FUNCTIONAL OUTCOMES OF LOWER LIMB OF STROKE PATIENTS AFTER RECEIVING PHYSIOTHERAPY

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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 OUTCOMES OF LOWER LIMB OF STROKE PATIENTS AFTER RECEIVING PHYSIOTHERAPY

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Declaration

I declare that the work presented here is my own. All source used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of the study. I would be bound to take written consent from my supervisor.

Signature: **Date:**

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Acronyms

ADL	Activity of Daily Living
AIDS	Acquired Immune Deficiency Syndrome
AVM	Artero Venous Malformation
BHPI	Bangladesh Health Professions Institute
CRP	Center for the Rehabilitation of the Paralyzed
CT	Computed Tomography
CVA	Cerebro Vascular Accident
DALYs	Disability-Adjusted Life Years
DVT	Deep Venous Thrombosis
ESR	Erythrocytic Sedimentation Rate
FIM	Functional Independent Measurement
HIV	Human Immunodeficiency Virus
LMIC	Low and Middle Income Countries
MRI	Magnetic Resonance Imagine
PT	Physiotherapy
SPSS	Statistical Package of the Social Sciences
TIA	Transient Ischemic Attack
WHO	World Health Organization

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Abstract

Purpose: The purpose of the study was to find out the functional outcome of lower limb of stroke patient after receiving physiotherapy at neurology outpatient unit of CRP. *Objective:* The aim of this study was to describe the functional outcomes lower limb of stroke patients after receiving at least 20 session physiotherapy. *Methodology:* Cross sectional study design was selected for this study. A prospective survey method has been done to accomplish the research purpose. Fifty samples were selected as convenience sampling from Physiotherapy Neurology outpatient unit of CRP. A standard questionnaire was used to collect data and outcome was measured by Functional Independent Measurement (FIM) scale. Data was analyzed by SPSS software version 16.0. And data was analyzed through descriptive statistics by using table, pie chart and bar chart. *Results:* Among 50 participants the mean age was 53.38 in where male 80% (n=40) and female 20% (n=10). Here male were predominantly higher than female. 42% (n=21) participants were LSH, 56% (n=23) were RSH and 2% (n=1) were BH, 70% (n=35) were ischemic and 30% (n=15) were hemorrhagic stroke. Significant improvements were observed from FIM rating scale. In static standing 32%, in dynamic standing 22%, in gait 26% and in stairing 14% participants were became complete independent after receiving physiotherapy. *Conclusion:* The results of this study provided more insight into the functional outcome of stroke patients. This information would assist the professional to justify the physiotherapy practice. More research is needed to evaluate the rehabilitation program for these patients.

Key words: Functional outcome, Stroke, FIM scale, Rehabilitation.

CHAPTER-I: INTRODUCTION

1.1 Background

Stroke is considered as a precious disease from human, family and community perspectives (Carlo, 2009). Stroke ranks number four among all causes of death after heart disease, cancer and chronic lower respiratory disease in terms of mortality (Legge et al., 2011). Stroke constitutes a substantial health care problem and is characterized by a high burden of disease from health care and public health perspectives in both worldwide and in the United States and the incidence rate of stroke is higher in African American than Caucasian (Sergeev, 2011). It is a second commonest cause of death approximately 9% (Mondal et al., 2012). Stroke is the fourth major cause of disease burden after heart disease, HIV/AIDS and unipolar depression worldwide (Joubert et al., 2008). Stroke is associated with a significant burden of disability and loss of quality-adjusted life years (Mu¨ller-Nordhorn et al., 2006). In China, stroke has been a major public health problem (Zhang et al., 2011).

Worldwide, stroke is a major cause of disability (Mondal et al., 2012). About 2.9% of the adult have had a stroke, of whom nearly a third live with a disability in American (Sergeev, 2011). In Scotland, it is the third commonest cause of death and the most frequent cause of severe adult disability (SIGN, 2010). In every society, stroke is a considerable cause of death and disability which is both a preventable and a treatable disease (Galvin et al., 2012). Stroke considered as a one of the principal causes of morbidity and mortality in elderly (Kalvin & Margaret, 2011) in the developed world and in all industrialized countries and it is the leading cause of disability (Belda-Lois et al., 2011). About 30% of stroke survivors are permanently disabled and require assistance to perform their activities of daily living (ADL) (Kalvin & Margaret, 2011).

Stroke is the third most common cause of death and is the main cause of acquired adult disability in high-income countries (Langhorne et al., 2009). In 2005, it is reported that about 5.7 million deaths occur due to stroke, 87% occurred in low and middle income countries where 80% of the population lives in rural areas (Joubert et al., 2008). In low and middle income countries (LMIC) approximately 85% of all

stroke deaths are registered which also account for 87% of total losses due to stroke in terms of disability-adjusted life years (DALYs) calculated worldwide in 72 million per year (Carlo, 2009). In Africa, the stroke mortality rate was also higher than in the United Kingdom, Canada and most other high-income countries (Mensah, 2008). Low and middle income countries have the largest burden of stroke accounting for more than 85% of stroke mortality worldwide (O' Donnell et al., 2010).

Stroke occurring rate is the same in men and women but women are more probable to die (Mensah, 2008). Stroke, either ischemic or hemorrhagic is more common in men than in women (Zhang et al., 2011). Stroke incidence was about 30% higher in men than in women in Western Europe (Appelros et al., 2009). Stroke is the third and fourth leading cause of death in women and men in the United States respectively (Sergeev, 2011). In 2002, stroke mortality in black men and women in the United States were 81.7 and 71.8 per 100 000 population respectively (Mensah, 2008). Under the age of 65 years more than half of men and women who have a stroke die within 8 years (Gordon et al., 2004).

In UK, the age adjusted annual death rate from stroke is about 200 per 100,000 in 12% of all death (Mondal et al., 2012). The age-standardized mortality rates for adults aged 30-69 years old in Nigeria and Tanzania are several-fold higher than the rates in Canada, the United Kingdom, Brazil, Pakistan, India, China and these rates are exceeded only by the high stroke mortality in the Russian Federation (Mensah, 2008). Around two thirds of the affected patients are above 65 years a stroke may occur at all ages, even in very young children, and can have many causes (Geurts et al., 2004). In the United States, Europe and Australia approximately 400/100 000 persons over the age of 45 years have a first stroke each year (Yavuzer, 2006).

After ischemic heart disease stroke ranks as the second cause of death in the world population where the third only if neoplastic diseases are considered as a group (Carlo, 2009). In the United States, stroke causes about one in every 18 deaths, and stroke mortality exceeds 130,000 (Sergeev, 2011). In black Africans, stroke is a significant cause of morbidity and mortality and it accounts for 2.8 – 4.5% of total deaths in the continent (Olaogun et al., 2011). In 48 European countries total number of stroke deaths is currently estimated at 1,239,000 per year (Carlo, 2009). In

developed countries stroke is the third most frequent cause of death (Hossain et al., 2011; Lewsey et al., 2009). Worldwide, yearly 16.3 million people suffer from stroke where 11.2 million events occur in developing countries like Bangladesh and each year approximately 5.8 million people die due to of stroke and two third of which occurs in developing nations (Mondal et al., 2012).

About 15 million people worldwide suffered a stroke in 2004 and also estimated that the mean stroke incidence rate in Western countries is 94 per 100,000 person years which reported by the World Health Organization (WHO) (Ejik et al., 2010). In Germany, each year 200,000 persons sustain their first stroke, and another 600,00 sustain a stroke after one or more prior strokes; roughly one citizen in five will have a stroke at some time in his or her life (Knecht et al., 2011). In the European Union, stroke incidence is about one million per year (Belda-Lois et al., 2011). Mortality rate of stroke was thus substantially higher in Africa than among US black people (Mensah, 2008). In the USA, it was reported that 530,000 people experience each year a new ischemic stroke (IS) and on average every 40 seconds someone in the same country has a stroke (Legge et al., 2011).

1.2 Rationale

Stroke is a common neurological condition, mostly seen in developing country. Day by day there is increasing the number of stroke patient, in different areas. In Bangladesh stroke also causes death where health support including rehabilitation is not available. For proper rehabilitation of stroke patient need multi-disciplinary team approach treatment. In this condition only medical management is not enough rather than the therapeutic management which also essential for stroke management. Physiotherapy is an important part of health care to prevent diseases as well as to improve or to regain the maximum level of independence in people with functional impairment. But many people are not aware about effectiveness of physiotherapy treatment. The individual functional status may be varied according to affected side, as individuals functional uses of lower limbs are different. It is very important to find out the functional outcome of affected lower limb while a physiotherapy management team does work towards the improvement or the recovery the functional status of stroke patient; otherwise the outcome of physiotherapy is not significant.

In Bangladesh, most of the patient comes at later stage and their improvements are not satisfactory. It is thought, if we can identify the specific factors, then we can give concentration on that specific factors for the better outcome of the people who are suffering from stroke; will get maximum benefits from physiotherapy treatment. The goals of physiotherapy are to provide opportunities for an individual to regain optimal skilled performance of functional actions and to increase levels of strength, endurance and physical fitness. So that this research will give ideas about the functional recovery of lower limb after taking physiotherapy and by this result we make appropriate measures of functional improvement of affected lower limb. This study also helps to play more attention to perform affected lower limb activity by physiotherapist and to provide important platform for physiotherapist.

1.3 Research question

What are the functional outcomes of lower limb of stroke patients?

1.4 Objectives

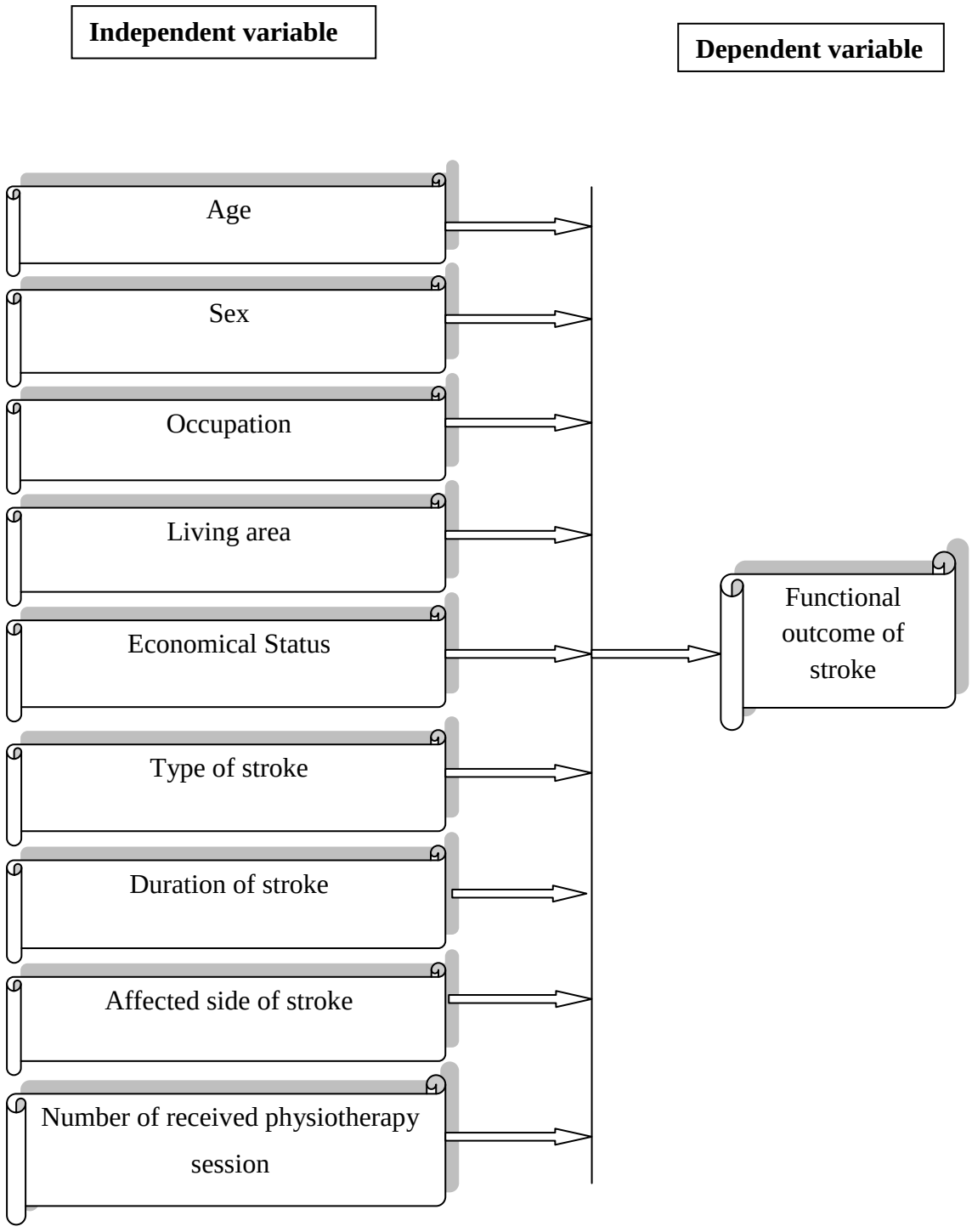
1.4.1 General objectives

- To find out the functional outcome of lower limb of stroke patient after receiving physiotherapy at neurology outpatient unit of CRP.

1.4.2 Specific objectives

- To find out the extend of static and dynamic standing balance of lower limb.
- To evaluate the improvement of gait pattern after physiotherapy.
- To explore the improvement of stairing ability of the patients.
- To find out the socio-demographic information of the stroke patients.
- To identify the number of physiotherapy session received by the stroke patient.

1.5 Conceptual Framework



1.6 Operational definition

Functional Independent 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. A FIM score is collected within 72 hours after admission to the rehabilitation unit. The FIM score ranges from 1 to 7 with 1 (Total Assistance) being the lowest possible score and 7 (Complete Independence) being the best possible score.

Functional outcome

Investigation what a person’s capable of doing how much assistance he/she needs and what equipment have to need to perform his/her activities.

Stroke

Stroke occurs when blood flow to the brain is damage resulting in abnormal function of brain. It causes by blockage or rupture of an artery to the brain. Stroke also is sometimes called a brain attack or a cerebrovascular accident (CVA).

Ischemic stroke

This type of stroke occurs as a result of an obstruction within a blood vessel supplying blood to the brain. It accounts for 87 percent of all stroke cases.

Haemorrhagic Stroke

A hemorrhagic stroke occurs when a blood vessel that carries oxygen and nutrients to the brain burst and spills blood into the brain. When this happens, a portion of the brain becomes deprived of oxygen and will stop functioning.

Risk factors of stroke

Risk factors are traits and lifestyle habits that increase the risk of disease. Extensive clinical and statistical studies have identified several factors that increase the risk of stroke.

CHAPTER-II: LIERATURE REVIEW

The father of Western Medicine Hippocrates, more than 24,00 years ago was first described stroke is a neurological condition which characterized by the sudden onset of paralysis muscle on one side or both side of the body (National Institute of Neurological Disorders and Stroke, 2004). According to World Health Organization (WHO), "stroke as rapidly developed clinical signs of focal disturbance of cerebral function lasting for more than 24 hours or leading to death without any apparent cause other than vascular origin" (Hossain et al., 2011).This definition of stroke excludes transient ischaemic attacks (TIA), which refers to a clinical presentations consistent with stroke may be caused by subdural haemorrhage, mass effect and trauma (Mensah, 2008).

Due to multifarious anatomy of the brain and its vasculature the clinical manifestations of stroke are highly variable (Boon et al., 1999). There are 2 main types of stroke-Ischemic stroke are the most common type of stroke and it is responsible for about 80% of all first ever in a life time stroke. This occurs due to reduction in blood supply; brain cells die from lack of oxygen results a clot blocks blood vessels or become too narrow for blood to flow within the brain (Porter, 2002). Haemorrhagic stroke are due to the rupture of an artery within the brain triggering an intracerebral haemorrhage about 15% of strokes or to the rupture of aneurysm or AVM entailing subarachnoid haemorrhage about 5% of strokes (Braunwald et al., 2003). The main pathological types of stroke are cerebral infarction, primary intra-cerebral haemorrhage and subarachnoid haemorrhage (Amanullah et al., 2009). Ischemic stroke is different from that of hemorrhagic stroke due to pathogenesis and their clinical factors would not be the same and incidence rate of ischemic stroke in East China was obviously higher than that of hemorrhagic stroke (Zhang et al., 2011).

Infarction from hemorrhage can be differentiated by the pathophysiological terms. About 80% of all stroke patients suffer from an infraction, and it is most common, whereas 20% of all stroke patients are struck by a hemorrhage. According to the location and the size of the brain lesion, clinical presentation varies from minor neurological symptoms to severe deficits (Hendricks, 2003).

Risk factors of stroke can be divided into two factors. They are modifiable or reversible and non-modifiable or irreversible factor. Non- modifiable factors are; age, gender (male > female except in the very young and very old) previous vascular event, e.g. myocardial infarction, stroke or peripheral embolism, (Hossain et al., 2011) high fibrinogen, race (Afro-Caribean> Asian > European), heredity, (Boon et al., 1999). Modifiable factors like hypertension, diabetes mellitus, heart disease (atrial fibrillation, heart failure, endocarditis), hyperlipidaemia, smoking, excessive alcohol drinking, polycythaemia and oral contraceptive (Hossain et al., 2011). Major risk factors for stroke are cigarette smoking and alcohol drinking which have long been recognized. Their pathophysiological effects are multifactorial, involving both systemic vasculature and blood rheology (Zhang et al., 2011).

Depending on the part of the brain injured the severity of the injury and the person's general health consequence of stroke may differ from man to man (Boon et al., 1999). One of the most prominent features in the acute phase is hemiparesis (Flansbjer et al., 2005) which is occurs in 80-90% of all stroke patients and may be accompanied by hemi hyperesthesia. Other remarkable features are represented by cognitive deficits such as aphasia, apraxia and hemi neglect (Hendricks, 2003). Motor impairment is the most common and widely recognized impairment following stroke and mostly focus of stroke rehabilitation is on the recovery of impaired movements and related functions (Galvin et al., 2012). Muscle weakness, pain, spasticity and poor balance can lead to a reduced tolerance to activity and further sedentary lifestyle which occurs due to impairments resulting from stroke. Community-dwelling individuals with stroke undertake extremely low levels of physical activity (Eng & Tang, 2007).

After a CVA individual may show sensitive and cognitive impairments, the motor impairments such as muscular weakness, hypertonia, abnormal movement patterns and physical deconditioning are the most common. Individuals with CVA have some musculoskeletal disorders which are considered as important impairments and usually determine limitations in performing functional activities and activities of daily living like gait, stair ascent and descent (Nascimento et al., 2011). Stroke may also causes some problem with language, including difficulty understanding speech or writing known as aphasia and knowing words but has difficulty to saying them clearly refers

to dysarthria, problem with memory, thinking, attention or learning, possible inability to recognize object, recognize body parts of the body that is affected or understand instructions, difficulty in swallowing (Edwards, 1996). Other problems are in bowel and bladder control, fatigue, depression, loss of body function, along with dependency to others (Stokes, 1998).

At onset of stroke other deficits may be present such as loss of consciousness, dysfunction of the cranial nerves, postural imbalance, coordination disorders and loss of sphincter control. In the sub-acute and chronic phase some complications secondary to the initial neurological deficits may develop. These consist of shoulder-hand syndrome due to multiple traumatizations in patients with paralysis of the upper extremity and hemi neglect or contractures resulting from severe spasticity (Hendricks, 2003). After stroke chest infection**,** epileptic seizures, DVT (Deep Venous Thrombosis), pulmonary embolism, contracture, painful shoulder, pressure sore, urinary tract infection, constipation**,** depression and anxiety may also occur. Other psychological problems like depression, unrealistic state, labile state and personality changes (Boon et al., 1999).

Stroke may also resulting activity limitations which sometimes referred to as disabilities are manifested by reduced ability to perform daily functions, such as dressing, bathing or walking. The level of activity limitation is generally related to but not completely dependent on the level of body impairment such as severity of stroke (Gordon et al., 2004). Balance disturbances may occurs due to decreased muscle strength, range of movement, abnormal muscle tone, motor coordination, sensory organization, cognition and multisensory integration (Oliviera et al., 2008).

A detailed history and thorough clinical examination is compulsory to make a diagnosis of stroke. Computerized tomography (CT) scan of the brain is an uncomplicated, non-invasive and accurate investigation in distinguishing cerebral infarction from hemorrhage. CT scan is most preferable to magnetic resonance imaging (MRI) in the acute stage because MRI does not easily identify intracranial haemorrhage within the first 48 hours after a bleeding episode (Amanullah et al., 2009).These investigations also help to confirm other vascular lesion. Another investigation which known as lumber puncture usually done for confirm diagnosis of

sub arachnoids hemorrhage. Some investigating that help to know about risk factor such as full blood count, blood glucose level, cholesterol level and ESR (Boon et al., 1999).

An emergency requiring imperative investigation and treatment are needed for stroke (Amanullah et al., 2009). There is no cure in management of stroke. By early detection and reducing the modifiable risk factors prevention of stroke is possible. This is very much important in the concept of our country where medical facilities and resources are limited and most of the people lives below poverty level (Hossain et al., 2011). A variety of biological and environmental factors are responsible for recovery after stroke and recovery profiles shows a high inter individual variability (Hendricks, 2003). At the same time as the specific effects of physiotherapy during rehabilitation remain uncertain there is increasing evidence that early physiotherapy can maximize physical recovery (Stokes, 1998).

Adjustment of multiple risk factors throughout a combination of inclusive lifestyle interventions and proper pharmacological therapy is now accepted as the keystone of initiatives aimed at the avoidance of frequent stroke and acute cardiac events in stroke survivors (Gordon et al., 2004). The physical management process aims to maximize functional ability and prevent secondary complications to enable the patient to resume all aspects of life in his or her own environment (Braunwald et al., 2003). After stroke restoring functions is a complex process involving spontaneous recovery and the effects of therapeutic interventions. Actually, some interaction between the stage of motor recovery and the therapeutic intervention must be noticed (Belda-Lois et al., 2011).

The objective of rehabilitations to return the patient to home and to exploit recovery by providing a safe, progressive treatment which is appropriate to the individual patient and suggesting that physical therapy can employ unused neural pathways (Braunwald et al., 2003). Rehabilitation of stroke patient include the comprehensive assessment of medical problems, impairments and disabilities, active physiological management, early mobilization and avoidance of bed rest, skilled nursing care, early setting of rehabilitation plans involving carers and early assessment and planning for discharge needs (Peppen et al.,2004). To deliver rehabilitation effectively, predictions

need to be made about the patients' expected degree of recovery to set suitable therapeutic goals, develop effective treatment plans and facilitate discharge planning (Carr & Shepherd, 2003).

Physiotherapy plays an important role in rehabilitation. Used techniques are exercise, manipulation, massage, skills training and electrical treatment which are used to help heal and recover movement. After stroke the main focus of physiotherapy is to help learn to use both sides of body again and regain as much strength and movement as possible (Stroke association, 2012). The physiotherapist plays a major role in the physical management of stroke using skills acquired during education and professional development, to identify and manage problems of stroke using scientific principles (Carr & Shepherd, 2003). After stroke organized multidisciplinary care and rehabilitation increase patient survival and self-determination as well as reducing the length of inpatient stay (Peppen et al., 2004).

Our brains cannot grow new cells to replace the ones that have been damaged after a stroke, so recovery depends on brain's ability to reorganize its undamaged cells and make up for what has been lost. This is called neuroplasticity. Physiotherapy can give an expert practical guidance to prevent this condition. Physiotherapists are frequently work with other members of the stroke team to make sure that they can help with the range of problems that stroke can cause. The team may consist of occupational therapists, speech and language therapists, doctors, nurses and social workers and also other specialists. This team is called the multidisciplinary stroke rehabilitation team (Stroke association, 2012). Usually, concepts of physiotherapy were focused on restoring and reduced motor control of the affected limb as well as postural control (Outermans et al., 2010).

Numerous important factors are emphasizing the potential value of exercise training and physical activity in stroke survivors. Some study showed that trainability of stroke survivors and recognized beneficial physiological, psychological, sensorimotor, strength, endurance, and functional effects of various types of exercise (Gordon et al., 2004). Recovery from impairment and disability is difficult to completely compare. Improvement of motor function, sensation and language are representative of neurological recovery. Neurological recovery occurs within first 1 to 3 month

following stroke. Further motor and sensory recovery may continue 6 month to 1 year later (Duncan, 1994).

Improving the ability to stand and walk is important for patients after stroke. Complex postural control mechanisms are necessitating for Standing and walking, the nature of which has not been fully determined (Garland et al., 2003). Standing and walking also require highly integrated sensori motor and perceptual functions of the central nervous system. Stroke may impair some functions such as more or less severe postural imbalance and walking disability. The severity of lower extremity paresis represents an important determinant for the regaining of independent transfers and walking in severe stroke patients. It has also been shown that the speed of hemiplegic gait is related to the muscle strength of the lower extremity (Hendricks, 2003).

Muscle activity of the lower extremities needs to be well coordinated to provide support, dynamic balance, propulsion, and foot clearance during human walking (Den-Otter et al., 2006). Evidence was found on the beneficial effects of muscle strength training in terms of lower limb muscular strength, but no favorable effects were found of strength training in terms of mobility-related tasks, such as stairing, walking, turning, making transfers, walking quickly and walking for specified distances, whereas some evidence was found for cardio respiratory training on walking capacity in terms of distance (Outermans et al., 2010).

Patients with stroke need rapid and optimal improvement of postural control which is essential to their independence, social participation and general health (Geurts et al., 2004). Progressive resistance training (PRT) is generally established as the most effective method for improving muscular strength and now it is prescribed by most major health organizations for improving health and fitness and it also help to improve lower extremity strength following stroke and when delivered at appropriate intensities, can provide significant functional benefit (Bowden et al., 2011).

Uneven weight distribution and difficulties in muscle use are often related to standing balance problems of patients following a stroke and may also increase postural sway during standing (Pyo¨ria et al., 2004). The capacity to voluntarily transfer body weight while maintaining standing balance over a fixed base of support and adopt a

different stance position is a precondition of safe mobility (Carr & Shephered, 2003). Evidence that textured floor surfaces and textured shoe insoles can improve static and dynamic balance in healthy young adult's points to their potential to improve balance in older people (Hatton et al., 2011).

Restoration of paretic leg muscle functions may determine the standing balance gains in patients with stroke (Geurts et al., 2004). Reduced ability to bear weight on the paretic limb is not limited to static standing tasks. Weight bearing during dynamic tasks such as rising from a chair or voluntarily weight shifting to 1 limb while standing is also compromised after a stroke. Asymmetrical weight bearing has been reported when rising from a chair, with the paretic limb accepting between 25% to 38% of body weight. In addition, it has been reported that individuals with stroke can shift only approximately 55% of their body weight onto the paretic limb while standing in the forward direction in a step stance posture and 65% in the lateral direction with feet parallel (Eng & Chu, 2002).

Maintaining an unperturbed two-legged standing position, a simple task for healthy individuals, may be quite an achievement for individuals with stroke who need prolonged inpatient rehabilitation care (Geurts et al., 2004). In both strength training and skill development, repetition is an important aspect of practice (Carr & Shephered, 2003). Some balance tests are used to measure the ability of a person to maintain the body's center of gravity (COG) within the base of support and to maintain stance when his or her balance is not perturbed (Pyo¨ria et al., 2004). In hemiparetic patients, weakness and impaired muscle control of the affected lower limb, decreased range of motion, and pain can lead to changes in the base of support (Oliviera et al., 2008).

Of all sensori-motor consequences of stroke, impaired postural control probably has the greatest impact on independence and gait (Geurts et al., 2004). Stepping and grasping movements of the limbs also appear to play an important functional role in maintaining upright stance (Pyo¨ria et al., 2004). Stepping requires relatively little muscle force even if maintaining a fixed base of support that stepping responses are even more vital to persons who suffer from impaired equilibrium reactions and muscle force, such as patients with stroke (Eng & Chu, 2002).

Patients following stroke gait re-education are an important physical therapy intervention. The walking patterns of both individuals without mobility problems and patients with hemiplegia have been well documented. The gait of stroke patient are characterized by problems with generating, timing, and grading of muscle activity, hyper tonicity, and mechanical changes in soft tissues (Lennon, 2001). Repetitive training of tasks results in improvement in lower limb function, supporting the idea that a high dose of repetitions are effective for improving gait-related activities (Outermans et al., 2010).

Approximately 85% of patients who have had a stroke regain gait by 6 months post-stroke have shown in several prospective cohort studies and about 20% of all stroke survivors show significant deterioration in mobility status between 1 and 3 years after stroke (Wevers et al, 2011). After stroke, between 52% and 85% of patients re-gain the capacity to walk but, their gait usually remains different from that of healthy subjects (Pradon et al., 2013). Recently, evidence was found on improved walking ability not only associated with improved motor control of the paretic lower limb but also rather with the development of compensation movement strategies and improved coping with loss of function in enhancing the ability to maintain balance over the non-paretic lower limb (Outermans et al., 2010).

Functional mobility like transfer of weight onto a limb is essential and is a requirement for rising from a chair, transferring, walking, turning, and stair climbing. Abnormal distribution of weight on the paretic limb is common after a cerebrovascular accident. Majority of individuals accounts 79%–87% with stroke bear less weight on the paretic limb and bear approximately 25%–43% of body weight during the static task of quiet standing and possible causes of this reduced ability after a stroke include pain, spasticity, impaired balance, sensory loss, neglect, muscle weakness, and perceptual deficits (Eng & Chu, 2002).

Walking training are early physical intervention which is generally organized as beneficial in the treatment of patient with stroke; but it is not clear what type of physical therapy programme would promote optimal recovery. Weight bearing, balance & co-ordination are the major component of training for independent

walking. Task specific intensive walking training, such as use of limb-load monitor, resisted exercises in upright position with an isokinetic device and walking on treadmill for optimizing of walking recovery in acute stroke patients (Nilsson et al., 2001).

To improve walking performance by addressing a combination of: (1) walking specific motor control; (2) dynamic balance; (3) cardio respiratory fitness and (4) muscular strength (Bowden et al., 2011). Individuals with hemiparesis commonly exhibit biomechanical gait changes and usually, they demonstrate decreased speed and cadence, prolonged swing phase, reduced range of motion, impaired balance and inability to transfer the weight into their paretic lower limb. Additionally, uncoordinated motion of the paretic limb occurs due to difficulties to change speed, direction, duration and intensity of muscular activity, resulting in (Nascimento et al., 2011).

Approximately 50%-60% of stroke patients still experience some degree of motor impairment and approximately 50% are at least partly dependent in activities-of-daily-living after completing standard rehabilitation (Belda-Lois et al., 2011). Physical fitness is important for the performance of everyday activities. In stroke patients, muscle strength and cardio respiratory fitness are impaired and it is not known whether improving fitness by physical fitness training reduces disability after stroke (Saunders et al., 2004). Following a stroke recovery and improvement of function is very very much important during the first year after the stroke (Pyo¨ria et al., 2004). Approximately 14% of stroke survivors achieve a full recovery in physical function, and between 25% and 50% require at least some assistance with activities of daily living, and half experience severe long-term effects such as partial paralysis. As a result, activity intolerance is common among stroke survivors, especially in the elderly (Gordon et al., 2004).

CHAPTER-III: METHODOLOGY

3.1 Study design

Cross sectional study was selected for conduct the study. A cross-sectional study is a descriptive study in which disease and exposure status is measured simultaneously in a given population and the most important advantage are it is quick and cheap (Bailey, 1997).

3.2 Study site and study area

This study was conducted in stroke patient at neurology outpatient unit of Centre for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka.

3.3 Study population and sampling

Sampling refers to the process of selecting the subjects/individual (Hicks, 1999). Stroke patient were the study population and sample was taken by using convenience sampling technique due to time limitation and to perform sampling easily.

3.4 Sample size

The equation of sample size calculation are given below-

$$n = \left\{\frac{Z(1-\frac{\alpha}{2})}{d}\right\}^2 \times pq$$

Here,

$Z(1-\frac{\alpha}{2})$= 1.96

P= 0.098

q= 1-p

=1-0.098

=0.902

d= 0.05

According to this equation the sample should be more than 135 people but due to lack of opportunity the study was conducted with 50 patients attending at physiotherapy department selected according to inclusion and exclusion criteria.

3.5 Selection Criteria

3.5.1 Inclusion criteria:

- Age range 30-70 years.
- Duration of onset more than 1 month up to 1 year.
- Both ischemic and heamorrhagic stroke are included.
- Patients who have receiving more than 20 session physiotherapy from neurology outpatient unit of CRP, Saver.

3.5.2 Exclusion criteria:

- Age range less than 30 or more than 70 years.
- Onset less than 1 month or more than 1 year.
- Any spinal deformities that affect the normal alignment of the patient.

3.6 Data collection methods and tools

Data collection method was questionnaire and tools were pen, papers, consent form and outcome was measured by Functional Independent Measurement scale (FIM).

3.7 Data analysis

Data was analyzed with the software named Statistical Package for Social Science (SPSS) version 16.0. And descriptive statistics was use to analyze data.

3.8 Ethical Consideration

The study protocol was submitted to the BHPI review board for approval as per the existing rules. This study followed the World Health Organization (WHO) & Bangladesh Medical Research Council (BMRC) guidelines and strictly maintained the confidentiality. Permission from in charge of Physiotherapy department of CRP was taken to conduct the study. Written consent (appendix) was taken from the participant including signature and informing them about the purpose of the study, anonymity, their rights to refuse answering any question, withdrawn from the study at any point of time and other issues mentioned in the form before starting the interviews. The participants were informed clearly that their information would be kept confidential and secure place. It should be assured the participant that his or her name or address would not be used. The participant will also be informed or given notice that the research result would not be harmful for them.

3.9 Limitations

100% accuracy will not be possible in any research so that some limitation may exist. Regarding this study, there were some limitations or barriers to consider the result of the study as below:

- The limitation of this study was small sample size. It was taken only 50 samples and could not able to collect samples by random selection because, there were not adequate subjects and study period was short.
- The one of major limitation was time. To conduct the research project on this topic, time period was very limited. As the study period was short so the adequate number of sample could not arrange for the study.
- The functional outcome that found in this study was not compared with standard functional expectation guideline which was also a limitation of this study
- Time and resources were limited which have a great deal of impact on the study.
- As the study was conducted at Centre for the Rehabilitation of the paralyzed (CRP) which may not represent the whole country.
- This study has provided for the first time data on the functional outcome of stroke patient in Bangladesh. No research has been done before on this topic. So there was little evidence to support the result of this project in the context of Bangladesh.

CHAPTER-IV: RESULTS

The purpose of the study is to find out the functional outcome of lower limb of stroke patient after receiving physiotherapy at neurology outpatient unit of CRP and to achieve this goal the result need to calculate and analysis in a systematic way and the result or analyzed data represent by bar graph and pie charts.

4.1 Socio-demographic Information

4.1.1 Age and gender of the participants

Among the 50 participants 14 participants were male and 8 participants were female in age group between 35-50 years, 26 were male and 2 were female above in age group between 51-70 years. There mean age was 53.38 (±8.65) years and minimum age was 35 years and maximum age was 70 years. In percentage 12 (24%) participants were between 35-48 years, 10 (20%) were between 49-50 years, 13 (26%) were between 52-55 years and 15 (30%) were between 58-70 years. Overall 44% participants were between age group 35-50 years and 56% participants were between age group 51-70 years where 80% participants were male and 20% participants were female.

Age group	**Gender of the participant**		**Total**
	Male	Female	
35 – 50 Years	14	8	22
51 – 70 Years	26	2	28
Total	**40**	**10**	**50**

Table-1: Cross tabulation between age and sex of the participants

4.1.2 Living area

In this study about 20 (40%) people were lived in urban area and about 30 (60%) people were lived in rural areas.

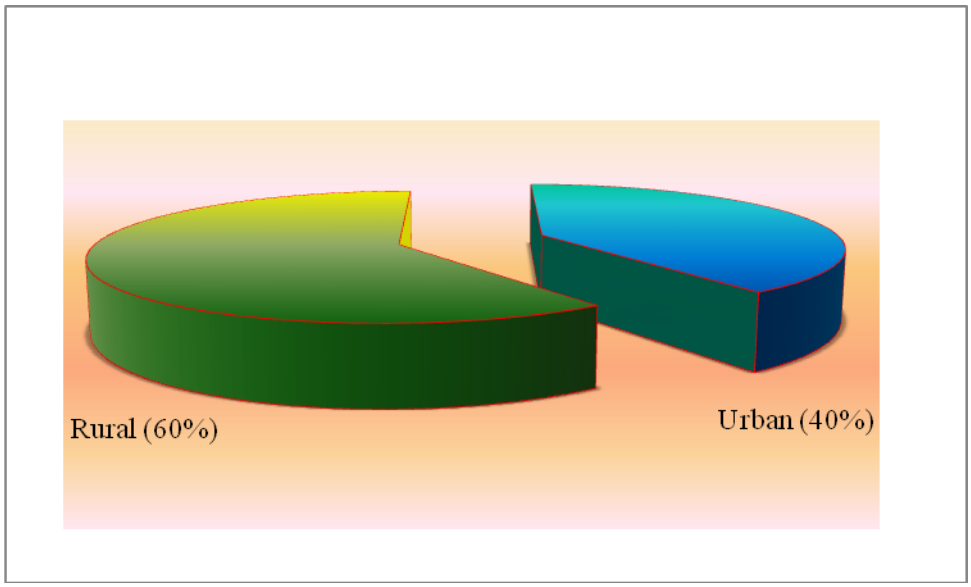


Figure-1: Living area of the participants.

4.1.3 Occupation

About 50 participant were involved as sample in this study. Most of the participants 16 (32%) were service holder, 15 (30%) were businessmen, 7 (14%) teacher, 6 (12%) were housewife. The study shows about the details information of the occupations of the participants.

Occupation	Number (n)	Percentage
Service holder	16	3
Agriculture	1	2
Factory/ Garments worker	2	4
Businessmen	15	30
Unemployed	2	4
Housewife	6	12
Teacher	7	14
Retired army officer	1	2
Total	**50**	**100**

Table-2: Occupation of the participants.

4.1.4 Economical status

The study showed the economical status among the participant in percentage where 4 (8%) were have their economical status in between 7000-10000, 13 (26%) were 10001-20000, 14 (28%) were 20001-30000 and 19 (38%) were 30001- above.

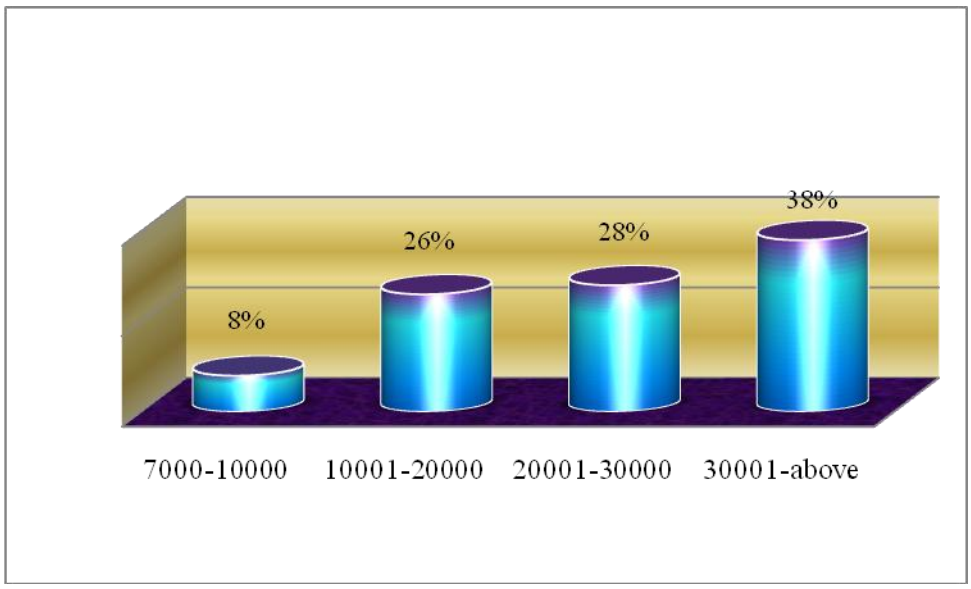


Figure-2: Economical status of the participants.

4.1.5 Educational level

Among 50 participants in this study, most of them were14 (28%) were graduate. After that the second most common were H.S.C level 10 (20%) and third most common were S.S.C level 9 (18%). The study shows the details about the educational status of the participants.

Education	Number (n)	Percentage
Illiterate	1	2
Primary	8	16
S.S.C	9	18
H.S.C	10	20
Graduate	14	28
Masters or above	8	16
Total	**50**	**100**

Table-3: Educational status of the participants

4.2 Stroke related information

4.2.1 Diagnosis

Among 50 of the participants, 21 (42%) were left sided hemiplegic (LSH), 28 (56%) were right sided hemiplegic (RSH) and 1 (2%) was bilateral hemiplegic (BH).

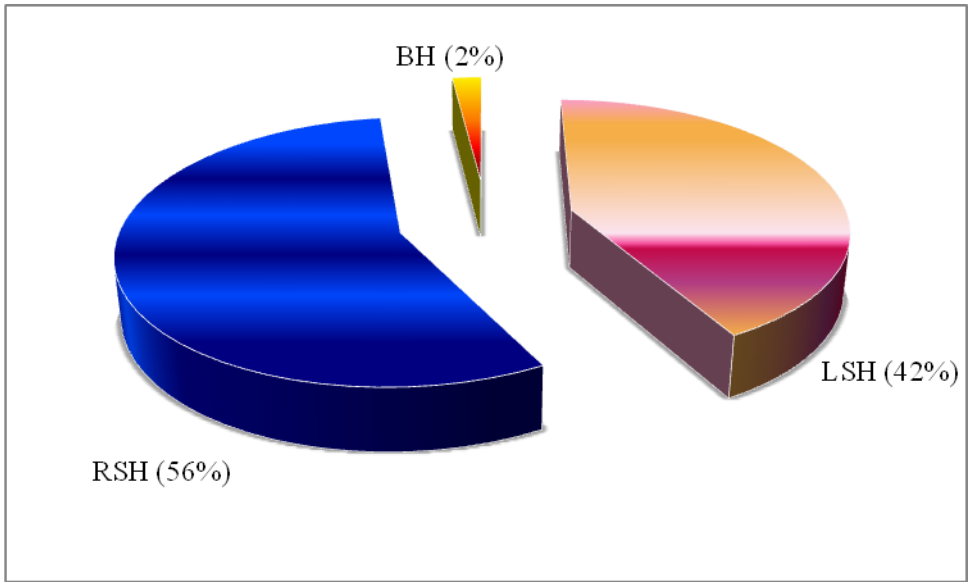


Figure-3: Diagnosis of the participants.

4.2.2 Type of stroke

Among 50 participants of stroke patients, in percentage 35 (70%) were ischemic stroke and 15 (30%) were hemorrhagic stroke where male participants were 40 (80%) and female participants were 10 (20%). The study showed that ischemic stroke was more common than

Gender of the participants	**Type of stroke of the participant**		**Total**
	Ischemic	Heamorrhagic	
Male	29	11	40
Female	6	4	10
Total	**35**	**15**	**50**

Table-4: Cross tabulation between gender and type of stroke of the participants

4.2.3 Duration of stroke

Out of 50 participants, the duration of stroke where 17 (34%) were 1-3 month, 15 (30%) were 4-6 month, 8 (16%) were 7-9 month, 10 (20%) were 10-12 month in bar graph.

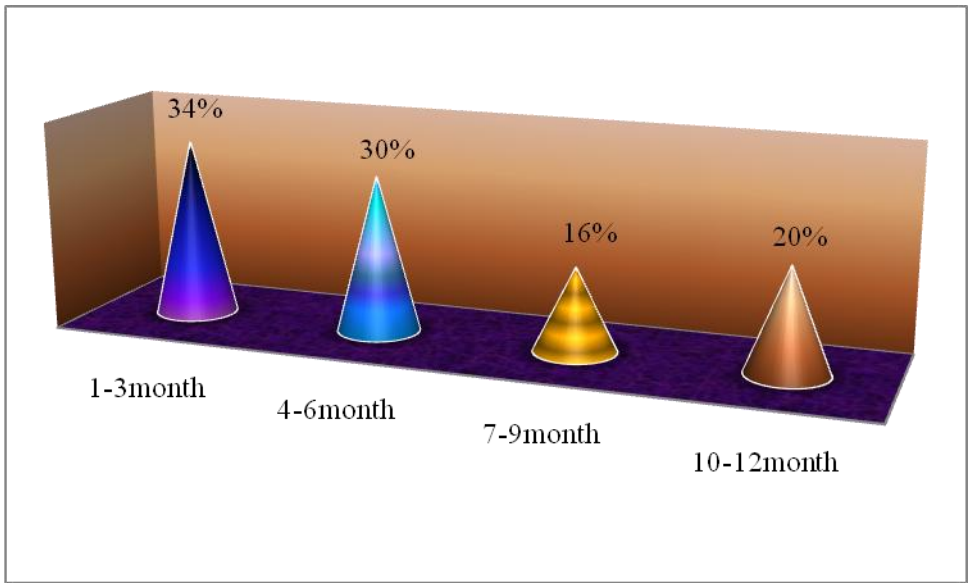


Figure-4: Duration of stroke of the participants.

4.2.4 Number of received physiotherapy session

Among 50 participants in this study, 28 (56%) participant received 20-30 physiotherapy session, 12 (24%) participant received 31-40 physiotherapy session, 8 (16%) participant received 41-50 physiotherapy session and 2 (4%) participant received 50-58received physiotherapy session.

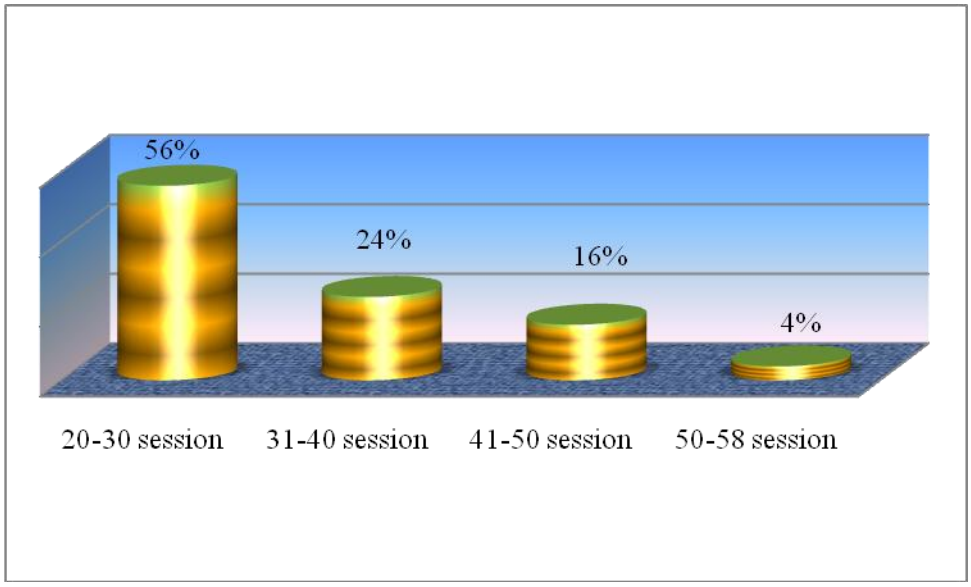


Figure-5: Number of physiotherapy session received by the participants.

4.3 Functional Independence Measure (FIM) related information

4.3.1 Static standing balance initial score

Among this 50 participants, 18 (36%) were need total assistance and 11 (22%) were need maximum assistance when they came at CRP neurology outpatient unit. The study shows the more information about the static standing balance initial score according to the functional independence measure (FIM).

Static standing	Number (n)	Percentage
Total Assistance	18	36
Maximum Assistance	11	22
Moderate Assistance	6	12
Minimal Assistance	5	10
Supervision	1	2
Modified Independent	7	14
Complete independent	2	4
Total	**50**	**100**

Table-5: Static standing balance initial score of the participants on FIM scale.

4.3.2 Static standing balance score after receiving physiotherapy

The study focused that most of the participants, most of them 16 (32%) were became independent, 11 (22%) were modified independent, 11 (22%) were need minimal assistance after receiving physiotherapy. The study shows details about the static standing balance score after receiving physiotherapy according to the functional independence measure (FIM).

Static standing	Number (n)	Percentage
Moderate Assistance	4	4
Minimal Assistance	11	22
Supervision	10	20
Modified Independent	11	22
Complete independent	16	32
Total	**50**	**100**

Table-6: Static standing balance score of the participants on FIM scale after receiving physiotherapy.

4.3.3 Dynamic standing balance initial score

Out of this 50 participants, most of them 30 (60%) were need total assistance, 6 (12%) were need maximum assistance and 6 (12%) were need only supervision. The study shows the detail information about initial score of dynamic standing balance according to the functional independence measure (FIM).

Dynamic standing	Number (n)	Percentage
Total Assistance	30	60
Maximum Assistance	6	12
Moderate Assistance	4	8
Supervision	6	12
Modified Independent	3	6
Complete independent	1	2
Total	**50**	**100**

Table-7: The dynamic standing balance initial score of the participants on FIM scale.

4.3.4 Dynamic standing balance score after receiving physiotherapy

The study showed that out of this 50 participants, most of them 11 (22%) became completely independent & 11 (22%) were need moderate assistance after receiving physiotherapy, 10 (20%) were need only supervision. The study shows the detail information about dynamic standing balance score after receiving physiotherapy according to the functional independence measure (FIM).

Dynamic standing	Number (n)	Percentage
Maximum Assistance	4	8
Moderate Assistance	11	22
Minimal Assistance	8	16
Supervision	10	20
Modified Independent	6	12
Complete independent	11	22
Total	**50**	**100**

Table-8: Dynamic standing balance score of the participants on FIM scale after receiving physiotherapy.

4.3.5 Gait initial score

Among the 50 participants, most of them 33 (66%) were need total assistance, 6 (12%) were need supervision, 5 (10%) were need minimal assistance during initially. The study shows the details information about dynamic standing balance initial score according to the functional independence measure (FIM).

Gait	Number (n)	Percentage
Total Assistance	33	66
Maximum Assistance	1	2
Moderate Assistance	2	4
Minimal Assistance	5	10
Supervision	6	12
Modified Independent	3	6
Total	**50**	**100**

Table-9: Gait initial score of the participants on FIM scale.

4.3.6 Gait score after receiving physiotherapy

The study focused that out of this 50 participants, all most 13 (26%) became completely independent after receiving physiotherapy, 9 (18%) were modified independent & 9 (18%) were still need total assistance after receiving physiotherapy. The study shows the details information about gait score after receiving physiotherapy according to FIM scale.

Gait	Number (n)	Percentage
Total Assistance	9	18
Moderate Assistance	6	12
Minimal Assistance	6	12
Supervision	7	14
Modified Independent	9	18
Complete Independent	13	26
Total	**50**	**100**

Table-10: Gait score of the participants on FIM scale after receiving physiotherapy.

4.3.7 Stairing initial score

Among the 50 participants, most of them 35 (70%) were need total assistance when they came at CRP neurology outpatient unit, 5 (10%) were need supervision. The study shows the detail information about the initial score of stairing according to the functional independence measure (FIM).

Stairing	Number (n)	Percentage
Total Assistance	35	70
Maximum Assistance	3	6
Moderate Assistance	3	6
Minimal Assistance	3	6
Supervision	5	10
Modified Independent	1	2
Total	**50**	**100**

Table-11: Stairing initial score of the participants on FIM scale.

4.3.8 Stairing score after receiving physiotherapy

The study focused that out of this 50 participants, all most 18 (36%) were still need total assistance and 7 (14%) were completely independent after receiving physiotherapy. The study shows the details information about stairing score after receiving physiotherapy according to FIM scale.

Stairing	Number (n)	Percentage
Total Assistance	18	36
Maximum Assistance	1	2
Moderate Assistance	6	12
Minimal Assistance	6	12
Supervision	6	12
Modified Independent	6	12
Complete Independent	7	14
Total	**50**	**100**

Table-12: Stairing score of the participants on FIM scale after receiving physiotherapy

4.3.9 At a glance, functional outcome of stroke following FIM scale:

FIM score	Static standing initial score	Static standing score after	Dynamic standing initial score	Dynamic standing score after	Gait initial score	Gait score after receiving PT	Stairing initial score	Stairing score after receiving PT
Complete independent = 7	2	16	1	11	0	13	0	7
Modified independent = 6	7	11	3	6	3	9	1	6
Supervision = 5	1	10	6	10	6	7	5	6
Minimum assistance = 4	5	11	0	8	5	6	3	6
Moderate assistance = 3	6	2	4	11	2	6	3	6
Maximum assistance = 2	11	0	6	4	1	0	3	2
Total assistance= 1	18	0	30	0	33	9	35	18
Total	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**

Table-13: Functional outcome of stroke following FIM scale

CHAPTER-V: DISCUSSION

The aim of this study was to assess the functional outcomes of lower limb of stroke patient after receiving physiotherapy at neurology outpatient unit of Centre for the Rehabilitation program of the Paralyzed (CRP). The examiner took 50 samples and tries to find out functional outcome of lower limb of stroke patients.

Age is one of variable in this study. Here the mean age was 53.38 years; other study in France mean age was 53.3 with SD 13.7 (Pradon et al., 2013). In Brazil (Sousa et al., 2011) showed that mean age 53.2 (SD, 7.52). In Canada mean age was 58 with 11.8 (Eng & Chu, 2002). In Korea showed that mean age was 48.4 (±5.4) (Song et al., 2004), mean age 58.74 (±9.73) (Olagun et al., 2011) in Nigeria, and mean age was 58 (±6.4) in Sweden (Flansbjer et al., 2005), in Kuwait mean age was 59.17 years (Ahmed et al., 2008), in Taiwan mean age was 60.3 (±12.8) (Wang et al., 2002), in Netherland mean age was 60.7 (±10.9) (Wevers et al., 2011), in Turkey showed mean age was 60.9 with SD 11.7 years (Yavuzer et al., 2006), in Taiwan another study reported that mean age was 63.42 (±11.06) (Yang et al., 2005). In Finland mean age 66.4(±10.3) (Peurala et al., 2007),in Canada another study reported that mean age was 67.0 (±12.3) (Moriello et al., 2011), in New Zealand mean age was 67.4 with SD12.5 years (Mudge & stott, 2009), in Italy showed that mean age was 68 (SD, 10) years (Pizzi et al., 2007), The mean age was in Brazil 65 years (Oliviera et al., 2008), In UK mean age was 71.5 years with SD 12.2 (Tyson et al., 2006). In Rome, Italy another study showed that mean age of the study population was 72 years with SD 9.6 (Cesaroni et al., 2009).

In my study, male female ratio was 4:1, where male participants were 80% and female participants were 20%. In Bangladesh, another study showed that, male were 74% and female were 25% (Hossain et al., 2011). In Sweden, study showed that male 76% and female 24% (Flansbjer et al., 2005), in Netherland male 77.78% and female 22.22% (Wevers et al., 2011), in Brazil male participants were 71.42% and female 28.57% (Nascioment et al., 2011), in Taiwan male were 75% and female were 25% (Yang et al., 2005), in Italy male 66.07% and female 33.93% (Pizzi et al., 2007). In Canada male 62.96% and female 37.03% (Garland et al., 2003). In Turkey, men 25 and

women 16 (Yavuzer et al., 2006), men 29 and women 20 (Mudge & Stott, 2009) in New Zealand. In UK male 37 and female 38 (Tyson et al., 2006), in Taiwan, another study was conducted between 30 male and 24 female (Wang et al., 2002), in Finland, male 51.78% and female 48.21% (Peurala et al., 2009), in USA male 49% and female 51% (O'Brien et al., 2011). In France male: female ratio was equal where male 50% and female 50 % (Pradon et al., 2013), another study reported in Finland 25 were male participants and 25 were female participants that means male female ratio same (Peurala, et al., 2007).

Study showed that 40% participants were from urban and 60% participants were from rural area. In Bangladesh, another study showed that 54% urban patient and 46% rural patient (Hossain et al., 2011). Another study (Sergeev, 2011) 85.6% were from urban and 14.4% were from rural, in this study also reported that rural stroke increased with age. In Peru, 71.44% were urban and 28.55% were rural, in Mexico, 50.07% were from urban and 49.92% were from rural, in China, 53.65% lived in urban and 46.34% lived in rural, in India, 50.15% were urban and 49.85% were from rural (Ferri et al., 2011). A prevalence study of 14,010 participants living in Bombay showed 842 cases/100,000 whereas in rural Kashmir only 143/100,000 was found (Walker et al., 2000).

In this study, most of the participants 32% were service holder, 2% were agriculture, 4% were factory/garments worker, 30% were businessmen, 4% were unemployed, 12% housewife, 14% were teacher and 2% retired army officer. In Bangladesh, another study showed that, Service holder 28%, businessman 17%, housewife 16%, retired 21%, agriculture 9%, others 9% (Hossain et al., 2011). In India, 2% were students, 34% were housewife, and 32% were farmer / laborer, 16.5% were retired, 15.5% were service holder/ businessmen (Dev & Joshi, 2012).

This study showed that monthly income 7000-10000 were 8%, 10001-20000 were 26%, 20001-30000 were 28% and 30001-above were 38%. In Bangladesh, another study reported that monthly income TK <5000 were 47%, 5000-10000 were 39% and >10000 were 14% participants (Hossain et al., 2011) and lower 35%, middle 63.9% and high 0.4% (Mondal et al., 2012). In America (Salbachet al., 2006) shows that monthly income insufficient 18%, adequate 28%, ample 54%. In India, <Rs 2500

(US$ 56) were 10.86%, Rs 2500–5000 (US$ 56–111) were 79.70% and >Rs 5000 (US$ 111) were 9.44% (Das et al., 2007).

In this study, 2% were illiterate, 16% were primary, 18% were S.S.C, 20% were H.S.C, 28% were graduate and 16% were masters and above among the participants educational status. In Cuba, none 2.5%, minimal 22.3%, primary 33.3%, secondary 24.8%, tertiary 17%, in Venezuela, none 8.1%, minimal 23.1%, primary 50.1%, secondary 13.8%, tertiary 4.8%, in Dominican Republic, none 19.6%, minimal 51.3%, primary 18.5%, secondary 6.3%, tertiary 3.6% (Ferri et al., 2011). Here (Salbachet al., 2006) shows in America 29% were none primary, secondary 37% and college-university 34%. In India, Primary (standard I to X) were 66% and Higher (standard XI and higher) were 34% (Das et al., 2007). In Canada, another study reported that Primary school was 11.5%, High school were 38.5%, College were 8.7% and University were 14.9% (Herrmann et al., 1998).

Among the 50 participants, 42% were left sided hemiplegic (LSH), 56% were right sided hemiplegic (RSH) and 2% was bilateral hemiplegic (BH). In Taiwan 25 were right sided hemiplegia, 26 were left sided hemiplegia and 3 were bilateral stroke (Wang et al., 2002).In Taiwan another study showed that 36% left hemiparesis and 64% right hemiparesis (Yang et al., 2005). In Netherland, 12 were left sided hemiplegia, 13 were right sided hemiplegia and 2 were bilateral stroke (Wevers et al., 2011). Other study in America (Salbachet al., 2006) shows 56% right sided hemiplegia and 43% left sided hemiplegia and 1% bilateral stroke. In Brazil, side of hemiparesis, right 43% and left 57% (Nascimento et al., 2011). Another study reported that affected side right 28 and left 25 in Netherland (Ilse et al., 2006). Lesion side left 55.35% and right 44.64% (Peurala et al., 2009) in Finland. 40% stroke survivors had right hemiparesis while 60% had left hemiparesis in Sweden (Flansbjer et al., 2008).

This study showed 70% were ischaemic and 30% were haemorrhagic stroke among participants. Other study (Zhang et al., 2011) in East China showed that 78% ischemic and 22% hemorrhagic stroke. In USA, participants of stroke survivors categorized as 89% ischemic and 11% hemorrhagic (O' Brien et al., 2011), in Netherland showed 38 ischemic and 15 hemorrhagic (Ilse et al., 2006) and another study in Netherland

reported that 24 ischemic and 3 hemorrhagic (Wevers et al., 2011). In France, (Pradon et al., 2013) indicated 75% ischemic and 25% hemorrhagic. In America, (Salbach et al., 2006) showed that 84% ischemic and 16% hemorrhagic, in Finland, 75% ischemic and 25% hemorrhagic (Peurala et al., 2009). In Taiwan, ischemic 25 and hemorrhagic 29 (Wang et al., 2002), 19 (38%) had ischemic type stroke while 31 (62%) had hemorrhagic (Olagun et al., 2011) in Naigeria. In Sweden, 37 infarct and hemorrhage 13 in number of stroke participants (Flansbjer et al., 2005). In Rome, Italy, presented ischemic 75% and hemorrhagic 25% of stroke (Cesaroni et al., 2009) and in (Moriello et al., 2011) showed in Canada ischemic 53 and hemorrhagic 10 in number. In UK (Tyason et al., 2006) 66 infarct and hemorrhage 9 in number of stroke participants.

In my study, the duration of stroke, 1-3 month were 34%, 4-6 month were 30%, 7-9 month were 16%, 10-12 month were 20%. But I could not found duration related study in our countries or other countries.

Among 50 participants in my study, 56% participant received 20-30 physiotherapy sessions, 24% participant received 31-40 physiotherapy sessions, 16% participant received 41-50 physiotherapy sessions, and 4% participant received 50-58 physiotherapy sessions. In UK, another study showed that among stroke patient received physiotherapy session on average 13.6 days, average number of physical therapy session per day was 1.5 and average time of per session was 38.1 minutes (Jette et al, 2005).

In this study, among 50 participants, initial score of static standing balance on FIM scale was mean 2.78 with SD 1.94 were 36% participants score was 1 that means need total assist, 22% need maximum assist FIM score was 2, 12% participants need moderate assist FIM score was 3, 10% need minimal assist FIM score was 4, 2% need supervision FIM score was 5, 14% were modified independent and FIM score was 6. 4% were complete independent and score of initial dynamic standing balance on FIM scale was mean 2.18 with SD 1.80 were 60% participants score was 1 that means need total assist, 12% need maximum assist FIM score was 2, 8% participants need moderate assist FIM score was 3, 12% need supervision FIM score was 5, 6% were modified independent and FIM score was 6, 2% were complete independent. In

Taiwan, another study showed that admission FIM score of standing balance was 55.2 with SD 23.9 (Lin et al., 1999).

In this study, among 50 participants, static standing balance on FIM scale after receiving physiotherapy was mean 5.56 with SD 1.26 were 4% participants need moderate assist that means FIM score was 3, 22% need minimal assist FIM score was 4, 20% need supervision FIM score was 5, 32% were modified independent and FIM score was 6. 22% were complete independent and score of dynamic standing balance on FIM scale after receiving physiotherapy was mean 4.72 with SD 1.65 were, 8% need maximum assistance that means FIM score was 2, 22% participants need moderate assist FIM score was 3, 16% need minimal assist FIM score was 4, 20% need supervision FIM score was 5, 12% were modified independent and FIM score was 6. 22% were complete independent. In Taiwan, another study showed that discharge FIM score of standing balance was 72.2 with SD 27.2 (Lin et al., 1999).

In my study, 66% participant's initial FIM score of gait was 1 that means need total assist, 2% need maximum assist FIM score was 2, 4% participants need moderate assist FIM score was 3, 10% need minimal assist FIM score was 4, 12% need supervision FIM score was 5, 6% were modified independent and FIM score was 6. In Australia, other study showed that, 41.3% participants initial score on FIM was 1, 13.8% score on FIM was 2, 6.4% participants FIM score was 3, 18.3% participants FIM score was 5, 1.8% participants FIM score was 6, 4.6% participants FIM score was 7 (Hill et al., 1997).

In my study, 26% participants FIM score of gait was 1 that means need total assist, 12% need moderate assist FIM score was 3, 12% participants need minimal assist FIM score was 4, 14% need supervision FIM score was 5, 18% were modified independent FIM score was 6, 26% participants become completely independent where FIM score was 7 after receiving physiotherapy. In Australia, 4.8% participants FIM score of gait was 1 that means need total assist, 2.9% need maximal assist FIM score was 2, 1.9% were need moderate assist FIM score was 3, 7.6% participants need supervision FIM score was 5, 43.8% were modified independent FIM score was 6, 35.2% participants become completely independent where FIM score was 7 after receiving physiotherapy (Hill et al., 1997).

In this study, out of 50 participants, 70% participants initial FIM score of stairing was 1 that means need total assist, 6% need maximum assist FIM score was 2, 6% participants need moderate assist FIM score was 3, 6% need minimal assist FIM score was 4, 10% need supervision FIM score was 5, 2% participants were independent and FIM score was 6. In Australia, 60.5% participants initial FIM score of stairing was 1 that means need total assist, 4.6% need maximum assist FIM score was 2, 9.2% participants need moderate assist FIM score was 3, 15.6% need minimal assist FIM score was 4, 6.4% need supervision FIM score was 5, 3.7% participants weremodified independent and FIM score was 6 and 0.0% participants were independent FIM score was 7 (Hill et al., 1997).

In this study, among 50 participants, 36% participants FIM score of stairing was 1 that means need total assist, 2% need maximum assist FIM score was 2, 12% participants need moderate assist FIM score was 3, 12% need minimal assist FIM score was 4, 12% need supervision FIM score was 5, 12% participants were modified independent and FIM score was 6, 14% participants were became independent and FIM score was 7 after receiving physiotherapy. In Australia, 19.2% participants initial FIM score of stairing was 1 that means need total assist, 2.9% need maximum assist FIM score was 2, 2.9% participants need moderate assist FIM score was 3, 4.8% need minimal assist FIM score was 4, 16.4% need supervision FIM score was 5, 39.4% participants were modified independent and FIM score was 6 and 14.4% participants were independent FIM score was 7after receiving physiotherapy (Hill et al., 1997).

CHAPTER-VI: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Stroke is one of the leading causes of morbidity, mortality and a socioeconomic challenge. This is particularly true for developing countries like Bangladesh, where health support system including the rehabilitation system is not within the reach of ordinary people. It is clear that, this destructive condition not only affects the patient but also their family. Bangladesh is a developing country with low socio-economic condition where people are not enough concerned about health. Health services are not sufficient in the Government and non-government sector. So, most people are suffering from lack of proper treatment. Now a day's different private clinics and hospital are trying to bring latest medical facilities in our country. But there is nothing to be mentioned about physiotherapy services. In Bangladesh the physiotherapy started after liberation war. But the people along with other health care professional are still confused about the effectiveness of physiotherapy for the recovery of stroke in Bangladesh. Most of the people are not enough familiar about physiotherapy. They consider it only as exercise. To make a bright future of physiotherapy it is essential to increase awareness about physiotherapy and effectiveness of early physiotherapy interventions for patient.

In Bangladesh physiotherapy is a developing professions which is dominated by other health professionals due to lack of standard manpower. For this reason it is important to develop local evidence based practice. Evidence based practice is significant to find out the absolute reason of achieving the treatment goals and improvement. Last of all, this research has tried to represent strong evidence on functional outcome of lower limb stroke patients after receiving physiotherapy.

6.2 Recommendations

The aim of this study was to find out functional outcome of lower limb stroke patient after receiving physiotherapy at neurology outpatient unit of CRP and the result which found from the study has fulfilled the aim of this research project. The following recommendations are-

- Should take more samples for generating the result and make more valid and reliable.
- Should take more samples for pilot study to establish the accuracy of the questionnaire.
- Sample should collect from different hospital, clinic, institute and organization in different district of Bangladesh to generalize the result.
- This study can also accomplish with other individual functional problems.
- To find out an effective and efficient result in generalized form, other measurement scale should be used in consideration.
- To achieve more improvement more time with greater concentration of physiotherapy was needed.
- Further comparative study could include t- test to find out the effectiveness of functional independence measure (FIM) which may test before starting rehabilitation and after rehabilitation.

This is an undergraduate study and doing the same study at graduate level will give more precise output. There were some limitation of this study mentioned at the relevant section; it is recommended to overcome those limitations during further study. So for further study it is strongly recommended to increase sample size with adequate time to generalize the result in all of the lower limb stroke patients in Bangladesh for better results and perspectives.

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APPENDEX

Permission letter

Date: March 23, 2013
To
Head of the Department,
Department of the physiotherapy,
Center for the Rehabilitation of the paralysed (CRP),
Savar, Dhaka-1343

Subject: Permission to collect data to conduct a research study.

Sir,
I beg most respectfully to state that I am a student of 4th year B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI) under the University of Dhaka. I am conducting a research on **"Functional outcome of lower limb stroke patient after receiving physiotherapy at neurology outpatient unit of CRP"** as a part of our course curriculum, under supervision of Md.Obidul Haque, Associate Professor and co-ordinator Department of Physiotherapy, BHPI. For this reason, I need to permission for collect data from Neurology unit of CRP.

I Therefore, pray and hope that you would be kind enough to grant me and thus oblige thereby.

Sincerely yours
Zenat Rehana
Zenat Rehana
4th year B.Sc. in physiotherapy
Session: 2007-2008
BHPI, CRP, Savar, Dhaka-1343

Allowed,
PB, CRP In-charge
24.03.13
Head, PT

Md. Sohrab Hossain
BPT, DU, D' Orthopaedics Cyriax (Belgium), MPH, PGT-UK, AUS, CA
Associate Professor Physiotherapy, BHPI
Head of the Physiotherapy Department, CRP

Farjana Sharmin
Clinical physiotherapist
24.03.13

FARJANA SHARMIN (RUMANA)
Clinical Physiotherapist
Neurology Unit, PT Dept.
CRP, Savar, Dhaka.

VERBAL CONSENT STATEMENT

(Please read out to the participant)

Assalamualaikum/Namasker, my name is *Zenat Rehana,* a final year student of Department of Physiotherapy at Bangladesh Health Professions Institute (BHPI) under the University of Dhaka and I am conducting this study for partial fulfillment of my Bachelor of Science in Physiotherapy. The title of the study is **"Functional outcome of lower limb of stroke patient after receiving physiotherapy."** I would like to know about some personal and other related information about Stroke. This will take approximately 20 - 30 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. I would not directly related with this area (Neurology), so your participation in the research will have no impact on your present or future treatment. All information provided by you will be kept confidential place and it will not be disclosed to others without your permission and your name will not used anywhere of this study. No any financial incentive will be provided. Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview.

If you have any query about the study, you may contact with me, **Zenat Rehana**, and/ or the supervisor of this study **Md.Obidul Haque**, Associate Professor and Head of Physiotherapy Department, BHPI, CRP, Savar, Dhaka-1343.

Do you have any questions before I start?

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

YES ☐

NO ☐

Signature of the Patient/Attendance with date……

Signature of the Interviewer with date……

"Functional outcome of lower limb of stroke patient after receiving physiotherapy".

Questionnaire

1. Personal details
    a. ID: Date:
    b. Patient's name:
    c. Age (in years):
    d. Sex: ☐

        1=Male
        2= Female

    e. Address:

        Village/House no- Thana-

        Post office- District-

2. Socio-demographic information of the patient:

    a. Marital status: ☐

        1=Married 4= Widower
        2=Unmarried 5=Divorced
        3=Widow

    b. Living area: ☐

        1=Urban
        2=Rural

c. Type of family: ☐

1=Nuclear family
2=Extended family

d. Occupation: ☐

1=Service holder	7=Housewife
2=Agriculture	8=Teacher
3=Factory/garments worker	9=Lawyer
4=Businessman	10=Doctor
5=Unemployed	11=Student
6=Day labour	12=other (specify)….

e. Earning member in the family:

f. Family income (BDT tk):

g. Educational level: ☐

1=Illiterate	4=H.S.C
2=Primary	5= Graduate
3=S.S.C	6=Masters or above

3. Diagnosis: ☐

1= CVA with LSH
2=CVA with RSH
3=CVA with BH

4. Type of stroke: ☐

1=Ischemic
2=Haemorrhagic

5. Date of incidence of stroke or duration of the incidence:

6. Occurrence of episode: | 1 | | 2 | | 3 | | More |

7. Numbers of received physiotherapy session:

8. Standing balance (static) initial score- please put a tick on the FIM scale score (1 / 2 / 3 / 4 / 5 /6 / 7)

   7=Complete Independent (Timely, safely)
   6=Modified Independent (Extra time, Device)
   5=Supervision (Cuing, Coaxing, Prompting)
   4=Minimal Assist (performs 75% or more of task)
   3=Moderate Assist (performs 50% to 74% of task)
   2= Maximum Assist (performs 25% to 49% of task
   1=Total Assist (performs less than 25% of task)

9. Standing balance (static) score after receiving 20 session physiotherapy- please put a tick on the FIM scale score (1 / 2 / 3 / 4 / 5 / 6 / 7)

   7=Complete Independent (Timely, safely)
   6=Modified Independent (Extra time, Device)
   5=Supervision (Cuing, Coaxing, Prompting)
   4=Minimal Assist (performs 75% or more of task)
   3=Moderate Assist (performs 50% to 74% of task)
   2= Maximum Assist (performs 25% to 49% of task
   1=Total Assist (performs less than 25% of task)

10. Standing balance (dynamic) initial score- please put a tick on the FIM scale score (1 / 2 / 3 / 4 / 5 / 6 / 7)

    7=Complete Independent (Timely, safely)
    6=Modified Independent (Extra time, Device)
    5=Supervision (Cuing, Coaxing, Prompting)
    4=Minimal Assist (performs 75% or more of task)

3=Moderate Assist (performs 50% to 74% of task)

2= Maximum Assist (performs 25% to 49% of task)

1=Total Assist (performs less than 25% of task)

11. Standing balance (dynamic) score after receiving 20 session physiotherapy- please put a tick on the FIM scale score (1 / 2 / 3 / 4 / 5 / 6 / 7)

    7=Complete Independent (Timely, safely)

    6=Modified Independent (Extra time, Device)

    5=Supervision (Cuing, Coaxing, Prompting)

    4=Minimal Assist (performs 75% or more of task)

    3=Moderate Assist (performs 50% to 74% of task)

    2= Maximum Assist (performs 25% to 49% of task)

    1=Total Assist (performs less than 25% of task)

12. Gait: Initial score: please put a tick on the FIM scale score (1 / 2 / 3 / 4 / 5 / 6 / 7)

    7=Complete Independent (Timely, safely)

    6=Modified Independent (Extra time, Device)

    5=Supervision (Cuing, Coaxing, Prompting)

    4=Minimal Assist (performs 75% or more of task)

    3=Moderate Assist (performs 50% to 74% of task)

    2= Maximum Assist (performs 25% to 49% of task)

    1=Total Assist (performs less than 25% of task)

13. Gait: Score after receiving 20 session physiotherapy- please put a tick on the FIM scale score (1 / 2 / 3 / 4 / 5 / 6 / 7)

    7=Complete Independent (Timely, safely)

    6=Modified Independent (Extra time, Device)

    5=Supervision (Cuing, Coaxing, Prompting)

    4=Minimal Assist (performs 75% or more of task)

    3=Moderate Assist (performs 50% to 74% of task)

2= Maximum Assist (performs 25% to 49% of task)

1=Total Assist (performs less than 25% of task)

14. Stairing: Initial score- please put a tick on the FIM scale score (1 / 2 / 3 / 4 / 5 / 6 / 7)

    7=Complete Independent (Timely, safely)

    6=Modified Independent (Extra time, Device)

    5=Supervision (Cuing, Coaxing, Prompting)

    4=Minimal Assist (performs 75% or more of task)

    3=Moderate Assist (performs 50% to 74% of task)

    2= Maximum Assist (performs 25% to 49% of task)

    1=Total Assist (performs less than 25% of task)

15. Stairing: Score after receiving 20 session physiotherapy- please put a tick on the FIM scale score (1 / 2 / 3 / 4 / 5 / 6 / 7)

    7=Complete Independent (Timely, safely)

    6=Modified Independent (Extra time, Device)

    5=Supervision (Cuing, Coaxing, Prompting)

    4=Minimal Assist (performs 75% or more of task)

    3=Moderate Assist (performs 50% to 74% of task)

    2= Maximum Assist (performs 25% to 49% of task)

    1=Total Assist (performs less than 25% of task)