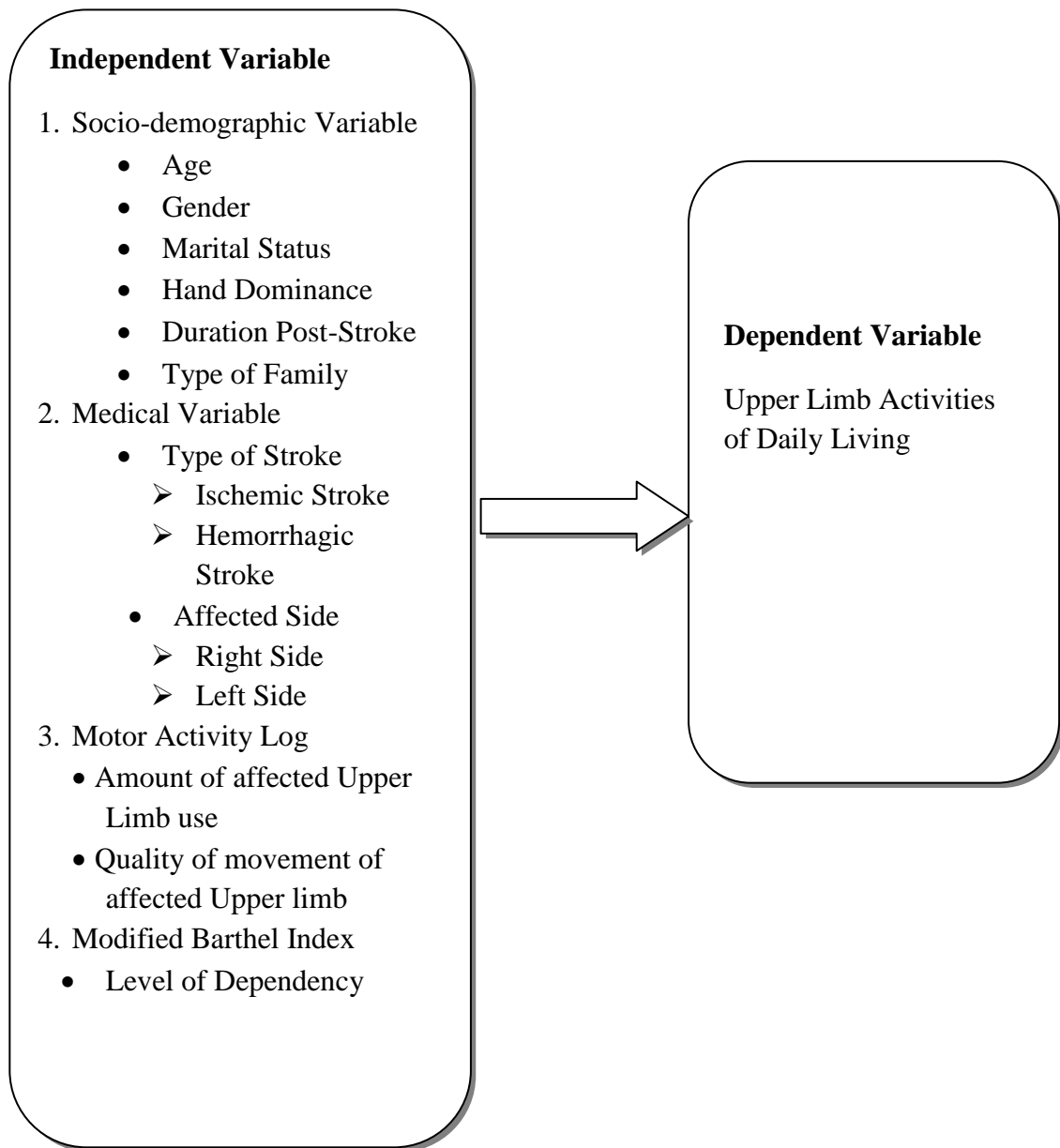


Figure 3.2: Conceptual Framework

### **3.3 Study Objectives**

#### **General Objective**

- To identify the status of Upper Limb Activities of Daily Living among Stroke patients

#### **Specific Objectives**

- To assess the amount of arm use and quality of arm use.
- To determine the level of dependency in ADL that involves hand use.
- To compare the difference in use of affected dominant and non-dominant hand after stroke.
- To find the association between UL use and dependency among stroke survivors.
- To find the relationship between demographic variable (age, gender, type of stroke) and level of dependency.

### **3.4 Study Design**

Study used a cross-sectional design to collect quantitative information about different variable that comes in play in the study. The study focuses on determining the status of Upper Limb use in patients with stroke and their level of dependence in ADL related to UL.

### **3.5 Study Population**

Stroke patients were included in this study were taking treatment from the out-patient neurological department, stroke rehabilitation unit and occupational therapy department of CRP, Bangladesh.

### **3.6 Study Area/Site**

The samples were collected from the out-patient department of CRP, Savar, Bangladesh.

#### **3.6.1 Centre for the Rehabilitation of the Paralyzed, Savar, Dhaka, Bangladesh**

CRP is a non-profitable institution working for the betterment and growth of the health care professionals in Bangladesh which provides medical services like Physiotherapy, Occupational Therapy, Speech and Language Therapy both indoor and outdoor.

### **3.7 Study Period**

This study extended from April 2018 to June 2019.

- Proposal Writing: 1<sup>st</sup> April 2018- 1<sup>st</sup> July 2018.
- Ethical Approval: 19<sup>th</sup> September 2018
- Data collection starting date: 1<sup>st</sup> December 2018
- Data collection end date: 28<sup>th</sup> February 2019.
- Ending Date for Research: 30<sup>th</sup> June 2019

### **3.8 Sample Size**

There is no documented prevalence of Stroke in Bangladesh. So, sample size was estimated according to the following criteria. The expected prevalence was taken to be 50%. The confidence interval was 95% and 5% error level. The formula used for sample size determination was as follows:

Sample size=  $z^2 p (1-p)/d^2$  where,

$z= 1.96$  (statistics for a level of confidence of 95%)

$p= 0.5$  (50% prevalence)

$d=0.05$  (precision of 5%)

$n= (1.96)^2 * 0.5(1-0.5)/ (0.05)^2$

$n=384$

The use of 50% prevalence gives large number of sample i.e. 384, which was not possible to collect from selected centre and due to limited time and limited patients. So, the collected sample was 65.

### **3.9 Inclusion and exclusion Criteria**

#### **3.9.1 Inclusion Criteria**

- Age – 18 and above
- Only one incidence of Stroke.
- Sub-acute and chronic patients with stroke.

### **3.9.2 Exclusion Criteria**

- Patient with complete paralysis of affected UL
- Neurologic condition other than stroke
- Patients who are bed-ridden

### **3.10 Sampling Techniques**

The participants for the study were collected by using convenience sampling. In this method the samples are chosen based on investigators feasibility and also according to the inclusion and exclusion criteria set by the researcher.

### **3.11 Data Collection Tool/Materials**

Questionnaire method was used to collect the data from the patients. The questionnaire used in the study was chosen after reviewing literature regarding UL function and level of dependency after stroke. The questionnaire was divided into 4 parts which included socio-demographic information of the participants; second part constitutes medical information about the respondents. The third and fourth part was standardized questionnaire which was translated to native language i.e. Bengali and pilot testing was done before the data collection after which the irrelevant questions were omitted and in some condition it was modified.

**3.11.1** The **socio-demographic questionnaire** included information about the participants like age of the patient, marital status, educational status, occupation, hand dominance of the patient before stroke, duration on post stroke, etc. The medical information about the patients was included in the medical information section which included: type of stroke, affected side of the body, other medical history etc.

**3.11.2** The **Motor Activity Log (MAL)** was used in measuring the use of participant's performance in daily activities. It consists of semi-structured questions which include 30 ADL activities like eating food, putting buttons. The scoring consist of 2 scales, Amount Scale and How Well Scale which measures amount of hand use in that activity and quality of movement of hand to perform that activity. It is widely used in stroke patients to measure outcome of upper limb use (Lang, Bland, Bailey, Schaefer, & Birkenmeier, 2013). This questionnaire is an essential measure which helps to know the amount of

affected hand use in day to day activities. It is considered to be different than other tools because it takes into account only those activities performed by affected hand where normal hand does not have any part. The MAL is known to show high internal consistency and inter-rater reliability with Cronbach's alpha  $\geq 0.88$  and ICC=0.90-0.94 (Van der Lee, Beckerman, Knol, De Vet, & Bouter, 2004). However, for the translated version of this questionnaire Chronbach's alpha is 0.98.

**3.11.3 The Modified Barthel Index** is most used scales that help to determine dependency patients suffering from stroke in daily activities which includes 10 basic things of ADL. It shows high reliability with ICC=0.94 (Hsueh, Lee, & Hsieh, 2001). The translated version of the questionnaire used in this study attained Chronbach's alpha 0.67. The highest score is 100 which indicate that the individual is totally independent in daily activities while low score indicating total dependence of the patient (Sulter, Steen, & De Keyser, 1999).

However, for this study activities which are related to Upper Limb were included in this study which is feeding, grooming, bathing and dressing. The total score for the four components is 30; higher score indicating better degrees of function and low score indicate that the patient is dependent in the above mentioned activities.

### **3.12 Data Collection Technique**

After the translation of the questionnaire, pilot study was done among 7 patients with stroke according to the inclusion and exclusion criteria to validate the translated questionnaire. From the study it was observed that some of the questions were not relevant to the context of Bangladesh and needed modification was done accordingly. From the pilot study necessary correction was done which ensured that there are no double meaning questions, ambiguous questions that could confuse and mislead the respondent.

The researcher started data collection after approval of study by the Institutional Review Board review (IRB) of Bangladesh Health Professions Institute (BHPI) and Dhaka University. After the ethical approval permission was taken from the head of Department of Physiotherapy, CRP, Savar for collection of data. During the data collection, the purpose of the study, information of the researcher was explained briefly to the

participants and was asked for the consent to participate in the research. The researcher was not native Bengali speaker so; assistant collected the data with the assistance of the researcher. The data collection was done through face to face interview and was explained properly if they did not understand the question. The scoring of the questionnaire was explained properly before asking any questions. Also, if the respondent hesitated to answer the questions were skipped. The respondent was assured about the privacy and confidentiality.

### **3.13 Data Management and Analysis**

Analyses were performed using Computer statistical analysis using Statistical Package for social science (SPSS) version 16 and Microsoft Excel spreadsheet. The collected data was reviewed, recorded and entered in SPSS version 16 and analysis was done using it. The large data were recorded into simplified data for easy analysis. For example, age was recorded into categories. The reliability test of questionnaire was done in SPSS to ensure internal validity.

Descriptive statistics were used to analyze the continuous data and presented as mean and standard deviation. The categorical data were presented in form of percentage which was used to create charts, graphs and some in tabulated forms. The difference between dominant and non-dominant hand use in ADL was done using non-parametric test (Mann-Whitney Test) because the study data did not meet the assumptions for parametric test (t test) was not met. Similarly, to find the association between two variables Spearman's Rank Correlation was used as the assumption for parametric test (Pearson's Correlation) was not met. The p-value which is less than 0.05 were considered to be statistically significant (Pallant, 2011).

### **3.14 Quality control and Assurance**

To ensure and improve the quality of the study, first of all questionnaire was translated according to WHO guidelines i.e. first in the national language that is Bengali language following the standard procedure of linguistic validation.

For translation, two individuals who were fluent in both languages were assigned for forward translation. They prepared two versions of questionnaires then they sat together and discussed to come up with one first version of translated questionnaire. Then

this translated version was provided to another person who is fluent in both languages and who have not seen the original copy of questionnaire for backward translation. Then all three translators sat together and consensus was be drawn with final version of translated questionnaires in Bengali language. Before starting data collection procedures, pilot study was conducted for the questionnaire to ensure the face validity of the questionnaire. Filled questionnaire is safely kept. The data collected was be reviewed, recorded and entered into the SPSS program to reduce the human errors that are likely to occur while entering and analysis of the data collected.

### **3.15 Ethical Consideration**

This study was conducted following the standard guidelines of ethical consideration. WHO guidelines were followed in this study. Firstly, prepared research proposal was submitted to the concerning authority after getting approval from course coordinator of Department of Masters in Rehabilitation Science and supervisor. Ethical approval was taken from Institutional Review Board review (IRB) of Bangladesh Health Professions Institute (BHPI) for conduction of research.

After getting approval, research proposal was submitted to Ethical Review Board (ERB) of to conduct the research in CRP, Bangladesh. Informed consent as well as questionnaires in both Bengali and English language was submitted along with proposal. Individual informed consent was taken from respondent before starting data collection. The respondents were informed of his right to leave or not give answer if he was not willing to answer any question within the questionnaire. Participants were not forced or coerce to answer the questions if they were not willing to. Confidentiality and anonymity of the information provided by patient will be maintained. It is protected by the law “right to privacy” which prevents the researcher from disclosing any direct information about the participants of the research.



### 4.1 Introduction

This section gives insight about the result of this study. The results are shown based upon the study objectives. The obtained results are represented in tables and figures accordingly. Section 4.2 shows the result of socio-demographic as well as clinical characteristics of the study participants. Section 4.3 describes the descriptive statistics of scores of the MAL and modified Barthel Index. Section 4.4- 4.7 illustrates the results of Spearman rho correlation and Mann-Whitney U test to fulfill the objectives.

### 4.2 Socio-demographic Characteristics of the Respondents

The study included 65 patients with stroke and is taking treatment in the out-patient department of the CRP.

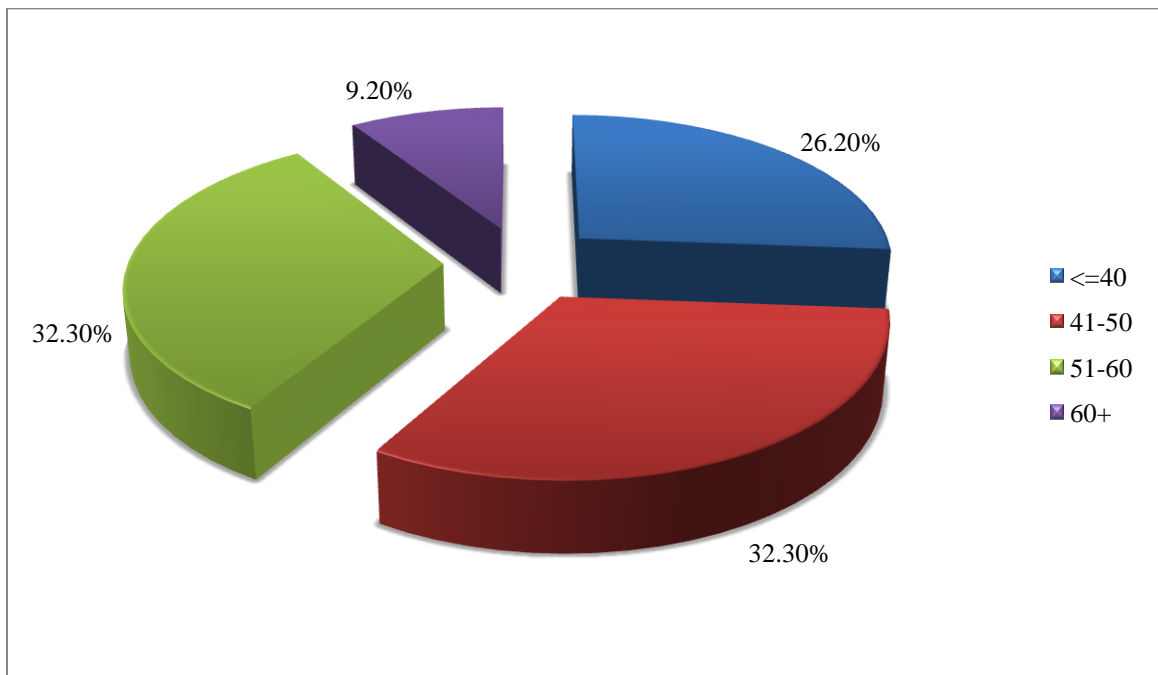
**Table 4.1:** Frequency Distribution of Socio Demographic Data

| Characteristics             | Number        | Minimum-<br>Maximum | M±SD              |
|-----------------------------|---------------|---------------------|-------------------|
| <b>Age of Participants:</b> | 65            | 28-80               | 49.11±10.747      |
| <b>Duration Post Stroke</b> | 65            | 3-36 months         | 9.75±8.24         |
|                             | <b>Number</b> |                     | <b>Percentage</b> |
| <b>Gender</b>               |               |                     |                   |
| Male                        | 46            |                     | 70.8 %            |
| Female                      | 19            |                     | 29.2 %            |
| <b>Type of Family:</b>      |               |                     |                   |
| Nuclear Family              | 49            |                     | 75.4 %            |
| Joint Family                | 16            |                     | 24.6 %            |

Note: M=Mean, SD=Standard Deviation

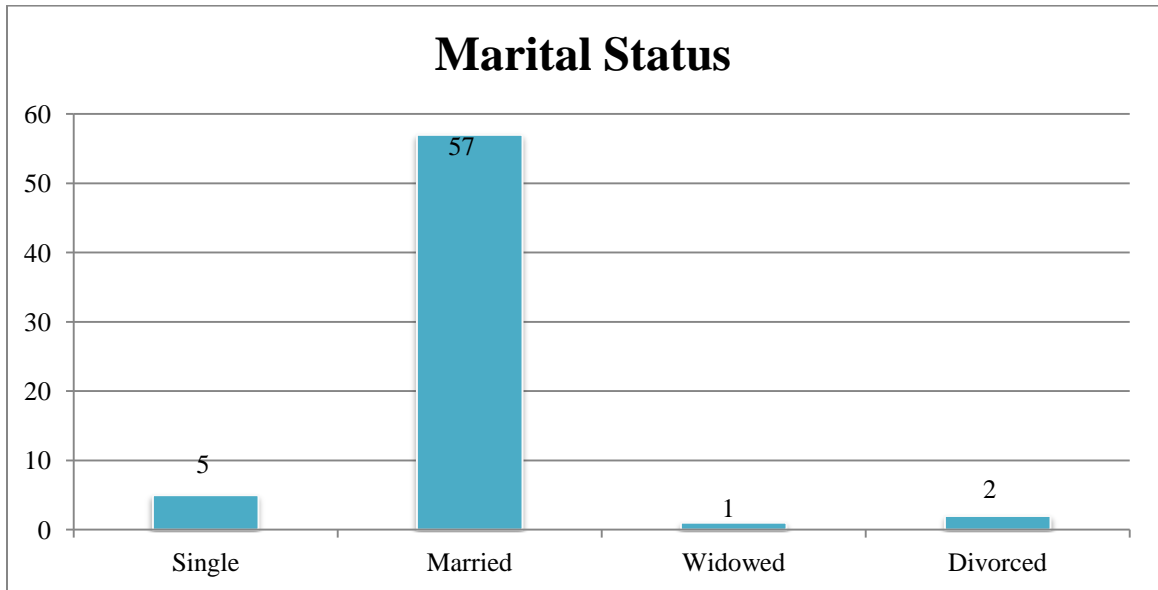
The frequency **Table 4.1** shows the socio-demographic variables of the patient. Patient with sub acute and chronic stroke took part in the study. However, the patients who participated in the study were from 3 months to 36 months after stroke. The mean

duration of post stroke of the patients is 9.75 months with standard deviation 8.24. As, shown in the **table 4.1** majority of patient were male (n=46) compared to females (n=19). In addition, from the data it was evident that most of the patients had nuclear family (n=49) and number of patients who had joint family (n=16) is comparatively less. The mean age of the study samples was 49.11 years (SD-10.75). The youngest participant included in the study was 28 years old while the participant who was oldest was 80 years old. The age of the patient is illustrated in the **Figure 4.1** below. From the figure it is clear that most of the patient is in age group 40-60 which is 32.3 % each category. There are very few participants of age 60 and above were 9.2% and the respondents who were aged 40 and below were 26%.

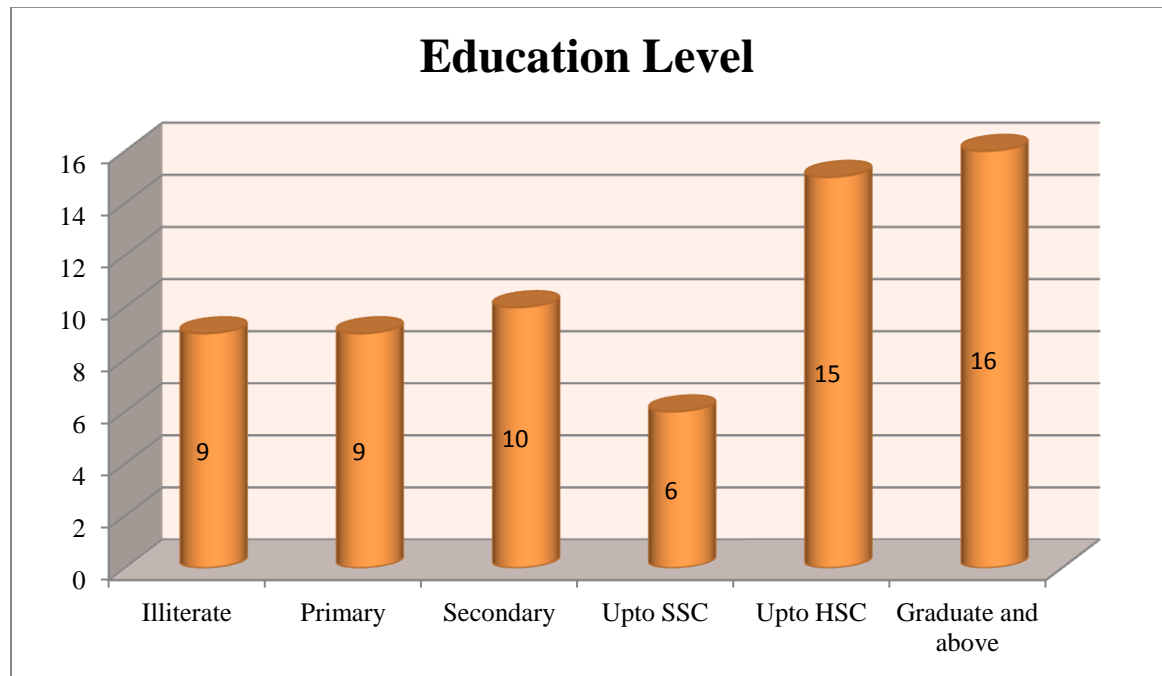


**Figure 4.1:** Age of the participants

Information about the marital status of the participants is illustrated in **Figure 4.2**. From the total of 65 participants only one participant was widowed and most of the participants were married which was 57. There were only 5 participants who were single.



**Figure 4.2:** Marital Status of participants



**Figure 4.3:** Educational Level of Participants

A total of 16 participants had completed graduate and above followed by 15 participants who had completed HSC education. The number of illiterate and participants who had completed primary education were 9. This information is illustrated in the **Figure 4.3**.

**Table 4.2:** Frequency Distribution of Clinical Characteristics of Stroke Patients

| <b>Variable</b>            | <b>Number</b> | <b>Percentage</b> |
|----------------------------|---------------|-------------------|
| <b>Hand Dominance</b>      |               |                   |
| Right                      | 65            | 100 %             |
| Left                       | 0             | 0 %               |
| <b>Type of Stroke</b>      |               |                   |
| Ischemic Stroke            | 23            | 35.4 %            |
| Hemorrhagic Stroke         | 42            | 64.6 %            |
| <b>Affected Upper Limb</b> |               |                   |
| Right                      | 35            | 53.8 %            |
| Left                       | 30            | 46.2 %            |

**Table 4.2** describes the frequency distribution of other variables of the study. All the participants were right hand dominant before they suffered stroke. Among the total of 65 patients 23 patients were recorded to have ischemic stroke whereas, 42 patients were recorded to have hemorrhagic stroke. The number of patients with right upper limb affected was 35. Likewise, number of participants with left upper limb affected was 30. So, it can be said that 35 patients had affected dominant UL and 30 patients had non-dominant UL affected.

### 4.3 Score of MAL and Modified Barthel Index

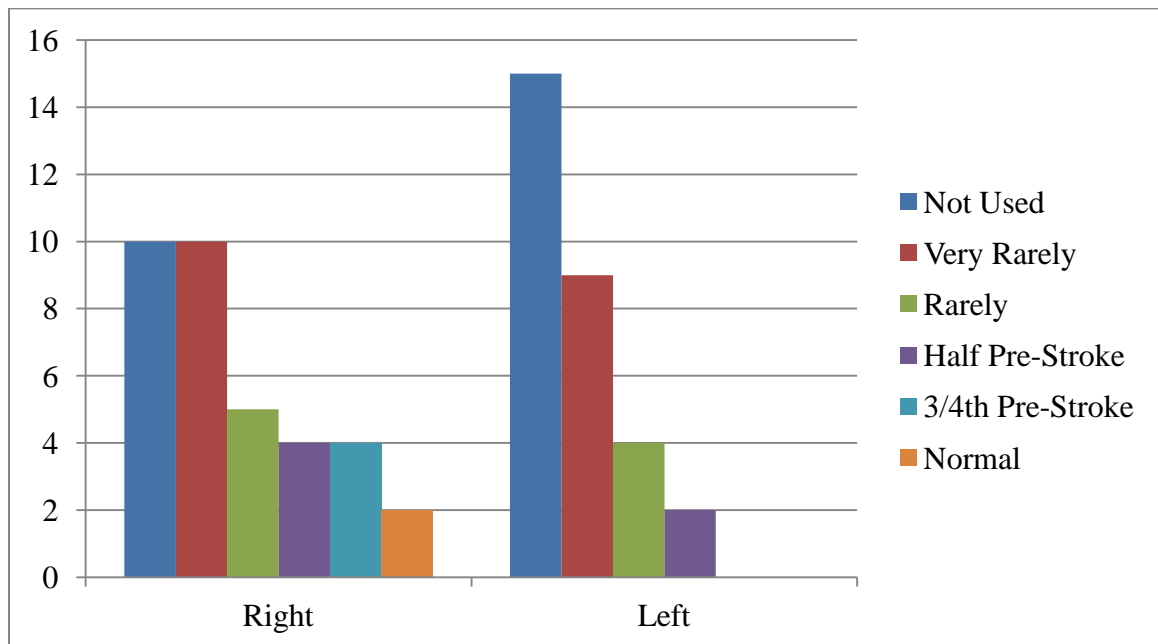
**Table 4.3:** Frequency Distribution of Motor Activity Log and Modified Barthel Index

| Scale                         | Frequency | Percentage | M ±SD     |
|-------------------------------|-----------|------------|-----------|
| <b>Amount Scale</b>           |           |            |           |
| Not used                      | 25        | 38.5 %     | 1.60±1.38 |
| Very Rarely                   | 19        | 29.2 %     |           |
| Rarely                        | 9         | 13.8 %     |           |
| Half Pre-Stroke               | 6         | 9.2 %      |           |
| 3/4 <sup>th</sup> Pre-Stroke  | 4         | 6.2 %      |           |
| Same as Pre-Stroke            | 2         | 3.1 %      |           |
| <b>How Well Scale</b>         |           |            |           |
| Not Used                      | 31        | 47.7 %     | 1.03±0.31 |
| Very Poor                     | 14        | 21.5 %     |           |
| Poor                          | 10        | 7 %        |           |
| Fair                          | 7         | 10.8%      |           |
| Almost Normal                 | 1         | 1.5 %      |           |
| Normal                        | 2         | 3.1 %      |           |
| <b>Modified Barthel Index</b> |           |            |           |
| Total Dependent               | 0         | 0 %        |           |
| Severe Dependent              | 17        | 26.2 %     |           |
| Moderate Dependent            | 26        | 40.0 %     |           |
| Slight Dependent              | 1         | 12.3 %     |           |
| Independent                   | 14        | 21.5 %     |           |

Note: M=Mean, SD=Standard Deviation

**Table 4.3** shows the frequency of patients for Motor Activity Log (Amount Scale and How Well scale) and Modified Barthel Index. In amount scale, there was more number of patients who did not use their affected arm during ADL while very few patients use their affected arm same as before stroke. Out of 65 patient, 25 patients did not use their affected arm for ADL while only 2 patients used their arm for ADL same as pre-stroke. The mean score of the amount scale is 1.60 with SD 1.38. How Well Scale measures the quality of movement of affected arm. From the results it was seen that very few patients (n=2) had normal movement while patients who did not use their affected arm was highest (n=31). The mean score of how well scale is 1.03 with SD 0.31.

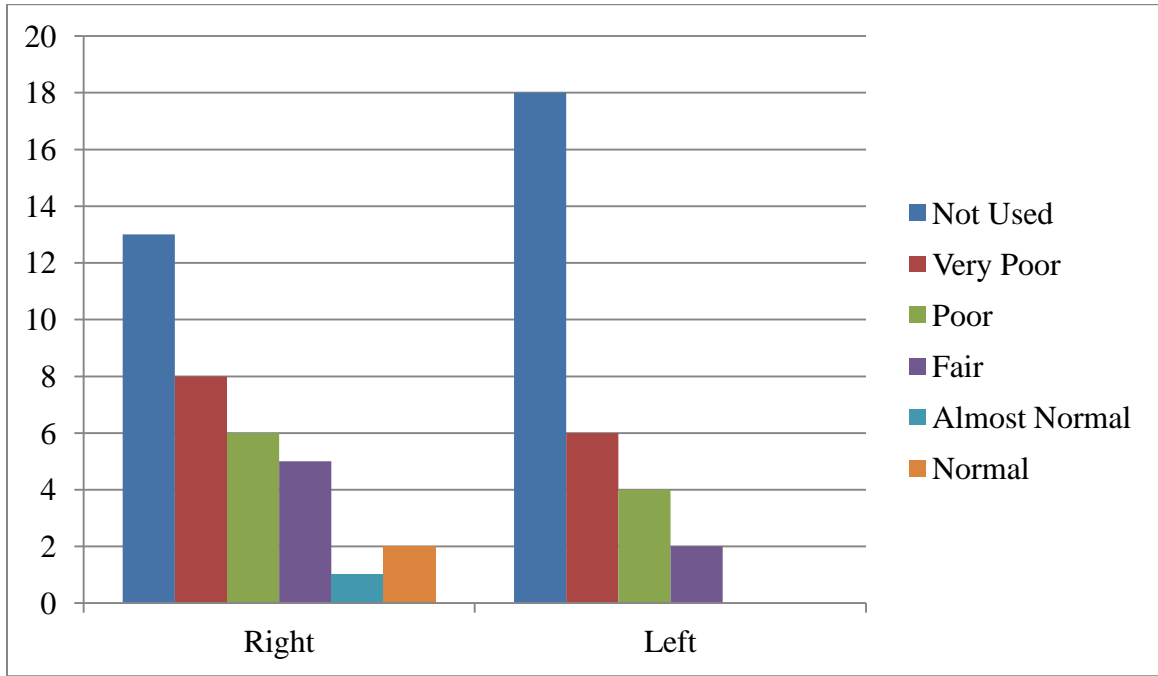
The Modified Barthel Index is commonly used scale that measure disability or dependence in ADL among stroke patients. It was found that there were no patients who were completely dependent in ADL. The number of patients who were independent was 14 while only 1 patient was found to be slight dependent. More number of patients were moderate dependent in the ADL.



**Figure 4.4:** Amount of UL use in patient in relation to dominance of hand

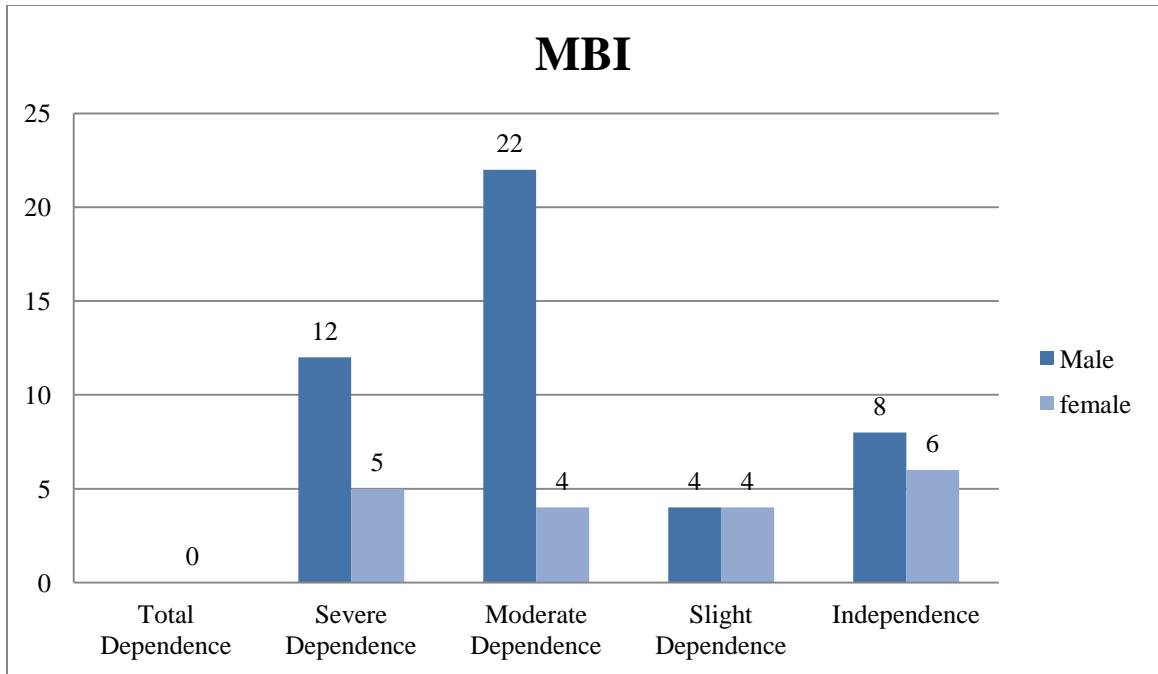
The given figure illustrates the amount of UL use in patient with right and left side affected. From the figure it is clear that 15 patient with left UL affected did not used their arm for ADL while only 10 patients with right side UL affected did not used their arm for

ADL. There were no patients with left UL affected who used their arm same as pre stroke while number patients with right UL affected who used their arm same as pre stroke and 3/4<sup>th</sup> pre stroke was 2 and 4 respectively.



**Figure 4.5:** How Well Score of patient with right and left hand affected

The how well scale scores with affected UL is shown in the **Figure 4.5**. There are no patients with normal movement in left UL affected while 2 patients used their arm almost normal as pre stroke. Additionally, it was seen that the number of patients who did not use their affected left UL for ADL was 18 while number of right UL affected who did not use their arm was only 13. It was also seen that there were more number of right UL affected patient who very poor and fair quality of movement compared to left UL had affected.



**Figure 4.6:** Level of Dependency according to gender

The scores of Modified Barthel Index are categorized according to gender of the patients. There were no patients who were totally dependent in their ADL while there were 8 male and 6 female patients who are totally independent in ADL. It was evident from the graph that number of male (n=34) who were severe and moderate dependent were much higher than females (n=9). Also it was seen that there were equal number of male and female who are slightly dependent (n=4).



#### 4.4 Differences in affected hand use according to hand dominance

**Table 4.4:** Difference in amount of affected hand use according to dominance

| Affected UL  | M     | Mdn   | SD    | Mann-Whitney test |                  |
|--------------|-------|-------|-------|-------------------|------------------|
|              |       |       |       | U                 | p                |
| Dominant     | 45.40 | 35.00 | 33.75 | 321.0             | 0.007 (2 tailed) |
| Non-dominant | 23.63 | 19.50 | 21.16 |                   |                  |
| Total        | 35.35 | 28.00 | 30.45 |                   |                  |

Note: M=Mean, Mdn=Median, SD=Standard Deviation

The result of Mann-Whitney U test showed that the total score of amount of UL use in patient with dominant UL affected ( $Mdn=35.0$ ) was higher for dominant hand affected patient than the non- dominant side affected ( $Mdn=19.50$ ),  $U=321.00, z= -2.69, p=0.007, r=0.33$ . Thus there is statistically significant difference between the score of amount scale of dominant and non-dominant UL affected patients.

#### 4.5 Association between age, arm use and dependency

**Table 4.5:** Correlation between age and MAL Scores with dependency

|                   | Level of Dependency<br>Spearman's rho |
|-------------------|---------------------------------------|
| Age               | <b>-0.281*</b>                        |
| Amount of UL use  | <b>0.404**</b>                        |
| Quality of UL use | <b>0.376**</b>                        |

\* $p < 0.05$  (2 tailed), \*\* $p < 0.01$  (2 tailed)

The correlation between age and level of dependency was investigated using Spearman's rho. The results revealed there is a small, negative association among age and level of dependency  $r=-0.281, n=65, p=0.023$ . Hence we can say that with the increasing age, the score in Modified Barthel Index decreases which indicates that older patients are more dependent in ADL compared to young patients. Similarly, association between amount of UL use and level of dependency was investigated using Spearman's rho. There was an intermediate positive correlation between amount of UL use and level of dependency  $r=0.404, n=65, p=0.001$ . Hence we can say that the increase in UL use the patient

become more independent. Moreover, the association between quality of UL use and level of dependency was investigated using Spearman's rho. There was an intermediate positive correlation between quality of UL use and level of dependency  $r=0.376$ ,  $n=65$ ,  $p=0.002$ . Hence we can say that the improvement in quality of movement of UL the patient become more independent.

#### 4.6 Difference in level of dependency in relation to gender

**Table 4.6:** Difference in level of dependency in relation to gender

| Gender | M      | Mdn   | SD    | Mann-Whitney test |       |
|--------|--------|-------|-------|-------------------|-------|
|        |        |       |       | U                 | P     |
| Male   | 21.91  | 22.00 | 6.639 | 334.0             | 0.135 |
| Female | 24.21  | 28.00 | 7.099 |                   |       |
| Total  | 22.584 | 24.00 | 6.80  |                   |       |

Note: M=Mean, Mdn=Median, SD=Standard Deviation

The above table illustrates the result of Mann-Whitney U Test among difference in gender in total score of dependence. The score of Barthel Index for male ( $Mdn=22.00$ ) was lower than for females ( $Mdn=28.00$ ),  $U=334.00$ ,  $z=-1.495$ ,  $p=0.135$ ,  $r=0.185$ . Hence, there is no statistical difference in level of dependency in relation to gender.

#### 4.7 Differences in level of dependency according to type of stroke

**Table 4.7:** Difference in level of dependency according to type of stroke

| Type of Stroke | M      | Mdn   | SD   | Mann-Whitney test |       |
|----------------|--------|-------|------|-------------------|-------|
|                |        |       |      | U                 | P     |
| Ischemic       | 24.043 | 27.00 | 5.88 | 413.50            | 0.337 |
| Stroke         |        |       |      |                   |       |
| Hemorrhagic    | 21.786 | 22.50 | 7.19 |                   |       |
| Stroke         |        |       |      |                   |       |
| Total          | 22.585 | 24.00 | 6.80 |                   |       |

Note: M=Mean, Mdn=Median, SD= Standard Deviation

The above table illustrates the result of Mann-Whitney U Test among difference in type of stroke in total score of dependence. The score of Barthel Index for ischemic stroke ( $Mdn=27.00$ ) was higher than for hemorrhagic stroke ( $Mdn=22.50$ ),  $U=413.50$ ,  $z=-0.960$ ,  $p=0.337$ ,  $r=0.11$ . Hence, there is no statistical difference in level of dependency according to type of stroke.

### 5.1 Introduction

The following section presents the overall results of the current study and compares the results obtained from this study with other similar research conducted in other countries. The study aimed at exploring the status of upper limb activities of daily living among patients with stroke. **Section 5.2**, describes the socio-demographic characteristics of the participants and compare the result with other similar studies. **Section 5.3**, illustrates the scores of Motor Activity Log and Modified Barthel Index also compares with it with other studies. **Section 5.4**, describes the results of differences in use of affected hand in relation to hand dominance. **Section 5.5** explains the result of correlation between age, MAL and level of dependency and compares the result with other study results. **Section 5.6** describes the difference in level of dependency according to gender and type of stroke.

### 5.2 Socio-demographic characteristics

The majority of participants were male which was 70.8 % of the total participant while female participants were only with 29.2%, which supports the study conducted in 2012 in which it was recorded that male were affected more than female (Islam et al., 2012). Another study revealed that though women are at high risk women with stroke are not reported as much as male (Bhalla, Marin, & Preux, 2009; Vibha & Laskar, 2011).

The mean age of the study patients which was recorded in this study is 49.11 (SD-10.747) with 64.7 % of patients aged 40-60 while in another study stroke was seen to be more common in people aged 50-60 (Mohammad, 2014). On the other hand, study from Spain found out that mean age of the study participants was 68, which might be due to variance in life expectancy among developed and Bangladesh (Carod-Artal, Egido, González, & Varela de Seijas, 2000). Additionally an Indian study concluded that only 10% to 15% of stroke is seen in individuals with age 40 and less while in his study it was

seen that 27.7% of the participants were below age 40 (Mehndiratta, Khan, Mehndiratta, & Wasay, 2014).

The study participants in this study were mostly literate with very less illiterate participants. The percentage of literate patient was found to be 86.2% while only 13.8% were illiterate. Among literate the patients who received primary, secondary, completed SSC and HSC is 13.8%, 15.4%, 9.2%, 23.1%, 24.6% respectively while patient who had completed graduation and above is 24.6%. Another study done in Bangladesh by Hossain et al., 2011, revealed similar results as the number of literate people were highest with 63% of total participants. From the literate group there were 31% of participants who completed school, 19% finished college with very few participants who had done graduation was only 13% (Hossain et al., 2011).

According to Wasay et al., 2014 it was evident that the hemorrhagic stroke in South Asian studies was higher in comparison to Western countries which support this study as 65.6% of the participants had hemorrhagic stroke while 35.4% had ischemic stroke. Likewise, the same study reported that hemorrhagic stroke was more evident in Bangladesh.

According to a study conducted by Harris and Eng, 2006, 9% of the total participants were left handed but in this study there were no participants who had left hand dominance before stroke. The reason that there is no patient with left hand dominance may be due to culture of the country. Also in our study the patient who had dominant hand affected by stroke was 53.8% while in the later study the individual with dominant hand affected due to stroke was 45%. Similarly, it was seen that among the total of 65 participants, there were 35 individual with right side hemiparesis (53.8%) and patients with left side hemiparesis was 30 (46.2%) which is almost equal. Similarly, in another study it was also seen that half of the patients were right side hemipareis with 48.8% (Fujita et al., 2015).

### **5.3 Amount of Upper Limb Use and Level of Dependency**

In this study it was seen that the number of patient who did not use or used their affected UL very rarely were very high which is 38.5% and 29.2 % respectively. According to a study performed by Thrane et al., 2011 and Wu et al., 2007 revealed that patients after

stroke attack tend to use the affected arm less than usual because they use the unaffected arm for all the activities hence avoiding use of affected UL. The mean score of amount scale among the 65 participants was 1.60 with SD 1.38 while in another study by Wu et al., 2007 found the mean score for amount scale was found to be 0.80 with SD 1.38.

The percentage of total dependent participants in study conducted in 2007 was 9.6% (Lázaro, Rubio, Sánchez, & García, 2007) and another study revealed total of 7.2% (Millán-Calenti et al., 2010) of dependent participants in ADL whereas, in our study the participants who were totally dependent were 0 and hence 0% of the subjects were totally dependent on ADL. Likewise, to check difference in gender in dependency Millán-Calenti et al, 2010, revealed that number of females who were dependent in ADL constitutes 25.1% of total sample while males were only 9.5% of the total sample. Likewise, a cross-sectional study revealed that females tend to be less independent in daily activities after stroke compared to males after stroke (Whitson et al., 2010). In contrast, in this study there was more number of male who were severely and moderately dependent with 52.3% of total population while only 13.8% of female were dependent on their ADL.

#### **5.4 Differences in use of affected upper limb according to dominance of hand**

To determine the difference between individual with dominant hand affected and non-dominant hand affected in the amount of use of the hand after stroke Mann-Whitney U test was conducted. There is statistically significant difference between the score of amount scale (use of UL for ADL) of dominant and non-dominant UL affected patients. The results were as follows: ( $U=321.00$ ,  $z= -2.69$ ,  $p=0.007$ ,  $r=0.3$ ). This result is supported by a study conducted in 2006 which revealed that when the stroke affects the dominant side it shows low impairment and hence the patients show high motivation to use the affected dominant hand (Harris and Eng, 2006).

## **5.5 Relationship between age and level of dependency and MAL and level of dependency**

To establish association between age and level of dependency Spearman's rho correlation was used. It showed low negative correlation with  $r=-0.281$ ,  $p=0.023$  which shows that as age of an individual increases they score lower in the Modified Barthel Index scores which indicates that with increasing age the dependency to perform ADL decreases. It is supported by a study done by Millán-Calenti et al., 2007 in which they found negative correlation between age of the participants and the total score of ADL scale ( $r= -0.527$  and  $p<0.001$ ), which concluded that the ability to perform ADL decreases with the increasing age and vice versa.

In this study correlation between UL use and level of dependency in ADL was done by Spearman's rho correlation which showed intermediate positive correlation ( $r=0.404$ ,  $p=0.001$ ). Also, association between quality of UL use and level of dependency was checked using Spearman's rho correlation which revealed there was intermediate positive correlation ( $r=0.376$ ,  $p=0.002$ ). The result indicates that when as a participant's use and quality of movement of UL increases the patient score higher in the scale which means they are independent when the UL use is increased. Similarly, another study conducted by Lang et al., 2007, determined that the use of unaffected and affected arm in hemiparetic group is almost same, but found that there is relationship between UL use and Functional Independence Measure score. Hence, they concluded that individual with higher independence used their arm more. In contrast, Thrane et al., 2011 found there is no significant relationship between the affected upper limb impairments and ADL. It was also found that the arm mobility may influence the capacity to execute personal self-care activities because even though patients have hemiplegia most of the activities can be performed by one arm. Likewise, a study by Fujita et al., 2015 revealed that there is no correlation between the affected arm use and ADL as the day to day activities is possible to do even by only one hand.

## **5.6 Differences in level of dependency in relation to gender and type of stroke**

To explore the difference between gender and total dependence score Mann-Whitney U Test was used. It showed that there was no statistical difference between male ( $Mdn=22.00$ ) and female ( $Mdn=28.00$ ) and total score of dependency ( $U=334.00$ ,  $z=-1.495$ ,  $p=0.135$ ,  $r=0.185$ ). Hence, it can be concluded that both male and female showed same level of dependency. Whereas, Glader et al., 2003 found that females were more dependent on ADL and seek help in performing ADL. But in another study it was found that there was more number of male (29.5%) who were dependent in functional activities than female (21.5%) participants (De Campos et al., 2017).

The present study revealed that both type of stroke have similar score in Barthel Index which was investigated by Mann-Whitney U Test. Thus, it states that there is no difference in level of dependency between hemorrhagic and ischemic stroke ( $U=413.50$ ,  $z=-0.960$ ,  $p=0.337$ ,  $r=0.11$ ). In contrast to the finding of this study, De Campos et al., 2017 found that patient with hemorrhagic patient had increased functional dependency than that of ischemic stroke. In addition the study also found that patient with hemorrhagic stroke did not recover well as ischemic stroke in context of dependency.



## 6.1 Introduction

The summary of the study is given in this chapter. **Section 6.2** provides a short idea of the results and findings of the study. There are few recommendations for the different stakeholders which is included in the **Section 6.3**. The strength and limitation of the study is stated in the **Section 6.5**. At the end of this chapter suggestion for future research is given which is incorporated in **Section 6.6**.

## 6.2 Conclusion

It was highlighted that stroke is among the many major issues confronted by people in the South Asian countries. In Bangladesh it accounts for 2.55% of total disabilities. The most common health related consequence that result from attaining stroke is impairment in motor functions which affects around half of the total stroke patient. It can be caused by ischemic or hemorrhagic stroke which results in reduced ability to complete day-day activities. Majority of the patient suffer from upper limb impairment and limiting the use of hand hence limiting their independence. The main intent of present investigation was to explore the status upper limb day to day related activities which includes amount of hand use, how well the patient use their hand and how much dependent they are to do these activities. The study revealed that most of the patient was of age group 40-60 years. In the mean time it showed that there are very patients who use their hand as same as before stroke while there were no patients who were totally dependent in the activities. It showed that the using affected dominant hand and affected non-dominant hand after stroke has a significant difference. Similarly, it revealed that there is some association between age, degree of hand usage and how well they can move the arm with level of dependency. Whereas, there was no significant difference found in male and female and level of dependency and type of stroke and dependency score.

Hence, we can say that if a dominant hand is affected by stroke the patient tend to use it more than when non-dominant hand is affected after stroke. From this study we can

conclude that the more they use their arm which is affected by stroke that results in increase in the independence of patient while with increasing age the independency of patient decreases. Also, we can say that dependency is not affected by gender or type of stroke.

### **6.3 Recommendations**

Professionals- The health professionals will be aware about the status of upper limb use after stroke. So, they can focus on the treatment plan which might help the patient to overcome these problems. It was found that the affected arm is not used as before stroke due to the use of unaffected arm in day to day activities so treatment focused on making the affected hand functional can be given.

The participant's upper limb status after stroke was known from this study. The patient can be motivated to use the affected arm in daily activities.

The centre CRP can use the information from the study and do further research with the results found.

### **6.4 Contribution**

**Methodology-** This is the first type of study done in CRP hence it is contribution to the existing literature of CRP.

**Policy-** With the study findings of this research the rehabilitation centre can strengthen the treatment protocols of the patient with stroke.

### **6.5 Strengths and Limitations**

#### **6.5.1 Strength of the study**

This study gives the insight about the condition of upper limb after a stroke and also it gives other information about the arm use and quality of arm movement and the level of dependency to perform daily activities. The information from this research can be used as baseline data to conduct other research with the same area. This study also found the associated factors for dependency after stroke and also difference in hand dominance on use of affected arm which is not done in CRP before. Hence, the data from this study can be used for future research purpose.

### **6.5.2 Limitation of the study**

**Researcher-** Due to language barrier for researcher, several data collectors had to be recruited which may lead to bias.

**Participants-** The sample in this study showed wide range of stroke characteristics.

**Data-** The collected was not normally distributed hence the parametric tests were not possible which is a huge limitation to this study.

Participants of this study were limited to a single rehabilitation centre of the country. Thus, the findings might not be representative of the overall stroke patients.

**Methodological Limitation-** The inclusion and exclusion criteria limited the sample size. If the sample size could be increased sufficiently a more exact result may be extracted which could be more representative.

### **6.6 Future Research Direction**

Prospective studies to further explore upper limb impairment on hemiparetic upper limb use and dependency on activities related to daily living can be done. Research study in this aspect can be conducted in future with review of inclusion and exclusion criteria. Further study can be done to find relation between other aspects of UL impairment (tone, spasticity, muscle power) and level of dependency. In addition, the data was only collected from one centre so the sample size was less and hence I suggest future researcher to collect data from other centers too. If the study is done with large sample size the result can be generalized.

## REFERENCES

- Akbari, S., Ashayeri, H., Fahimi, M. A., & Lyden, P. D. (2011). The correlation of independency in activities of daily living performance with cognitive status and the intensity of neurological impairment in right-handed stroke patients. *NeuroRehabilitation*, *29*(3), 311-316. doi:10.3233/NRE-2011-0707
- Andersen, K. K., Olsen, T. S., Dehlendorff, C., & Kammergaard, L. P. (2009). Hemorrhagic and ischemic strokes compared. *Stroke*, *40*(6), 2068-2072. doi:10.1161/strokeaha.108.540112
- Barreca, S., Wolf, S. L., Fasoli, S., & Bohannon, R. (2003). Treatment interventions for the paretic upper limb of stroke survivors: A critical review. *Neurorehabilitation and Neural Repair*, *17*(4), 220-226. doi:10.1177/0888439003259415
- Basri, R., Shaik, M. M., Alam, M. K., Mondol, M. B., Mohammad, Q. D., & Gan, S. H. (2013). Waist to hip ratio, waist to height ratio and body mass index predict Stroke risk in a Bangladeshi population. *International Medical Journal*, *20*(6), 740 - 743. Retrieved from <https://www.researchgate.net/publication/259694792>
- Beebe, J. A., & Lang, C. E. (2009). Relationships and responsiveness of six upper extremity function tests during the first six months of recovery after Stroke. *Journal of Neurologic Physical Therapy*, *33*(2), 96-103. doi:10.1097/npt.0b013e3181a33638
- Benjamin, E. J., Blaha, M. J., Chiuve, S. E., Cushman, M., Das, S. R., Deo, R., & Jiménez, M. C. (2017). Heart disease and stroke statistics—2017 update: A report from the American heart association. *Circulation*, *135*(10), 146-603. doi:10.1161/cir.0000000000000491

- Bhalla, D., Marin, B., & Preux, P. M. (2009). Stroke profile in Afghanistan, Nepal, and India. *Neurology Asia*, *14*(2), 87-94. doi:10.1016/j.neurol.2012.01.403
- Carod-Artal, J., Egido, J. A., González, J. L., & Varela de Seijas, E. (2000). Quality of life among stroke survivors evaluated 1 year after stroke. *Stroke*, *31*(12), 2995-3000. doi:10.1161/01.str.31.12.2995
- De Campos, L. M., Martins, B. M., Cabral, N. L., Franco, S. C., Pontes-Neto, O. M., Mazin, S. C., & Dos Reis, F. I. (2017). How many patients become functionally dependent after a stroke? A 3-year population-based study in Joinville, Brazil. *PLOS ONE*, *12*(1), e0170204. doi:10.1371/journal.pone.0170204
- Deoke, A., Deoke, S., Saoji, A., & Hajare, S. (2012). Profile of modifiable and non-modifiable risk factors in stroke in a rural based tertiary care Hospital – A case control study. *Global Journal of Health Science*, *4*(3), 158-163. doi:10.5539/gjhs.v4n3p158
- Dobkin, B. H. (2005). Rehabilitation after stroke. *New England Journal of Medicine*, *352*(16), 1677-1684. doi:10.1056/NEJMcp043511
- Faria-Fortini, I., Michaelsen, S. M., Cassiano, J. G., & Teixeira-Salmela, L. F. (2011). Upper extremity function in stroke subjects: Relationships between the international classification of functioning, disability, and health domains. *Journal of Hand Therapy*, *24*(3), 257-265. doi:10.1016/j.jht.2011.01.002
- Feigin, V. L., Lawes, C. M., Bennett, D. A., Barker-Collo, S. L., & Parag, V. (2009). Worldwide stroke incidence and early case fatality reported in 56 population-based studies: a systematic review. *The Lancet Neurology*, *8*(4), 355-369. doi:10.1016/s1474-4422(09)70025-0

- Filiatrault, J., Arsenault, A. B., Dutil, E., & Bourbonnais, D. (1991). Motor function and activities of daily living assessments: A study of three tests for persons with hemiplegia. *American Journal of Occupational Therapy*, *45*(9), 806-810.  
doi:10.5014/ajot.45.9.806
- Fujita, T., Sato, A., Togashi, Y., Kasahara, R., Ohashi, T., Tsuchiya, K., ... Otsuki, K. (2015). Identification of the affected lower limb and unaffected side motor functions as determinants of activities of daily living performance in stroke patients using partial correlation analysis. *Journal of Physical Therapy Science*, *27*(7), 2217-2220. doi:10.1589/jpts.27.2217
- Glader, E., Stegmayr, B., Norrving, B., Terént, A., Hulter-Åsberg, K., Wester, P., & Asplund, K. (2003). Sex differences in management and outcome after stroke. *Stroke*, *34*(8), 1970-1975. doi:10.1161/01.str.0000083534.81284.c5
- Harris, J. E., & Eng, J. J. (2006). Individuals with the dominant hand affected following stroke demonstrate less impairment than those with the nondominant hand affected. *Neurorehabilitation and Neural Repair*, *20*(3), 380-389.  
doi:10.1177/1545968305284528
- Harris, J. E., & Eng, J. J. (2007). Paretic upper-limb strength best explains arm activity in people with stroke. *Physical Therapy*, *87*(1), 88-97. doi:10.2522/ptj.20060065
- Hossain, A. M., Ahmed, N. U., Rahman, M., Islam, M. R., Sadhya, G., & Fatema, K. (2011). Analysis of socio-demographic and clinical factors associated with hospitalized stroke patients of Bangladesh. *Faridpur Medical College*, *6*(1), 19-23. doi:10.3329/fmcj.v6i1.7405

- Hsueh, I. P., Lee, M. M., & Hsieh, C. L. (2001). Psychometric Characteristics of the barthel activities of daily living index in stroke patients. *Journal of Formosan Medical Association, 100*(8), 526–532. Retrieved from [http://www.fma.org.tw/jfma/PDF/2001-100/issue\\_8/Article\\_3.pdf](http://www.fma.org.tw/jfma/PDF/2001-100/issue_8/Article_3.pdf)
- Islam, M. N., Moniruzzaman, M., Khalil, M. I., Basri, R., Alam, M. K., Loo, K. W., & Gan, S. H. (2012). Burden of Stroke in Bangladesh. *International Journal of Stroke, 8*(3), 211-213. doi:10.1111/j.1747-4949.2012.00885.x
- James, S., Ziviani, J., & Boyd, R. (2013). A systematic review of activities of daily living measures for children and adolescents with cerebral palsy. *Developmental Medicine & Child Neurology, 56*(3), 233-244. doi:10.1111/dmcn.12226
- Lai, S., Studenski, S., Duncan, P. W., & Perera, S. (2002). Persisting consequences of stroke measured by the stroke impact scale. *Stroke, 33*(7), 1840-1844. doi:10.1161/01.str.0000019289.15440.f2
- Lang, C. E., Bland, M. D., Bailey, R. R., Schaefer, S. Y., & Birkenmeier, R. L. (2013). Assessment of upper extremity impairment, function, and activity after stroke: foundations for clinical decision making. *Journal of Hand Therapy, 26*(2), 104-115. doi:10.1016/j.jht.2012.06.005
- Lang, C. E., Wagner, J. M., Edwards, D. F., & Dromerick, A. W. (2007). Upper extremity use in people with hemiparesis in the first few weeks after stroke. *Journal of Neurologic Physical Therapy, 31*(2), 56-63. doi:10.1097/npt.0b013e31806748bd

- Langhorne, P., Coupar, F., & Pollock, A. (2009). Motor recovery after stroke: a systematic review. *The Lancet Neurology*, 8(8), 741-754. doi:10.1016/s1474-4422(09)70150-4
- Lawrence, E. S., Coshall, C., Dundas, R., Stewart, J., Rudd, A. G., Howard, R., & Wolfe, C. D. (2001). Estimates of the prevalence of acute stroke impairments and disability in a multiethnic population. *Stroke*, 32(6), 1279-1284. doi:10.1161/01.str.32.6.1279
- Lázaro, A. A., Rubio, E. A., Sánchez, A. S., & García, J. H. (2007). Functional capacity for daily living activities among senior citizens attending community centers in the city of Zaragoza, Spain, 2005. *Revista española de salud pública*, 81(6), 625-636. doi:10.1590/S1135-57272007000600006
- Mehndiratta, M. M., Khan, M., Mehndiratta, P., & Wasay, M. (2014). Stroke in Asia: geographical variations and temporal trends. *Journal of Neurology, Neurosurgery & Psychiatry*, 85(12), 1308-1312. doi:10.1136/jnnp-2013-306992
- Mercier, L., Audet, T., Hebert, R., Rochette, A., & Dubois, M. (2001). Impact of motor, cognitive, and perceptual disorders on ability to perform activities of daily living after stroke. *Stroke*, 32(11), 2602-2608. doi:10.1161/hs1101.098154
- Miah, M. T., Hoque, A. A., Tarafder, B. K., Romel, S. M., & Hassan, M. K. (2008). Stroke in young age - Study of 50 cases. *Journal of Medicine*, 9(1), 10-15. doi:10.3329/jom.v9i1.1419
- Miah, S., Gupta, P. S., Hossain, M., Chowdhury, F. R., Nayan, M. J., & Hossain, S. S. (2012). Health seeking behavior of stroke patients: Experience from a tertiary care



centre of Bangladesh. *Pakistan Journal of Medical Sciences*, 28(3), 413-416.

Retrieved from

[https://www.researchgate.net/profile/Muhammad\\_Mosaraf\\_Hossain/publication/263026387\\_Health\\_seeking\\_behavior\\_of\\_stroke\\_patients\\_Experience\\_from\\_a\\_tertiary\\_care\\_centre\\_of\\_Bangladesh/links/00b495399925a9c3fe000000/Health-seeking-behavior-of-stroke-patients-Experience-from-a-tertiary-care-centre-of-Bangladesh.pdf](https://www.researchgate.net/profile/Muhammad_Mosaraf_Hossain/publication/263026387_Health_seeking_behavior_of_stroke_patients_Experience_from_a_tertiary_care_centre_of_Bangladesh/links/00b495399925a9c3fe000000/Health-seeking-behavior-of-stroke-patients-Experience-from-a-tertiary-care-centre-of-Bangladesh.pdf)

- Millán-Calenti, J. C., Tubío, J., Pita-Fernández, S., González-Abraldes, I., Lorenzo, T., Fernández-Arruty, T., & Maseda, A. (2010). Prevalence of functional disability in activities of daily living (ADL), instrumental activities of daily living (IADL) and associated factors, as predictors of morbidity and mortality. *Archives of Gerontology and Geriatrics*, 50(3), 306-310. doi:10.1016/j.archger.2009.04.017
- Mohammad, Q. (2014). Management of stroke - Bangladesh perspective. *Bangladesh Medical Journal*, 42(1), 34-37. doi:10.3329/bmj.v42i1.18979
- O'Donnell, M. J., Xavier, D., Liu, L., Zhang, H., Chin, S. L., Rao-Melacini, P., ... Yusuf, S. (2010). Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the interstroke study): a case-control study. *The Lancet*, 376(9735), 112-123. doi:10.1016/s0140-6736(10)60834-3
- Ovbiagele, B., & Nguyen-Huynh, M. N. (2011). Stroke epidemiology: Advancing our understanding of disease mechanism and therapy. *Neurotherapeutics*, 8(3), 319-329. doi:10.1007/s13311-011-0053-1
- Pallant, J. (2011). *SPSS Survival Manual: A step by step guide to data analysis using the SPSS* (4th ed.). Crows Nest, Australia: Allen and Unwin.

- Pandit, A., Arjyal, A., Farrar, J., & Basnyat, B. (2006). Nepal. *Practical Neurology*, 6(2), 129-133. doi:10.1136/jnnp.2006.089060
- Patra, J., Taylor, B., Irving, H., Roerecke, M., Baliunas, D., Mohapatra, S., & Rehm, J. (2010). Alcohol consumption and the risk of morbidity and mortality for different stroke types - a systematic review and meta-analysis. *BMC Public Health*, 10(1), 1-12. doi:10.1186/1471-2458-10-258
- Prasad, K., Vibha, D., & Meenakshi. (2012). Cerebrovascular disease in south Asia – part I: A burning problem. *JRSM Cardiovascular Disease*, 1(7), 1-7. doi:10.1258/cvd.2012.012025
- Raghavan, P. (2007). The nature of hand motor impairment after stroke and its treatment. *Current Treatment Options in Cardiovascular Medicine*, 9(3), 221-228. doi:10.1007/s11936-007-0016-3
- Roger, V. L., Go, A. S., Lloyd-Jones, D. M., Benjamin, E. J., Berry, J. D., Borden, W. B., ... Turner, M. B. (2012). Heart disease and stroke statistics—2012 update. *Circulation*, 125(1). doi:10.1161/cir.0b013e31823ac046
- Sacco, R. L., Adams, R., Albers, G., Alberts, M. J., Benavente, O., Furie, K., & Johnston, S. C. (2006). Guidelines for prevention of stroke in patients with ischemic stroke or transient ischemic attack: a statement for healthcare professionals from the American Heart Association/American Stroke Association Council on Stroke: co-sponsored by the Council on Cardiovascular Radiology and Intervention: the American Academy of Neurology affirms the value of this guideline. *Circulation*, 113(10), 409-449. Retrieved from <https://www.ahajournals.org/doi/pdf/10.1161/circ.113.10.e409>

- Sacco, R. L., Kasner, S. E., Broderick, J. P., Caplan, L. R., Connors, J. J., Culebras, A., ... Vinters, H. V. (2013). An updated definition of stroke for the 21st century. *Stroke*, *44*(7), 2064-2089. doi:10.1161/str.0b013e318296aeca
- Samsa, G. P., & Matchar, D. B. (2004). How strong is the relationship between functional status and quality of life among persons with stroke? *The Journal of Rehabilitation Research and Development*, *41*(3A), 279. doi:10.1682/jrrd.2003.08.0117
- Shaik, M. M., Loo, K. W., & Gan, S. H. (2012). Burden of stroke in Nepal. *International Journal of Stroke*, *7*(6), 517-520. doi:10.1111/j.1747-4949.2012.00799.x
- Shrestha, A., Shah, D. B., Koirala, S. R., Adhikari, K. R., Sapkota, S., & Regmi, P. R. (2011). Retrospective analysis of stroke and its risk factors at Bir Hospital. *Post-Graduate Medical Journal of NAMS*, *11*(2), 28-30. Retrieved from <https://pmjn.org/index.php/pmjn/article/view/58>
- Stephens, S., Kenny, R. A., Rowan, E., Kalaria, R. N., Bradbury, M., Pearce, R., ... Ballard, C. G. (2005). Association between mild vascular cognitive impairment and impaired activities of daily living in older stroke survivors without dementia. *Journal of the American Geriatrics Society*, *53*(1), 103-107. doi:10.1111/j.1532-5415.2005.53019.x
- Stroke Statistics. (2018). Stroke Statistics | Internet Stroke Center. Retrieved from <http://strokecenter.org/patients/about-stroke/stroke-statistics/>
- Sulter, G., Steen, C., & De Keyser, J. (1999). Use of the barthel index and modified rankin scale in acute stroke trials. *Stroke*, *30*(8), 1538-1541. doi:10.1161/01.str.30.8.1538

- Thrane, G., Emaus, N., Askim, T., & Anke, A. (2011). Arm use in patients with subacute stroke monitored by accelerometry: Association with motor impairment and influence on self-dependence. *Journal of Rehabilitation Medicine*, 43(4), 299-304. doi:10.2340/16501977-0676
- Van der Lee, J., Beckerman, H., Knol, D., De Vet, H., & Bouter, L. (2004). Clinimetric properties of the motor activity log for the assessment of arm use in hemiparetic patients. *Stroke*, 35(6), 1410-1414. doi:10.1161/01.str.0000126900.24964.7e
- Veerbeek, J. M., Kwakkel, G., Van Wegen, E. E., Ket, J. C., & Heymans, M. W. (2011). Early prediction of outcome of activities of daily living after stroke: A systematic review. *Stroke*, 42(5), 1482-1488. doi:10.1161/strokeaha.110.604090
- Vibha, & Laskar, A. (2011). Women's health: Beyond reproductive years. *Indian Journal of Public Health*, 55(4), 247. doi:10.4103/0019-557x.92399
- Wasay, M., Khatri, I. A., & Kaul, S. (2014). Stroke in south Asian countries. *Nature Reviews Neurology*, 10(3), 135-143. doi:10.1038/nrneurol.2014.13
- Whitson, H. E., Landerman, L. R., Newman, A. B., Fried, L. P., Pieper, C. F., & Cohen, H. J. (2010). Chronic medical conditions and the sex-based disparity in disability: The cardiovascular health study. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 65A(12), 1325-1331. doi:10.1093/gerona/gdq139
- World Health Ranking. (2017). Stroke in Bangladesh. Retrieved from <https://www.worldlifeexpectancy.com/bangladesh-stroke>
- Wu, C., Chen, C., Tsai, W., Lin, K., & Chou, S. (2007). A randomized controlled trial of modified constraint-induced movement therapy for elderly stroke survivors:

Changes in motor impairment, daily functioning, and quality of life. *Archives of Physical Medicine and Rehabilitation*, 88(3), 273-278.

doi:10.1016/j.apmr.2006.11.021

Yen, J. G., Wang, R. Y., Chen, H. H., & Hong, C. T. (2005). Effectiveness of modified constraint-induced movement therapy on upper limb function in stroke subjects. *Acta Neurologica Taiwanica*, 14(1), 16-20. Retrieved from [http://www.ant-tnsjournal.com/Mag\\_Files/14-1/14-1p16.pdf](http://www.ant-tnsjournal.com/Mag_Files/14-1/14-1p16.pdf)

## **Appendix I: Information Sheet**

I am **Jyoti Karanjit**, student of M Sc. in Rehabilitation Science under Dhaka University, BHPI, CRP, Savar of Bangladesh. Towards fulfillment of the course module it is obligatory to conduct a research study. In this regard, I would like to invite you to take part in the research study, titled “**STATUS OF UPPER LIMB ACTIVITIES OF DAILY LIVING AMONG STROKE PATIENTS.**” The aim of the study is to determine the relationship of Upper Limb impairment and ADL among Stroke patients.

Your participation in this study is voluntary. If you do not agree to participate at all, you can withdraw your support to the study anytime whenever you want, despite consenting to take part earlier. There will be no change in this regard to participate or not to participate in this study. Your answer will be recorded in this questionnaire which will take approximately 30 minutes and will be kept highly confidential and private. You will not be paid for your participation. Participation in this study might not benefit you directly. This study will not the cause any risk or harm to you. Confidentiality of all documents will be highly maintained. Collected data will never be used in such a way that you could be identified in any presentation or publication without your permission. If you have any question now or later regarding the study, please feel free to ask the person stated below.

**Jyoti Karanjit**

M Sc. in Rehabilitation Science

BHPI, CRP-Chapain, Savar, Dhaka-1343

Cell Phone: 088-01787127197

## Appendix II: Institutional Review Board Form



### বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই) Bangladesh Health Professions Institute (BHPI)

(The Academic Institute of CRP)

Ref.

CRP-BHPI/IRB/09/18/1228

Date: 19/09/2018

To,  
Jyoti Karanjit  
M.Sc. in Rehabilitation Science (MRS)  
Session: 2017-2018, Student ID: 181170091  
BHPI, CRP-Savar, Dhaka-1343, Bangladesh

**Subject:** Approval of thesis proposal "Status of Upper Limb Activities of Daily Living among Stroke patients in CRP" by ethics committee.

Dear Jyoti Karanjit,

Congratulations,

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above mentioned thesis, with yourself, as the Principal Investigator" The Following documents have been reviewed and approved:

| S.N. | Name of Documents                           |
|------|---------------------------------------------|
| 1.   | Thesis Proposal                             |
| 2.   | Questionnaire (English and Bengali version) |
| 3.   | Information sheet & consent form.           |

The study involves answering a questionnaire to determine the status of activities performed by upper limb after stroke at CRP in Bangladesh, which takes about 20 to 30 minutes to complete it. Since, there is no likelihood of any harm to the participants, the members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at AM 09:00 a.m. on 22<sup>nd</sup> April 2018 at BHPI.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

*Muhammad Millat Hossain* 19/09/2018

Muhammad Millat Hossain  
Assistant Professor, Dept. of Rehabilitation Science  
Member Secretary, Institutional Review Board (IRB)  
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

## Appendix III: Permission Letter

Date: 19/09/2018

To,  
The Head of Department,  
Neurology Department,  
CRP, Savar, Bangladesh.

Subject: Application for the permission to collect data from respected department.

Respected Sirs,

I am Jyoti Karanjit, currently pursuing Masters in Rehabilitation Science from BHPI under Dhaka University. As a part of my curriculum for thesis I am conducting a thesis on topic **Status of Upper Limb Activities of Daily Living among Stroke patients at CRP, Bangladesh**. The main aim of the thesis is to determine upper limb function among stroke patients used in day to day life. For this reason I have to collect data from Neurology Department as well as Stroke Department of CRP, Savar, Dhaka, Bangladesh. I assure you my work will not hamper the treatment of the patients. In addition, I will make sure not to cause problem to the Department. So, I would like to ask permission to collect data from the departments.

It would be very grateful if you do grant me permission for the collection of data from the Neurology Department and Stroke Department. Looking forward for positive response.

Thanking You.

Sincerely yours,



Jyoti Karanjit,  
MSc. Rehabilitation Science,  
2018-2019 Batch,  
CRP, Savar, Bangladesh.

Approved  
25/09/18

Be forwarded  
for  
Kind  
Approval.  
19/09/18  
Muhammad Milat Hossain  
Assistant Professor  
Project & Course Coordinator  
Unit of Rehabilitation Science  
BHPI, CRP, Savar, Dhaka-1313 Bangladesh



## Appendix III: Consent Form

সম্মতিপত্র

আসসালামু আলাইকুম/নমস্কার

আমি জ্যোতি কারনজিৎ, এম.এস.সি. ইন রিহ্যাবিলিটেশন সায়েন্স, বাংলাদেশ হেলথ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই), ঢাকা বিশ্ববিদ্যালয়ের একজন ছাত্রী। স্নাতকোত্তর ডিগ্রী প্রাপ্তির জন্য আমার একটি গবেষনামূলক প্রকল্প পরিচালনা করা প্রয়োজন এবং আমার গবেষণা প্রকল্পটি হচ্ছে **Status of Upper Limb Activities of Daily Living among Stroke Patients at CRP**. যেটি আমি করছি জনাব মোহাম্মদ হাবিবুর রহমান সহযোগী অধ্যাপক (ফিজিওথেরাপি বিভাগ, বিএইচপিআই, সিআরপি, সাভার, ঢাকা-১৩৪৩) এর অধীনে। এই গবেষণাটি মূলত সিআরপি-তে আগত স্ট্রোক আক্রান্ত রোগীর তাদের দৈনন্দিন কাজে কতটা ভালভাবে তাদের হাত ব্যবহার করতে পারছে তা জানার জন্য করা হচ্ছে। তথ্য পাওয়ার জন্য আপনাকে কিছু প্রশ্ন জিজ্ঞাসা করতে হবে। আপনার সরবরাহকৃত যাবতীয় তথ্য গোপন রাখা হবে। আপনার সাহায্য যথাযথ ভাবে সমাদৃত হবে; আমি আপনাকে যথাসম্ভব সঠিক তথ্য দিতে অনুরোধ করবো। আপনার যদি কোন কিছু জানার থাকে তাহলে কোন সংকোচ ছাড়াই জিজ্ঞাসা করতে পারেন। এই অধ্যয়নে আপনার অংশগ্রহণ স্বেচ্ছাকৃত এবং যে কোন নেতিবাচক প্রশ্নের উত্তর আপনি ইচ্ছা করলে নাও দিতে পারেন এবং যেকোন সময় এই অধ্যয়ন থেকে নিজেকে প্রত্যাহার করে নিতে পারবেন।

আমি উপরিউক্ত তথ্যগুলি পড়েছি অথবা আমার সামনে পড়া হয়েছে। আমি স্বেচ্ছায় এই জরিপে অংশগ্রহণ করছি।

অংশগ্রহণকারীর নাম .....

সাক্ষাৎকারের তারিখ.....

নিরক্ষর অংশগ্রহণকারীদের জন্য বৃদ্ধাঙ্গুলির ছাপ

|     |     |
|-----|-----|
|     |     |
| ডান | বাম |

## Appendix III: Questionnaire

### 1. ব্যক্তিগত তথ্যাবলী (Personal Details)

| অংশগ্রহণকারীর নাম<br>(Participant Name): |                                                       | আইডি নম্বর (ID No):                                                                                                                                                        |
|------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.1                                      | বয়স (Age):                                           |                                                                                                                                                                            |
| 1.2                                      | লিঙ্গ (Sex):                                          | i. পুরুষ (Male)<br>ii. মহিলা (Female)                                                                                                                                      |
| 1.3                                      | ঠিকানা (Address):                                     |                                                                                                                                                                            |
| 1.4                                      | যোগাযোগের নম্বর (Contact Number):                     |                                                                                                                                                                            |
| 1.5                                      | বৈবাহিক অবস্থা<br>(Marital Status):                   | i. অবিবাহিত (Single)<br>ii. বিবাহিত (Married)<br>iii. তালাকপ্রাপ্ত (Divorced)<br>iv. বিধবা (Widow)<br>v. বিপত্নীক (Widower)                                                |
| 1.6                                      | শিক্ষাগত যোগ্যতা<br>(Education)                       | i. নিরক্ষর (Illiterate)<br>ii. প্রাথমিক (Primary)<br>iii. মাধ্যমিক (Secondary)<br>iv. উচ্চ মাধ্যমিক (HSC)<br>v. স্নাতক ও তদুর্ধ্ব শিক্ষাগত যোগ্যতা<br>(Graduate and above) |
| 1.7                                      | পেশা (Occupation):                                    |                                                                                                                                                                            |
| 1.8                                      | মাসিক আয়: (Monthly Income)                           |                                                                                                                                                                            |
| 1.9                                      | পরিবারের ধরন ও সদস্য সংখ্যা (Family type and Number): | i. একক পরিবার (Nuclear Family)<br>ii. যৌথ পরিবার (Joint Family)                                                                                                            |
| 1.91                                     | কোন হাত বেশী ব্যবহার করেন? (Hand Dominance)           | i. ডান (Right)<br>ii. বাম (Left)                                                                                                                                           |
| 1.92                                     | স্ট্রোক পরবর্তী সময়কাল:<br>(Duration Post Stroke)    |                                                                                                                                                                            |

## 2. স্বাস্থ্যগত তথ্যসমূহ (Medical Information)

|     |                                                                        |                                                                                                    |
|-----|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 2.1 | স্ট্রোকের ধরন:<br>(Type of Stroke)                                     | i. ইসকেমিক (Ischaemic)<br>ii. হেমোরাজিক (Hemorrhagic)<br>iii. অন্যান্য (Others)                    |
| 2.2 | মস্তিষ্কেও আক্রান্ত অংশ:<br>(Affected part of brain)                   | i. ডান অংশ (Right)<br>ii. বাম অংশ (Left)<br>iii. অন্যান্য (Others)                                 |
| 2.3 | শরীরের আক্রান্ত অংশ (Affected side of body)                            | i. ডান পাশ (Right)<br>ii. বাম পাশ (Left)                                                           |
| 2.4 | স্ট্রোক ছাড়া অন্য কোনো রোগ আছে কি?<br>(Any disease other than stroke) | i. না (No)<br>ii. হ্যাঁ(যদি থাকে, তবে উল্লেখ করুন)<br>(yes)                                        |
| 2.5 | ব্যক্তিগত অভ্যাস<br>(Personal Habits)                                  | i. না (No)<br>রর. হ্যাঁ -<br>• ধূমপান (Smoking)<br>• মদ্যপান (Alcohol)<br>• পানখাওয়া (Betel leaf) |

## 3. স্ক্যান্ডিনেভিয়ান স্ট্রোক স্কেল (Scandinavian Stroke Scale)

|                                                           |                                                                                          |   |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------|---|
| 3.1                                                       | ** Tick the score                                                                        |   |
| 3.1<br>বাহু,<br>মোটর<br>শক্তি<br>(Arm,<br>motor<br>power) | স্বাভাবিকভাবে হাত তোলার ঐমতা আছে, (raises arm with normal strength)                      | 6 |
|                                                           | কম ঐমতায় হাত তুলতে পারে (raises arm with reduced strength)                              | 5 |
|                                                           | কনুই ভাঁজ করে তোলার ঐমতা আছে, (raises arm with flexion in elbow)                         | 4 |
|                                                           | নড়তে পারে কিন্তু মাধ্যাকর্ষণের বিরুদ্ধে না (can move, but not against gravity)          | 2 |
|                                                           | প্যারালাইসিস (paralysis)                                                                 | 0 |
| 3.2                                                       |                                                                                          |   |
| 3.2<br>হাত<br>মোটর<br>শক্তি<br>(Hand,<br>motor<br>power)  | স্বাভাবিক ঐমতা (normal strength)                                                         | 6 |
|                                                           | সম্পূর্ণ পরিসরে হ্রাসকৃত ঐমতা (reduced strength in full range)                           | 4 |
|                                                           | কিছু বিচলন, আঙ্গুল দিয়ে তালু ধরতে পারে না (some movement, fingertips do not reach palm) | 2 |
|                                                           | প্যারালাইসিস (paralysis)                                                                 | 0 |

4. মটর একটিভিটি লগ (Motor Activity Log) : (Only for the affected Upper Limb)

| S.No | কাজ (Activity)                                                                    | কি পরিমারন পাবেন (Amount Scale)                                                                                                                                                                                   |   |   |   |   |   | কতটা ভালো ভাবে পাবেন (How Well Scale)                                                                                                                                   |   |   |   |   |   | মন্তব্য<br>(Comment) |
|------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|----------------------|
|      |                                                                                   | A. ব্যবহার করিনা (Not used)<br>B. খুবই অল্প সময় ব্যবহার করি (very rarely)<br>C. কম সময় (rarely)<br>D. কঅর্ধেক সময় (Half pre-stroke)<br>E. তিন চতুর্থাংশ (3/4 pre-stroke)<br>F. স্বাভাবিক ( same as pre-stroke) |   |   |   |   |   | A. ব্যবহার করিনা (Not used)<br>B. খুবই খারাপ (very poor)<br>C. খারাপ (poor)<br>D. মোটা মোটা ভালো (fair)<br>E. প্রায় স্বাভাবিক (almost normal)<br>F. স্বাভাবিক (normal) |   |   |   |   |   |                      |
|      |                                                                                   | A                                                                                                                                                                                                                 | B | C | D | E | F | A                                                                                                                                                                       | B | C | D | E | F |                      |
| 4.1  | একটি হালকা সুইচ চেপে আলো জালান (Turn on a light with a light switch)              |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |                      |
| 4.2  | ড্রয়ার খুলতে পারেন কী (Open Drawer)                                              |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |                      |
| 4.3  | ড্রয়ার থেকে একটি পোশাক সরাতে পারেন কি (Remove an item of clothing from a drawer) |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |                      |
| 4.4  | ফোন উঠাতে পারেন কী (Pick up Phone)                                                |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |                      |
| 4.5  | গাড়ি থেকে বের হতে পারেন কী (Get out of a vehicle/car)                            |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |                      |
| 4.6  | ঘরের দরজার নব ঘুড়িয়ে দরজা খুলতে পারেন কী? (Open door)                           |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |                      |
| 4.7  | টিভির রিমোট কন্ট্রোল ব্যবহার করতে পারেন কী? (Use a TV remote)                     |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |                      |

|      |                                                                                                | A. ব্যবহার করিনা (Not used)<br>B. খুবই অল্প সময় ব্যবহার করি (very rarely)<br>C. কম সময় (rarely)<br>D. কঅর্ধেক সময় (Half pre-stroke)<br>E. তিন চতুর্থাংশ (3/4 pre-stroke)<br>F. স্বাভাবিক ( same as pre-stroke) |   |   |   |   |   | A. ব্যবহার করিনা (Not used)<br>B. খুবই খারাপ (very poor)<br>C. খারাপ (poor)<br>D. মোটা মোটি ভালো (fair)<br>E. প্রায় স্বাভাবিক (almost normal)<br>F. স্বাভাবিক (normal) |   |   |   |   |   | Comment |
|------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---------|
|      |                                                                                                | A                                                                                                                                                                                                                 | B | C | D | E | F | A                                                                                                                                                                       | B | C | D | E | F |         |
| 4.8  | হাত ধুতে পারেন কী (Wash your hand)<br>( হাতে সাবান মাখা ও পানি দিয়ে পরিষ্কার করা)             |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.9  | পানি কল চালু এবং বন্ধ করতে পারেন কী ?<br>(Turning on/off a tap)                                |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.10 | হাত মুছতে পারেন কী ? (Dry your hands)                                                          |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.11 | জুতা পরতে পারেন কী ? (Put on your shoes)<br>(জুতার ফিতা বাধা ওভেল ফেলাগানো)                    |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.12 | জুতা খুলতে পারেন কী ? (Take off your shoes)<br>(জুতার ফিতা খোলা ও ভেলক্রো খোলা)                |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.13 | গ্লাস, বোতল, অথবা পানীয়র বাসন উঠাতে পারেন কী?<br>(Pick up a glass, bottle, cup or can)        |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.14 | দাঁত মাজতে পারেন কী? (Brush your teeth) ( ব্রাশে<br>টুথপেস্ট লাগানো বাদ দিয়ে)                 |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.15 | মুখে, ক্রিম, লোশন, অথবা শেভিং ক্রিম লাগাতে পারেন<br>কী? (Put on makeup, shaving cream, lotion) |                                                                                                                                                                                                                   |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |

|      |                                                                                                           | A. ব্যবহার করিনা (Not used)<br>B. খুবই অল্প সময় ব্যবহার করি<br>(very rarely)<br>C. কম সময় (rarely)<br>D. কঅর্ধেক সময় (Half pre-stroke)<br>E. তিন চতুর্থাংশ (3/4 pre-stroke)<br>F. স্বাভাবিক ( same as pre-stroke) |   |   |   |   |   | A. ব্যবহার করিনা (Not used)<br>B. খুবই খারাপ (very poor)<br>C. খারাপ (poor)<br>D. মোটা মোটি ভালো (fair)<br>E. প্রায় স্বাভাবিক (almost normal)<br>F. স্বাভাবিক (normal) |   |   |   |   |   | Comment |
|------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---------|
|      |                                                                                                           | A                                                                                                                                                                                                                    | B | C | D | E | F | A                                                                                                                                                                       | B | C | D | E | F |         |
| 4.16 | চাবি দিয়ে দরজা খুলতে পারেন কী ? (use a key to unlock a door)                                             |                                                                                                                                                                                                                      |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.17 | হাতে কোন জিনিস বহন করতে পারেন কী?<br>(Carry an object in your hand)<br>( হাতের উপরে বহন কলে প্রযোজ্য নহে) |                                                                                                                                                                                                                      |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.18 | খাওয়ার জন্য চামচ অথবা কাটা চামচ ব্যবহার করতে পারেন কী ?(use hands to eat)                                |                                                                                                                                                                                                                      |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.19 | আপনার চুল আচরাতে পারেন কী? (comb your hair)                                                               |                                                                                                                                                                                                                      |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.20 | কাপে হ্যান্ডলে ধেও কাপ উঠাতে পারেন কী? (Pick up a cup by handle)                                          |                                                                                                                                                                                                                      |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.21 | শাট অথবা জামায় বোতাম লাগাতে পারেন কী? (Button a shirt/blouse)                                            |                                                                                                                                                                                                                      |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |
| 4.22 | হাতে আঙ্গুল দিয়ে ধরে খাবার খেতে পারেন কী যেমন-<br>(স্যান্ডেউইচ) (Eat a sandwich or finger food)          |                                                                                                                                                                                                                      |   |   |   |   |   |                                                                                                                                                                         |   |   |   |   |   |         |

## 5. Modified Barthel Index

| Activity                                                            | Description                                                                                                                                                                                                        | Score |
|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 5.1 গোসলঃ<br>(Bathing)                                              | গোসল করতে পুরোপুরি নির্ভরশীল (Total Dependence)                                                                                                                                                                    | 0     |
|                                                                     | গোসলে সাহায্য লাগে ? কিন্তু রোগী কিছুটা কাজ করতে পারে<br>(Assistance is required in all aspects of bathing, but patient is able to make some contribution)                                                         | 1     |
|                                                                     | কাপড় ধৌত করতে এবং শুকাতে সাহায্য লাগে<br>(Assistance is required with either transfer to shower/bath or with washing or drying; including inability to complete a task)                                           | 3     |
|                                                                     | নির্দেশনা লাগে (Supervision is required)                                                                                                                                                                           | 4     |
|                                                                     | রোগী নিজে নিজেই সব করতে পারে অন্য কারোর সাহায্য ছাড়া<br>(The patient must be able to bath without another person being present)                                                                                   | 5     |
| 5.2 জামা কাপড়<br>পরিধান<br>(Dressing)                              | জামা কাপড় পড়তে রোগীর অন্যের উপর নির্ভর করতে হয়<br>(The patient is dependent in all aspects of dressing and is unable to participate in the activity)                                                            | 0     |
|                                                                     | রোগী নিজে কিছুটা কাজ করতে পারে কিন্তু সব কাজের জন্য অন্যের উপর নির্ভর করতে হয় (The patient is able to participate to some degree, but is dependent in all aspects of dressing.)                                   | 1     |
|                                                                     | কাপড় পড়তে এবং খুলতে অন্যের সাহায্য লাগে (Assistance is needed in putting on, and/or removing any clothing.)                                                                                                      | 5     |
|                                                                     | কিছুটা সাহায্য লাগে বোতাম, জিপার, ব্রা এবং সু খুলতে<br>(Only minimal assistance is required with fastening clothing such as buttons, zips, bra, shoes, etc.)                                                       | 8     |
|                                                                     | রোগী পড়তে পারে, এবং পোশাক খুলতে পারে (The patient is able to put on and remove clothes independently)                                                                                                             | 10    |
| 5.3 পরিষ্কার<br>পরিচ্ছন্নতাঃ<br><br>(Personal Hygiene/<br>grooming) | সব কাজের জন্য নির্ভরশীল (The patient is dependent in all aspects.)                                                                                                                                                 | 0     |
|                                                                     | সাহায্য লাগে (Assistance is required in all steps of personal hygiene, but patient able to make some contribution)                                                                                                 | 1     |
|                                                                     | কিছুটা সাহায্য লাগে (Some assistance is required in one or more steps of personal hygiene.)                                                                                                                        | 3     |
|                                                                     | রোগী নিজেই সব কাজ করতে পারে কিন্তু মিনিমাম সাহায্য লাগে (Patient is able to conduct his/her own personal hygiene but requires minimal assistance before and/or after the operation)                                | 4     |
|                                                                     | রোগী নিজেই সব দৈনন্দিন কাজ করতে পারে (The patient can do all activities independently)                                                                                                                             | 5     |
| 5.4 খাওয়া দাওয়া<br>(Feeding)                                      | পুরোপুরি নির্ভরশীল (Dependent in all aspects)                                                                                                                                                                      | 0     |
|                                                                     | সাহায্য লাগে (someone must provide active assistance during the meal.)                                                                                                                                             | 1     |
|                                                                     | নিজে নিজেই করতে পারে, কিছুটা সাহায্য লাগে (Able to feed self with supervision)                                                                                                                                     | 5     |
|                                                                     | নিজে নিজেই করতে পারে, অন্য কারো সাহায্য প্রয়োজন হয় না (Independence in feeding with prepared tray, except may need meat cut, milk carton opened or jar lid etc. The presence of another person is not required.) | 8     |
|                                                                     | রোগী নিজে নিজেই খেতে পারে (The patient can feed self from a tray or table)                                                                                                                                         | 10    |

