

**FUNCTIONAL OUTCOME AND QUALITY OF LIFE OF PATIENTS  
WITH STROKE AFTER RECEIVING REHABILITATION  
SERVICES AT CRP**

**Bipul Debnath**

Bachelor of Science in Physiotherapy (B. Sc. PT)

DU Roll No:151

Registration no: 5234

Session: 2012-2013

BHPI, CRP, Savar, Dhaka-1343.



**Bangladesh Health Professions Institute (BHPI)**

Department of Physiotherapy

CRP, Savar, Dhaka-1343,

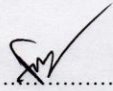
Bangladesh

February-2017

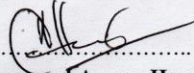
We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

**FUNCTIONAL OUTCOME AND QUALITY OF LIFE OF PATIENTS WITH STROKE AFTER RECEIVING REHABILITATION SERVICES AT CRP**

Submitted by **Bipul Debnath**, for the partial fulfilment of the requirements for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT)



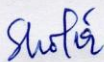
.....  
**Firoz Ahmed Mamin**  
Assistant Professor  
Department of Physiotherapy  
BHPI, CRP, Savar, Dhaka  
Supervisor



.....  
**Mohammad Anwar Hossain**  
Associate Professor, Physiotherapy, BHPI  
Head of the Physiotherapy Department, CRP  
BHPI, CRP, Savar, Dhaka



.....  
**Mohammad Habibur Rahman**  
Assistant Professor  
Department of Physiotherapy  
BHPI, CRP, Savar, Dhaka



.....  
**Md. Shofiqul Islam**  
Assistant Professor  
Department of Physiotherapy  
BHPI, CRP, Savar, Dhaka



.....  
**Md. Obaidul Haque**  
Associate Professor & Head  
Department of Physiotherapy  
BHPI, CRP, Savar, Dhaka

**Declaration**

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of information of the study, I would be bound to take written consent from the Department of Physiotherapy, Bangladesh Health Professions Institute (BHPI).

Signature: Bipul Debnath

Date: 04.10.17

**Bipul Debnath**

Bachelor of Science in Physiotherapy (B. Sc. PT)

Du Roll No: 151

Registration no: 5234

Session: 2012-2013

BHPI, CRP, Savar, Dhaka.

# Contents

	<b>Page No.</b>
Acknowledgement	i
Acronyms	ii
List of figure	iii
List of table	iv-v
Abstract	vi
<b>CHAPTER 1: INTRODUCTION</b>	<b>1-7</b>
1.1 Background	1-3
1.2 Rationale	4
1.3 Research Question	5
1.4 Aim	6
1.5 Objectives	6
1.6 Operational definition	7
<b>CHAPTER 2: LITERATURE REVIEW</b>	<b>8-14</b>

<b>CHAPTER – 3: METHODOLOGY</b>	15-21
3.1 Study design	15
3.2 Study site	15
3.3 Study Population	15
3.4 Sample size	15
3.5 Sampling technique	15
3.6 Inclusion criteria	15
3.7 Exclusion criteria	16
3.8 Data collection tools	16
3.8.1 Procedure of data collection	19
3.8.2 Data analysis procedure	19
3.8.3 Level of Significance	21
3.9 Ethical consideration	21
<b>CHAPTER 4: RESULTS</b>	22-53
<b>CHAPTER 5: DISCUSSION</b>	54-58
<b>CHAPTER 6: CONCLUSION AND RECOMMENDATIONS</b>	59
6.1 Conclusion	59
6.2 Recommendation	59
<b>REFERENCES</b>	60-64
<b>APPENDIX</b>	
Informed consent (Bangla)	65
Informed consent (English)	66
Questionnaire (Bangla and English)	67-81
Permission letter	82-83

## Acknowledgement

I start with the name of Almighty **Krishna** who gives me the opportunity to complete this project in time with great success. The second acknowledgement must go to my family members who had always inspired me for preparing the project properly.

I would like to express the deepest gratefulness to my supervisor Firoz Ahmed Mamin, Assistant Professor of Physiotherapy, he continually and convincingly guides me in regard to research. His powerful supervision and excellent guidance without I could not able to complete this project.

I am extremely grateful to my honorable teacher Mohammad Habibur Rahman and Md. Shofiqul Islam, for the good advice, support and guide to conduct this research.

I would like to give special thanks to my honorable teachers Md. Obaidul Haque, Associate Professor and Head, Department of Physiotherapy, BHPI; Mohammad Anwar Hossain, Associate Professor and Head of the Physiotherapy Department, CRP and all of my teachers for helping me in this study.

My special thanks all the staff of Neurology unit of Physiotherapy. I am grateful to Faruq Ibn Sadeq and Masud Rana, Clinical Physiotherapist of Neurology unit, CRP, Savar, Dhaka.

I am grateful to Sazia Afrin, Sarmin Rima, Rina Shamima, Batia Nahar Hafizur Rahman, Intern Physiotherapist, Department of Physiotherapy, CRP, Savar, Dhaka for their excellent guidelines throughout the period of this study.

I would like to thank to all participants of the study for their enormous co-operation during data collection. I would also like to special thanks to BHPI librarian for her heartily help and her associates for their kind support.

Finally, I would like to state my grateful feelings towards my friends Soumik Biswas, Shanchita Bhowmik, Tithi and a helpful person Kulsum Akter and my seniors for their continuous suggestions and supports.

## Acronyms

<b>ADL</b>	Activities of Daily Living
<b>BBS</b>	Berg Balance Scale
<b>BHPI</b>	Bangladesh Health Professions Institute
<b>CRP</b>	Centre for the Rehabilitation of the Paralysed
<b>CVA</b>	Cerebrovascular Accident
<b>FIM</b>	Functional Independent Measure
<b>IRB</b>	Institutional Review Board
<b>MDT</b>	Multi-Disciplinary Team
<b>PT</b>	Physiotherapist
<b>QoL</b>	Quality of Life
<b>SPSS</b>	Statistical Package for Social Sciences
<b>TIA</b>	Transient Ischemic Attack
<b>WHO</b>	World Health Organization

## List of Figures

<b>Figure No</b>	<b>Description</b>	<b>Page No</b>
01.	Berg balance scale compare	47
02.	Mobility of the participants	49
03.	Self-care of the participants	50
04	Usual activities of the participants	51
05	Pain or discomfort of the participants	52
06	Anxiety / depression of the participants	53



## List of Table

<b>Table No.</b>	<b>Description</b>	<b>page</b>
01.	Sociodemographic information of the patients	22
02.	Sociodemographic information of the patients	23
03.	Rehabilitation service	24
04	Rank and test statistics of patient's Total motor FIM Score	25
05	Descriptive Statistics of patients motor FIM Score	25
06	Rank and test statistics of patients cognitive FIM Score	26
07	Descriptive Statistics of patients cognitive FIM Score	26
08	Rank and test statistics of patients Total FIM Score	27
09	Descriptive Statistics of patients total FIM Score	27
10	Functional Independence Measure of Eating score	28
11	Functional Independence Measure of Bathing	29
12	Functional Independence Measure of Grooming	30
13	Functional Independence Measure of Dressing Upper Body	31
14	Functional Independence Measure of Dressing Lower Body	32
15	Functional Independence Measure of Toileting	33
16	Functional Independence Measure of Bladder Control	34
17	Functional Independence Measure of Bowel Control	35
18	Functional Independence Measure of Chair/ Wheelchair Transfer	36
19	Functional Independence Measure of Toilet transfer	37
20	Functional Independence Measure of Tub & Shower transfer	38
21	Functional Independence Measure of Walk/Wheelchair	39
22	Functional Independence Measure of Stairs transfer	40
23	Functional Independence Measure of Comprehension	41

24	Functional Independence Measure of Expression	42
25	Functional Independence Measure of Social Interaction	43
26	Functional Independence Measure of Problem Solving	44
27	Functional Independence Measure of Memory	45
28	Rank and test statistics of patients Total BBS Score	46
29	Descriptive Statistics of patients total BBS Score	46
30	Rank and test statistics of patients Today's health in EQ VAS	48
31	Descriptive Statistics of patients total EQ VAS Score	48

## Abstract

*Purpose:* Stroke is described as one of the most devastating neurological impairment. To assess the functional outcome, balance and quality of life after rehabilitation at CRP.

*Objectives:* The aim of the study is to know that, to find out the outcome of functional ability, balance and quality of life after 4-week rehabilitation.

*Methodology:* The design was an observational study that followed the progress of functional activity, balance and quality of life of stroke patient from CRP. Measurements were made in two step. 1<sup>st</sup> step in admission and 2<sup>nd</sup> step after 4-week rehabilitation. Total 36 patients were taken for the study. Data were collected by questionnaires; FIM scale was used for functional outcome measure, BBS was used for balance measure and EQ-5D-5L questionnaire was used to assess the quality of life of the patients. Descriptive test, Wilcoxon Test was performed for finding result.

*Result:* This study was found that male participants about 69.4% and 30.6% were female. Males were more affected than female. Among n=36 patients, 36(100%) patients were taking physiotherapy, 33(91.7%) patients were taking Occupational Therapy and 22(61.1%) patients were taking Speech and language therapy. Total mean physiotherapy 500 minutes in 4 weeks. Total mean Occupational Therapy 376 minutes in 4 weeks. Total mean Speech and language therapy 235.23 minutes in 4 weeks. Among the current services in CRP patients were more prone in taking physiotherapy services. After rehabilitation there was significant amount of changes in Functional outcome, balance, and quality of life.

*Conclusion:* The study concluded as rehabilitation is significantly capable of producing beneficial effects on the improvement of their functional ability, balance and quality of life.

## **1.1 Background**

Stroke is one of the most regular reasons for death, along with harmful tumors and disease of the heart and blood vessels (Aydin et al., 2016) but stroke is an avoidable and curable disease (Party, 2012). Among the chief public health problem, Stroke is most common (Srivastava et al., 2010). It is the vital reason for grown-up handicap and the second driving reason for death (Van et al., 2015).

According to the World Health Organization, every year 15 million people hurt by the stroke, from them 5 million expired and left 5 million are completely disabled (Aydin et al., 2016). The occurrence of disability among stroke survivor is between 24–54% (Srivastava et al., 2010). In developing, the country over two-third of stroke patients died worldwide (Liu et al., 2007).

The number of stroke-related burdens is expected to increase over the next two decades but there is an impressive development discover in the medical management of stroke (Langhorne et al., 2011). Within the 2050 year, there is a possibility to increase stroke patient a huge number. 50 % patients need special help for their daily living activity within 12 months (Van et al., 2015).

Stroke is defined by the World Health Organization as ‘a clinical syndrome consisting of rapidly developing clinical signs of focal disturbance of cerebral lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin.’ (Hossain et al., 2011). Stroke is one of the leading vital of death and disability worldwide and more so in backward Countries like, where expected treatment is available including rehabilitation The primary initiative of the rehabilitation approach may be able to make a return on the nervous function and improve long-term results and quality of life (Hossain et al., 2011).

In Bangladesh there are 162.2 million people, 26% lives in urban areas and the majority (74%) lives in rural areas. In Bangladesh, stroke has been ranked as the third leading cause of death after coronary heart disease and infectious diseases such as influenza and pneumonia. The mortality rate of stroke increased from 6.00% (in 2006) to 8.57%, (in

2011) with an age-adjusted mortality rate of 108.31 per 100,000 people (in 2011). The World Health Organization (WHO) ranks mortality due to stroke in Bangladesh as number 84 in the world (Islam et al., 2012).

In most stroke patients, between 6-9 months and 5 years after stroke, disability is stabilized. In framingham studies, the following obstructions occurred among the elderly patients within 6 months after stroke: 50% had some hemiparesis, 30% could not walk without some assistance, 26% were dependent on ADL, 19% had aphasia, 35% had depression symptoms, 26% were existing in a nursing home (Carod and Egido, 2009).

The mortality rate progressively decreases in the last few decades, and residual impairments and disabilities are subsequent increase and decrease functional outcome and quality of life. The strongest impact of poor quality of life among stroke patients is Depression. Post-stroke depression (PSD) is one of the common emotional complaints affecting stroke patient (Srivastava et al., 2010).

Most South Asian studies compared to Western countries have reported a high percentage of hemorrhagic stroke (19-46%). This discovery may be related to the high prevalence of high blood pressure in South Asia and poor control. The prevalence of intracerebral hemorrhage (ICH) is particularly high in younger patients (15-45 years of age) with stroke (32-43%). The high frequency of ICH reported in Bangladesh (31-33%). Cardio embolic Stroke is less common in South Asia compared to Western countries (Wasay et al., 2014).

The most frequent diagnosis among patients treated by rehabilitation therapists is stroke. There are 2 main types of stroke- Ischemic & Hemorrhagic. An important long term problem of post stroke is presence of motor and sensory deficits that are directly associated with balance impairment. Balance problems are very common after stroke, and it is related with the poor recovery of activities of daily living (ADL) and mobility and an increased risk of falls. (Tyson et al., 2006).

The results of the patient's progress and rehabilitation are evaluated by various functional status steps; The FIM (effective independent measurement) score among them is the most common. These scores can be managed easily for a reliable measurement and periodic evaluation of patient performance changes (Appelros et al., 2008). Effective Independence

Measures FIM was developed in collaboration with American Congress rehabilitation and American Academy of Physical Medicine and Rehabilitation in 1983 lead by Carl Ganger and Byron Hamilton (Aydin et al., 2016).

It was made more than 20 years ago, the FIM has been widely used, as proved by its use for multiple diseases, including stroke, severe brain injury, cancer, and back injury. Physical rehabilitation, including physical therapy, occupational therapy and speech therapy, was shown to improve the effective results of patients who had stroke (Douglas et al., 2010).

Evaluate the severity of the stroke measuring balance is important for clinicians for giving the most appropriate therapy and assessing treatment outcome for people with stroke. Berg Balance Scale is most commonly used for assessing balance (Chien et al., 2007). Reduction of balance among stroke patients includes lessening of postural stability, lessening inequality of weight distribution in standing and lessening in dynamic standing balance. In addition, stroke patients also decrease their range of stability, which is defined as the maximum distance that a person can transfer his weight to his weight without balancing. After the results of stroke, the risk of fall increased and in decreased functional independence due to inadequate balance or postural control. Bug Balance Scale Score is considered to be the most effective measurement and measures the ability of dynamic and static balance (Tung et al., 2010).

After stroke for the recovery of stroke patients a variety of therapeutic methods have been invented. The most common neurophysiological method, which increase motor functions and orthopedic procedures which increase the performance of the affected limb strength and motor relearning system (Chan et al., 2006). Several systemic reviews have shown that the recovery is improved for high-intensity therapies. Although there is no clear guidance at the best stage of the practice, the importance of increasing the training of knowledge is widely accepted. Rehabilitation should begin as soon as possible after stroke. After the formal rehabilitation period, recovery may continue for months or even years after stroke. In recent years there has been increased focus on improved outcomes after acute stroke. This interest is inspired by advances in knowledge of the mechanisms of recovery and the role of neuronal plasticity (Van et al., 2015).

## **1.2 Rationale**

Stroke is a medical condition in which poor blood flow to the brain results in cell death. There are two main types of stroke: ischemic, due to lack of blood flow, and hemorrhagic, due to bleeding. They result in part of the brain not functioning properly. Signs and symptoms of a stroke may include an inability to move or feel on one side of the body, problems understanding or speaking, feeling like the world is spinning, or loss of vision to one side. Signs and symptoms often appear soon after the stroke has occurred. Only medical management is not enough for stroke patient. Rehabilitation is important for stroke patient to improve their life style. A rehabilitation team is usually multidisciplinary as it involves staff with different skills working together to help the patient. These include physicians trained in rehabilitation medicine, clinical pharmacists, nursing staff, physiotherapists, occupational therapists, speech and language therapists. Stroke rehabilitation should be started as quickly as possible and can last anywhere from a few days to over a year. It is important to, to find out the outcome of functional ability, balance and quality of life after rehabilitation. The intend of the study is to know about after receiving rehabilitation their improvement on functional ability by FIM scale, balance by Berg balance scale and Quality of life by EQ-5D-5L and importance of rehabilitation. Lastly from this study responsiveness will be increased and may provide proper advice or suggestion which will be helpful for stroke patient.

### **1.3 Research Question**

What are the functional outcome, balance and quality of life of patient with stroke after 4-week rehabilitation at CRP?



#### **1.4 Aim of the study**

The aim of the study is to know that, to find out the outcome of functional ability, balance and quality of life after 4-week rehabilitation.

#### **1.5 Objectives**

1. To find out the socio-demographic characteristics of the stroke patient.
2. To identify the number of physiotherapy, occupational therapy and speech and language therapy session received by the stroke patient.
3. To find out the functional outcome using an FIM scale among stroke patient.
4. To find out the balance using Berg Balance Scale among stroke patient.
5. To find out the quality of life using EQ-5D-5L scale among stroke patient.

## **1.6 Operational Definition**

### **Stroke Rehabilitation**

Stroke Rehabilitation is a progressive, dynamic, goal orientated process aimed at enabling a person. with impairment to reach their optimal physical, cognitive, emotional, communicative, and social functional level.

### **Stroke**

a clinical syndrome consisting of rapidly developing clinical signs of focal disturbance of cerebral lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin.

### **Functional independence measurement scale (FIM)**

The FIM instrument refers to a scale that is used to measure one's ability to function with independence. The FIM is used worldwide in medical rehabilitation units.

### **Balance**

Balance is defined as postural stability and viewed as the ability of maintaining the centre of mass within the base of support.

### **Berg Balance Scale**

The Berg Balance Scale (or BBS) is a widely used clinical test of a person's static and dynamic balance abilities, named after Katherine Berg, one of the developers. For functional balance tests, the BBS is generally considered to be the gold standard.

### **Quality of life**

The standard of health, comfort, and happiness experienced by an individual or group.

### **EQ-5D-5L scale**

EuroQol five questionnaire (EQ-5D) is a standardized instrument for measuring generic health status.

Stroke is the main cause of long-term disability in Western countries, and functional results depend on the severity of the stroke. The number of stroke survivors with estimated incomplete recovery is estimated to be 460 / 100,000 and one-third will take care of at least one of the daily living (ADL) activities. Between 50 and 70% stroke survive functional independence regain, but 15-30% are permanently disabled, and 20% begin attaining institutional care after 3 months. 85% of stroke patients have upper limb function loss at the start of stroke (Carod and Egido, 2009).

According to WHO 2001, the death of stroke in low-income and middle-income countries was 85.5% of stroke deaths worldwide. The evidence from the developed countries is that one in 20 adults (aged >14 years) is affected by stroke. Although stroke mortality and load rates vary greatly among the low-income countries (Feigin et al., 2009). Stroke is a long-lasting disease, yet studies have focused on measuring short term results mainly in the domain of impairments and disability. In 1980 with the development of the international classification of impairments, disabilities and handicaps by the World Health Organization (WHO). In view of the result of stroke in 174 intense stroke tests, the number of deaths is 76%, impairment in 76%, disability in 42% and handicap in only 2% (Patel et al., 2006).

Stroke is a major cause of death in the United States, third for female and fourth for men. Stroke rates are slightly higher in man, but women's higher stroke death rates are overall (68 vs 44 per 100 000 in 2002) due to high average age of women. Many studies have found that women who have stroke have less positive results than male patients. Women have more physical impairments and limitations in activities of daily living (ADL), or basic components of self-care. Women face more mental impairment, depression, and fatigue and lower overall quality of life (QOL) than men after stroke (Gargano et al., 2007).

Major health problems in cerebrovascular accident (CVA), or stroke, in their human and economic toll There are more than 700,000 strokes in the United States every year, resulting in more than 4.8 million stroke survivors today due to more than 160,000 deaths a year. From 1988 to 1997, the age-adjusted stroke hospital increased by 18.6 percent, the total stroke hospital increased by 38.6 percent. In 2004, stroke prices were estimated at

\$ 53.6 billion, with an average life expectancy of \$ 140,048. Because stroke is also a leading cause of functional impairments, 3 months and 15 to 30 percent of the organisms need organisms after being permanently disabled 20 percent (Douglas et al., 2010).

Stroke in the UK is also a major cause of a disease and death. About 110,000 stroke occurs in England, in recent studies, an incident was reported between 2002-2004 for 1.36 / 1000 / year and 1.62 / 1000 /year. A study in Scotland is responsible for the higher proportion of the elderly population of the population, which reports a high incident rate of 2.8 / 1000 / year. Although stroke has died in the last 40 years, in 2008, more than 46,000 people died in England and Wales (9% of all deaths). The current UK health policy emphasizes great on reducing stroke. These key risk factors, including high blood pressure, brain, high cholesterol, atrial fibrillation, and diabetes, require better management (Lee et al., 2011).

Every year, 200,000 people in Germany maintain their first stroke, and another 60,000 strokes after one or more of the pre-stroke; In almost five years almost a person can get a stroke at any time of his or her life. About 80% of stroke is ischemic and 20% is hemorrhagic. Under the age of 65 more than one-fourth of stroke patients are below Risk factors (Hypertension, smoking, lack of exercise, weights and other risk factors) are essential for the underlying stroke of vascular diseases. Medicines and lifestyle help with the necessary changes (Knecht et al., 2011).

Regular mortality statistics indicate that there are several differences in stroke deaths among European countries, which are much lower than most east European countries. European region's projections are 65-year-old population ratio, which can lead to most stroke incidents, up to 35% in 2050 from 20% to 2000, and middle-aged between 2000 to 37.7 years to 47.7 years in 2050 (Truelsen et al., 2006).

In Singapore, stroke injury is 4.03% of the population of 1.8 / 1000 people over 50 years of age. Struggling with stroke will increase our population of rapid population in Singapore and stroke will further increase the outbreak of survivors. Almost 40% of strokes have survived from serious disabilities with the huge impact on social and health-related health. The Multidisciplinary team improves functional results following a stroke of rehabilitation, with the possibility of institutionalization and decrease of death (Ng et al., 2013).

In Thailand, stroke is the third major cause of death. Despite the initial resistance to progress, many consequences of stroke have deteriorated for survivors: About 50% of the 12-month stroke survivors depend on others for self-care and personal activity in daily life. It keeps a significant demand for healthcare through hospital readmissions, community support needs and rehabilitation organizations. Stroke patients lives with not only the problem of strokes, but also their functional impairments and their reduced social interactions (Van et al., 2015).

The estimated number of stroke outbreaks in India is 44 to 843 per 100,000 populations. Most of Pakistan's data come from hospital based case series. Annual stroke incidence in Pakistan is 250 per 100,000 populations, which is projected in a guess of 350,000 new cases every year. A recent study conducted in Karachi's urban slum estimates the prevalence of life expectancy of 21.8% of stroke and transient ischemic attack among people 35 years and older. Another population-based study showed 4.8% stroke outbreak using interviews with an elected ethnic group in northwestern Pakistan and Afghanistan, the average age of 45 years of stroke. In Pakistan, there is a female stroke of stroke, and the age of stroke in the stroke than the male is even smaller. In these two demographic studies, very high trends in stroke can be confusing and confusing due to case-specific problems. With the population of nearly 20 million people, the proportion of stroke in Sri Lanka, 9% of every 1000 population. Limited information is available in Bangladesh with stroke prevalence: A study shows a total outbreak of 3 people per 1,000 people. The estimated stroke of stroke shows slight changes across all South Asian countries. No information is available from Afghanistan, Nepal, Bhutan and Maldives (Wasay et al., 2014).

In Bangladesh the occurrence of stroke has been estimated 0.20%, 0.30%, 0.20%, 1.00%, and 1.00% for the age groups 40–49 years, 50–59 years, 60–69 years, 70–79 years, and 80 years and above, respectively. The overall prevalence for stroke was 0.30%, and the ratio of male: female patients was 3.44: 2.41 (Islam et al., 2013).

In Western countries, with the frequency of ischemic stroke (IS) 10 times more frequent than hemorrhagic (HS). HS is considered to be at higher risk of mortality than IS. In previous studies, patients with HS are usually associated with excessive stroke death. Some

risk factors are common for both HS and IS. Diabetes and ischemic cardiovascular disease are well-established, but the relative role of risk factors such as high blood pressure, smoking, and alcohol use are controversial. An ongoing nationwide Danish Stroke Registry was established in March 2001, with the aim of registering all patients admitted with severe stroke. In February 2007, there were 39 484 patients in the registry, of which 3993 were HS (Andersen et al., 2009).

According to World Health Organization estimates, 86% of worldwide stroke deaths occur in developing countries globally. South Asia is considered to be the largest contributor to stroke deaths in the world, possibly accounting for more than 40% of world stroke deaths. In this region, heart disease may be higher for stroke, and stroke and heart disease are affected more than 10 years before the rest of the world. South Asian countries have a very large stroke population and on the other hand, limited by human resources (neuroscientists and stroke specialists) and financial resources (Wasay et al., 2014).

**Stroke Rehabilitation** It is a program that helps stroke victims overcome the inability of the brain to suffer from damage and after all spontaneous recovery from brain damage, despite their inability to help them to be physically, emotionally, and socially able. Early physical, occupational and speech therapy is the Proper rehabilitation of stroke patients (Nessa et al., 2009). Physiotherapy interventions provided by physiotherapists and try to improve balance, gait, and movement. Occupational therapy interventions provided by occupational therapists and they aimed at improving activities of daily living, occupation, and leisure activity. Interventions for speech and language therapy interventions provided by speech and language therapists and they usually aimed at improving language, communication, or swallowing abilities (Langhorne et al., 2011). Before and after the treatment the condition of the patient is examined is a specific part of the treatment and the effectiveness of physiotherapy. It compares the success of quality medical treatment and clinical workplace quality through a real assessment. Stroke is a severe illness. The standard of stroke is not given only by local neurological symptoms, such as motor and neurological function and lack of sensory deficiency, but negativity, depression, fatigue, vascular dementia, and frequent fall and bone breakdown. In the case of severe rehabilitation, after examining the

patient's condition after stroke, it is necessary to evaluate the entire disease process and to verify both medication therapy and complete rehabilitation (Tarasova et al., 2008).

Balance is defined as postural stability and viewed as the ability of maintaining the centre of mass within the base of support. The three elements of postural control are Symmetry, steadiness and dynamic stability (Tung et al., 2010). Individuals with stroke typically experience lower limb motor deficit. In order to improve the effect of lower limbs, interventions generally focus on postural balance training and dynamics of lower limbs. There are several standard results for evaluation of balance, including stroke rehabilitation and lower limb movement evaluation. Therefore, people with stroke need a minimum change score for a particular condition for proper detection of change in individual conditions (Hiengkaew et al., 2012).

Berg Balance Scale (BBS) Effective Balance is a widely used clinical measurement. It is widely used as a measurable measure in the study of adult people with different conditions, for example. Among the communities of Parkinson's disease, stroke, vestibular disease and long-term care organizations in various healthcare settings, day hospitals, general hospital geriatric wards and adult communities. Due to this extensive use of research and practice, its psychometric characteristics must be fully researched and reported in a clinical and related manner. The BBS has been found to have both high inter (ICC = 0.98) and intra-rater reliability (ICC = 0.98) (Donoghue and Stokes, 2009).

Stroke often results in decreased balance. Balance is essential for the best performance of the controlling system and for many daily activities. Equivalent evaluation is important for determining appropriate activity, determining the most effective treatment interventions, and identifying safe and unsafe activities after stroke. As the balance changes over time after the stroke, it is important to have a measurable measure that clinicians can monitor this change and adjust the treatment accordingly. The Bug Balance Scale (BBS) was originally designed to quantify quantitatively among adult adults. Stroke rehabilitation works in a recent study of 655 physiotherapists, BBS is widely regarded as an evaluation tool from community-based care, with intensive care. Given the extensive use of BBS after stroke and its understanding value is good (Blum et al., 2008).

As a result of stroke surviving patient rehabilitation, showed that 93% of patients had difficulty in walking independently after being out of the hospital. 'A 200-member post discharge status review of a local rehabilitation hospital shows that 69.2% of households were unable to participate in the work, 37.6% were homes and 70.0% did not travel. 'Similar results were found in another study conducted by Sarah and Gill, found a higher relation between balance function and effective recovery of patients (Chan et al., 2006).

Quality of life (QoL) has been defined by the WHO QOL group as 'individuals' perceptions of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns. QoL can also be defined as a person's sense of well-being, purpose in life, autonomy, ability to assume worthwhile roles, and ability to participate in significant relationships (Carod and Egidio, 2009).

Ischemic stroke results more favorable among young people than older patients. However, the disease is still notable. The follow-up studies have focused on death and on the repeat of Ischemic stroke, but there are a less number of health-related quality of life (HRQoL ) studies in the lives of young people with ischemic strokes. People with stroke need to provide information about the specific decisions about HRQoL. HRQoL will have to evaluate at least physical, functioning, emotional and social health (Naess et al., 2006).

Factors and mortality are higher in women than men, compared to their growth of stroke, longevity and stroke event rates. In addition, stroke-related results, including disability and quality of life (QOL) are poor among women, but their causes are not well understood. The social impact of women's poor stroke results is compounded by this increase that older women are more likely to live alone and socially isolate (Reeves et al., 2008).

Stroke rehabilitation usually involves a cyclical process by evaluation, patient identification and measurement; setting goals, setting real and progressive goals for improvement; intervention, help achieve goals; And reassessment, to assess progress against agreed goals. The most recognizable frustration caused by the motor impairment, in which the function muscle movement is restricted. Other common weaknesses include speech and language, swearing, sight, sensation, and consciousness (Langhorne et al., 2011).



Effective Independence measurement (FIM) was designed to provide a consistent data collection tool compared to the rehabilitation results in continued health care. In addition, an FIM attempts to establish a way to collectively rehabilitate information. Designers were designed to do FIM so that they could track the effectiveness of their patients through rehabilitation care and follow-up. FIM result management equipment is widely used in such nursing facilities as settings; acute, subacute, and rehabilitation hospitals (Douglas et al., 2010).

18 items of FIM assess patient's degree and care burden. 13 items disqualify the motor function and set restrictions on 5 cognitive functions. Each item is rated on a 7-point scale, 1 = Total Support (<25% independence) and 7 = Total independence (100% independence). Ratings are deposited across all items and are used to determine the degree required to complete the patient's original, routine daily work. The degree of dependency from a helper depends on the dependency of a helper. The FIM is regularly measured first at admission to the rehabilitative care and then at discharge from the care (Douglas et al., 2010).

### **3.1. Study Design**

Here observational study design was used for the study. Subjects were interviewed at admission day and 4 weeks after rehabilitation.

### **3.2 Study site**

The researcher was collected data from the Neurology unit of CRP, Savar, Dhaka. Stroke patients were treated here. It was easy for the researcher to gather information from the patients with Stroke.

### **3.3 Study Population**

The study populations were stroke patients who admitted at CRP for treatment from 16 April 2017 to 23 May 2017.

### **3.4 Sample size**

Sample size for this study was 36. These 36 participants were in a single group.

### **3.5 Sampling technique**

Participants were selected from CRP because they were easily accessible for the researcher. Purposive sampling targets a particular group of people. The samples were collected on the basis of some inclusion and exclusion criteria.

### **3.6 Inclusion criteria**

1. Patient with stroke who are treated by a physiotherapist in CRP Neurology unit.
2. Both male and female.
3. Duration of stroke above 1 month.

### **3.7 Exclusion criteria**

1. Mentally ill and medically unstable patient.
2. Patient suffering from serious pathological disease. e.g. tumors, tuberculosis etc.
3. History of previous stroke.

### **3.8 Data collection tools**

The tools that needed for the study were Bengali Consent form and questionnaire and other some necessary materials that were pen, pencil, eraser, clip board, white paper and note book.

### **Measurement tool**

FIM scale, Berg balance scale, EQ-5D-5L scale

#### **FIM scale**

The Functional Independence Measure (FIM) is an assessment tool that aims to evaluate the functional status of patients throughout the rehabilitation process following a stroke, traumatic brain injury, spinal cord injury or cancer. FIM is comprised of 18 items, grouped into 2 subscales - motor and cognition.

The motor subscale includes

Eating

Grooming

Bathing

Dressing, upper body

Dressing, lower body

Toileting

Bladder management

Bowel management

Transfers - bed/chair/wheelchair

Transfers – toilet

Transfers - bath/shower

Walk/wheelchair

Stairs

The cognition subscale includes

Comprehension

Expression

Social interaction

Problem solving

Memory

Each item is scored on a 7-point ordinal scale, ranging from a score of 1 to a score of 7. The higher the score, the more independent the patient is in performing the task associated with that item.

- 1 - Total assistance with helper
- 2 - Maximal assistance with helper
- 3 - Moderate assistance with helper
- 4 - Minimal assistance with helper
- 5 - Supervision or setup with helper
- 6 - Modified independence with no helper
- 7 - Complete independence with no helper

The total score for the FIM motor subscale (the sum of the individual motor subscale items) will be a value between 13 and 91.

The total score for the FIM cognition subscale (the sum of the individual cognition subscale items) will be a value between 5 and 35.

The total score for the FIM instrument (the sum of the motor and cognition subscale scores) will be a value between 18 and 126.

### **Berg Balance Scale**

The Berg balance scale is used to objectively determine a patient's ability (or inability) to safely balance during a series of predetermined tasks. It is a 14 item list with each item

consisting of a five-point ordinal scale ranging from 0 to 4, with 0 indicating the lowest level of function and 4 the highest level of function and takes approximately 20 minutes to complete.

Item description score (0-4)

Sitting to standing

Standing unsupported

Sitting unsupported

Standing to sitting

Transfers

Standing with eyes closed

Standing with feet together

Reaching forward with outstretched arm

Retrieving object from floor

Turning to look behind

Turning 360 degrees

Placing alternate foot on stool

Standing with one foot in front

Standing on one foot

Interpretation

0–20, wheelchair bound

21–40, walking with assistance

41–56, independent

### **EQ-5D-5L scale**

The EQ-5D-5L comprises five dimensions of health: mobility, ability to self-care, ability to undertake usual activities, pain and discomfort, and anxiety and depression. Each contain have 5 point. 1 is no problem and 5 is severe problem. Visual analogue scale is the second part of the questionnaire, asking to mark health status on the day of the interview on a 20 cm vertical scale with end points of 0 and 100. There are notes at the both ends of the scale

that the bottom rate (0) corresponds to " the worst health you can imagine", and the highest rate (100) corresponds to "the best health you can imagine".

### **3.8.1 Procedure of data collection**

The study procedure had conducted through assessing the patient, initial recording, treatment and final recording. After screening the patient at the department, the patients were assessed by a qualified physiotherapist. 4 weeks of treatment was provided for every subject. 36 subjects were chosen for data collection according to the inclusion criteria.

### **3.8.2 Data analysis procedure**

Data was analyzed with the software which named Statistical Package for Social Science (SPSS) version 23.0 and Microsoft Excel 2016. Every questionnaire was rechecked for missing information or unclear information. At first put the name of variables in the variable view of SPSS and the types, values, decimal, label alignment and measurement level of data. The next step was to input data view of SPSS. After input all data researcher checked the inputted data to ensure that all data had been accurately transcribed from the questionnaire sheet to SPSS data view. Then the raw data was ready for analysis in SPSS. Descriptive statistic test, Wilcoxon Test was performed for finding result. Data was presented by using the bar graph, and table.

### **Wilcoxon Test**

This test also known as ‘‘Wilcoxon matched pair signed rank test’’, is an alternative to the paired t test, when the assumption of normality or equality of variances is not meet. When there are just two measures to be compared from the same case, and the data are normally distributed or the sample size is large, we apply a paired samples t test (also known as a related sample t test). In this same situation if the data are not normally distributed we use Wilcoxon test.

### **Assumption 1**

Each pair of observations must represent a random sample from a population and must be independent of every other pair of observations.

### Assumption 2

The z test yields relatively accurate results to the extent that the sample size is large.

### Assumption 3

The Distribution of the differences scores is continuous and symmetrical in the population.

### Wilcoxon Test for Large Samples (n>25)

In case of large sample sizes, ranks are assumed to be normally distributed. In this case, T is replaced by z statistic given as

$$z = \frac{T - \frac{N(N+1)}{4}}{\sqrt{\frac{N(N+1)(2N+1)}{24}}}$$

Here,

T= Lowest Value of among Positive & Negative Rank.

N= Total number of the participants

Z= Value of Wilcoxon matched pair signed rank test

Calculation Wilcoxon matched pair signed rank test z value for Total FIM score stated below-

$$\begin{aligned} Z &= \frac{0 - \frac{36(36+1)}{4}}{\sqrt{\frac{36(36+1)(2 \times 36+1)}{24}}} \\ &= \frac{0-333}{\sqrt{\frac{1369 \times 73}{24}}} \end{aligned}$$

Here,

$$T = 0$$

$$N = 40$$

$$Z = ?$$

$$\begin{aligned}
&= \frac{-333}{\sqrt{\frac{97236}{24}}} \\
&= \frac{-333}{\sqrt{4051.5}} \\
&= -5.23
\end{aligned}$$

### **Interpretation**

Calculated z value is compared with table z value to find p value. If  $p < 0.05$ , we reject the null hypothesis of equality of two groups at  $\alpha = 0.05$ . If otherwise, we cannot reject the null hypothesis and accept it.

### **3.8.3 Level of Significance**

In order to find out the significance of the study, the “p” value was calculated. The p values refer to the probability of the results for experimental study. The word probability refers to the accuracy of the findings. A p value is called level of significance for an experiment and a p value of  $< 0.05$  was accepted as significant result for health service research. If the p value is equal or smaller than the significant level, the results are said to be significant.

### **3.9 Ethical consideration**

The whole process of this research project was done by following the Bangladesh Medical Research Council (BMRC) guidelines, Institution Review Board (IRB) and World Health Organization (WHO) Research guidelines. The proposal of the dissertation including methodology was approved by Institutional Review Board and obtained permission from the concerned authority of ethical committee of Bangladesh Health Professions Institute (BHPI). Informed consent was used to take permission from all participants. Participants’ rights and privileges were ensured. All the participants were aware about the aim and objectives of the study. Findings of the study were disseminated with the approval of regarding authority. The researcher strictly maintained the confidentiality regarding participant’s condition and treatment.



### Socio-demographic information at a glance

Among 36 patients most of them were above 50 years. 25(69.4%) patients were male and the other 11(30.6) patients were female. Out of the participant the mean age was 51.58 years. Majority of them were lived in rural area and some of them were lived in semirural area and the other lived in urban area. (Table- 1 and 2)

**Table 1: Sociodemographic information of the patients**

Variables	Categories	Number of Participant	Percentage	Mean
Age	30-40 years	7	19.4%	51.58
	41-50 years	9	25.0%	
	51-60 years	13	36.1%	
	61-70 years	7	19.4%	
		(n=36)		
Sex	Male	25	69.4%	
	Female	11	30.6%	
Marital status	Married	34	94.4%	
	Unmarried	2	5.6%	
Monthly income before stroke	Male	25	69.4%	30800.00
	Female	11	30.6%	00
		(n=36)		
Monthly income after stroke	Male	25	69.4%	3200.00
	Female	11	30.6%	00
		(n=36)		
Monthly income of family		(n=36)		29916.67

**Table 2: Sociodemographic information of the patients**

Variables	Categories	Number of Participant	Percentage
Educational status	No formal education	10	27.8%
	Primary education	10	27.8%
	Secondary education	8	22.2%
	Higher secondary	2	5.6%
	Bachelor degree or above	6	16.7%
Occupational status	Service holder	15	41.7%
	Businessman	8	22.2%
	House wife	11	30.6%
	Others	2	5.6%
Living area of the participants	Rural	18	50.0%
	Semi Urban	13	36.1%
	Urban	5	13.9%
Smoking status	Yes	17	47.2%
	No	19	52.8%
Alcohol consumption status	Yes	6	16.7%
	No	30	83.3%
History of stroke in family	Yes	8	22.2%
	No	28	77.8%
Type of stroke	Ischemic	28	77.8%
	Hemorrhagic	8	22.2%
Affected side	Right	20	55.6%
	Left	16	44.4%
Past medical history	Hypertension	34	94.4%
	Diabetics	22	61.1%
	Heart disease	9	25.0%
	Lung disease	3	8.3%

### Rehabilitation service

Among n=36 patients, 36(100%) patients were taking physiotherapy,33(91.7%) patients were taking Occupational Therapy and 22(61.1%) patients were taking Speech and language therapy. Total mean physiotherapy 500 minutes in 4 weeks. Total mean Occupational Therapy 376 minutes in 4 weeks. Total mean Speech and language therapy 235.23 minutes in 4 weeks. 1 session is 45 minutes.

**Table 3: Rehabilitation service at a glance**

	Number of Participant (n=36)	Percentage	Mean In session	Mean In minutes	Minimum session	Maximum session
Physiotherapy	36	100.0%	11.11	500	5	18
Occupational Therapy	33	91.7%	8.36	376.2	1	20
Speech and Language Therapy	22	61.1%	5.23	235.35	1	10

## Functional Independence Outcome

**Table 4: Rank and test statistics of patient's Total motor FIM Score**

Motor FIM score after 4-week rehabilitation- Motor FIM score at admission	N	Mean Rank	Sum of Ranks	Test Statistics (Wilcoxon Signed-Rank Test)	
				Based on negative ranks Z	P
Positive rank	36	18.50	666.00	-5.247	<0.001
Negative rank	0	.00	.00		
Ties	0				
<b>Total</b>	<b>36</b>				

Table described the comparison of the participants before (pretest) and after (post-test) motor FIM score. The table's legend displayed Positive rank 36 that means 36 participants' total motor FIM score increased after receiving rehabilitation. In addition, Negative rank 0 that mean none of the participant's total Motor FIM score decreased after receiving rehabilitation services. Moreover 'ties' = 0 indicate that no participant's remained same as pretest motor FIM score after receiving rehabilitation services. P value is <0.05 which indicate that there is less than a 5% chance that the results are due to random error and it is significant. Therefore, it is can be said that, after receiving rehabilitation services improved motor Functional Independence among participants.

**Table 5: Descriptive Statistics of patients motor FIM Score**

	Admission Mean	After 4-week rehabilitation Mean	Outcome in Percentage
Motor FIM (13 to 91)	44.53 (48.93%)	55.19 (60.65%)	11.71%

**Table 6: Rank and test statistics of patients cognitive FIM Score**

Cognitive FIM score after 4-week rehabilitation- Cognitive FIM score at admission	N	Mean Rank	Sum of Ranks	Test Statistics (Wilcoxon Signed-Rank Test)	
				Based on negative ranks Z	P
Positive rank	33	17.00	666.00	-5.239	<0.001
Negative rank	0	.00	.00		
Ties	3				
<b>Total</b>	<b>36</b>				

Table described the comparison of the participants before (pretest) and after (post-test) cognitive FIM score. The table’s legend displayed Positive rank 36 that means 33 participants’ cognitive FIM score increased after receiving rehabilitation. In addition, Negative rank 0 that mean none of the participant’s total cognitive FIM score decreased after receiving rehabilitation services. Moreover ‘ties’ = 3 indicates that 3 participant’s remained same as pretest cognitive FIM score after receiving rehabilitation services. P value is <0.05 which indicate that there is less than a 5% chance that the results are due to random error and it is significant. Therefore, it is can be said that, after receiving rehabilitation services improved cognitive Functional Independence among participants.

**Table 7: Descriptive Statistics of patients cognitive FIM Score**

	Admission Mean	After 4-week rehabilitation Mean	Outcome in Percentage
Cognitive FIM (5 to 35)	25.36 (72.46%)	27.83 (79.51%)	7.05%

**Table 8: Rank and test statistics of patients Total FIM Score**

FIM after 4-week rehabilitation- FIM at admission	N	Mean Rank	Sum of Ranks	Test Statistics (Wilcoxon Signed-Rank Test)	
				Based on negative ranks Z	P
Positive rank	36	18.50	666.00	-5.239	<0.001
Negative rank	0	.00	.00		
Ties	0				
<b>Total</b>	<b>36</b>				

Table described the comparison of the participants before (pretest) and after (post-test) FIM score. The table's legend displayed Positive rank 36 that means 36 participants' total FIM score increased after receiving rehabilitation. In addition, Negative rank 0 that mean none of the participant's total FIM score decreased after receiving rehabilitation services. Moreover 'ties' = 0 indicate that no participant's remained same as pretest FIM score after receiving rehabilitation services. P value is <0.05 which indicate that there is less than a 5% chance that the results are due to random error and it is significant. Therefore, it is can be said that, after receiving rehabilitation services improved Functional Independence among participants.

**Table 9: Descriptive Statistics of patients total FIM Score**

	Admission Mean	After 4-week rehabilitation Mean	Outcome in Percentage
Total FIM (18 to 126)	69.89 (55.47%)	82.75 (65.68%)	(10.2%)

### **Functional Independence Measure of Eating score**

During admission among the participants 16.7% stroke patients needed Total assistance, 8.3% stroke patients needed Maximal assistance, 2.8% stroke patients needed moderate assistance, 13.9% stroke patients needed minimal assistance, 44.4% stroke patients needed Supervision, 13.9% stroke patients need modified independence to perform eating activity.

On the other hand, after 4-week rehabilitation among the participants 13.9% stroke patients needed Maximal assistance, 13.9% stroke patients needed moderate assistance, 7.5% stroke patients needed minimal assistance, 19.4% stroke patients needed Supervision, 19.4% stroke patients needed modified independence, 11.1% stroke patients were complete independence to perform eating activity.

So after 4-week rehabilitation the level of dependency decreased to perform eating activity.

**Table 10: Functional Independence Measure of Eating score**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	6 (16.7%)	0
Maximal assistance	3 (8.3%)	5 (13.9%)
Moderate assistance	1 (2.8%)	5 (13.9%)
Minimal assistance	5 (13.9%)	3 (7.5%)
Supervision	16 (44.4%)	7 (19.4%)
Modified independence	5 (13.9%)	17 (19.4%)
Complete independence	0	4 (11.1%)

### **Functional Independence Measure of Bathing**

During admission among the participants 19.4% stroke patients needed Total assistance, 13.9% stroke patients needed Maximal assistance, 11.1% stroke patients needed moderate assistance, 25% stroke patients needed minimal assistance, 27.8% stroke patients needed Supervision, 2.8% stroke patient needed modified independence to perform bathing activity.

On the other hand, after 4-week rehabilitation among the participants 19.4% stroke patients needed Maximal assistance, 19.4% stroke patients needed moderate assistance, 16.7% stroke patients needed minimal assistance, 27.8% stroke patients needed Supervision, 16.7% stroke patients needed modified independence to perform bathing activity.

So after 4-week rehabilitation the level of dependency decreased to perform bathing activity.

**Table 11: Functional Independence Measure of Bathing**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	7 (19.4%)	0
Maximal assistance	5 (13.9%)	7 (19.4%)
Moderate assistance	4 (11.1%)	7 (19.4%)
Minimal assistance	9 (25.0%)	6 (16.7%)
Supervision	10 (27.8%)	10 (27.8%)
Modified independence	1 (2.8%)	6 (16.7%)
Complete independence	0	0



### **Functional Independence Measure of Grooming**

During admission among the participants 25% stroke patients needed Total assistance, 22.2% stroke patients needed Maximal assistance, 27.8% stroke patients needed moderate assistance, 16.7% stroke patients needed minimal assistance, 5.6% stroke patients needed Supervision, 2.8% stroke patients needed modified independence to perform grooming activity.

On the other hand, after 4-week rehabilitation among the participants 27.8% stroke patients needed Maximal assistance, 19.4% stroke patients needed moderate assistance, 33.3% stroke patients needed minimal assistance, 11.1% stroke patients needed Supervision, 5.6% stroke patients needed modified independence, 2.8% stroke patient was complete independence to perform grooming activity.

So after 4-week rehabilitation the level of dependency decreased to perform grooming activity.

**Table 12: Functional Independence Measure of Grooming**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	9 (25.0%)	0
Maximal assistance	8 (22.2%)	10 (27.8%)
Moderate assistance	10 (27.8%)	7 (19.4%)
Minimal assistance	6 (16.7%)	12 (33.3%)
Supervision	2 (5.6%)	4 (11.1%)
Modified independence	1 (2.8%)	2 (5.6%)
Complete independence	0	1 (2.8%)

### **Functional Independence Measure of Dressing Upper Body**

During admission among the participants 16.7% stroke patients needed Total assistance, 22.2% stroke patients needed Maximal assistance, 38.9% stroke patients needed moderate assistance, 11.1% stroke patients needed minimal assistance, 8.3% stroke patients needed Supervision, 2.8% stroke patient needed modified independence to perform upper body dressing activity.

On the other hand, 4-week rehabilitation among the participants 22.2% stroke patients needed Maximal assistance, 16.7% stroke patients needed moderate assistance, 36.1% stroke patients needed minimal assistance, 13.9% stroke patients needed Supervision, 8.3% stroke patients needed modified independence, 2.8% stroke patient was complete independence to perform upper body dressing activity.

So after 4-week rehabilitation the level of dependency decreased to perform upper body dressing activity.

**Table 13: Functional Independence Measure of Dressing Upper Body**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	6 (16.7%)	0
Maximal assistance	8 (22.2%)	8 (22.2%)
Moderate assistance	14 (38.9%)	6 (16.7%)
Minimal assistance	4 (11.1%)	13 (36.1%)
Supervision	3 (8.3%)	5 (13.9%)
Modified independence	1 (2.8%)	3 (8.3%)
Complete independence	0	1 (2.8%)

### **Functional Independence Measure of Dressing Lower Body**

During admission among the participants 16.7% stroke patients needed Total assistance, 25% stroke patients needed Maximal assistance, 33.3% stroke patients needed moderate assistance, 13.9% stroke patients needed minimal assistance, 8.3% stroke patients needed Supervision, 2.8% stroke patients need modified independence to perform dressing activity of lower body.

On the other hand, after 4-week rehabilitation among the participants 30.6% stroke patients needed Maximal assistance, 22.2% stroke patients needed moderate assistance, 27.8% stroke patients needed minimal assistance, 8.3% stroke patients needed Supervision, 11.1% stroke patients needed modified independence to perform dressing activity of lower body.

So after 4-week rehabilitation the level of dependency decreased to perform dressing activity of lower body.

**Table 14: Functional Independence Measure of Dressing Lower Body**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	6 (16.7%)	0
Maximal assistance	9 (25.0%)	11 (30.6%)
Moderate assistance	12 (33.3%)	8 (22.2%)
Minimal assistance	5 (13.9%)	10 (27.8%)
Supervision	3 (8.3%)	3 (8.3%)
Modified independence	1 (2.8%)	4 (11.1%)
Complete independence	0	0

### **Functional Independence Measure of Toileting**

During admission among the participants 33.3% stroke patients needed Total assistance, 25% stroke patients needed Maximal assistance, 16.7% stroke patients needed moderate assistance, 13.9% stroke patients needed minimal assistance, 2.8% stroke patient needed Supervision, 8.3% stroke patients needed modified independence to perform toileting activity.

On the other hand, after 4-week rehabilitation among the participants 33.3% stroke patients needed Maximal assistance, 22.2% stroke patients needed moderate assistance, 13.9% stroke patients needed minimal assistance, 16.7% stroke patients needed Supervision, 13.9% stroke patients needed modified independence to perform toileting activity.

So after 4-week rehabilitation the level of dependency decreased to perform toileting activity.

**Table 15: Functional Independence Measure of Toileting**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	12 (33.3%)	0
Maximal assistance	9 (25.0%)	12 (33.3%)
Moderate assistance	6 (16.7%)	8 (22.2%)
Minimal assistance	5 (13.9%)	5 (13.9%)
Supervision	1 (2.8%)	6 (16.7%)
Modified independence	3 (8.3%)	5 (13.9%)
Complete independence	0	0

### **Functional Independence Measure of Bladder Control**

During admission among the participants 13.9% stroke patients needed moderate assistance, 8.3% stroke patients needed minimal assistance, 19.4% stroke patients needed Supervision, 13.9% stroke patients needed modified independence, 44.4% stroke patients were complete independence to perform bladder control activity.

On the other hand, after 4-week rehabilitation among the participants 13.9% stroke patients needed minimal assistance, 8.3% stroke patients needed Supervision, 27.8% stroke patients need modified independence, 50% stroke patients were complete independence to perform bladder control activity.

So after 4-week rehabilitation the level of dependency decreased to perform bladder control activity.

**Table 16: Functional Independence Measure of Bladder Control**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	0	0
Maximal assistance	0	0
Moderate assistance	5 (13.9%)	0
Minimal assistance	3 (8.3%)	5 (13.9%)
Supervision	7 (19.4%)	3 (8.3%)
Modified independence	5 (13.9%)	10 (27.8%)
Complete independence	16 (44.4%)	18 (50.0%)

### **Functional Independence Measure of Bowel Control**

During admission among the participants 13.9% stroke patients needed moderate assistance, 8.3% stroke patients needed minimal assistance, 19.4% stroke patients needed Supervision, 13.9% stroke patients needed modified independence, 44.4% stroke patients needed were independence to perform bowel control activity.

On the other hand, after 4-week rehabilitation among the participants 2.8% stroke patient needed moderate assistance, 11.1% stroke patients needed minimal assistance, 11.1% stroke patients needed Supervision, 25% stroke patients needed modified independence, 50% stroke patients were complete independence to perform bowel control activity.

So after 4-week rehabilitation the level of dependency decreased to perform bowel control activity.

**Table 17: Functional Independence Measure of Bowel Control**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	0	0
Maximal assistance	0	0
Moderate assistance	5 (13.9%)	1 (2.8%)
Minimal assistance	3 (8.3%)	4 (11.1%)
Supervision	7 (19.4%)	4 (11.1%)
Modified independence	5 (13.9%)	9 (25.0%)
Complete independence	16 (44.4%)	18 (50.0%)

### **Functional Independence Measure of Chair /Wheelchair Transfer**

During admission among the participants 16.7% stroke patients needed Total assistance, 2.8% stroke patient needed Maximal assistance, 38.9% stroke patients needed moderate assistance, 19.4% stroke patients needed minimal assistance, 13.9% stroke patients needed Supervision, 8.3% stroke patients needed modified independence to perform chair/wheelchair transfer activity.

On the other hand, after 4-week rehabilitation among the participants 16.7% stroke patients needed Maximal assistance, 5.6% stroke patients needed moderate assistance, 25% stroke patients needed minimal assistance, 19.4% stroke patients needed Supervision, 25% stroke patients needed modified independence, 8.3% stroke patients were complete independence to perform chair/wheelchair transfer activity.

So after 4-week rehabilitation the level of dependency decreased to perform chair/wheelchair transfer activity.

**Table 18: Functional Independence Measure of Chair/ Wheelchair Transfer**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	6 (16.7%)	0
Maximal assistance	1 (2.8%)	6 (16.7%)
Moderate assistance	14 (38.9%)	2 (5.6%)
Minimal assistance	7 (19.4%)	9 (25.0%)
Supervision	5 (13.9%)	7 (19.4%)
Modified independence	3 (8.3%)	9 (25.0%)
Complete independence	0	3 (8.3%)

### **Functional Independence Measure of Toilet transfer**

During admission among the participants 16.7% stroke patients needed Total assistance, 11.1% stroke patients needed Maximal assistance, 36.1% stroke patients needed moderate assistance, 16.7% stroke patients needed minimal assistance, 11.1% stroke patients needed Supervision, 8.3% stroke patients needed modified independence to perform toilet transfer activity.

On the other hand, after 4-week rehabilitation among the participants 16.7% stroke patients needed Maximal assistance, 13.9% stroke patients needed moderate assistance, 22.2% stroke patients needed minimal assistance, 25% stroke patients needed Supervision, 13.9% stroke patients needed modified independence, 8.3% stroke patients were complete independence to perform toilet transfer activity.

So after 4-week rehabilitation the level of dependency decreased perform toilet transfer activity.

**Table 19: Functional Independence Measure of Toilet transfer**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	6 (16.7%)	0
Maximal assistance	4 (11.1%)	6 (16.7%)
Moderate assistance	13 (36.1%)	5 (13.9%)
Minimal assistance	6 (16.7%)	8 (22.2%)
Supervision	4 (11.1%)	9 (25.0)%
Modified independence	3 (8.3%)	5 (13.9%)
Complete independence	0	3 (8.3%)



### **Functional Independence Measure of Tub & Shower transfer**

During admission among the participants 16.7% stroke patients needed Total assistance, 8.3% stroke patients needed Maximal assistance, 38.9% stroke patients needed moderate assistance, 16.7% stroke patients needed minimal assistance, 8.3% stroke patients needed Supervision, 11.1% stroke patients need modified independence to perform tub & shower activity.

On the other hand, during Discharge among the participants 16.7% stroke patients needed Maximal assistance, 13.9% stroke patients needed moderate assistance, 22.2% stroke patients needed minimal assistance, 25% stroke patients needed Supervision, 13.9% stroke patients need modified independence, 8.3% stroke patients were complete independence to perform tub & shower activity.

So after 4-week rehabilitation the level of dependency decreased to perform tub & shower transfer activity.

**Table 20: Functional Independence Measure of Tub & Shower transfer**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	6 (16.7%)	0
Maximal assistance	3 (8.3%)	6 (16.7%)
Moderate assistance	14 (38.9%)	5 (13.9%)
Minimal assistance	6 (16.7%)	8 (22.2%)
Supervision	3 (8.3%)	9 (25.0)%
Modified independence	4 (11.1%)	5 (13.9%)
Complete independence	0	3 (8.3%)

### **Functional Independence Measure of Walk/Wheelchair**

During admission among the participants 16.7% stroke patients needed Total assistance, 19.4% stroke patients needed Maximal assistance, 22.2% stroke patients needed moderate assistance, 19.4% stroke patients needed minimal assistance, 13.9% stroke patients needed Supervision, 8.3% stroke patients needed modified independence to perform walk/wheelchair transfer activity.

On the other hand, after 4-week rehabilitation among the participants 13.9% stroke patients needed Maximal assistance, 13.9% stroke patients needed moderate assistance, 19.4% stroke patients needed minimal assistance, 19.4% stroke patients needed Supervision, 30.6% stroke patients needed modified independence, 2.8% stroke patient was complete independence to perform walk/wheelchair transfer activity.

So after 4-week rehabilitation the level of dependency decreased to perform walk/wheelchair transfer activity.

**Table 21: Functional Independence Measure of Walk/Wheelchair**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	6 (16.7%)	0
Maximal assistance	7 (19.4%)	5 (13.9%)
Moderate assistance	8 (22.2%)	5 (13.9%)
Minimal assistance	7 (19.4%)	7 (19.4%)
Supervision	5 (13.9%)	7 (19.4%)
Modified independence	3 (8.3%)	11 (30.6%)
Complete Independence	0	1 (2.8%)

### **Functional Independence Measure of Stairs transfer**

During admission among the participants 41.7% stroke patients needed Total assistance, 33.3% stroke patients needed Maximal assistance, 8.3% stroke patients needed moderate assistance, 5.6% stroke patients needed minimal assistance, 5.6% stroke patients needed Supervision, 5.6% stroke patients needed modified independence to perform stairs transfer activity.

On the other hand, after 4-week rehabilitation among the participants 13.9% stroke patients needed Total assistance, 30.6% stroke patients needed Maximal assistance, 22.2% stroke patients needed moderate assistance, 16.7% stroke patients needed minimal assistance, 5.6% stroke patients needed Supervision, 8.3% stroke patients needed modified independence, 2.8% stroke patient was complete independence to perform stairs transfer activity.

So after 4-week rehabilitation the level of dependency decreased to perform stairs transfer activity.

**Table 22: Functional Independence Measure of Stairs transfer**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	15 (41.7%)	5 (13.9%)
Maximal assistance	12 (33.3%)	11 (30.6%)
Moderate assistance	3 (8.3%)	8 (22.2%)
Minimal assistance	2 (5.6%)	6 (16.7%)
Supervision	2 (5.6%)	2 (5.6%)
Modified independence	2 (5.6%)	3 (8.3%)
Complete Independence	0	1 (2.8%)

### **Functional Independence Measure of Comprehension**

During admission among the participants 2.8% stroke patient needed Maximal assistance, 13.9% stroke patients needed moderate assistance, 19.4% stroke patients needed minimal assistance, 19.4% stroke patients needed Supervision, 39.9% stroke patients needed modified independence, 5.6% stroke patients were complete independence to perform comprehension activity.

On the other hand, during Discharge among the participants 5.6% stroke patients needed moderate assistance, 16.7% stroke patients needed minimal assistance, 19.4% stroke patients needed Supervision, 38.9% stroke patients needed modified independence, 19.4% stroke patients were complete independence to perform comprehension activity.

So after 4-week rehabilitation the level of dependency decreased to perform comprehension activity.

**Table 23: Functional Independence Measure of Comprehension**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	0	0
Maximal assistance	1 (2.8%)	0
Moderate assistance	5 (13.9%)	2 (5.6%)
Minimal assistance	7 (19.4%)	6 (16.7%)
Supervision	7 (19.4%)	7 (19.4%)
Modified independence	14 (38.9%)	14 (38.9%)
Complete Independence	2 (5.6%)	7 (19.4%)

## Functional Independence Measure of Expression

During admission among the participants 2.8% stroke patients needed Maximal assistance, 16.7% stroke patients needed moderate assistance, 16.7% stroke patients needed minimal assistance, 19.4% stroke patients needed Supervision, 41.7% stroke patients needed modified independence, 2.8% stroke patient were complete independence to perform expression activity.

On the other hand, during Discharge among the participants 5.6% stroke patients needed moderate assistance, 19.4% stroke patients needed minimal assistance, 22.2% stroke patients needed Supervision, 41.7% stroke patients needed modified independence, 11.1% stroke patients were complete independence to perform expression activity.

So after 4-week rehabilitation the level of dependency decreased to perform expression activity.

**Table 24: Functional Independence Measure of Expression**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	0	0
Maximal assistance	1 (2.8%)	0
Moderate assistance	6 (16.7%)	2 (5.6%)
Minimal assistance	6 (16.7%)	7 (19.4%)
Supervision	7 (19.4%)	8 (22.2%)
Modified independence	15 (41.7%)	15 (41.7%)
Complete Independence	1 (2.8%)	4 (11.1%)

## Functional Independence Measure of Social Interaction

During admission among the participants 2.8% stroke patient needed Maximal assistance, 19.4% stroke patients needed moderate assistance, 13.9% stroke patients needed minimal assistance, 19.4% stroke patients needed Supervision, 41.7% stroke patients needed modified independence, 2.8% stroke patient needed was independence to perform social interaction activity.

On the other hand, 4-week rehabilitation among the participants 2.8% stroke patient needed moderate assistance, 19.4% stroke patients needed minimal assistance, 13.9% stroke patients needed Supervision, 36.1% stroke patients need modified independence, 27.8% stroke patients were complete independence to perform social interaction activity.

So after 4-week rehabilitation the level of dependency decreased to perform social interaction activity.

**Table 25: Functional Independence Measure of Social Interaction**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	0	0
Maximal assistance	1 (2.8%)	0
Moderate assistance	7 (19.4%)	1 (2.8%)
Minimal assistance	5 (13.9%)	7 (19.4%)
Supervision	7 (19.4%)	5 (13.9%)
Modified independence	15 (41.7%)	13 (36.1%)
Complete Independence	1 (2.8%)	10 (27.8%)

### **Functional Independence Measure of Problem Solving**

During admission among the participants 2.8% stroke patient needed Maximal assistance, 13.9% stroke patients needed moderate assistance, 13.9% stroke patients needed minimal assistance, 16.7% stroke patients needed Supervision, 36.1% stroke patients need modified independence, 16.7% stroke patients needed complete independence to perform problem solving activity.

On the other hand, after 4-week rehabilitation among the participants 8.3% stroke patients needed moderate assistance, 19.4% stroke patients needed minimal assistance, 11.1% stroke patients needed Supervision, 44.4% stroke patients needed modified independence, 16.7% stroke patients were complete independence to perform problem solving activity.

So after 4-week rehabilitation the level of dependency decreased to perform problem solving activity.

**Table 26: Functional Independence Measure of Problem Solving**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	0	0
Maximal assistance	1 (2.8%)	0
Moderate assistance	5 (13.9%)	3 (8.3%)
Minimal assistance	5 (13.9%)	7 (19.4%)
Supervision	6 (16.7%)	4 (11.1%)
Modified independence	13 (36.1%)	16 (44.4%)
Complete Independence	6 (16.7%)	6 (16.7%)

### **Functional Independence Measure of Memory**

During admission among the participants 2.8% stroke patient needed Maximal assistance, 13.9% stroke patients needed moderate assistance, 2.8% stroke patient needed minimal assistance, 16.7% stroke patients needed Supervision, 41.7% stroke patients needed modified independence, 22.2% stroke patients were complete independence to perform memorizing activity.

On the other hand, after 4-week rehabilitation among the participants 8.3% stroke patients needed moderate assistance, 8.3% stroke patients needed minimal assistance, 13.9% stroke patients needed Supervision, 30.6% stroke patients need modified independence, 38.9% stroke patients were complete independence to perform memorizing activity.

So after 4-week rehabilitation the level of dependency decreased to perform memorizing activity.

**Table 27: Functional Independence Measure of Memory**

<b>Domain</b>	<b>Admission</b>	<b>Discharge</b>
Total assistance	0	0
Maximal assistance	1 (2.8%)	0
Moderate assistance	5 (13.9%)	3 (8.3%)
Minimal assistance	1 (2.8%)	3 (8.3%)
Supervision	6 (16.7%)	5 (13.9%)
Modified independence	15 (41.7%)	11 (30.6%)
Complete Independence	8 (22.2%)	14 (38.9%)



## Balance Outcome

**Table 28: Rank and test statistics of patients Total BBS Score**

BBS after 4-week rehabilitation- BBS at admission	N	Mean Rank	Sum of Ranks	Test Statistics (Wilcoxon Signed-Rank Test)	
				Based on negative ranks Z	P
Positive rank	36	18.50	666.00	-5.243	<0.001
Negative rank	0	.00	.00		
Ties	0				
<b>Total</b>	<b>36</b>				

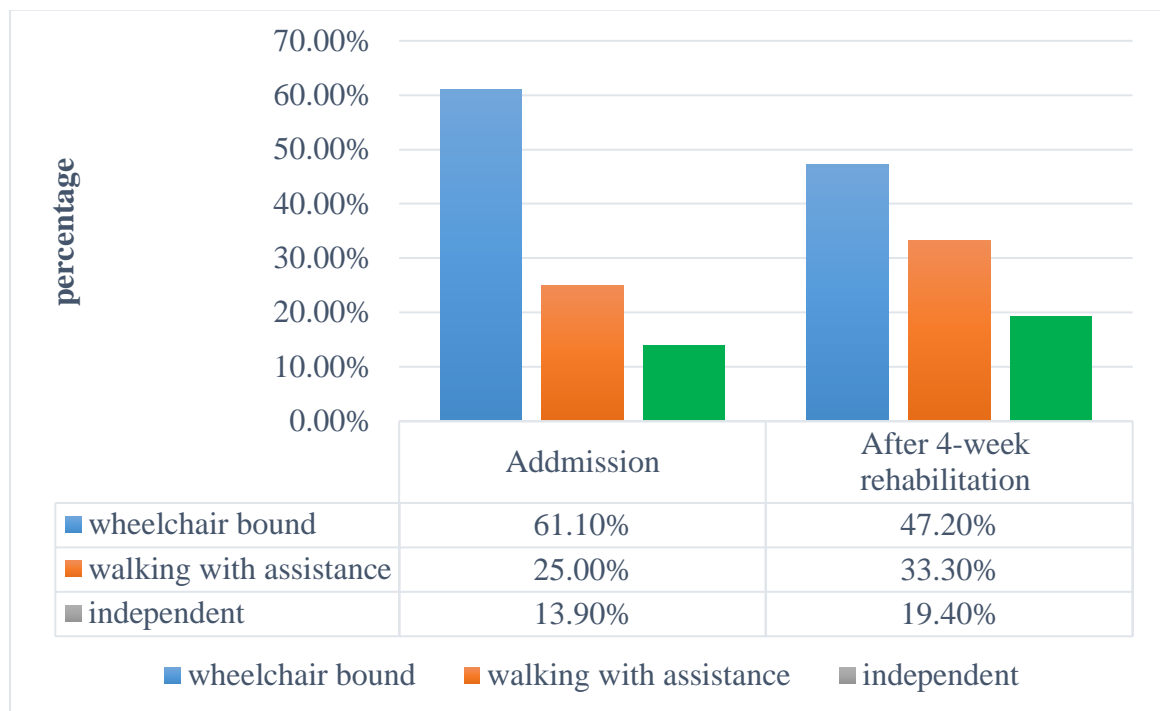
Table described the comparison of the participants before (pretest) and after (post-test) BBS score. The table's legend displayed Positive rank 36 that means 36 participants' total BBS score increased after receiving rehabilitation. In addition, Negative rank 0 that mean none of the participant's BBS score decreased after receiving rehabilitation services. Moreover 'ties' = 0 indicate that no participant's remained same as pretest BBS score after receiving rehabilitation services. P value is <0.05 which indicate that there is less than a 5% chance that the results are due to random error and it is significant. Therefore, it is can be said that, after receiving rehabilitation services improved balance among participants.

**Table 29: Descriptive Statistics of patients total BBS Score**

	Admission Mean	After 4-week rehabilitation Mean	Outcome in Percentage
Total BBS (0 to 56)	17.61 (31.45%)	25.67 (45.84%)	(14.39%)

## Berg balance scale compare

Among 36 patients in admission 22(61.1%) were wheelchair bound, 9(25%) were walking with assistance and 5(13.9%) were independent. After 4-week rehabilitation 17(47.2%) were wheelchair bound, 12(33.3%) were walking with assistance and 7(19.4%) were independent.



**Figure 1: Berg balance scale compare**

## Today's health in EQ VAS

**Table 30: Rank and test statistics of patients Today's health in EQ VAS**

EQ VAS after 4-week rehabilitation- EQ VAS at admission	N	Mean Rank	Sum of Ranks	Test Statistics (Wilcoxon Signed-Rank Test)	
				Based on negative ranks Z	P
Positive rank	36	18.50	666.00	-5.338	<0.001
Negative rank	0	.00	.00		
Ties	0				
<b>Total</b>	<b>36</b>				

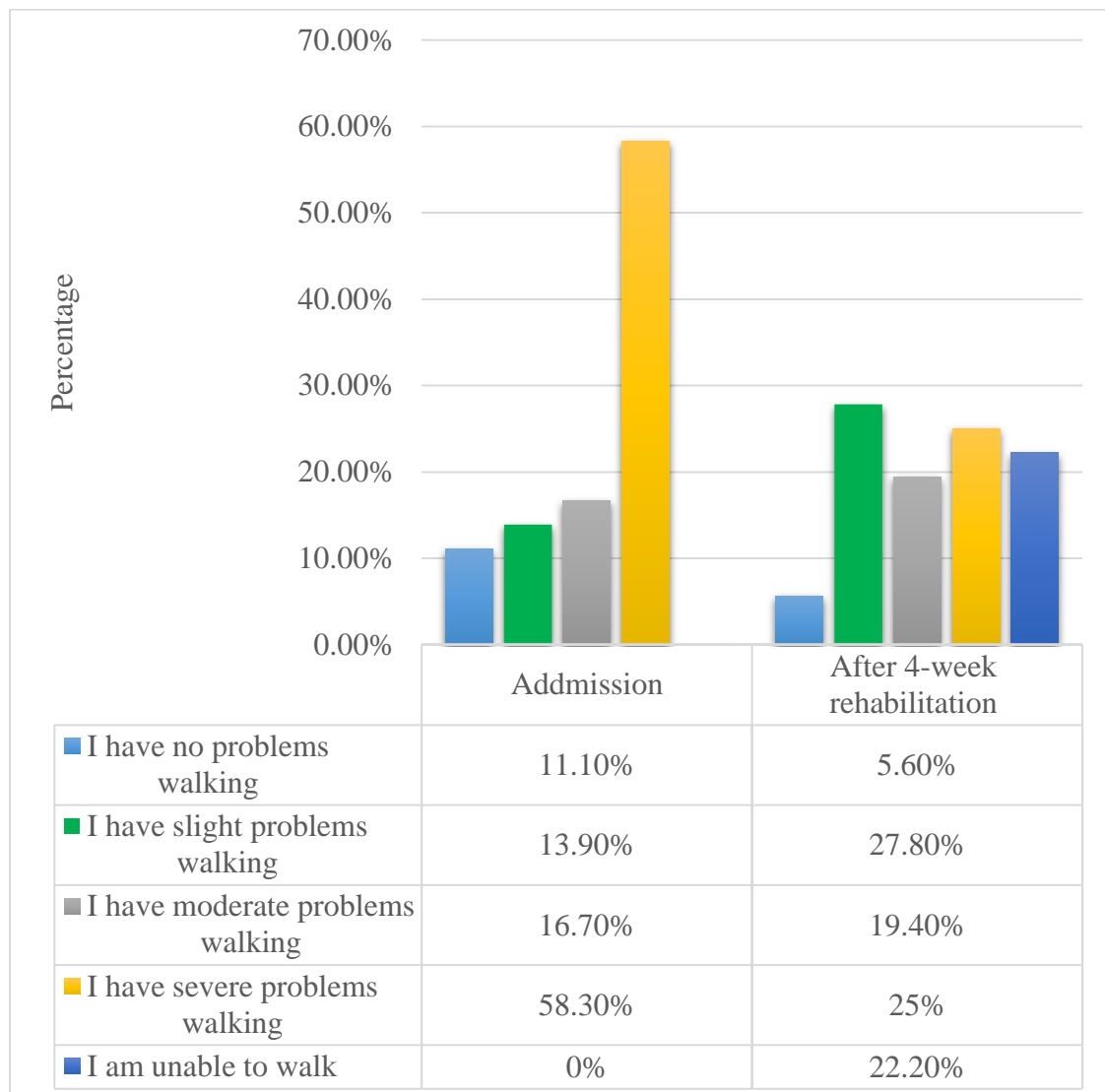
Table described the comparison of the participants before (pretest) and after (post-test) today's health in EQ VAS. The table's legend displayed Positive rank 36 that means 36 participants' today's health in EQ VAS score increased after receiving rehabilitation. In addition, Negative rank 0 that mean none of the participant's today's health in EQ VAS score decreased after receiving rehabilitation services. Moreover 'ties' = 0 indicate that no participant's remained same as pretest today's health in EQ VAS score after receiving rehabilitation services. P value is <0.05 which indicate that there is less than a 5% chance that the results are due to random error and it is significant. Therefore, it is can be said that, after receiving rehabilitation services improved quality of life among participants.

**Table 31: Descriptive Statistics of patients total EQ VAS Score**

	Admission Mean	After 4-week rehabilitation Mean	Outcome in Percentage
Today's health (0 to 100)	38.61 (38.61%)	55.14 (55.14%)	(16.53%)

## Mobility of the participants

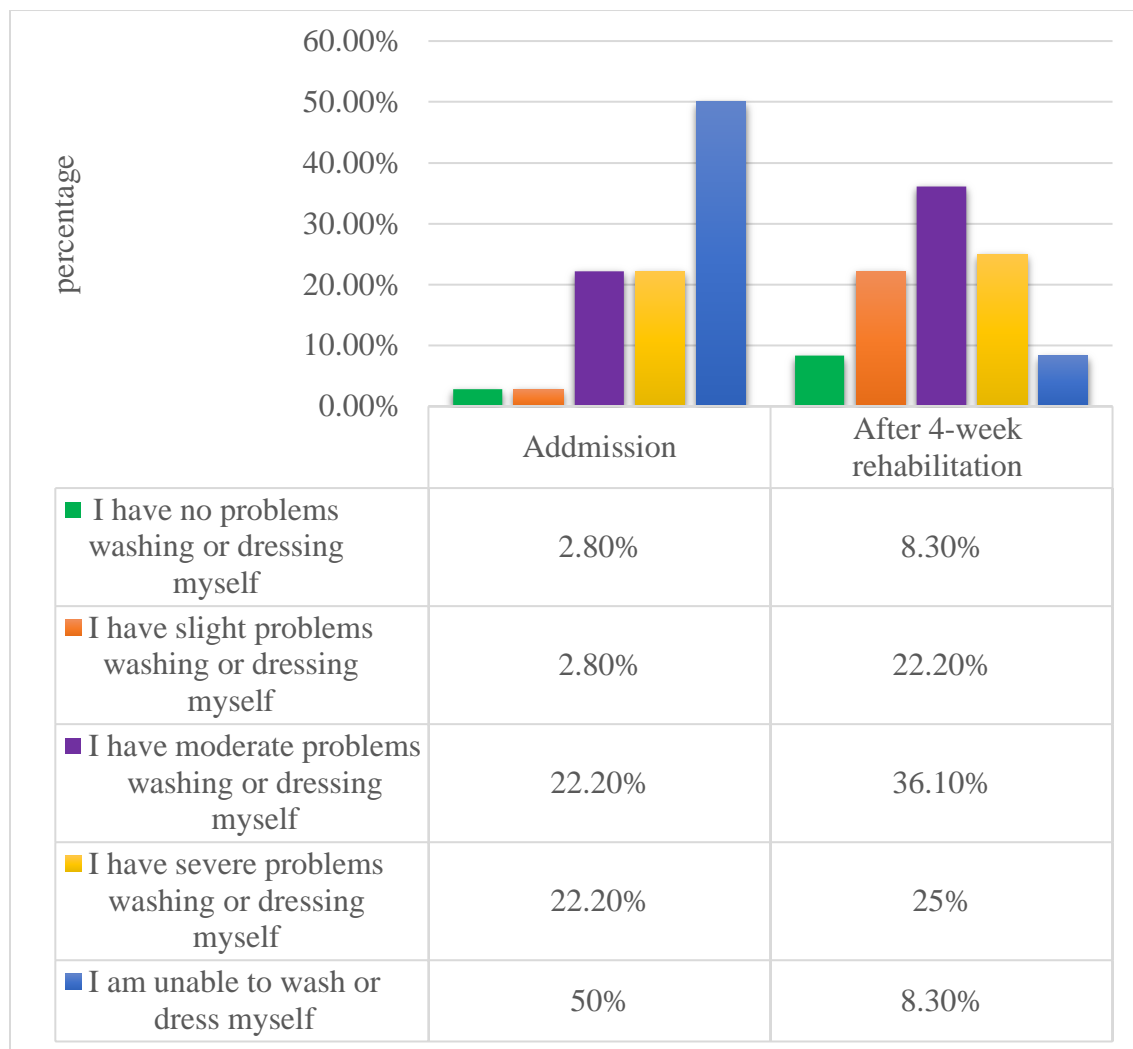
In this study in admission 0% (0) had no problems in walking, 11.1% (4) had slight problems in walking, 13.9% (5) had moderate problems in walking, 16.7% (6) had severe problems in walking and 58.3% (21) had unable to walk. After 4-week rehabilitation 5.6% (2) had no problems in walking, 27.8% (10) had slight problems in walking, 19.4% (7) had moderate problems in walking, 25% (9) had severe problems in walking and 22.2% (8) had unable to walk (Figure 2).



**Figure 2: Mobility of the participants**

## Self-care of the participants

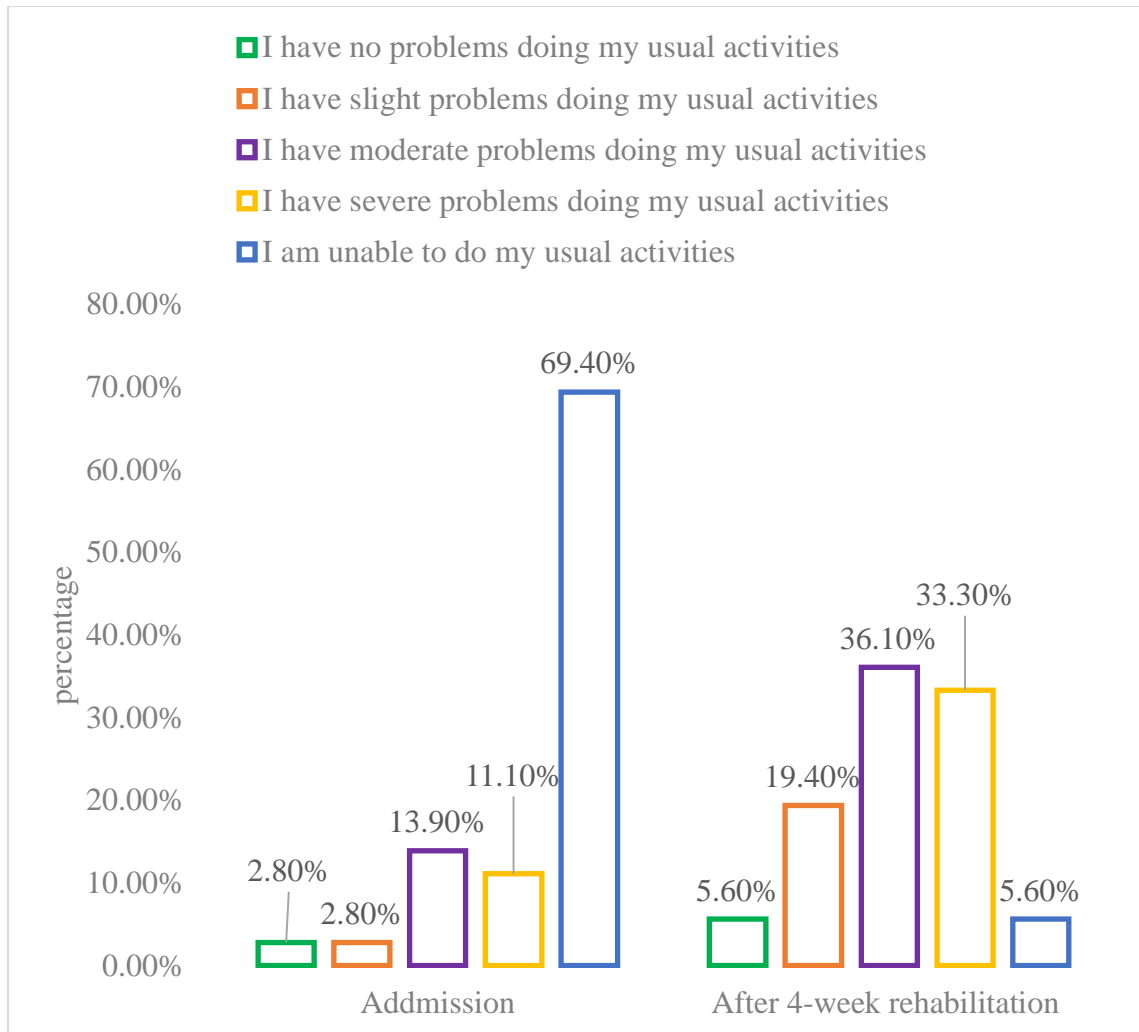
In this study in admission 2.8% (1) had no problems in washing or dressing myself, 2.8% (1) had slight problems in washing or dressing myself, 22.2% (8) had moderate problems in washing or dressing myself, 22.2% (8) had severe problems in washing or dressing myself and 50% (18) had unable to wash or dress myself. After 4-week rehabilitation 8.3% (3) had no problems in washing or dressing myself, 22.2% (8) had slight problems in washing or dressing myself, 36.1% (13) had moderate problems in washing or dressing myself, 25% (9) had severe problems in washing or dressing myself and 8.3% (3) had unable to wash or dress myself (Figure 3).



**Figure 3: Self-care of the participants**

## Usual activities of the participants

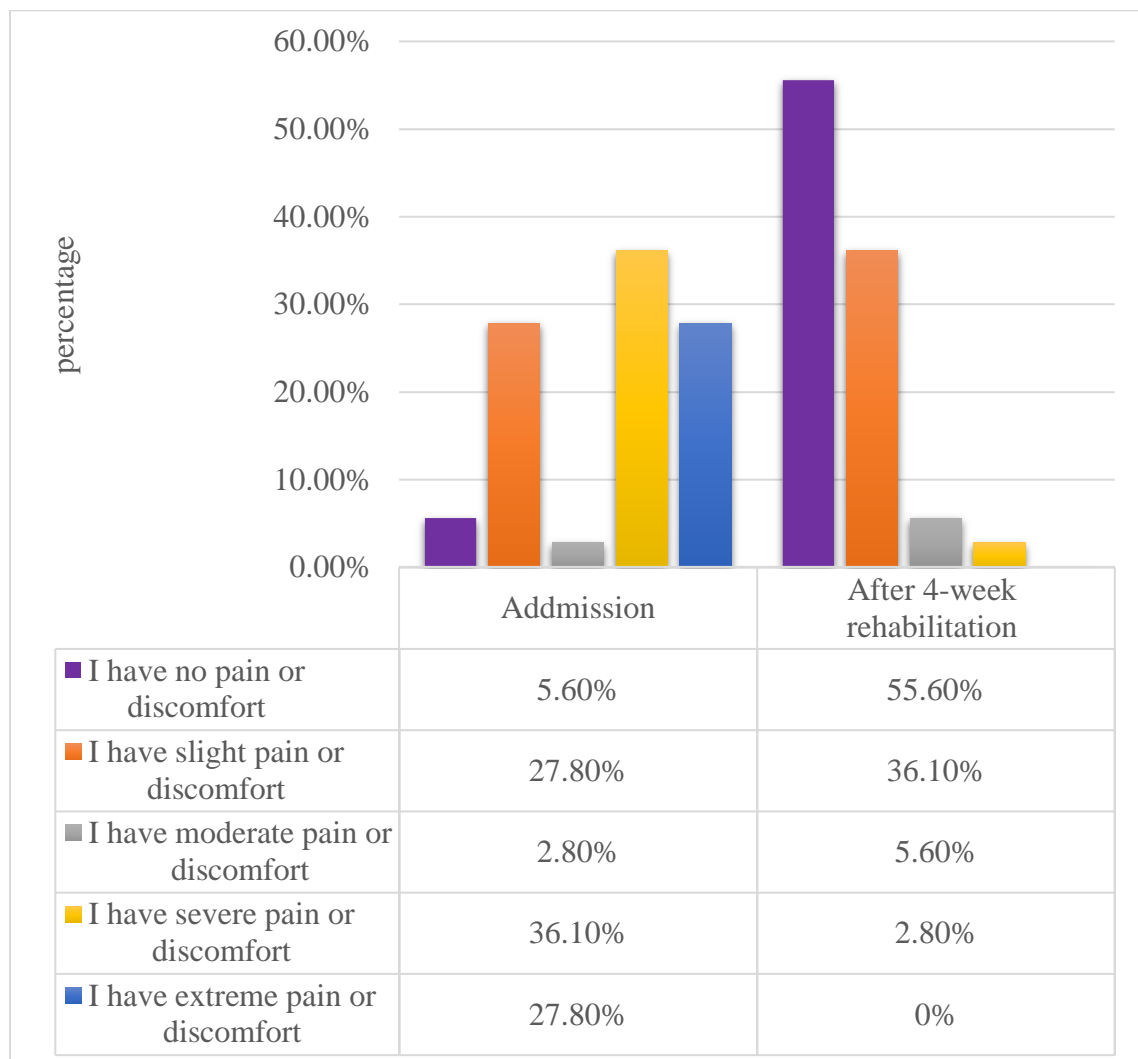
In this study in admission 2.8% (1) had no problems in doing my usual activities, 2.8% (1) had slight problems in doing my usual activities, 13.9% (5) had moderate problems in doing my usual activities, 11.4% (4) had severe problems in doing my usual activities and 69.4% (25) had unable to do my usual activities. After 4-week rehabilitation 5.6% (2) had no problems in doing my usual activities, 19.4% (7) had slight problems in doing my usual activities, 36.1% (13) had moderate problems in doing my usual activities, 33.3% (12) had severe problems in doing my usual activities and 5.6% (2) had unable to do my usual activities (Figure 4).



**Figure 4: Usual activities of the participants**

## Pain / discomfort of the participants

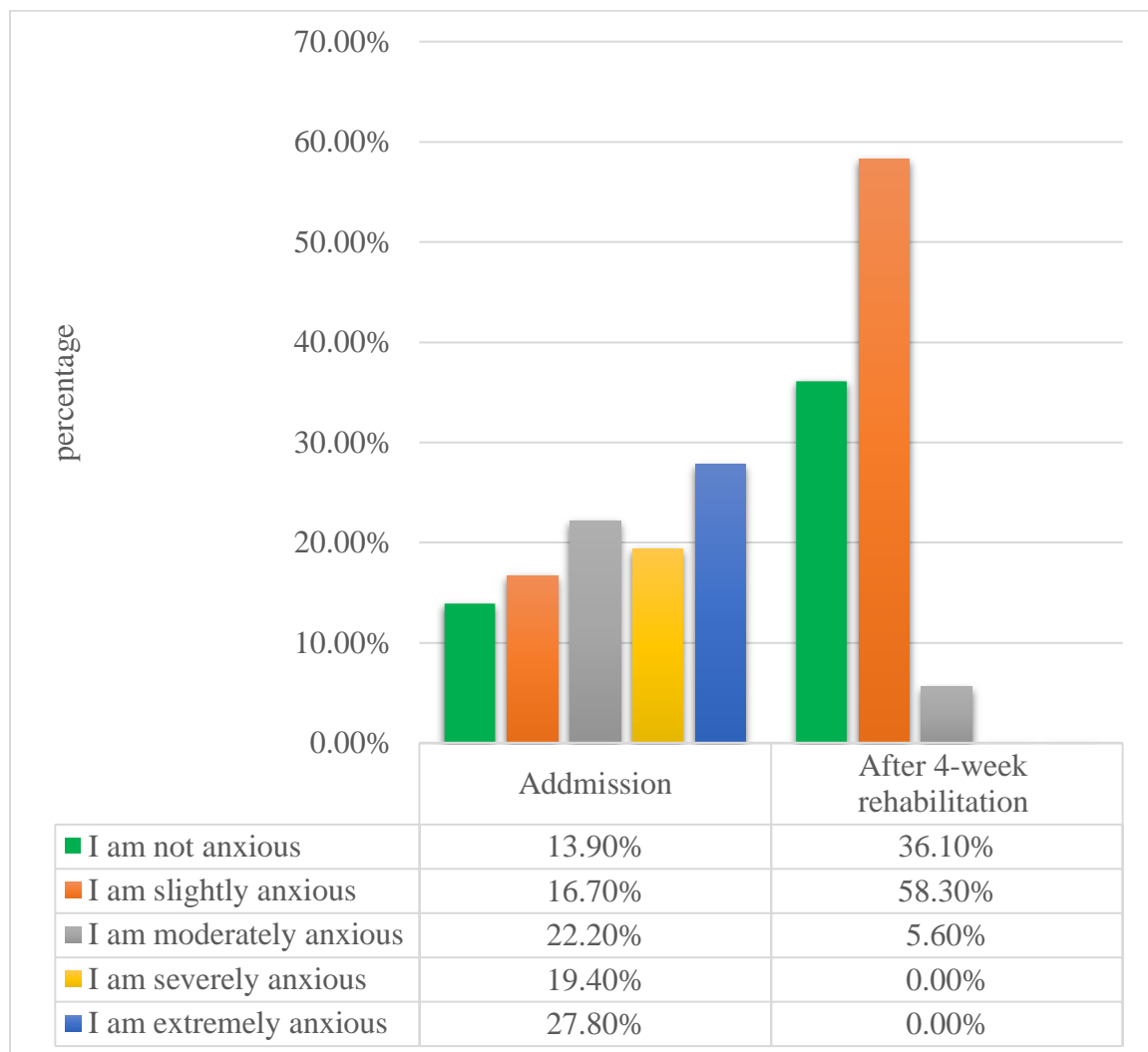
In this study in admission 5.6% (2) had no problems in pain or discomfort, 27.8% (10) had slight problems in pain or discomfort, 2.8% (1) had moderate problems in pain or discomfort, 36.1% (13) had severe problems in pain or discomfort and 27.8% (10) had extreme pain or discomfort. After 4-week rehabilitation 55.6% (20) had no problems in pain or discomfort, 36.1% (13) had slight problems in pain or discomfort, 5.6% (2) had moderate problems in pain or discomfort, 2.8% (1) had severe problems in pain or discomfort and 0% (0) had extreme pain or discomfort (Figure 5).



**Figure 5: Pain or discomfort of the participants**

## Anxiety / depression of the participants

In this study in admission 5% (13.9) had no anxiety / depression, 16.7% (6) had slight anxiety / depression, 22.2% (8) had moderate anxiety / depression, 19.4% (7) had severe anxiety / depression and 27.8% (10) had extremely anxiety / depression. After 4-week rehabilitation 36.1% (13) had no anxiety / depression, 58.3% (21) had slight anxiety / depression, 5.6% (2) had moderate anxiety / depression, 0% (0) had severe anxiety / depression and 0% (0) had extremely anxiety / depression (Figure 6).



**Figure 6: Anxiety / depression of the participants**



The objectives of the study were to find out the demographic profile of the stroke patients and functional outcome, balance and quality of life after rehabilitation at CRP. In this study almost 36.1% of the participants were age group 51-60 years. The mean age of the respondents was 51.58 years. In here height age of the participants was 70 and lowest age was 30. Among these participants below 50 years was 44.4 % and more than 50 years was 66.6%. In this study 69.4% were male and 30.6% were female.

In Germany, a study by Foerch et al. (2009) found that mean age was 74 years and 20% of the participants were below 64 years and 73% were more than 74 years. In a study by Hossain et al. (2011) in Bangladesh found that peak incidence was between 51 to 70 years (69%). In this Analysis almost 71% of the participants were male and 29% were female. Another study by Mondol et al. (2012) in Bangladesh stated that male patients were 73.4% and female were 26.6%.

In this study we found no formal education in 10(27.8%) participants, Primary education in 10(27.8%) participants, 8(22.2%) of them were SSC passed, 2(5.6%) of them were HSC passed and the other 6(16.7%) participants were Bachelor degree or above passed. In a study by Hossain et al. (2011) in Bangladesh found that 31% patients received schooling, 19% patients received college education, only 13% went to university or similar institution and only 37% were never attended school.

Analysis stated that almost 34(94.4%) were married. 15(41.7%) of them were Service holder, 11(30.6%) of them were housewife, 8(22.2%) of them were businessman and 2(5.6%) were from other profession. In a study by Hossain et al. (2011) in Bangladesh found that 17% patients were businessman, 16% were housewife and his study showed that 79% affected parson were working force of our society which indicate a serious impact on the families of the sufferers.

The study showed that 13.9% the participants came from urban area, 36.1% from semi urban and 50% were from rural area. Analysis showed that (22.2%) participants have family history of stroke and 28(77.8%) has no family history. 34(94.4%) patients were

affected by HTN, 22(61.1%) patients were affected by diabetes, 9(25%) were affected by cardiovascular disease, 3(8.3%) was affected by lung disease. 6(16.7%) were drinker, but not daily. And others 30(83.3%) were not drinker. 17(47.2%) participants were smoker and 19(52.8%) participants were nonsmoker. 28(77.8%) participants were attacked by ischemic stroke and 8(22.2%) participants were attacked by hemorrhagic stroke. And 20(55.6%) were right sided hemiplegic and 16(44.4%) were left sided hemiplegic

In another study Hossain et al. (2011) mentioned that 63% HTN, 21% were diabetics and 12% were serum cholesterol problem. Another study by Mondol et al. (2012) found that 56.7% were affected by hypertension, diabetics was the next common entry 23%, ischemic heart disease was 17.7%, dyslipidemia was 5.1%, rheumatologic condition 6.6%, respiratory disease 3.6% chronic kidney disease 2.4%, electric imbalance 1.2%, dementia 1.2% and malignancy 0.2%. The high percentage of irregularly treated patients in all the studies seems to be due to lack of adequate knowledge or motivation for continuous treatment of hypertension.

A study by Nayeem et al. (2010) in Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka found that 44% patients have smoking habit. These study shows 87% were ischemic and 13% were hemorrhagic stroke among participant. Other study Hossain et al. (2011) stated that 61% were ischemic and 39% were hemorrhagic stroke at Faridpur medical college, Bangladesh. And also mentioned that higher rate of hemorrhagic stroke is also found in number of hospitals in Asian countries such as Singapore, Malaysia (33%) Thailand (30%),<sup>37</sup> Korea (31%), Taiwan (31%). One of the cause of high incidence of hemorrhagic stroke in this hospital may be due to the acute admission is more related to hemorrhagic stroke.

In a study they took 144 stroke patients. The majority were men (90 patients, 62.5%). Their mean age was  $65.10 \pm 11.56$  years. 85 (59%) and 59 (41%) patients had hemiparesis on the right and left sides, respectively. The stroke types included ischemic (131 patients, 91%) and hemorrhagic (13 patients, 9%). Tobacco and alcohol use were reported by 60 (41%) and 38 (26%) patients, respectively (Aydin et al., 2016).

In another study Ng et al, (2013) found that The mean age was  $64.1 \pm 12.5$  years, 58.9% were male patients and 78.9% consisted of ischemic strokes. The average rehabilitation

length of stay was  $18.7 \pm 13.9$  days and the majority (87.7%) were discharged home. The most common risk factor was hypertension (78.4%) and urinary tract infection (21.2%) was the commonest post-stroke complication.

In this study Among  $n=36$  patients, 36(100%) patients were taking physiotherapy, 33(91.7%) patients were taking Occupational Therapy and 22(61.1%) patients were taking Speech and language therapy. Total mean physiotherapy 500 minutes in 4 weeks. Total mean Occupational Therapy 376 minutes in 4 weeks. Total mean Speech and language therapy 235.23 minutes in 4 weeks. 1 session is 45 minutes.

In this study the mean admission motor FIM and 4-week rehabilitation scores were 44.53 (48.93%) and 55.19 (60.65%) respectively with a mean functional gain of 11.71%. The mean admission cognitive FIM and 4-week rehabilitation scores were 25.36 (72.46%) and 27.83 (79.51%) respectively with a mean functional gain of 7.05% and lastly the mean admission total FIM and 4-week rehabilitation scores were 69.89 (55.47%) and 82.75 (65.68%) respectively with a mean functional gain of (10.2%).

In a cohort study Aydin et al, (2016) The mean admission FIM and discharge FIM scores were  $67.9 \pm 23.0$  and  $83.2 \pm 23.5$  respectively with a mean functional gain of  $15.4 \pm 12.3$  FIM points. Younger, male, and hemorrhagic stroke patients had better functional outcomes.

Another study shows that the FIM admission score was  $28.56 \pm 12.10$  and after 8-week rehabilitation  $75.06 \pm 25.55$  and FIM gain  $47.12 \pm 19.03$  (Nessa et al., 2009).

In this study the mean admission BBS was 17.61 with a mean after 4-week rehabilitation of 25.67. This balance gain is highly significant ( $p < 0.001$ ).

In a study the admission mean BBS was  $35.75 \pm 11.55$ . All the patients were chronic (Srivastava et al., 2010).

In this study in admission 22(61.1%) were wheelchair bound, 9(25%) were walking with assistance and 5(13.9%) were independent. After 4-week rehabilitation 17(47.2%) were wheelchair bound, 12(33.3%) were walking with assistance and 7(19.4%) were independent. Rehabilitation decrease the disability and improve balance.

In this study in admission 0% (0) had no problems in walking, 11.1% (4) had slight problems in walking, 13.9% (5) had moderate problems in walking, 16.7% (6) had severe problems in walking and 58.3% (21) had unable to walk. After 4-week rehabilitation 5.6% (2) had no problems in walking, 27.8% (10) had slight problems in walking, 19.4% (7) had moderate problems in walking, 25% (9) had severe problems in walking and 22.2% (8) had unable to walk. After rehabilitation decreased the problem of mobility most of the patients.

In this study the mean admission EQ VAS and 4-week rehabilitation scores were 38.61 (38.61%) and 55.14 (55.14%) respectively with a mean functional gain of (16.53%). After rehabilitation EQ VAS was improved most of the patients.

In this study in admission 2.8% (1) had no problems in washing or dressing myself, 2.8% (1) had slight problems in washing or dressing myself, 22.2% (8) had moderate problems in washing or dressing myself, 22.2% (8) had severe problems in washing or dressing myself and 50% (18) had unable to wash or dress myself. After 4-week rehabilitation 8.3% (3) had no problems in washing or dressing myself, 22.2% (8) had slight problems in washing or dressing myself, 36.1% (13) had moderate problems in washing or dressing myself, 25% (9) had severe problems in washing or dressing myself and 8.3% (3) had unable to wash or dress myself. After rehabilitation increased self-care most of the patients.

In this study in admission 2.8% (1) had no problems in doing my usual activities, 2.8% (1) had slight problems in doing my usual activities, 13.9% (5) had moderate problems in doing my usual activities, 11.4% (4) had severe problems in doing my usual activities and 69.4% (25) had unable to do my usual activities. After 4-week rehabilitation 5.6% (2) had no problems in doing my usual activities, 19.4% (7) had slight problems in doing my usual activities, 36.1% (13) had moderate problems in doing my usual activities, 33.3% (12) had severe problems in doing my usual activities and 5.6% (2) had unable to do my usual activities. After rehabilitation increased usual activity most of the patients.

In this study in admission 5.6% (2) had no problems in pain or discomfort, 27.8% (10) had slight problems in pain or discomfort, 2.8% (1) had moderate problems in pain or discomfort, 36.1% (13) had severe problems in pain or discomfort and 27.8% (10) had extreme pain or discomfort. After 4-week rehabilitation 55.6% (20) had no problems in pain or discomfort, 36.1% (13) had slight problems in pain or discomfort, 5.6% (2) had

moderate problems in pain or discomfort, 2.8% (1) had severe problems in pain or discomfort and 0% (0) had extreme pain or discomfort. After rehabilitation decreased pain and discomfort most of the patients.

In this study in admission 5% (13.9) had no anxiety / depression, 16.7% (6) had slight anxiety / depression, 22.2% (8) had moderate anxiety / depression, 19.4% (7) had severe anxiety / depression and 27.8% (10) had extremely anxiety / depression. After 4-week rehabilitation 36.1% (13) had no anxiety / depression, 58.3% (21) had slight anxiety / depression, 5.6% (2) had moderate anxiety / depression, 0% (0) had severe anxiety / depression and 0% (0) had extremely anxiety / depression After rehabilitation decrease anxiety most of the patients.

The first limitation of this study is sample size. Another major limitation is time. The period is very limited to conduct the research project on this topic. As the study period short so the adequate number of sample could not arrange for the study. As the study is conducted at Centre for the Rehabilitation of the paralyzed (CRP) which may not represent the whole country.

**6.1 Conclusion**

The study was an observational study design to examine the functional outcome, balance and quality of life after rehabilitation. Rehabilitation had beneficial effects on the improvement of the quality of life of stroke patient. Rehabilitation is very important for stroke patient. Physiotherapy had an important role in rehabilitation.

**6.2 Recommendation**

We need to do more research on this subject. Long time research would give you specific result about rehabilitation. After stroke as early as possible patient will receive rehabilitation for their better function, balance and quality of life.

## References

- Andersen, K.K., Olsen, T.S., Dehlendorff, C. and Kammergaard, L.P., (2009). Hemorrhagic and ischemic strokes compared. *Stroke*, 40(6):2068-2072.
- Appelros, P., Stegmayr, B. and Terént, A., (2009). Sex differences in stroke epidemiology. *Stroke*, 40(4):1082-1090.
- Aydin, T., Taspinar, O., Kepekci, M., Keskin, Y., Erten, B., Gunel, M., Gok, M., Bektas, E., Sarac, M. and Mutluer, A.S., (2016). Functional independence measure scores of patients with hemiplegia followed up at home and in university hospitals. *Journal of Physical Therapy Science*, 28(2):553-557.
- Blum, L. and Korner-Bitensky, N., (2008). Usefulness of the Berg Balance Scale in stroke rehabilitation: A systematic review. *Physical Therapy*, 88(5):559.
- Carod-Artal, F.J. and Egido, J.A., (2009). Quality of life after stroke: the importance of a good recovery. *Cerebrovascular Diseases*, 27(1):204-214.
- Chan, D.Y., Chan, C.C. and Au, D.K., (2006). Motor relearning programme for stroke patients: a randomized controlled trial. *Clinical Rehabilitation*, 20(3):191-200.
- Chien, C.W., Lin, J.H., Wang, C.H., Hsueh, I.P., Sheu, C.F. and Hsieh, C.L., (2007). Developing a short form of the postural assessment scale for people with stroke. *Neurorehabilitation and Neural Repair*, 21(1):81-90.
- Donoghue, D. and Stokes, E.K., (2009). How much change is true change? The minimum detectable change of the Berg Balance Scale in elderly people. *Journal of Rehabilitation Medicine*, 41(5):343-346.
- Douglas Chumney DPT, P.T., Kristen Nollinger DPT, P.T., Kristina Shesko DPT, P.T., Karen Skop DPT, P.T., Madeleine Spencer DPT, P.T. and Newton, R.A., (2010). Ability of Functional Independence Measure to accurately predict functional outcome of stroke-specific population: systematic review. *Journal of Rehabilitation Research and Development*, 47(1):17.

English, C.K., Hillier, S.L., Stiller, K. and Warden-Flood, A., (2006). The sensitivity of three commonly used outcome measures to detect change amongst patients receiving inpatient rehabilitation following stroke. *Clinical Rehabilitation*, 20(1):52-55.

Feigin, V.L., Lawes, C.M., Bennett, D.A., Barker-Collo, S.L. and 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.

Foerch, C., Sitzer, M., Steinmetz, H., and Haefelin, T.N., (2009). Future Demographic Trends Decrease the Proportion of Ischemic Stroke Patients Receiving Thrombolytic Therapy: A Call to Set-Up Therapeutic Studies in the Very Old. *Stroke*, 40:1900-1902.

Forjaz, M.J., Rodriguez-Blazquez, C., Ayala, A., Rodriguez-Rodriguez, V., de Pedro-Cuesta, J., Garcia-Gutierrez, S. and Prados-Torres, A., (2015). Chronic conditions, disability, and quality of life in older adults with multi morbidity in Spain. *European Journal of Internal Medicine*, 26(3):176-181.

Gargano, J.W. and Reeves, M.J., (2007). Sex differences in stroke recovery and stroke-specific quality of life. *Stroke*, 38(9):2541-2548.

Golicki, D., Niewada, M., Buczek, J., Karlinska, A., Kobayashi, A., Janssen, M.F. and Pickard, A.S., (2015). Validity of EQ-5D-5L in stroke. *Quality of Life Research*, 24(4):845-850.

Hossain, A.M., Ahmed, N.U., Rahman, M., Islam, M.R., Sadhya, G. and Fatema, K., (2011). Analysis of sociodemographic and clinical factors associated with hospitalized stroke patients of Bangladesh. *Faridpur Medical College Journal*, 6(1):19-23.

Hiengkaew, V., Jitaree, K. and Chaiyawat, P., (2012). Minimal detectable changes of the Berg Balance Scale, Fugl-Meyer Assessment Scale, Timed "Up & Go" Test, gait speeds, and 2-minute walk test in individuals with chronic stroke with different degrees of ankle plantarflexor tone. *Archives of Physical Medicine and Rehabilitation*, 93(7):1201-1208.

Islam, M.N., Moniruzzaman, M., Khalil, M.I., Basri, R., Alam, M.K., Loo, K.W. and Gan, S.H., (2013). Burden of stroke in Bangladesh. *International Journal of Stroke*, 8(3):211-213.



- Jeong, S., Inoue, Y., Kondo, K., Matsumoto, D. and Shiraishi, N., (2014). Formula for predicting FIM for stroke patients at discharge from an acute ward or convalescent rehabilitation ward. *Japanese Journal of Comprehensive Rehabilitation Science*, 5:19-25.
- Katherine Salter, B., Mark Hartley, B. and Norine Foley, B., (2006). Impact of early vs delayed admission to rehabilitation on functional outcomes in persons with stroke. *Journal of Rehabilitation Medicine*, 38:113-117.
- Knecht, S., Hesse, S. and Oster, P., (2011). Rehabilitation after stroke. *Deutsches Arzteblatt International*, 108(36):600-6.
- Langhorne, P., Bernhardt, J. and Kwakkel, G., (2011). Stroke rehabilitation. *The Lancet*, 377(9778):1693-1702.
- Lee, S., Shafe, A.C. and Cowie, M.R., (2011). UK stroke incidence, mortality and cardiovascular risk management 1999–2008: time-trend analysis from the General Practice Research Database. *British Medical Journal*, 1(2):000269.
- Liu, M., Wu, B., Wang, W.Z., Lee, L.M., Zhang, S.H. and Kong, L.Z., (2007). Stroke in China: epidemiology, prevention, and management strategies. *The Lancet Neurology*, 6(5): 456-464.
- Mondol, B.A., Chowdhury, R.N., Rahman, K.M., Khan, S.U., Haque, M.A., Haque, B., Khan, M.Z.R., Habib, M., and Mohammad, Q.D., (2012). Major comorbidities in stroke patients: a hospital based study in Bangladesh. *Journal of Dhaka Medical Collage*, 21(1):16-22
- Naess, H., Waje-Andreassen, U., Thomassen, L., Nyland, H. and Myhr, K.M., (2006). Health-related quality of life among young adults with ischemic stroke on long-term follow-up. *Stroke*, 37(5):1232-1236.
- Nayeem, A., Hannan, M.A., Islam, M.R., and Barman, K.K., (2010). Blood monocyte count in hypertensive ischemic stroke patients. *Bangladesh Journal of Neuroscience*, 26 (2):68-73.

- Nessa, J., Khaleque, M.A., Begum, S., Ahmed, A.H., Islam, S. and Afsan, M., (2009). Rehabilitation of Stroke Patients-Effects of Early Intervention of Physical Therapy on Functional Outcome. *Bangladesh Journal of Anatomy*, 7(1):62-67.
- Ng, Y.S., Astrid, S., De Silva, D.A., Tan, M.L.D., Tan, Y.L. and Chew, E., (2013). Functional outcomes after inpatient rehabilitation in a prospective stroke cohort. *Proceedings of Singapore Healthcare*, 22(3):175-182.
- Reeves, M.J., Bushnell, C.D., Howard, G., Gargano, J.W., Duncan, P.W., Lynch, G., Khatiwoda, A. and Lisabeth, L., (2008). Sex differences in stroke: epidemiology, clinical presentation, medical care, and outcomes. *The Lancet Neurology*, 7(10):915-926.
- Srivastava, A., Taly, A.B., Gupta, A. and Murali, T., (2010). Post-stroke depression: prevalence and relationship with disability in chronic stroke survivors. *Annals of Indian Academy of Neurology*, 13(2):123.
- Tarasova, M., Bartlova, B., Nosavcovova, E., Al Fadhli, A.K., Pospisil, P., Konecny, L., Pohanka, M., Fiser, B., Dobsak, P. and Siegelova, J., (2008). Effectiveness of physiotherapy in acute phase of stroke. *Scripta Medica*, 82(3):185-194.
- Patel, M.D., Tilling, K., Lawrence, E., Rudd, A.G., Wolfe, C.D.A. and McKeivitt, C., (2006). Relationships between long-term stroke disability, handicap and health-related quality of life. *Age and Ageing*, 35(3):273-279.
- Truelsens, T., Piechowski-Jozwiak, B., Bonita, R., Mathers, C., Bogousslavsky, J. and Boysen, G., (2006). Stroke incidence and prevalence in Europe: a review of available data. *European Journal of Neurology*, 13(6):581-598.
- Tung, F.L., Yang, Y.R., Lee, C.C. and Wang, R.Y., (2010). Balance outcomes after additional sit-to-stand training in subjects with stroke: a randomized controlled trial. *Clinical Rehabilitation*, 24(6):533-542.
- Tyson, S.F. and Connell, L.A., (2009). How to measure balance in clinical practice? A systematic review of the psychometrics and clinical utility of measures of balance activity for neurological conditions. *Clinical Rehabilitation*, 23(9):824-840.

Tyson, S.F., Hanley, M., Chillala, J., Selley, A. and Tallis, R.C., (2006). Balance disability after stroke. *Physical Therapy*, 86(1):30.

Van der Riet, P., Maguire, J., Dedkhard, S. and Sibbritt, D., (2015). Are traditional Thai therapies better than conventional treatment for stroke rehabilitation? A quasi-experimental study. *European Journal of Integrative Medicine*, 7(1):16-22.

Verheyden, G., Vereeck, L., Truijen, S., Troch, M., Herregodts, I., Lafosse, C., Nieuwboer, A. and De Weerd, W., (2006). Trunk performance after stroke and the relationship with balance, gait and functional ability. *Clinical Rehabilitation*, 20(5):451-458.

Wasay, M., Khatri, I.A. and Kaul, S., (2014). Stroke in south Asian countries. *Nature Reviews Neurology*, 10(3):135-143.

## অনুমতি পত্র

(অংশগ্রহণকারীকে পড়েশোনাতে হবে)

আসসালামু আলাইকুম / নমস্কার ,আমার নাম বিপুল দেবনাথ ,আমি বাংলাদেশ হেল্থ প্রফেশনস ইন্সটিটিউট (বি এইচ পি আই)- এ ফিজিওথেরাপি কোর্সের এক জন ছাত্র। আমার গবেষণায় কাজের জন্য আমি স্ট্রোক রোগীদের উপর একটি গবেষণা পরিচালনা করছি এবং আমার অধ্যয়ন শিরোনাম – সি আর পি তে পুনর্বাসন সেবা প্রাপ্তির পর স্ট্রোক রোগীদের কর্মক্ষমতা এবং জীবন মান। এক্ষেত্রে আমি আপনার এবং স্ট্রোক সম্পর্কে আনুষঙ্গিক কিছু তথ্য জানতে চাচ্ছি। যা প্রায় ২০ মিনিট সময় লাগবে। এটি একটি শিক্ষা গত গবেষণা এবং অন্য কোন উদ্দেশ্যে ব্যবহার করা হবে না। গবেষক সরাসরি নিউরোলজি ইউনিট এর সাথে সম্পর্কিত নয়, তাই গবেষণায় আপনার অংশগ্রহণ নিউরোলজি ইউনিটে আপনার বর্তমান বা ভবিষ্যতে চিকিৎসা কোনো প্রভাব ফেলবে না। গবেষক গবেষণা চলাকালীন প্রতিটি ধাপে গোপনীয়তা বজায় রাখবেন। আপনার তথ্য আপনার অনুমতি ছাড়া ব্যবহার করা হবে না। এই গবেষণায় আপনার অংশগ্রহণ ইচ্ছা অনুযায়ী এবং এই অধ্যয়নের যে কোন সময়ে নিজেকে প্রত্যাহার করতে পারবেন।

আপনি একজন অংশগ্রহণকারী হিসেবে অধ্যয়ন সম্পর্কে কোনো প্রশ্ন থাকে তাহলে আপনি আমাকে অথবা ফিরোজ আহমেদ মমিন এর সঙ্গে যোগাযোগ করতে পারেন., ফিজিওথেরাপি বিভাগের সহকারী অধ্যাপক, বি এইচ পি আই , সিআরপি, সাভার, ঢাকা।

আমি আপনার অনুমতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি ?

হ্যাঁ

না

অংশগ্রহণকারীর স্বাক্ষর \_\_\_\_\_ তারিখ \_\_\_\_\_

সাক্ষাৎকারকারীর স্বাক্ষর \_\_\_\_\_ তারিখ \_\_\_\_\_

### ১। রোগীর তথ্য

১.১	সনাক্তকরণ নম্বর :
১.২	উত্তরদাতাদের নাম :
১.৩	ঠিকানা :
১.৪	ফোন নম্বর :
১.৫	সাক্ষাৎকারের তারিখ :

## CONSENT FORM

**(Please read out to the participants)**

Assalamualaikum/Namasker, my name is Bipul Debnath. I am 4<sup>th</sup> year student of B.Sc. in Physiotherapy program at Bangladesh Health Professions Institute (BHPI). For my study purpose I am conducting a study on stroke patients and my study title is “Functional outcome and quality of life of patients with stroke after receiving rehabilitation services at CRP. I would like to know about some personal and other related information regarding stroke. This will take approximately 20 minutes. This is an academic study and will not be used for any other purpose. The researcher is not directly related to neurology unit, so your participation in the research will have no impact on your present or future treatment in neurology unit. Researcher will maintain confidentiality of all procedures. Your data will never be used without your permission. Your participation in this study is voluntary and you may withdraw yourself at any time during this study.

If you have any query about the study or your right as a participant, you may contact with me or Firoz Ahmed Mamin, Assistant Professor, Department of Physiotherapy, BHPI, CRP, Savar, Dhaka.

So, may I have your consent to proceed with the interview or work?

Yes

No

Signature of the Participant \_\_\_\_\_ Date \_\_\_\_\_

Signature of the Interviewer \_\_\_\_\_ Date \_\_\_\_\_

### 1. Patient information

1.1	Identification number:
1.2	Name of respondents:
1.3	Address:
1.4	Phone number:
1.5	Date of interview :

সি আর পি তে পুনর্বাসন সেবা প্রাপ্তির পর স্ট্রোক রোগীদের কর্মক্ষমতা এবং জীবন মান

বাংলা প্রশ্নাবলী :

সনাক্তকরণ নম্বর:

## ২.রোগীদের আর্থ-জনতাত্ত্বিক তথ্য

	প্রশ্ন	উত্তর
২.১	বয়স	বছর
২.২	লিঙ্গ	১= পুরুষ ২= মহিলা
২.৩	বৈবাহিক অবস্থা	১=বিবাহিত ২=অবিবাহিত ৩=বিধবা/বিপত্নীক ৪=বিবাহ বিচ্ছিন্ন
২.৪	শিক্ষা গত অবস্থা	১= কোন প্রাতিষ্ঠানিক শিক্ষা নাই ২=প্রাথমিক শিক্ষা ৩=মাধ্যমিক শিক্ষা ৪=উচ্চ মাধ্যমিক শিক্ষা ৫=স্নাতকডিগ্রী/ স্নাতকোত্তর
২.৫	পেশা	১=চাকরি ২=ব্যবসা ৩=গৃহিনী ৪= অন্যান্য
২.৬	বসবাসের এলাকা	১=গ্রাম ২=উপ শহর ৩=শহর
২.৭	স্ট্রোক এর আগে ব্যক্তির মাসিক আয়	
২.৮	স্ট্রোক এর পরে ব্যক্তির মাসিক আয়	
২.৯	পরিবারের মাসিক আয়	
২.১০	পরিবারে স্ট্রোকের ইতিহাস	১=হ্যাঁ ২=না
২.১১	মদ্যপান	১=হ্যাঁ ২=না
২.১২	ধূমপান	১=হ্যাঁ ২=না

২.১৩	যদি হ্যাঁ, প্রতিদিন সিগারেট সংখ্যা / বছর	
২.১৪	পূর্বের চিকিৎসা ইতিহাস	১=উচ্চ রক্ত চাপ ২= বহু মূত্র রোগ ৩=হৃদরোগ ৪=ফুসফুসের রোগ ৫=অন্যান্য

### ৩. স্ট্রোক এবং চিকিৎসা সম্পর্কিত তথ্য

৩.১	স্ট্রোকের তারিখ	/ /
৩.২	স্ট্রোকের প্রকার	১=ইস্কেমিক ২= হেমোরাজিক
৩.৩	ক্ষতিগ্রস্ত পাশ	১= ডান ২=বাম

### ৪. পুনর্বাসনসেবা

৪.১	ফিজিওথেরাপি শুরুর তারিখ	/ /
৪.২	ফিজিওথেরাপি শুরুর তারিখে FIM	
৪.৩	FIM এর প্রথম মূল্যায়ন (তারিখ: )	
৪.৪	FIM এর দ্বিতীয় মূল্যায়ন (তারিখ: )	
৪.৫	ফিজিওথেরাপি শুরুর তারিখে EQ-5D-5L	
৪.৬	চতুর্থ সপ্তাহ শেষে EQ-5D-5L এর মূল্যায়ন	
৪.৭	ফিজিওথেরাপি শুরুর তারিখে BBS	
৪.৮	চতুর্থ সপ্তাহ শেষে BBS এর মূল্যায়ন	
৪.৯	চার সপ্তাহ শেষে প্রাপ্ত: ফিজিওথেরাপি (মোট মিনিট)	
৪.১০	চার সপ্তাহ শেষে প্রাপ্ত: অকুপেশনাল থেরাপি (মোট মিনিট)	
৪.১১	চার সপ্তাহ শেষে প্রাপ্ত: স্পিচ অ্যান্ড ল্যাঙ্গুয়েজ থেরাপি (মোট মিনিট)	

**FUNCTIONAL OUTCOME AND QUALITY OF LIFE OF PATIENTS WITH STROKE AFTER RECEIVING REHABILITATION SERVICES AT CRP.**

**Questionnaire**

**ID/ Code:**

**2. Patients socio-demographic information**

	<b>Question</b>	<b>Response</b>
2.1	Age	Year
2.2	Sex	1= Male 2=Female
2.3	Marital status	1=Married 2=Unmarried 3=Widow/widower 4=Divorcee
2.4	Educational status	1= No formal education 2=Primary education 3=Secondary education 4=Higher secondary 5=Bachelor degree or above
2.5	Occupation	
2.6	Living area	1=Rural 2=Semi Urban 3= Urban
2.7	Average monthly income of the person before stroke	
2.8	Average monthly income of the person after stroke	
2.9	Average monthly income of family	
2.10	History of stroke in family	1=Yes 2=No
2.11	Alcohol consumption	1=No 2=Yes
2.12	Smoking	1=No 2=Yes
2.13	If yes, number of cigarette per day / year	



2.14	Past medical history	1=Hypertension 2=diabetes mellitus 3=heart disease 4=lung disease 5=Other (Risk factor of stroke)
------	----------------------	--

### 3. Stroke and treatment related information

3.1	Date of stroke	
3.2	Type of stroke?	1= Ischemic 2= Hemorrhagic
3.3	Affected side?	1= Right 2 = Left

### 4. Rehabilitation service

4.1	Beginning of physiotherapy session	
4.2	FIM on Physiotherapy starting date	
4.3	1 <sup>st</sup> evaluation FIM (Date : )	
4.4	2 <sup>nd</sup> evaluation FIM (Date : )	
4.5	EQ-5D-5L on Physiotherapy starting date	
4.6	After 4 <sup>th</sup> week complete evaluation of EQ-5D-5L	
4.7	BBS on Physiotherapy starting date	
4.8	After 4 <sup>th</sup> week complete evaluation of BBS	
4.9	After 4 <sup>th</sup> week Received Physiotherapy (Total minutes)	
4.10	After 4 <sup>th</sup> week Received Occupational therapy (Total minutes)	
4.11	After 4 <sup>th</sup> week Received Speech and Language therapy (Total minutes)	

### Functional outcome scale (FIM)

	<b>Admission</b>	<b>After 4 week rehabilitation</b>
Self-Care		
A. Eating		
B. Grooming		
C. Bathing		
D. Dressing - Upper Body		
E. Dressing - Lower Body		
F. Toileting		
Sphincter Control		
G. Bladder Management		
H. Bowel Management		
Transfers		
I. Bed, Chair, Wheelchair		
J. Toilet		
K. Tub, Shower		
Locomotion		
L. Walk/Wheelchair		
M. Stairs		
Motor Subtotal Score		
Communication		
N. Comprehension		
O. Expression		
Social Cognition		
P. Social Interaction		
Q. Problem Solving		
R. Memory		
Cognitive Subtotal Score		
TOTAL FIM Score		

## **Berg Balance Test**

### **1. SITTING TO STANDING**

INSTRUCTIONS: Please stand up. Try not to use your hands for support.

- ( ) 4 able to stand without using hands and stabilize independently
- ( ) 3 able to stand independently using hands
- ( ) 2 able to stand using hands after several tries
- ( ) 1 needs minimal aid to stand or to stabilize
- ( ) 0 needs moderate or maximal assist to stand

### **2. STANDING UNSUPPORTED**

INSTRUCTIONS: Please stand for two minutes without holding.

- ( ) 4 able to stand safely 2 minutes
- ( ) 3 able to stand 2 minutes with supervision
- ( ) 2 able to stand 30 seconds unsupported
- ( ) 1 needs several tries to stand 30 seconds unsupported
- ( ) 0 unable to stand 30 seconds unassisted

If a subject is able to stand 2 minutes unsupported, score full points for sitting unsupported. Proceed to item #4.

### **3. SITTING WITH BACK UNSUPPORTED BUT FEET SUPPORTED ON FLOOR OR ON A STOOL**

INSTRUCTIONS: Please sit with arms folded for 2 minutes.

- ( ) 4 able to sit safely and securely 2 minutes
- ( ) 3 able to sit 2 minutes under supervision
- ( ) 2 able to sit 30 seconds
- ( ) 1 able to sit 10 seconds
- ( ) 0 unable to sit without support 10 seconds

#### **4. STANDING TO SITTING**

INSTRUCTIONS: Please sit down.

- ( ) 4 sits safely with minimal use of hands
- ( ) 3 controls descent by using hands
- ( ) 2 uses back of legs against chair to control descent
- ( ) 1 sits independently but has uncontrolled descent
- ( ) 0 needs assistance to sit

#### **5. TRANSFERS**

INSTRUCTIONS: Arrange chairs(s) for a pivot transfer. Ask subject to transfer one way toward a seat with armrests and one way toward a seat without armrests. You may use two chairs (one with and one without armrests) or a bed and a chair.

- ( ) 4 able to transfer safely with minor use of hands
- ( ) 3 able to transfer safely definite need of hands
- ( ) 2 able to transfer with verbal cueing and/or supervision
- ( ) 1 needs one person to assist
- ( ) 0 needs two people to assist or supervise to be safe

#### **6. STANDING UNSUPPORTED WITH EYES CLOSED**

INSTRUCTIONS: Please close your eyes and stand still for 10 seconds.

- ( ) 4 able to stand 10 seconds safely
- ( ) 3 able to stand 10 seconds with supervision
- ( ) 2 able to stand 3 seconds
- ( ) 1 unable to keep eyes closed 3 seconds but stays steady
- ( ) 0 needs help to keep from falling

#### **7. STANDING UNSUPPORTED WITH FEET TOGETHER**

INSTRUCTIONS: Place your feet together and stand without holding.

- ( ) 4 able to place feet together independently and stand 1 minute safely

- ( ) 3 able to place feet together independently and stand for 1 minute with supervision
- ( ) 2 able to place feet together independently and to hold for 30 seconds
- ( ) 1 needs help to attain position but able to stand 15 seconds feet together
- ( ) 0 needs help to attain position and unable to hold for 15 seconds

## **8. REACHING FORWARD WITH OUTSTRETCHED ARM WHILE STANDING**

INSTRUCTIONS: Lift arm to 90 degrees. Stretch out your fingers and reach forward as far as you can. (Examiner places a ruler at end of fingertips when arm is at 90 degrees. Fingers should not touch the ruler while reaching forward. The recorded measure is the distance forward that the finger reach while the subject is in the most forward lean position. When possible, ask subject to use both arms when reaching to avoid rotation of the trunk.)

- ( ) 4 can reach forward confidently >25 cm (10 inches)
- ( ) 3 can reach forward >12.5 cm safely (5 inches)
- ( ) 2 can reach forward >5 cm safely (2 inches)
- ( ) 1 reaches forward but needs supervision
- ( ) 0 loses balance while trying/ requires external support

## **9. PICK UP OBJECT FROM THE FLOOR FROM A STANDING POSITION**

INSTRUCTIONS: Pick up the shoe/slipper which is placed in front of your feet.

- ( ) 4 able to pick up slipper safely and easily
- ( ) 3 able to pick up slipper but needs supervision
- ( ) 2 unable to pick up but reaches 2-5cm (1-2 inches) from slipper and keeps balance independently
- ( ) 1 unable to pick up and needs supervision while trying
- ( ) 0 unable to try/needs assist to keep from losing balance or falling

## **10. TURNING TO LOOK BEHIND OVER LEFT AND RIGHT SHOULDERS**

### **WHILE STANDING**

INSTRUCTIONS: Turn to look directly behind you over toward left shoulder. Repeat to the right. (Examiner may pick an object to look at directly behind the subject to encourage a better twist turn.)

- ( ) 4 looks behind from both sides and weight shifts well
- ( ) 3 looks behind one side only other side shows less weight shift
- ( ) 2 turns sideways only but maintains balance
- ( ) 1 needs supervision when turning
- ( ) 0 needs assist to keep from losing balance or falling

## **11. TURN 360 DEGREES**

INSTRUCTIONS: Turn completely around in a full circle. Pause. Then turn a full circle in the other direction.

- ( ) 4 able to turn 360 degrees safely in 4 seconds or less
- ( ) 3 able to turn 360 degrees safely one side only in 4 seconds or less
- ( ) 2 able to turn 360 degrees safely but slowly
- ( ) 1 needs close supervision or verbal cueing
- ( ) 0 needs assistance while turning

## **12. PLACING ALTERNATE FOOT ON STEP OR STOOL WHILE STANDING UNSUPPORTED**

INSTRUCTIONS: Place each foot alternately on the step/stool. Continue until each foot has touched the step/stool four times.

- ( ) 4 able to stand independently and safely and complete 8 steps in 20 seconds
- ( ) 3 able to stand independently and complete 8 steps >20 seconds
- ( ) 2 able to complete 4 steps without aid with supervision
- ( ) 1 able to complete >2 steps needs minimal assist
- ( ) 0 needs assistance to keep from falling/unable to try

### **13. STANDING UNSUPPORTED ONE FOOT IN FRONT**

INSTRUCTIONS: (DEMONSTRATE TO SUBJECT)

Place one foot directly in front of the other. If you feel that you cannot place your foot directly in front, try to step far enough ahead that the heel of your forward foot is ahead of the toes of the other foot. (To score 3 points, the length of the step should exceed the length of the other foot and the width of the stance should approximate the subject's normal stride width)

- ( ) 4 able to place foot tandem independently and hold 30 seconds
- ( ) 3 able to place foot ahead of other independently and hold 30 seconds
- ( ) 2 able to take small step independently and hold 30 seconds
- ( ) 1 needs help to step but can hold 15 seconds
- ( ) 0 loses balance while stepping or standing

### **14. STANDING ON ONE LEG**

INSTRUCTIONS: Stand on one leg as long as you can without holding.

- ( ) 4 able to lift leg independently and hold >10 seconds
- ( ) 3 able to lift leg independently and hold 5-10 seconds
- ( ) 2 able to lift leg independently and hold = or >3 seconds
- ( ) 1 tries to lift leg unable to hold 3 seconds but remains standing independently
- ( ) 0 unable to try or needs assist to prevent fall

**ITEM DESCRIPTION SCORE (0-4)**

1. Sitting to standing \_\_\_\_\_
  2. Standing unsupported \_\_\_\_\_
  3. Sitting unsupported \_\_\_\_\_
  4. Standing to sitting \_\_\_\_\_
  5. Transfers \_\_\_\_\_
  6. Standing with eyes closed \_\_\_\_\_
  7. Standing with feet together \_\_\_\_\_
  8. Reaching forward with outstretched arm \_\_\_\_\_
  9. Retrieving object from floor \_\_\_\_\_
  10. Turning to look behind \_\_\_\_\_
  11. Turning 360 degrees \_\_\_\_\_
  12. Placing alternate foot on stool \_\_\_\_\_
  13. Standing with one foot in front \_\_\_\_\_
  14. Standing on one foot \_\_\_\_\_
- TOTAL (maximum 56) \_\_\_\_\_

0–20, wheelchair bound

21–40, walking with assistance

41–56, independent



English Questionnaire: EQ-5D-5L

Under each heading, please check the ONE box that best describes your health TODAY.

**MOBILITY**

- I have no problems walking  1
- I have slight problems walking  2
- I have moderate problems walking  3
- I have severe problems walking  4
- I am unable to walk  5

**SELF-CARE**

- I have no problems washing or dressing myself  1
- I have slight problems washing or dressing myself  2
- I have moderate problems washing or dressing myself  3
- I have severe problems washing or dressing myself  4
- I am unable to wash or dress myself  5

**USUAL ACTIVITIES** (*e.g. work, study, housework, family or leisure activities*)

- I have no problems doing my usual activities  1
- I have slight problems doing my usual activities  2
- I have moderate problems doing my usual activities  3
- I have severe problems doing my usual activities  4
- I am unable to do my usual activities  5

**PAIN / DISCOMFORT**

- I have no pain or discomfort  1
- I have slight pain or discomfort  2
- I have moderate pain or discomfort  3
- I have severe pain or discomfort  4
- I have extreme pain or discomfort  5

**ANXIETY / DEPRESSION**

- I am not anxious or depressed  1
- I am slightly anxious or depressed  2
- I am moderately anxious or depressed  3
- I am severely anxious or depressed  4
- I am extremely anxious or depressed  5

We would like to know how good or bad your health is TODAY.

This scale is numbered from 0 to 100.

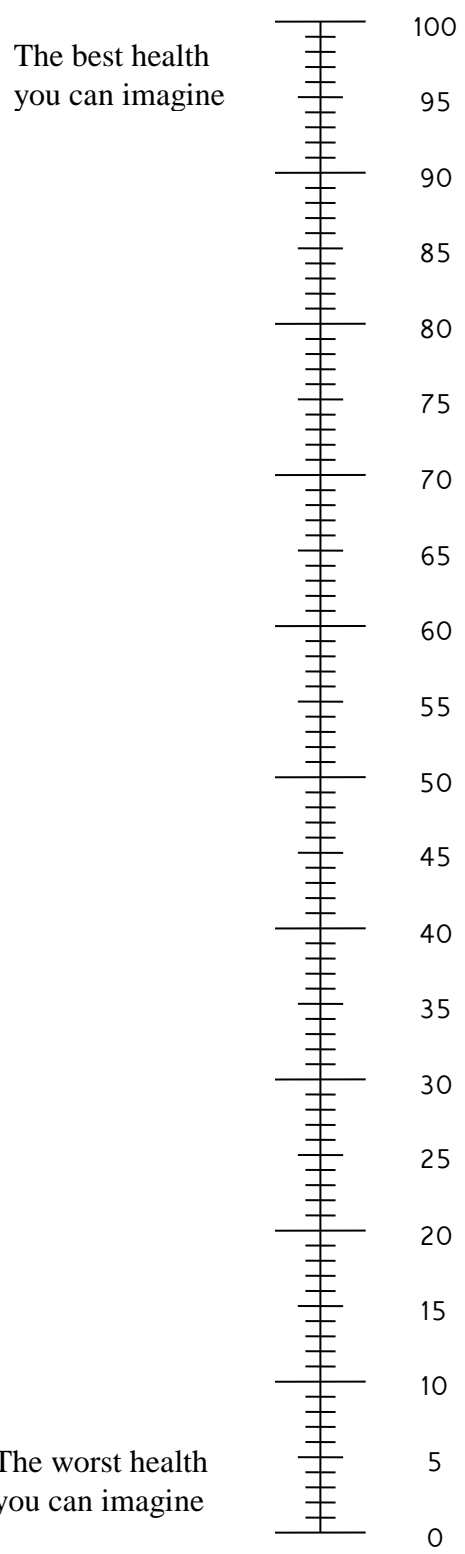
100 means the best health you can imagine.

0 means the worst health you can imagine.

Mark an X on the scale to indicate how your health is TODAY.

Now, please write the number you marked on the scale in the box below.

YOUR HEALTH TODAY =



প্রতিটি শিরোনামের তলায়, **একটি** বাক্সে টিক চিহ্ন দেবেন যেখানে দিলে আপনার **আজকের** শরীর স্বাস্থ্যের অবস্থা সঠিকভাবে বোঝা যায়।

### হাঁটা চলা

- হাঁটা চলায় আমার কোনো অসুবিধা হয় না  ১
- হাঁটা চলায় আমার অল্প কিছুটা অসুবিধা হয়  ২
- হাঁটা চলায় আমার মাঝারি অসুবিধা হয়  ৩
- হাঁটা চলায় আমার প্রবল অসুবিধা হয়  ৪
- আমি হাঁটা চলা করতে পারছি না।  ৫

### নিজের যত্ন নিজে নেওয়া

- নিজের ধোয়া-মোছা করতে বা কাপড় পরতে আমার কোনো অসুবিধা হয় না  ১
- নিজের ধোয়া-মোছা করতে বা কাপড় পরতে আমার অল্প কিছুটা অসুবিধা হয়  ২
- নিজের ধোয়া-মোছা করতে বা কাপড় পরতে আমার মাঝারি অসুবিধা হয়  ৩
- নিজের ধোয়া-মোছা করতে বা কাপড় পরতে আমার প্রবল অসুবিধা হয়  ৪
- নিজের ধোয়া-মোছা করতে বা কাপড় পরতে পারি না  ৫

### সাধারণ কাজকর্ম (যেমন স্বাভাবিক কাজকর্ম, পড়াশুনা, বাড়িঘরের কাজ, পরিবার বা অবসরের কাজ)

- সাধারণ কাজ কর্ম করতে আমার কোনো অসুবিধা হয় না  ১
- সাধারণ কাজ কর্ম করতে আমার অল্প কিছুটা অসুবিধা হয়  ২
- সাধারণ কাজ কর্ম করতে আমার মাঝারি অসুবিধা হয়  ৩
- সাধারণ কাজ কর্ম করতে আমার প্রবল অসুবিধা হয়  ৪
- সাধারণ কাজ কর্ম করতে পারি না  ৫

### গায়ে ব্যথা / খারাপ লাগা

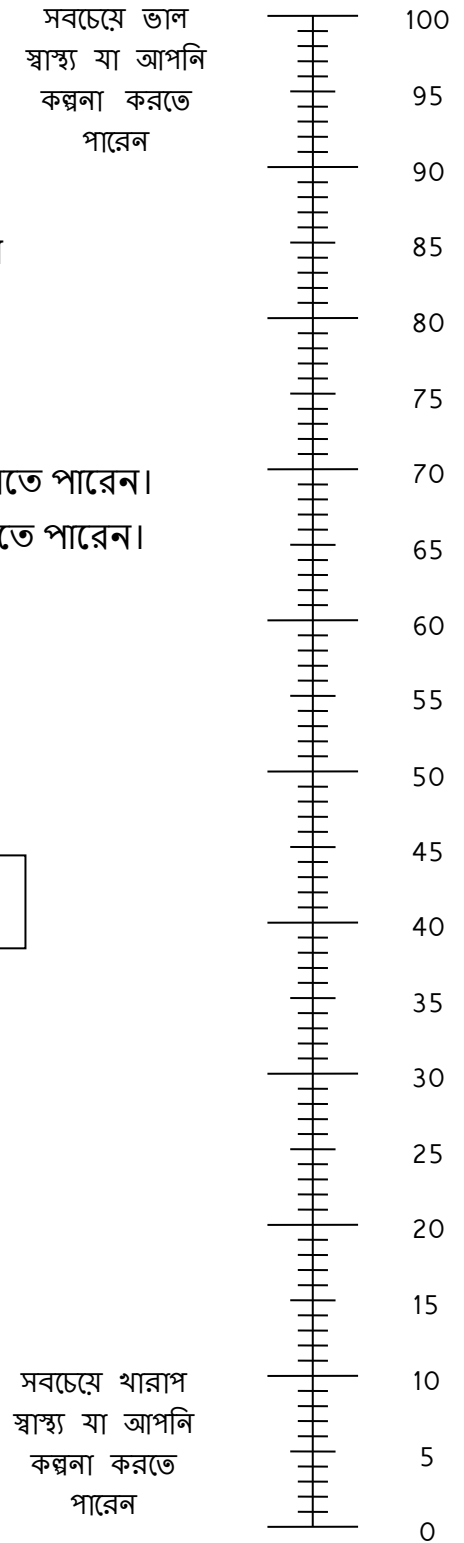
- গায়ে কোনো ব্যথা নেই বা খারাপ লাগে না  ১
- গায়ে অল্প কিছুটা ব্যথা হয় বা খারাপ লাগে  ২
- গায়ে মাঝারি ব্যথা হয় বা খারাপ লাগে  ৩
- গায়ে প্রবল ব্যথা হয় বা খারাপ লাগে  ৪
- গায়ে খুব বেশি ব্যথা হয় বা খারাপ লাগে  ৫

### দুশ্চিন্তা / মনমরা ভাব

- আমার দুশ্চিন্তা বা মনমরা ভাব নেই  ১
- আমার অল্প কিছুটা দুশ্চিন্তা বা মনমরা ভাব আছে  ২
- আমার মাঝারি দুশ্চিন্তা বা মনমরা ভাব আছে  ৩
- আমার প্রবল দুশ্চিন্তা বা মনমরা ভাব আছে  ৪
- আমার খুব দুশ্চিন্তা হচ্ছে বা আমি খুব মনমরা আছি  ৫

- আমরা জানতে চাই আপনার স্বাস্থ্য **আজকে** কতটা ভালো বা খারাপ আছে।
- এই স্কেলে 0 থেকে 100 পর্যন্ত নম্বর আছে।
- 100 মানে সবচেয়ে ভাল স্বাস্থ্য যা আপনি কল্পনা করতে পারেন।  
0 মানে সবচেয়ে খারাপ স্বাস্থ্য যা আপনি কল্পনা করতে পারেন।
- **আজকে** আপনার স্বাস্থ্য কেমন আছে তা চিহ্নিত করতে এই স্কেলের উপরে একটা X চিহ্ন দিন।
- এবার আপনি যেখানে চিহ্ন লাগিয়েছেন সেই নম্বরটি নিচের বাক্সে লিখুন।

আজ আপনার স্বাস্থ্য =



April 6, 2017

To  
The Head  
Department of the Physiotherapy  
Center for the Rehabilitation of the paralysed (CRP)  
Chapain, Savar, Dhaka-1343

Through: Head, Department of Physiotherapy, BHPI

Subject: Application for permission to collect data to conduct a research study.

Dear Sir,

I respectfully state that I am Bipul Debnath student of 4<sup>th</sup> year B.Sc. in Physiotherapy of Bangladesh Health Professions Institute (BHPI). In 4<sup>th</sup> year course curriculum, I have to do a research project. My research title is "Functional outcome and quality of life of patients with stroke after receiving rehabilitation services at CRP" and my supervisor is Firoz Ahmed Mamin, Assistant Professor, Department of Physiotherapy (BHPI). For this reason, I need to collect data from stroke patients at your department. I need your kind permission for data collection at Neurology unit of CRP at Savar and Mirpur, Dhaka.

Therefore, I pray and hope that you would be kind enough to grant my application and give me the permission for collect data.

Yours faithfully

*Bipul Debnath*

Bipul Debnath  
4<sup>th</sup> year B.Sc. in Physiotherapy  
Class roll: 03  
Session: 2012-2013  
BHPI, CRP, Savar, Dhaka-1343

*Approved  
please contact with  
Arif M Mamin Dava  
as a counter part of  
data collection process*

*Forwarded*

*9/6/17*

**Md. Obaidul Haque**  
Associate Professor & Head of the Department  
Department of Physiotherapy  
Bangladesh Health Professions Institute (BHPI)  
CRP, Chapain, Savar, Dhaka-1343

*Fm  
6.4.17*

**Firoz Ahmed Mamin**  
BSc (Hons) MSc in Clinical Neuroscience (London)  
Assistant Professor  
Department of Physiotherapy  
BHPI CRP Savar, Dhaka

*[Signature]*  
**Dr. Md. Faruk Hossain**  
Associate Professor &  
Department of Physiotherapy, Dept.  
1343



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)  
BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)  
(The Academic Institute of CRP)

Ref: CRP-BHPI/IRB/04/17/93

Date: 15/04/2017

To  
Bipul Debnath  
B.Sc in Physiotherapy  
Session: 2012-2013, Student ID 11212003  
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

**Subject: "Functional outcome and quality of life of patients with stroke after receiving rehabilitation services at CRP".**

Dear Bipul Debnath,

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on 14/8/2016 to conduct the above mentioned thesis, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Thesis Proposal
2	Questionnaire (English and Bengali version)
3	Information sheet & consent form.

Since the study involves Functional Independent Measurement scale (FIM) scale, EQ-5D-5L, Berg Balance Scale and a self-administered questionnaire that takes 15 to 20 minutes, have no likelihood of any harm to the participants and have possibility of benefit of patients to design appropriate rehabilitation program. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 09:00 AM on August 17, 2016 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  
Assistant Professor, Dept. of Rehabilitation Science  
Member Secretary, Institutional Review Board (IRB)  
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

CRP-Chapain, Savar, Dhaka-1343. Tel: 02-7745464-5, 7741404 , Fax: 02-7745069,  
Email: contact@crp-bangladesh.org, www.crp-bangladesh.org