FUNCTIONAL RECOVERY OF AFFECTED UPPER LIMB PATIENT FOLLOWED BY STROKE

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

Session: 2005-2006

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Bangladesh

February, 2012

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 RECOVERY OF UPPER LIMB AFFECTED PATIENT FOLLOWED BY STROKE

Submitted by **Tania Pasha**, for partial fulfilment of the requirement for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT)

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DECLERATION

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 my supervisor.

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Acknowledgment

First of all, I would like to express my gratefulness to Almighty Allah to complete this dissertation proposal in time.

I would like to express my munificent thanks to my supervisor Md. Shofiqul Islam, Lecturer of Physiotherapy, for his sincere guidance to accomplice this course work and for discussing different opportunities to the tropic, every critical points and suggestion. I am also grateful to him for giving me his valuable time when I needed. Thanks to all my teacher of the Bangladesh Health Professions Institute (BHPI) for their support and guidance throughout the study.

I am very much grateful to my classmate, especially Tanzina Kabir for helping me throughout my study. I extended my gratitude to Mohosina who is librarian of BHPI and their associates.

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Abstract

Purpose: To identify functional recovery of affected upper limb patient followed by stroke. *Objective:* To explore the improvement level of affected upper arm function, to identify the functional outcome of affected hand movement activities, to assess the advanced hand activities of affected side and to analyze the information among independent variables and dependent variable. *Methodology:* The study design was cross sectional. Total 5o samples were selected by purposive sampling from inpatient of Centre of the Rehabilitation of the Paralysed (CRP). Data was collected by mixed type questionnaire. Descriptive statistics were used data analysis which focused through pie chart and bar chart. Upper limb functions (upper arm function, hand movements and advanced hand activities) measured by Motor Assessment Scale (MAS). Then the performance score measured of stroke patients. The expected outcome is, may be maximal improvement of functional recovery of hemiplegic upper limb or not. My target is to minimize the limitation of functional outcome by proper physiotherapy treatment and improve patient activities of daily living. *Conclusion:* This study find out upper limb functional outcome of stroke patients and highlighted that without proper physiotherapy treatment the proper recovery of stroke patients cannot achieve.

CHAPTER – I: INTRODUCTION

1.1 Background

All countries of the world are trying to proof their ability to remain in the competitive world. For this reason, there is no scope of neglecting any sector. Health sector is very important issue in our life. Stroke is the third most common cause of death in the developed world after cancer and ischemic heart disease, and is the most common cause of severe physical disability (Haslet et al., 1999). An annual incidence per 100000 populations that varies from less than 50 to more than 400 has been documented as strokes in different regions of the world (Rajeh et al., 1993). Traditionally, the term 'stroke' has been used to include episodes of focal brain dysfunction due to focal ischemia or haemorrhage as well as subarachnoid haemorrhage (Haslet et al., 1999). The brain is very complex according its anatomy and function. With the advanced of age, the brain become more prone to get many complicated life frightening diseases. (National Institute of Neurological Disorders and Stroke, 2004). Internal carotids, anterior spinal artery, middle cerebral artery, posterior cerebral artery are some major arteries that supply blood to the brain (Gutman, 2001). Brain cells die when they no longer receive oxygen and nutrients by sudden bleeding into or around the brain and it refer to stroke (National Institute of Neurological Disorders and Stroke, 2004). Stroke is a cause of significant morbidity and mortality in the Western world and also across the Asia. The mortality from ischemic stroke in the United Kingdom is at least 1.5 times more common among South Asian origin (Gunarathne et al., 2009). Approximately 400 persons per 100,000 populations over the age of 45 years have a first stroke each year in the United States, Europe, and Australia (Dobkin, 2005). Stroke is a major medical and social problem because of its high prevalence and its high mortality rate (Scmidt et al., 1988). So it is the leading cause of disability in the adult population and is frequently accompanied by substantial loss of motor function (Kunkel et al., 1999). The hemiplegic upper limb is affected in many stroke patients, and recovery is often poor. Adding a specific physiotherapy intervention in the acute phase after stroke proved to be effective up to 1 year after the onset of stroke. These results are encouraging for further treatment directed at stimulation of motor activity of the hemiplegic arm (Feys et al., 1998).

1.2 Justification of the study

Stroke is the leading cause of disability worldwide. In under developed countries like Bangladesh stroke also causes death where health support system including rehabilitation is not available. For proper rehabilitation of stroke patient need multi-disciplinary treatment. In this condition, only medical management is not enough rather than the therapeutic management is also essential for people stroke management. Physiotherapy specialized in re-educating normal movement helping patient to regain the maximum level of independence in their lives when the patient with stroke has experience functional impairment. But many people are not aware about effectiveness of physiotherapy treatment. For that, stroke patient can not fully perform his activities of daily living properly especially in affected side. The individual functional status may be varied according to affected side, as individuals functional uses of upper limbs are different. It is very important to find out the functional recovery of affected upper limb while a physiotherapy management team does work towards the improvement or the recovery of the functional status of stroke patient, otherwise the outcome of physiotherapy was not significant. The main aim of physiotherapy treatment is to improve the function especially upper limb. Because by upper limb, all important functional tasks of are performed. Effectiveness of physiotherapy practice is essential to promote functional outcome of stroke patient. So that this research will give ideas about the functional recovery of upper limb after taking physiotherapy and by this result we take appropriate measures to improvement function of affected upper limb. This study also helps to play more attention to perform affected upper limb activity by physiotherapists and to provide important platform for physiotherapists. The physiotherapists can explain these factors to the family members and to the patient, so that the family members can take measures to achieve the client potential.

1.3 Research Question

What is the functional recovery of affected upper limb followed by stroke?

1.4 Objectives

1.4.1 General objective

- To find out the functional recovery of affected upper limb followed by stroke patient during discharge in CRP neurology outdoor.

1.4.2 Specific objectives

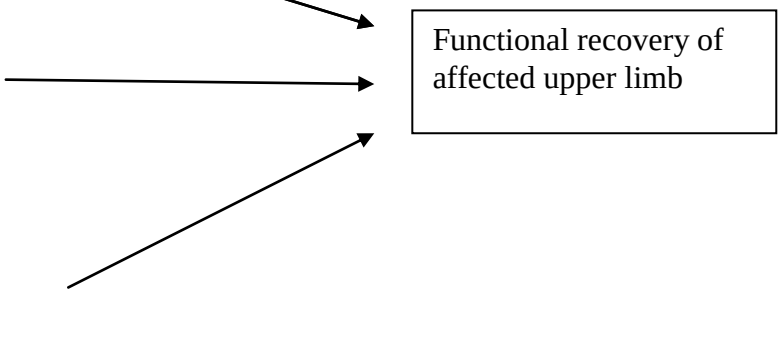
- To explore the improvement level of affected upper arm function of stroke patients.
- To identify the functional outcome of affected hand movement activities.
- To assess the advanced hand activities of affected side.
- To analyze the information among independent variables and dependent variable.

1.5 List of variables

Independent variables

- Socio economic conditions
  - Age
  - Sex
  - Education
  - Economy
- Type of stroke
  - Ischemic
  - Haemorrhagic

Dependent variable



1.6 Operational definition

Motor assessment scale (MAS): This scale was designed to measure the progress of functional recovery of stroke Patients. It has 9 items and score ranging from 0 to 6. The 3 items of MAS used for upper limb.

- Upper-Arm Function
- Hand Movements
- Advanced Hand Activities

Functional recovery: Functional recovery means the improvement of function during perform a goal directed task and it helps to involve activities of daily living. In this study, upper arm function, hand movements and advanced hand activities are included as functional recovery measure.

Stroke: According to World Health Organisation Stroke is, rapidly developed clinical sign of focal disturbances of cerebral functions of presumed vascular origin and of more than 24 hours duration. Stroke occurs when the blood supply to part of the brain is suddenly interrupted or when a blood vessel in the brain bursts, spilling blood into the spaces surrounding brain cells.

Types of stroke: There are main two ways of "brain attack" can happen ischemic and haemorrhagic strokes.

Ischemic stroke: This takes place when a clot blocks vessels or become to narrow for blood to flow within the brain due to a reduction in blood supply, brain cell die from lack of oxygen.

Haemorrhagic strokes: This type of stroke happens when a blood vessel in the brain busts blood bleeds into the brain.

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: LITERATURE REVIEW

The term "stroke" is synonymous with Cerebrovascular Accident, which is characterised by sudden or gradual onset of neurological symptoms caused by diminished supply of blood to the brain. It is a neurological condition which was first recognized as the sudden onset of paralysis of muscle on one side or both side of the body, by the father of Western Medicine Hippocrates, more than 2,400 years ago (National Institute of Neurological Disorders and Stroke, 2004). When the duration is more than three weeks, often permanent, it is commonly known as completed stroke **(**Caplan, 1983). At that time it was thought that it was impossible to remove this strong disease, let alone survive in the world. But now it has been proved that it is quite possible to survive, to recover and even to resume daily activities after following stroke by proper medical and therapeutic management, where physiotherapy play a vital role (National Institute of Neurological Disorders and Stroke, 2004). Stroke is a common medical emergency with an annual incidence of between 180 and 300 per 100000. The incidence rises steeply with age, and in many developing countries due to adoption of less healthy lifestyles (Haslet et al., 1999). Every year, 15 million people have a stroke (Whiteley et al., 2009). Each year in the United States, approximately 730,000 people have strokes, and nearly 400,000 survive with some level of neurologic impairment and Disability (Kelly et al., 1998).

In most studies cerebral infarctions were the most common and accounted for 50% to 80% of cases, whereas intracerebral hemorrhage (ICH) was seen in 10% to 30% (Rajeh et al., 1993). "Brain attack" can happen by main two ways, ischemic and haemorrhagic strokes. Ischemia is the term used to describe the loss of oxygen and nutrients for brain cells when there is inadequate blood flow due to blockage of a blood vessel supplying the brain. (National Institute of Neurological Disorders and Stroke, 2004). The initial deficit and the degree of motor recovery after ischemic stroke vary greatly and are related to some factors as lesion type, topography, and size (Feydy et al., 2002). This type of stroke accounts for approximately 80 percent of all strokes (Stroke, 2006). When an artery in the brain bursts, blood spews out into the surrounding tissue and upsets not only the blood supply but the delicate chemical balance neurons require to function. This is called a hemorrhagic stroke. Such strokes account for approximately

20 percent of all strokes (National Institute of Neurological Disorders and Stroke, 2004). Cerebral micro bleeds are frequently detected in patients with stroke, especially those who experience intracerebral hemorrhage. All hemorrhagic strokes occurred in deep brain regions, and they were associated with micro bleeds located in the deep brain region (Bokura et al., 2011). Haemorrhagic and ischaemic strokes present with different patterns of initial recovery. Some of the initial recovery in haemorrhagic stroke can be attributed to the resolution of inflammation. Some stroke patients fail to regain consciousness within the first 24 hours following the stroke and it is considered widely that the majority will not regain consciousness. The physiotherapy management of these patients is including regular chest care, turning and positioning (Strokes, 2000).

On the basis of WHO recommendations, the neurologic signs were assessed and recorded at then time of maximum deficit during the first 24 hours after the onset of symptoms (Scmidt et al., 1988). About one-fifth of patients with an acute stroke will die within a month of the event, and at least half of those who survive will be left with physical disability (Haslet et al., 1999). Hemiplegia as a consequence of stroke is considered to be a recovering a neurological condition (Carr and Shepherd, 2003). More than 50% of patients being left with a residual motor deficit, especially a deficit affecting the hand (Calautti and Baron, 2003). Up to 85% of patients show an initial deficit in the arm. Three to six months later, problems remain in 55% to 75% of patients. While recovery of arm function is poor in a significant number of patients, leg function has proven to be less of a problem**.** Seventy-five to eighty-three percent of surviving stroke patients learns to walk again. This discrepancy might be due to several reasons. Three quarters of strokes occur in the region supplied by the middle cerebral artery. As a consequence, the upper limb will be affected in a large number of patients (Feys et al., 1998).

The upper is associated with the lateral aspect of the lower portion of the neck. It is suspended from the trunk by muscles and small skeletal articulation between the clavicle and the sternum, the sternocavicular joint (Drake et al., 2005). The upper limb is characterized by its mobility and ability to grasp strike and conduct fine motor skills. Synchronized interplay occurs between the joints of the upper limb to coordinate the intervening segments to perform smooth, efficient motion at the most workable distance for a specific task. (Moore and Dally, 2006). Functional recovery of the arm includes

grasping, holding, and manipulating objects, which requires the recruitment and complex integration of muscle activity from shoulder to fingers. Furthermore, secondary complications such as inferior subluxation of the glenohumeral joint, shoulder-hand syndrome, soft tissue lesions, and painful shoulder frequently hinder rehabilitation of the hemiplegic arm. Another actor that might decrease the probability of return of upper limb function is the lack of spontaneous stimulation during functional activities. Each transfer and each attempt to stand or walk will require bilateral activity in the legs. In performing upper limb activities, the patient may use the non affected side exclusively (Feys et al., 1998). So treatment of the upper extremity of people with hemiplegia continues to be a challenging and often frustrating experience for clinicians. Investigators in the Copenhagen Stroke Study noted that, recovery of upper extremity function in more than half of patients with stroke having severe upper extremity paresis can be achieved only by compensation using the unaffected upper extremity (Blanton and Wolf, 1999).

The hand is used to discriminate between objects on the basis of touch. The pads on the palmer aspect of the fingers contain a high density of somatic sensory receptors. Also the sensory cortex of the brain developed to interpreting information from the hand, particularly from the thumb, is disproportionately large relative to that for many other region of skin (Drake et al., 2005). Stroke results disturbances touch, pain, temperature, pressure and proprioception, that is so important to the perceptual motor functioning of a person. For that, after stroke patient may disuse the affected extremities, even when motor recovery is apparently good (Pedretti, 1996). As a result of stroke, it produces serious functional impairments, particularly in motor function. Most patients with stroke have unilateral weakness, due to involvement of motor system at the level of motor cortices, the subcortical nuclei or the axons that project to the spinal cord. Such patients typically have significant weakness in the extremities contra lateral to the brain infraction, which recovers over a period of time ranging from several months to several years (Small et al., 2002). At any time after the stroke, however, cognitive, language, and motor skills may improve by means of the cerebral processes involved in ordinary learning. This experience-induced neuroplasticity includes greater excitability and recruitment of the neurons in both hemispheres of the brain that contribute to performance, sprouting of dendrites that communicate with other neurons, and strengthening of these synaptic connections (Dobkin, 2005). Some neurons may not die,

but cease functioning until their blood supply improves, mainly depends on tissue ischemia and resulting oedema (Neylon, 1991). Due to stroke, it increase muscle tone or hypo tonicity may apparent and loss of coordination, selective and isolated movement (Pedretti, 1996). More than 50% of patients being left with a residual motor deficit after stroke, especially a deficit affecting the hand (Calautti and Baron, 2003). Intact sensation and proprioception has good prognosis for functional recovery after stroke (Pedretti, 1996).

Lenon et al., (2005) reported that two stages in stroke care are recognised, an initial acute stage focused on impairment, and a second stage focused on disability and handicap. Standards have been identified in the areas of assessment, goal setting, teamwork, treatment, education of patients and carers and expected outcomes. Functional recovery is influenced by a variety of biologic and environmental factors, and recovery depends on individual variability. Motor recovery seems to occur predominantly in the first few months after stroke, although some patients may show considerable recovery in later phases (Hendricks et al., 2002). Neurological and functional recovery occurs mainly within the first 6 months after stroke. Furthermore, evidence of the effect of organized stroke rehabilitation is increasing and in the future, this treatment may be offered to a wider spectrum of stroke patients than previously, and for rational planning of health care, unbiased population based studies of the time course of recovery from stroke are essential (Jorgensen et al., 1995). In addition, this training should be repetitive, functional, meaningful, and challenging for a patient (Kwakkel et al., 2008).

In the most common physical consequence of stroke is hemiplegia, other sequelae could indicate perceptual, cognitive, sensory and communication problems, all of which need to be considered in physiotherapy management. Whatever the cause of the stroke, a proportion of patients will recover to some degree. Recover is related to site, extent and nature of the lesion, the integrity of the collateral circulation and the pre-morbid status of the patient (Strokes, 2000). About 73% and 88% of first-time strokes (infarctions only) result in an acute hemi paresis of the upper and/or lower limbs (Foulkes et al., 1988; Duncan et al., 1994).The majority of stroke patients, the upper limb is more severely involved than the lower limb, as most strokes occur in the territory of the middle cerebral artery. From an initial state of flaccid weakness after stroke and some

patients do not recover any significant voluntary upper limb movements (Shelton and Reding, 2001). Movement control of the body on the contra lateral side of the brain lesion proceeds through stages of recovery in which the sensory and motor function are often re-established abnormally. In the upper extremity, after a period of flaccidity, a common course of recovery includes the development of an uncontrolled flexion synergy. Individuals with this uncontrolled flexion synergy have great difficulty isolating joint movements (Cauraugh et al., 2000). Flexor synergy of upper limb mainly seen in elbow, wrist, fingers and thumb joints. The extension synergy of upper limb usually in elbow and wrist joints (Calilliet, 2003). Moreover, 60% of the post stroke individuals continue with residual motor dysfunction as a long-term disability after the first year. These chronic motor problems lead to difficulty in the execution of functional movements (eg, picking up a glass of water or buttoning a shirt) in post stroke individuals (Cauraugh et al., 2000). Only limited attention has been given to upper-extremity rehabilitation after stroke, and functional recovery of the arm and hand are generally limited compared with that for the lower extremities (Nakayama et al., 1994). The upper limbs are of special concern because the impact of upper-extremity impairments on disability and health is so marked (Olsen, 1990). Traditionally, early intervention for the upper limb focuses on reduction of impairment using techniques such as positioning and exercise to reduce shoulder subluxation, spasticity, and contractures. In the post acute stages, interventions typically target relearning of motor abilities using different training techniques (Henderson et al., 2007).

More than 60% of hospitalized patients with cerebrovascular disease survive, but over 70% of those who do survive are disabled. Stroke might be a bit more frequent in men than women, but this finding has been controversial. Death rates are influenced by age, which affects men and women equally. Since the 1970s, medication has been created to manage hyperlipidimia, hypertension, myocardial infarctions, and heart failure (Kaplan and Calliet, 2003). A number of longitudinal studies indicate that, in 30% to 66% of hemiplegic stroke patients, the paretic arm remains without function when measured 6 months after stroke, whereas only 5% to 20% demonstrate complete functional recovery. The absence of a measurable grip function at 1 month after stroke was found to be indicative of a poor functional recovery of the hemiplegic arm, whereas early return of voluntary motion of the paretic arm within the first weeks after stroke is considered to be a good prognostic sign (Kwakkel et al., 2003). Of all stroke survivors,

30% to 66% are unable to use their affected arm in performing activities of daily living. Although forced use therapy appears to improve arm function in chronic stroke patients, there is no conclusive evidence (Lee et al., 1999). An early report indicated that only 20% of patients with a flaccid upper limb 2 weeks after stroke regained any functional use of the hand. Although it has typically been assumed that most recovery after stroke takes place within the first 3 months, clinical studies of motor training have shown improvements in functional upper limb performance more than 1 year post stroke patients who have some active finger and wrist movement. Therefore, it is probably more accurate to say that although the most rapid recovery typically takes place very early as a result of spontaneous process involving post-lesion reparative mechanisms in the brain, such as resolution of oedema, functional recovery may go on for much longer in those with some active use of the limb. This later recovery reflects the ongoing nature of reorganizational processes in the nervous system in response to use and activity. So it appears likely that many patients with paralysed hand muscles early after stroke recover little if any functional limb uses (Carr and Shepherd, 2003).

Recent studies have shown that in Europe there are 200 to 300 new stroke patients per 100,000 every year, of whom about 30% survive with important motor deficits. After the acute phase, all patients require continuous medical care and rehabilitation treatment, often necessitating one-on-one manual interaction with physiotherapists. Optimal restoration of arm and hand motor function is essential in permitting stroke patients to independently perform activities of daily living. (Masiero et al., 2007). Measuring severity of stroke, motor impairment and recovery are necessary for upper limb rehabilitation (Lucca, 2009). Patients with subarachnoid haemorrhage are treated surgically. If they are not, then treatment is conservative, with prolonged bed rest about 4-6 weeks and perhaps medication to prevent clot lyses. In some cases of ischemic stroke, a secondary deterioration occurs 2 or 3 days after the initial event, usually due to evolving oedema around the infarct, this may respond to drug treatment. Almost all patients with ischemic stroke are put on aspirin to prevent recurrence. Those with dense hemiplegias should have stockings and warfarin as prophylaxis against deep venous trombosis (DVT). If the heart is considered a likely source of emboli, then long-term treatment with anticoagulants may be indicated (Strokes, 2000). Risk factors are traits and lifestyle habits that increase the risk of disease. Some modified, treated or controlled risk factors are hypertension, heart disease (heart failure, arterial fibrillation,

transient ischaemic attack), hyperlipidaemia, tobacco use or cigarette smoking, excess alcohol consumption, polycythaemia, oral contraceptives, sedentary life style, thrombocytopenia. Some partially modifiable risk factors are homocystinuria, and diabetes Mellitus. Some uncontrolled risk factors are age, gender (male > female, except very young or very old), race (Afro-Caribbean > Asian > European), heredity (Haslet et al., 1999). General management of acute stroke include attempting to stop progression of the lesion to limit deficits, reducing cerebral oedema, treating seizures and preventing complication such as Deep Venous Thrombosis or aspiration that may lead to severe illness (Gillen et al., 2004). Between 50% and 90% of stroke patients are treated in hospital and only a proportion of these are treated in specialised stroke rehabilitation units. Regardless of location, stroke management necessitates a multidisciplinary team, which can include physiotherapists, occupational therapists, nurses, speech therapists, doctors and in some units a psychologist (Davidson and Waters, 2000). Physiotherapy during rehabilitation remain uncertain, there is increasing evidence that early physiotherapy can maximise physical recovery. The physiotherapist's plays a major role in the physical management of stroke, using skills acquired during education and professional development, to identify and manage the problems of stroke using scientific principles (Strokes, 2000).

Loss of functional movement is a common consequence of stroke for which a wide range of interventions has been developed. Some treatment helps to improve motor recovery, particularly those that have focused on high-intensity and repetitive task-specific practice (Langhorne et al., 2009). The value of specific rehabilitation therapies aimed at assisting adaptation to impairment and designed to restore function by minimizing impairment (Ward and Cohen, 2004). The degree of upper limb recovery after stroke varies widely and is directly related to the degree of initial severity and the interval from stroke to initiation of voluntary movement. During this period, motor recovery is believed to be enhanced by various techniques such as the neurodevelopmental technique, sensorimotor integration, proprioceptive neuromuscular facilitation, biofeedback, and functional utilization of evolving synergies. Both basic and clinical studies suggest that post stroke motor recovery or motor relearning of the paretic limb may be maximized by the active repetitive use of the affected limb (Chae et al., 1998). Therapeutic electrical stimulation is a therapeutic strategy aimed at improving impairments of the upper extremity in stroke (Kroon et al., 2002). Chronic

stroke patient with hemiparesis sometimes treated with repetitive transcranial magnetic stimulation therapy (Takeuch et al., 2008). Although there are many documented physiotherapeutic treatments for stroke, such as electrical stimulation, splinting, massage, passive movements and treatment is administered at the level of impairment and disability, and centres on manipulation of the body in order to bring about functional and/or aesthetic changes to movement and posture (Davidson and Waters, 2000). Physical activity or exercise required for the maintenance of functional independence in older adults (Paterson and Warburton, 2010). Strength training with paretic muscles could benefit individuals with post stroke. Furthermore, aerobic exercise has also been shown to be related to improvement of overall sensorimotor function after stroke (Edwards, 2002).

Physiotherapy is a major component of rehabilitation for stroke patients and has been shown to have a statistically positive effect on outcome (Davidson and Waters, 2000). Recoveries of upper limb in hemiparetic stroke patients are correlated to neurophysiological measures and the spasticity measure (Naghdi et al., 2010). The physical management process aims to maximise functional ability and prevent secondary complications to enable the patient to resume all aspects of life in his or her own environment. In patients who regain consciousness within 24 hours, the first 3 months are a critical period when greatest recovery is thought to occur, although potential for improvement may exist for many months. Physiotherapy during this initial period should aim to maximise all aspect of recovery in order to limit residual disability and reduce handicap (Strokes, 2000). Operating as a clinical movement scientist, the physiotherapist is able to identify and measure the disorders of movement, and to design, implement and evaluate appropriate therapeutic strategies (Strokes, 2000). Functional outcome enhanced when patient participate in multidisciplinary rehabilitation activity (Volpe et al., 2000). With the multidisciplinary team of health care professional, the main role of physiotherapist include restoration of function, prevention of secondary complications, such as shortening of soft tissues and the development of painful shoulder (Strokes, 2000).

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. For the able-bodied and the disabled, it is recognized that practice is the way to achieve these aims (Carr and Shepherd, 2003). Motor rehabilitation of adults with hemiplegia uses a number of physiotherapy approaches developed by authors such as Bobath, Rood, Kabat, Brunnstrom and Perfetti (Paci, 2003). Stroke tends to result in a range of disabilities which have been shown to benefit from rehabilitation, in particular physiotherapy. Patients tend to have high expectations of the extent of recovery they can achieve through physiotherapy (Wiles et al., 2009). Functional disability is generally caused by hemiplegia after stroke. Physiotherapy used to be the only way of improving motor function in such patients (Scheidtmann et al., 2001). Furthermore, careful handling, electrical stimulation, movement with elevation, strapping, and the avoidance of overhead pulleys could effectively reduce or prevent pain in the paretic upper limb (Wolf et al., 2003). If the patient spends more time in this activity than in exercising the impaired limbs, it is not hard to guess the probable outcomes. However, the intensive and repetitive practice required to improve performance may not be demanded if patients are perceived to fatigue easily, particularly if they are elderly. The intervention of an experienced physiotherapist can improve mobility and reduce disability in patients seen late after a stroke (Wade et al., 1992). Albert et al., (2010) reported that robot-assisted therapy improved outcomes over 36 weeks as compared with usual care but not with intensive therapy. The beneficial effects of such programmes include not only improved physiological responses but also improved functional motor performance. Simple ways to increase exercise tolerance and endurance, even in early stages may include setting goals such as increasing the speed of movement and the number of repetitions (Carr and Shepherd, 2003).

CHAPTER-III: METHODOLOGY

3.1 Study design

The major purpose of surveys was described the characteristics of population. Mainly major two types of surveys can be conducted they were cross sectional survey and longitudinal survey. In cross sectional survey collect information from sample that has been drawn from a predetermined population. Furthermore, the information is collected at just one point in time and observational type of cross sectional study was performed in this research.

3.2 Study site and area

This study conducted in stroke patient at CRP neurology outdoor, Centre of Rehabilitation of Paralysis (CRP), Savar, Dhaka and Study area was neurology.

3.3 Sample size

For survey research it was better to get as many participants as possible. As this project is in course curriculum, there are verities of limitation for like as time length. Possible total number of sample was 50.

Sample Size Calculation

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

Here,

Z (1-α/2) = 1.96

P=26%= 0.26

q = 1-p = 1-0.26= 0.74

d= 0.05

n= $\frac{1.96\times1.96\times0.26\times0.74}{0.05\times0.05}$= 295

But in this study the sample size was 50 of stroke patient at CRP neurology outdoor Centre of Rehabilitation of Paralysis (CRP), Savar, Dhaka, who were interested to take part in this study. The sample was selected according to the inclusion and Exclusion criteria.

3.4 Sampling Technique

Sample was taken by using purposive sampling method due to limitation of time and to perform sampling easily.

3.5 Inclusion and Exclusion criteria

Inclusion criteria

- Stroke patient either with left or right sided hemiplegic.
- Both male and female patients with 31 to 70 years old.
- Duration of stroke onset 3 months to 2 year.
- Having good static sitting balance and some dynamic sitting balance.
- Documentation was clear for the necessary information.
- Patient who have receiving physiotherapy at least 3 months from CRP neurology unit.
- Patient who agree willingly participate in the study.

Exclusion criteria

- Medically unstable patient.
- Patient with subbluxed shoulder, shoulder pain, facial palsy and any deformity that affect normal alignment.
- Have poor static sitting balance and dynamic sitting balance.
- Patient with receptive and expressive dysphasia.
- Patient with cognitive problem or typically injured and psychologically unstable.

3.6 Data collection method and tools

Data was collected by a questionnaire on paper. In this survey design questionnaires or interviews were used as a means by which information is gathered. Data collection tools were pen, papers, consent form, questionnaire and Motor Assessment Scale.

3.7 Data management and analysis plan

SPSS (Statistical Package for the Social Sciences) computer software.

3.8 Duration of data collection

The duration of data collection is approximately 6 weeks (2^{nd} May to 15^{th} June, 2011).

3.9 Ethical considerations

To conduct this research project the formal permission was taken from BHPI (Bangladesh Heath Profession Institute) research ethical committee. Participants will explain exactly and clearly about the whole research process. For this study, the researcher will not interfere with their clients and clinical practice. They will inform that their participation is fully voluntary. Confidentiality of information was maintained and participant code was used to make participants personal identity invisible. After completion all of ethical issue started to collect data and completed within the allocated time frame.

3.10 Limitation of the study

- As it was the first research of the researcher, so the researcher might overlook some mistakes.
- Resources are limited have a great deal of impact on the study. For better it would take more time.
- There is no control group.
- The researcher could not compare the study with other due to lack of studies about present practice for stroke.
- The researcher looks small numbers of sample about 50, which was very small for generalize the result and not find out the relation among dependent and independent variables due to time limitation.
- The researcher collect data from the Neurology out door in CRP, so the result of this study can not generalized of all stroke patients in Bangladesh.

CHAPTER-IV: RESULTS

The numerical outcome of the study is described in this chapter. The physical condition of the sample patients is taken into numerical values by using MAS scale.

4.1 Age of participants

Among the 50 participants who have suffered by stroke lowest age was 31 and the highest age was 70 years. And frequency is 5 participants in between 31-40 years, 16 participants in between 41-50 years, 14 participants in between 51-60 years and 15 participants in between 61-70 years. The percentages at 31-40 years are 10%, 41-50 years are 32%, 51-60 years are 28%, and 61-70 years are 30%.

Age of participants	Number	Percent
31-40	5	10.0
41-50	16	32.0
51-60	14	28.0
61-70	15	30.0
Total	50	100.0

Figure 1: Age of participants

4.2 Sex of participants

Among the 50 participants, 33 were male and 17 were female participants who were suffered by stroke. The percentage of male and female who were affected by stroke is male 66% and female 34%.

Sex of participants	Number	Percent
Male	33	66.0
Female	17	34.0
Total	50	100.0

Figure 2: Sex of the Participants

4.3 Educational Level of participants

Among the 50 participants frequency of educational level who were suffered by stroke are, 7 participants for illiterate, 18 participants for primary, 8 participants for S.S.C, 6 participants for H.S.C, 9 participants for Graduate and 2 participants for Masters or above. The percentages are, illiterate is 14%, primary 36%, S.S.C 16%, H.S.C 12%, Graduate 18% and Masters or above is 4%.

Educational Level of participants	Number	Percent
Illiterate	7	14.0
Primary	18	36.0
S.S.C	8	16.0
H.S.C	6	12.0
Graduate	9	18.0
Masters and above	2	4.0
Total	50	100.0

Figure 3: Educational Level of participants

4.4 Family Income of participants

Among the 50 participants who suffered by stroke, the frequency of family income are 6 participants for 3000-5000 taka, 10 participants for 5001-10,000 taka, 20 participants for 10,001-15,000 taka, 14 participants for 15,001- Above amount. The percentages are 12% for 3000-5000 taka, 20% for 5001-10,000 taka, 40% for 10,001-15,000 taka, and 28% for 15,001- Above.

Family Income of participants	Number	Percent
3000-5000	6	12.0
5001-10,000	10	20.0
10,001-15,000	20	40.0
15,001-Above	14	28.0
Total	50	100.0

Figure 4: Family Income of participants

4.5 Stroke Type of participants

Among the 50 participants who suffered by stroke, their frequency are 40 participants for ischaemic stroke and 10 participants for haemorrhagic stroke. The percentages are, ischaemic stroke is 80% and haemorrhagic stroke is 20%.

Stroke Type of participants	Number	Percent
Ischaemic	40	80.0
Haemorrhagic	10	20.0
Total	50	100.0

Figure 5: Stroke Type of participants

4.6 Motor Assessment Scale-1 of participants

50 stroke participants are used in this study. This gives us information about frequency of MAS1. In MAS1 scale score 1 present in 4 participants, score 2 present in 4 participants, score 3 present in 3 participants, score 4 present in 8 participants, score 5 present in 10 participants, score 6 present in 21 participants. It shown that, maximum participants was present in score 6. The percentage is 8% when score was 1, percentage is 8% when score was 2, percentage is 6% when score was 3, percentage is 16% when score was 4, percentage is 20% when score was 5, and percentage is 42% when score was 6. So, maximum percentages was present in highest score 6 on MAS1.

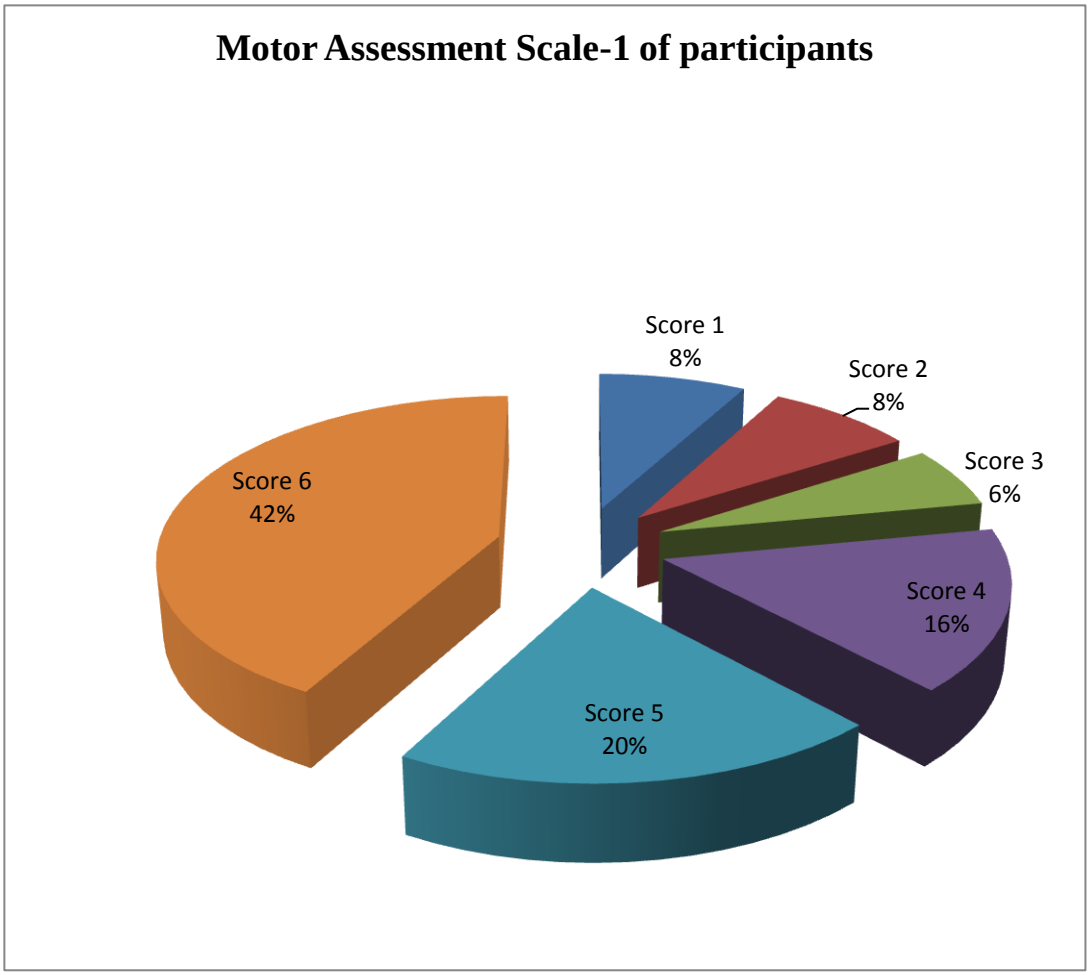


Figure 6: Motor Assessment Scale-1 of participants

4.7 Motor Assessment Scale-2 of participants

Among the 50 participants who suffered by stroke, the frequency is 6 and percentage is 12% present in 4 participants when MAS2 scale score was 1, the frequency is 1 and percentage is 2% when MAS2 scale score was 2, the frequency is 9 and percentage is 18% when MAS2 scale score was 3, the frequency is 9 and percentage is 18% when MAS2 scale score was 4, the frequency is 10 and percentage is 20% when MAS2 scale score was5 , the frequency is 15 and percentage is 30% when score was 6. So, in 50 stroke patients maximum frequency and percentages was present in highest score 6 on MAS2.

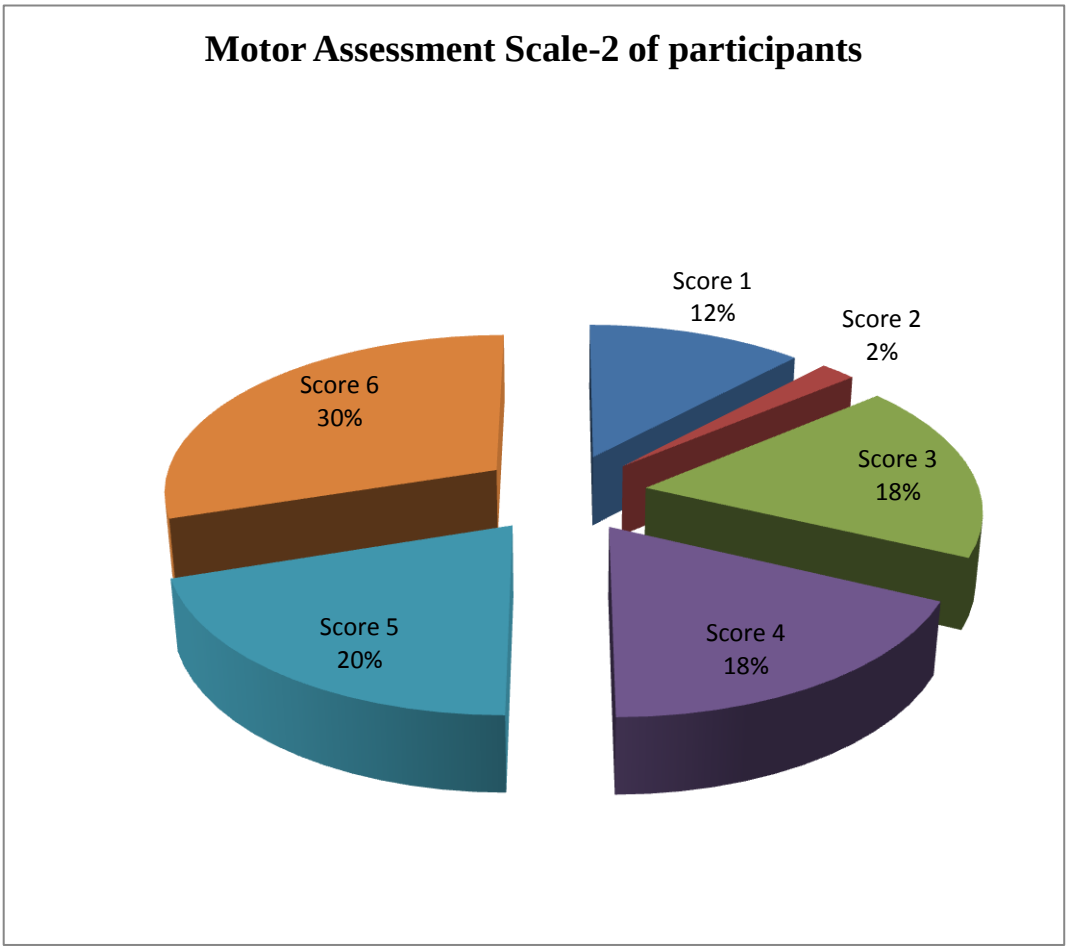


Figure -7: Motor Assessment Scale – 2 of Participants

4.8 Motor Assessment Scale-3 of participants

Among the 50 participants who suffered by stroke, the frequency is 6 and percentage is 12% when MAS3 scale score was 0, the frequency is 6 and percentage is 12% when MAS3 scale score was 1, the frequency is 2 and percentage is 4% when MAS3 scale score was 2, the frequency is 9 and percentage is 18% when MAS3 scale score was 3, the frequency is 5 and percentage is 10% when MAS3 scale score was 4, the frequency is 9 and percentage is 18% when MAS3 scale score was 5, the frequency is 13 and percentage is 26% when MAS3 scale score was 6. So, in 50 stroke patients maximum frequency and percentages was present in highest score 6 on MAS3.

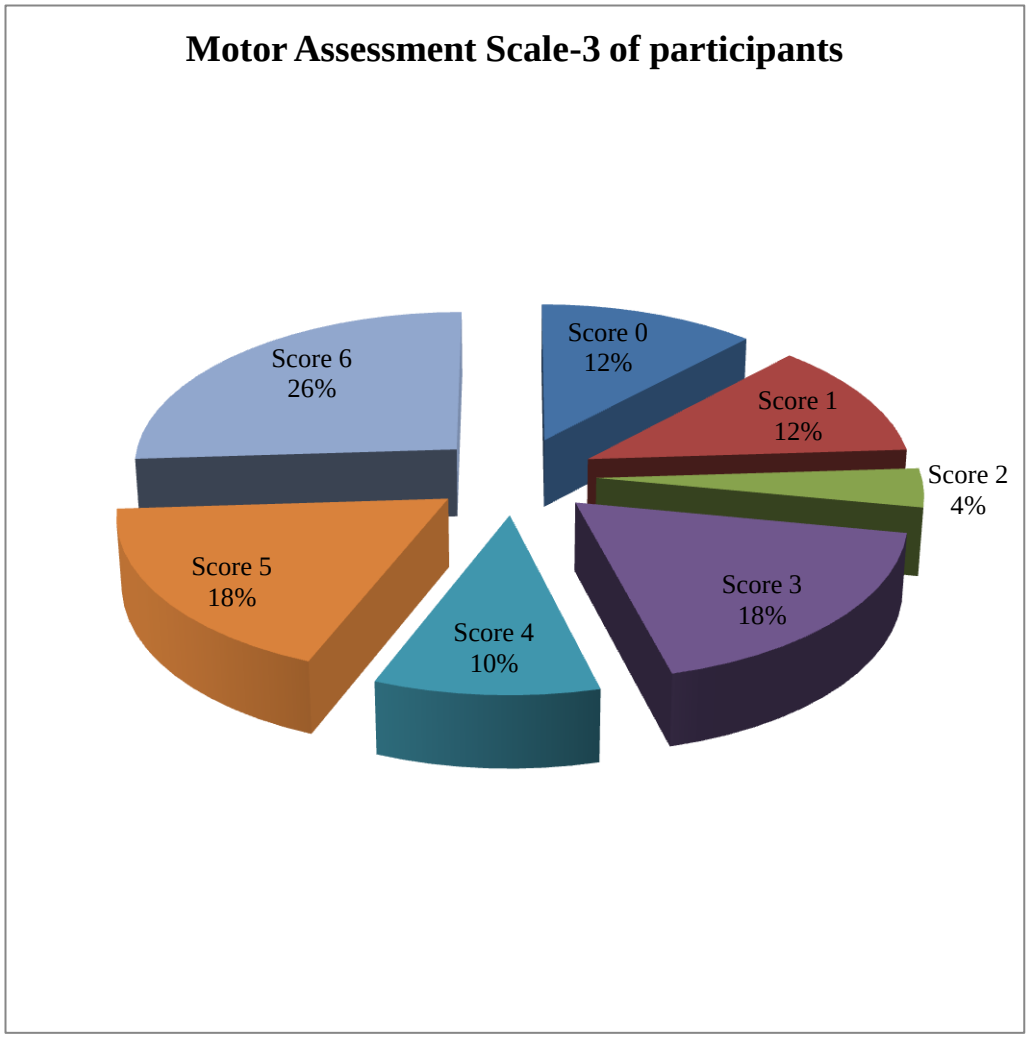


Figure 8: Motor Assessment Scale-3 of participants

4.9 Relation of age and MAS1

Among the 50 stroke patients, 31-40 age range was presents in 5 participants and from them 2% was obtained score 4 and 8% was obtained score 6 of MAS1. 41-50 age range was presents in 16 participants and from them 6% was obtained score 1, 2% was obtained score 3, 6% was obtained score 5 , 18% was obtained score 6 of MAS1. In 51-60 age range 14 participants was presents and from them 4% was obtained score 2, 2% was obtained score 3, 8% was obtained score 4, 6% was obtained score 5, and 8% was score 6 of MAS1. In 61-70 age range 15 participants was presents and from them 2% was obtained score 1, 4% was obtained score 2, 2% was obtained score 3, 6% was obtained score 4, 8% was score 5 and 8% was score 6 of MAS1. So, 42% participants was obtained higest score 6 and 20% was obtained score 5 in MAS1 in age group 31-70.

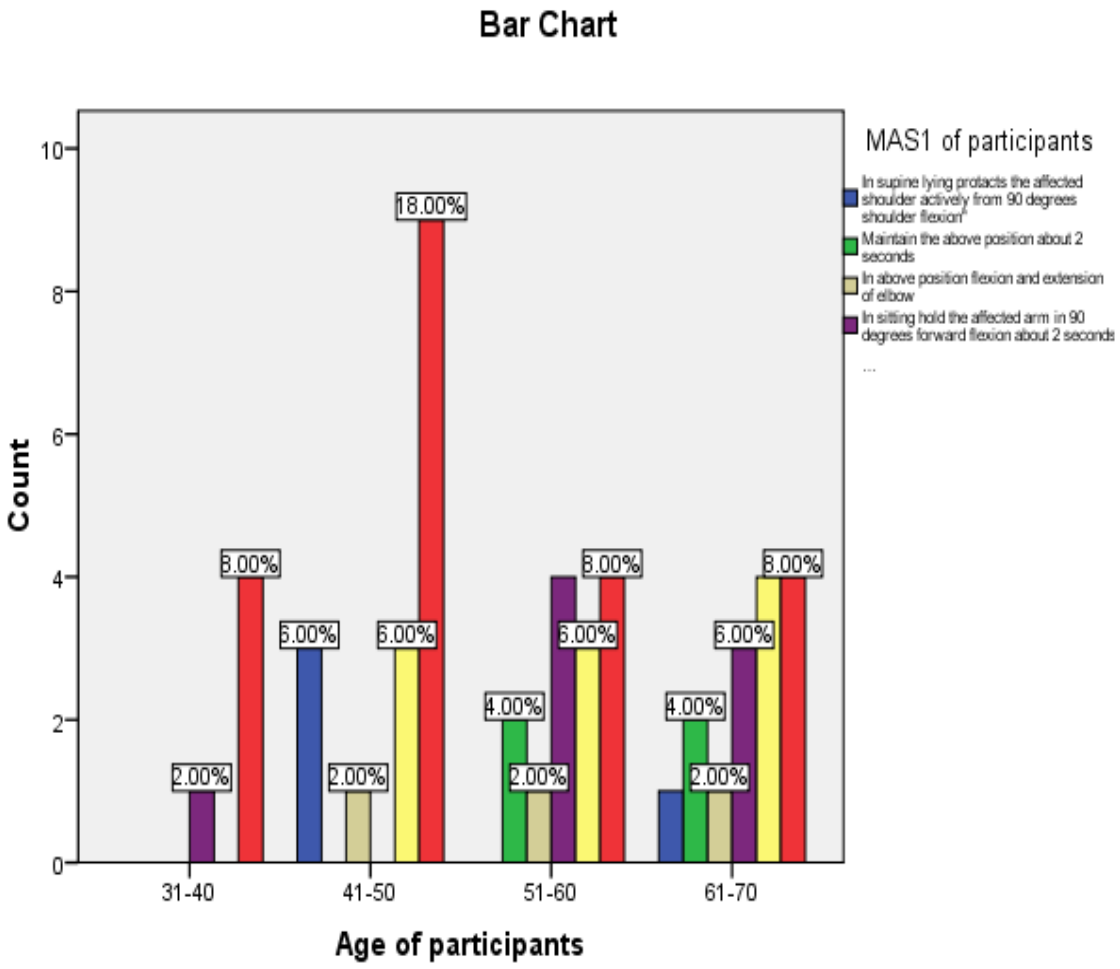


Figure 9: Relation of age and MAS1

4.10 Relation of age and MAS2

Among the 50 stroke patients, 31-40 age range was presents in 5 participants and from them 2% was obtained score 4, 4% was obtained score 5 and 4% was obtained score 6 of MAS2. 41-50 age range was presents in 16 participants and from them 6% was obtained score 1, 2% was obtained score 3, 6% was obtained score 4, 6% was obtained score 5 and 12% was obtained score 6 of MAS2. In 51-60 age range 14 participants was presents and from them 4% was obtained score1, 8% was obtained score 3, 6% was obtained score 4, 6% was obtained score 5, and 4% was score 6 of MAS2. In 61-70 age range 15 participants was presents and from them 2% was obtained score 1, 2% was obtained score 2, 8% was obtained score 3, 4% was obtained score 4, 4% was score 5 and 10% was score 6 of MAS2. So, 30% participants was obtained higest score 6 and 20% participants was obtained score 5 in MAS2 in age group 31-70.

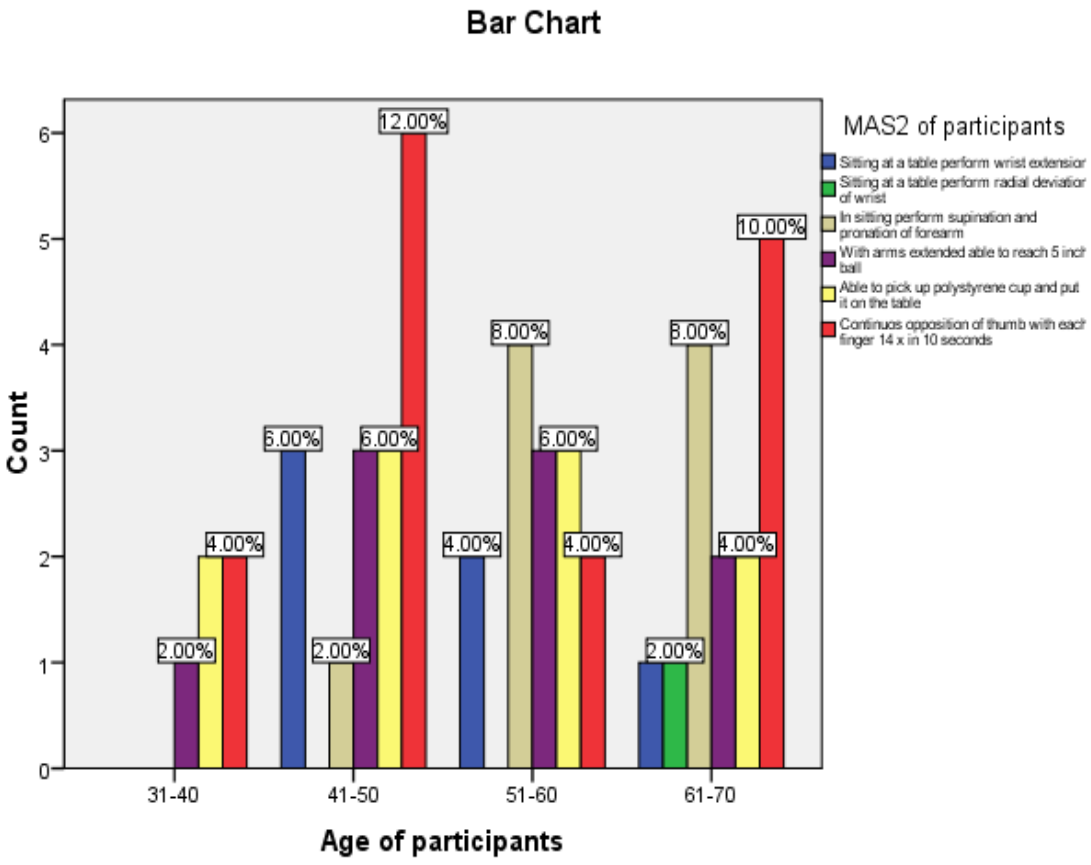


Figure 10: Relation of age and MAS2

4.11 Relation of age and MAS3

Among the 50 stroke patients, 31-40 age range was presents in 5 participants and from them 2% was obtained score 3, 2% was obtained score 4, 2% was obtained score 5 and 4% was obtained score 6 of MAS3. 41-50 age range was presents in 16 participants and from them 6% was obtained score 0, 2% was obtained score 2, 2% was obtained score 3, 2% was obtained score 4, 6% was obtained score 5 and 14% was obtained score 6 of MAS3. In 51-60 age range 14 participants was presents and from them 4% was obtained score 0, 6% was obtained score 1, 8% was obtained score 3, 4% was obtained score 4, 4% was obtained score 5,and 0% was score 6 of MAS3. In 61-70 age range 15 participants was presents and from them 2% was obtained score 0, 6% was obtained score 1, 2% was obtained score 2, 6% was obtained score 3, 2% was obtained score 4, 6% was score 5 and 6% was score 6 of MAS3. So, 24% participants was obtained higest score 6 and 18% participants was obtained score 5 in MAS3 in age group 31-70.

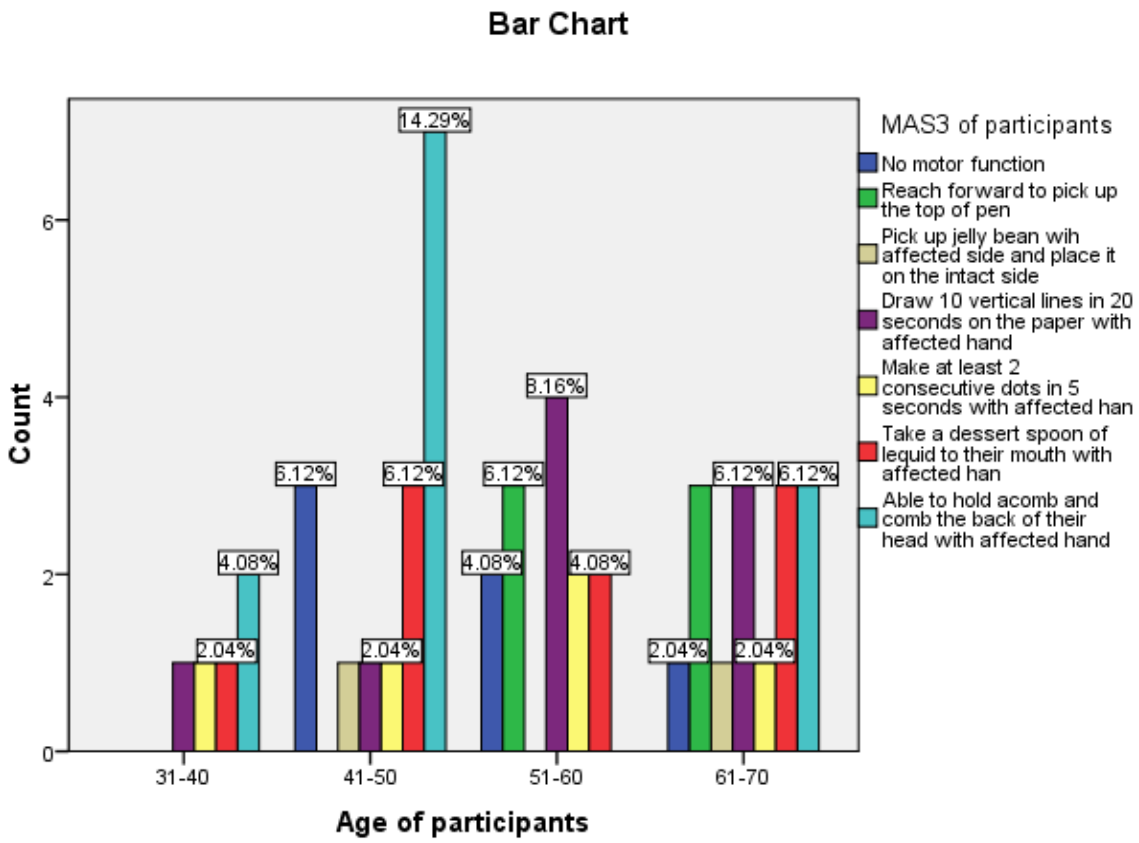


Figure 11: Relation of age and MAS3

4.12 Relation of sex and MAS1

Among 33 male stroke patients 2% was obtained score 1, 8% was obtained score 2, 4% was obtained score 3, 12% was obtained score 4, 12% was obtained score 5 and 28% was obtained score 6 of MAS1. In 17 female stroke patients 6% was obtained score 1, 0% was obtained score 2, 2% was obtained score 3, 4% was obtained score 4, 8% was obtained score 5 and 14% was obtained score 6 of MAS1. So, in both sex higest score 6 was obtained in 42% and scre 5 was obtainned in 20% participants.

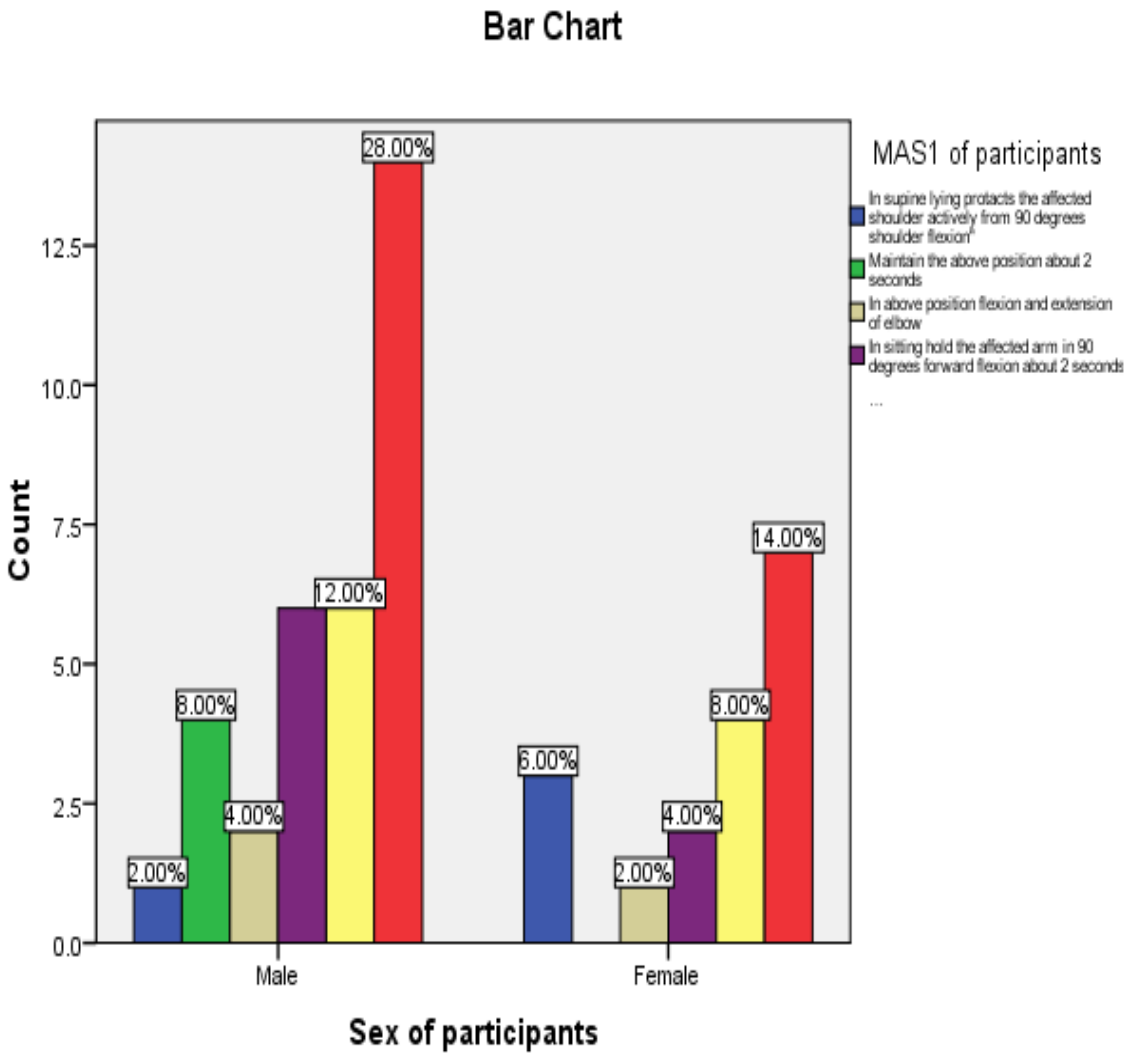


Figure 12: Relation of sex and MAS1

4.13 Relation of sex and MAS2

Among 33 male stroke patients 6% was obtained score 1, 2% was obtained score 2, 14% was obtained score 3, 12% was obtained score 4, 14% was obtained score 5 and 18% was obtained score 6 of MAS2. In 17 female stroke patients 6% was obtained score 1, 0% was obtained score 2, 4% was obtained score 3, 6% was obtained score 4, 6% was obtained score 5 and 12% was obtained score 6 of MAS2. So, in both sex higest score 6 was obtained in 30% and scre 5 was obtainned in 20% participants.

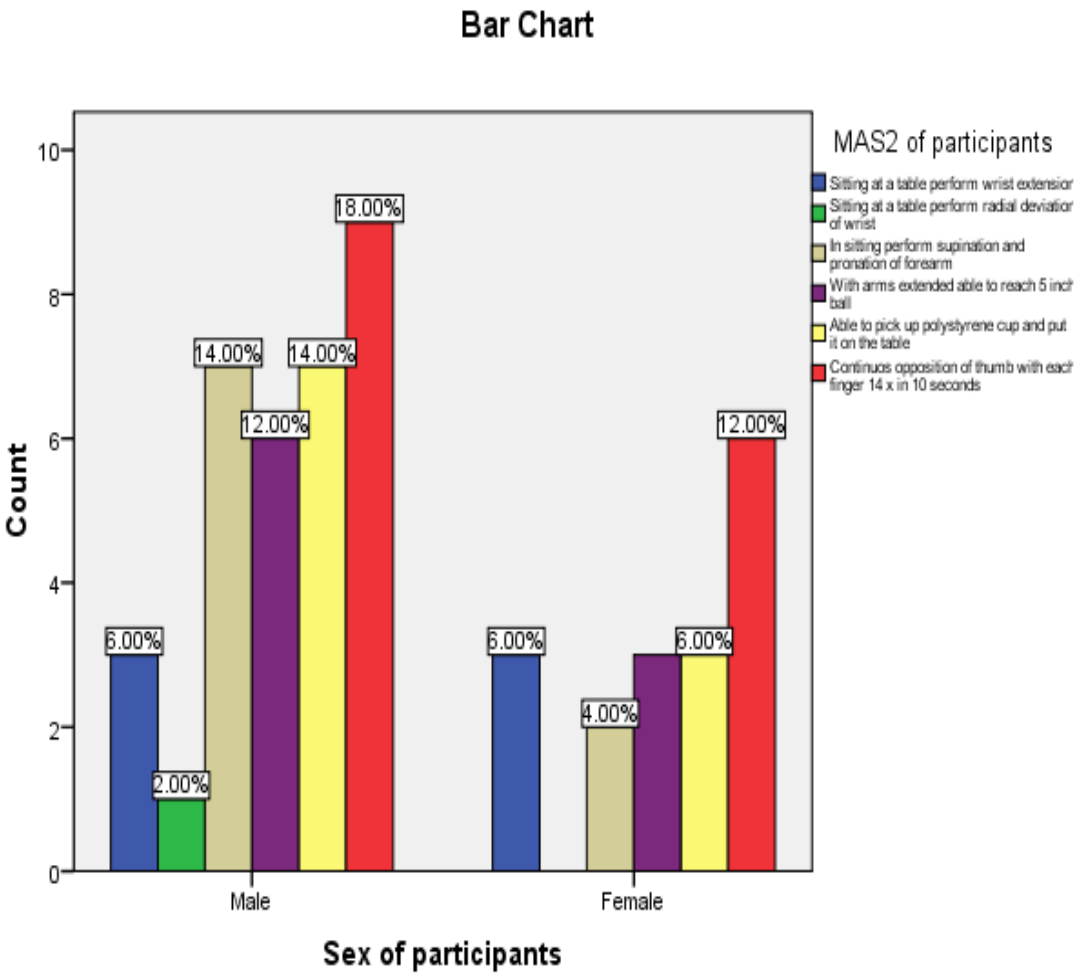


Figure 13: Relation of sex and MAS2

4.14 Relation of sex and MAS3

Among 33 male stroke patients 6% was obtained score 0, 8% was obtained score 1, 2% was obtained score 2, 16% was obtained score 3, 8% was obtained score 4, 8% was obtained score 5 and 18% was obtained score 6 of MAS3. In 17 female stroke patients 6% was obtained score 0, 4% was obtained score 1, 2% was obtained score 2, 2% was obtained score 3, 2% was obtained score 4, 10% was obtained score 5 and 6% was obtained score 6 of MAS3. So, in both sex higest score 6 was obtained in 24% and scre 5 was obtainned in 18% participants.

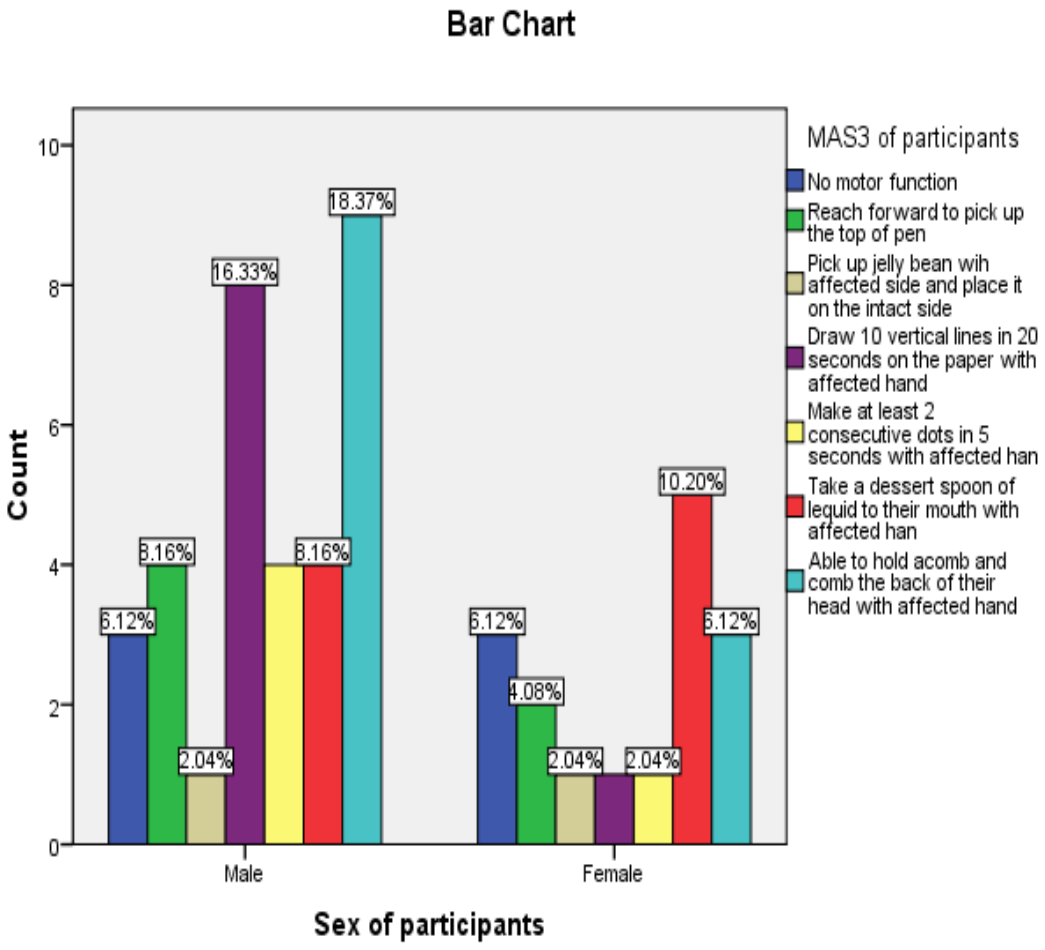


Figure14: Relation of sex and MAS3

4.15 Relation of educational level and MAS1

Among 7 Illiterate stroke participants 2% was obtained score 1, 0% was obtained score 2, 2% was obtained score 3, 4% was obtained score 4, 0% was obtained score 5, 6% was obtained score 6. In 18 Primary level educated stroke participants 4% was obtained score 1, 2% was obtained score 2, 2% was obtained score 3, 2% was obtained score 4, 14% was obtained score, 12% was obtained score 6. In 8 S.S.C level 0% was obtained score 1, 2% was obtained score 2, 0% was obtained score 3, 2% was obtained score 4, 2% was obtained score 5, 10% was obtained score 6. In 6 H.S.C level educated participants the 0% was obtained score 1, 0% was obtained score 2, 0% was obtained score 3,2 % was obtained score 4, 4% was obtained score 5, 6% was obtained score 6. In 9 Graduate levels 2% was obtained score 1, 4% was obtained score 2, 0% was obtained score 3, 6% was obtained score 4, 0% was obtained score 5, 6% was obtained score 6. In 2 Masters and above level 0% was obtained score 1, 0% was obtained score 2, 2% was obtained score 3, 0% was obtained score 4, 0% was obtained score 5, 2% was obtained score 6. So, in all educational level higest score 6 was obtained in 42% and score 5 was obtainned in 20% participants in MAS1.

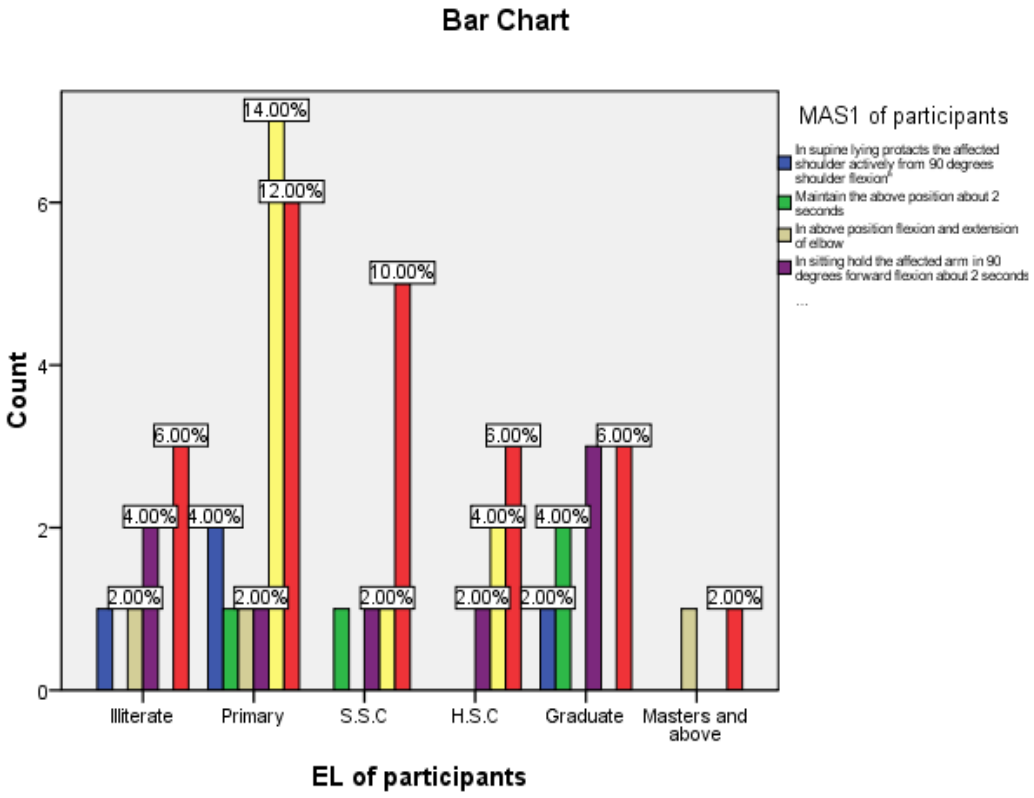


Figure 15: Relation of educational level and MAS1

4.16 Relation of educational level and MAS2

Among 7 Illiterate stroke participants 2% was obtained score 1, 0% was obtained score 2, 4% was obtained score 3, 2% was obtained score 4, 0% was obtained score 5, 6% was obtained score 6. In 18 Primary level educated stroke participants 6% was obtained score 1, 0% was obtained score 2, 6% was obtained score 3, 8% was obtained score 4, 6% was obtained score, 10% was obtained score 6. In 8 S.S.C level 0% was obtained score 1, 2% was obtained score 2, 0% was obtained score 3, 2% was obtained score 4, 4% was obtained score 5, 8% was obtained score 6. In 6 H.S.C level educated participants the 0% was obtained score 1, 0% was obtained score 2, 2% was obtained score 3, 0% was obtained score 4, 6% was obtained score 5, 4% was obtained score 6. In 9 Graduate levels 4% was obtained score 1, 0% was obtained score 2, 4% was obtained score 3, 6% was obtained score 4, 0% was obtained score 5, 4% was obtained score 6. In 2 Masters and above level 0% was obtained score 1, 0% was obtained score 2, 2% was obtained score 3, 0% was obtained score 4, 0% was obtained score 5, 2% was obtained score 6. So, in all educational level higest score 6 was obtained in 30% and score 5 was obtainned in 20% participants in MAS2.

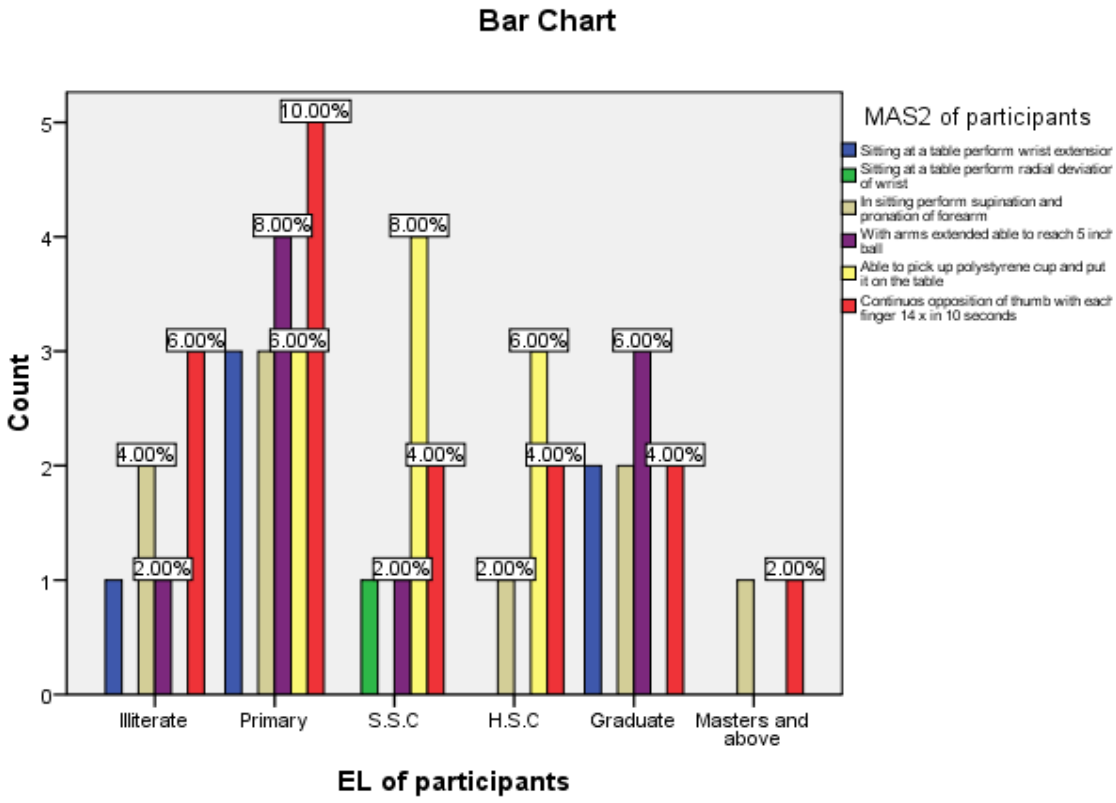


Figure 16: Relation of educational level and MAS2

4.17 Relation of educational level and MAS3

Among 7 Illiterate stroke participants 2% was obtained score 0, 4% was obtained score 1, 0% was obtained score 2, 2% was obtained score 3, 0% was obtained score 4, 2% was obtained score 5, 4% was obtained score 6. In 18 Primary level educated stroke participants 6% was obtained score 0, 4% was obtained score 1, 2% was obtained score 2, 4% was obtained score 3, 6% was obtained score 4, 4% was obtained score, 10% was obtained score 6. In 8 S.S.C level 0% was obtained score 0, 2% was obtained score 1, 0% was obtained score 2, 2% was obtained score 3, 2% was obtained score 4, 6% was obtained score 5, 4% was obtained score 6. In 6 H.S.C level educated participants 0% was obtained score 0, 0% was obtained score 1, 0% was obtained score 2, 2% was obtained score 3, 2 % was obtained score 4, 6% was obtained score 5, 2% was obtained score 6. In 9 Graduate levels 4% was obtained score 0, 2% was obtained score 1, 0% was obtained score 2, 8% was obtained score 3, 0% was obtained score 4, 0% was obtained score 5, 4% was obtained score 6. In 2 Masters and above level 0% was obtained score 0, 0% was obtained score 1, 2% was obtained score 2, 0% was obtained score 3, 0% was obtained score 4, 0% was obtained score 5, 2% was obtained score 6. So, in all educational level higest score 6 was obtained in 26% and score 5 was obtainned in 18% participants in MAS3.

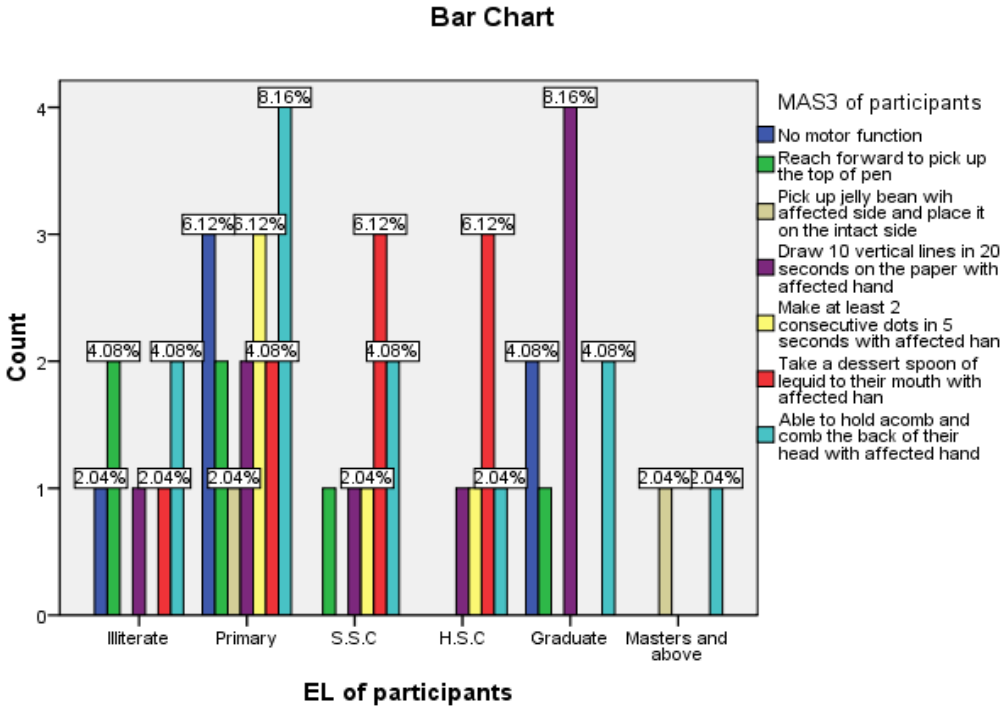


Figure 17: Relation of educational level and MAS3

4.18 Relation of stroke type and MAS1

Among the 50 stroke patients, 40 ischaemic stroke patients present and from them 8% was obtained score 1, 4% was obtained score 2, 6% was obtained score 3, 14% was obtained score 4, 12% was obtained score 5, 36% was obtained score 6. In 10 haemorrhagic participants 0% was obtained score 1, 4% was obtained score 2, 0% was obtained score 3, 2% was obtained score 4, 8% was obtained score 5, 6% was obtained score 6. So, 42% participants was obtained higest score 6 and 20% participants was obtained score 5 in MAS1 in both type of stroke.

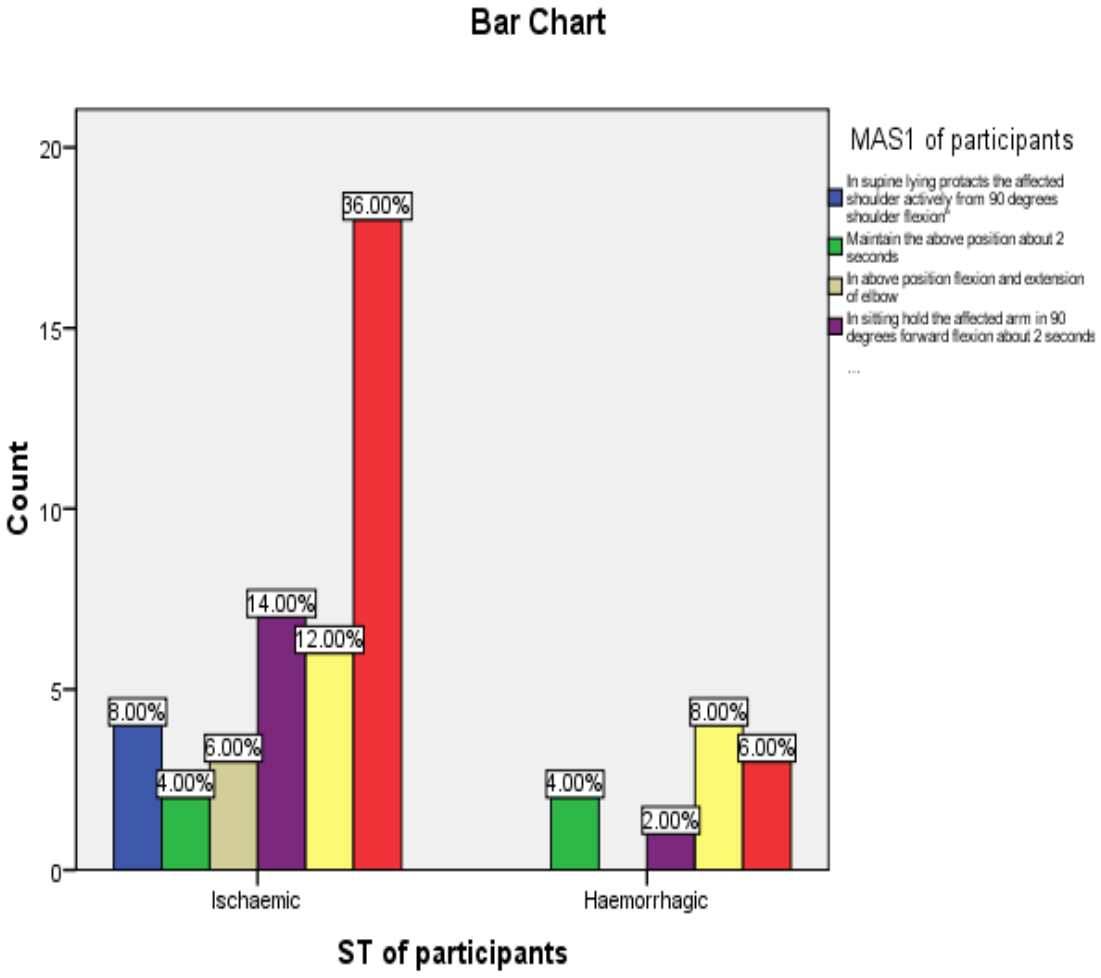


Figure 18: Relation of stroke type and MAS1

4.19 Relation of stroke type and MAS2

Among the 50 stroke patients, 40 ischaemic stroke patients present and from them 10% was obtained score 1, 0% was obtained score 2, 16% was obtained score 3, 14% was obtained score 4, 16% was obtained score 5, 24% was obtained score 6. In 10 haemorrhagic participants 2% was obtained score 1, 2% was obtained score 2, 2% was obtained score 3, 4% was obtained score 4, 4% was obtained score 5, 6% was obtained score 6. So, 30% participants was obtained higest score 6 and 20% participants was obtained score 5 in MAS2 in both type of stroke.

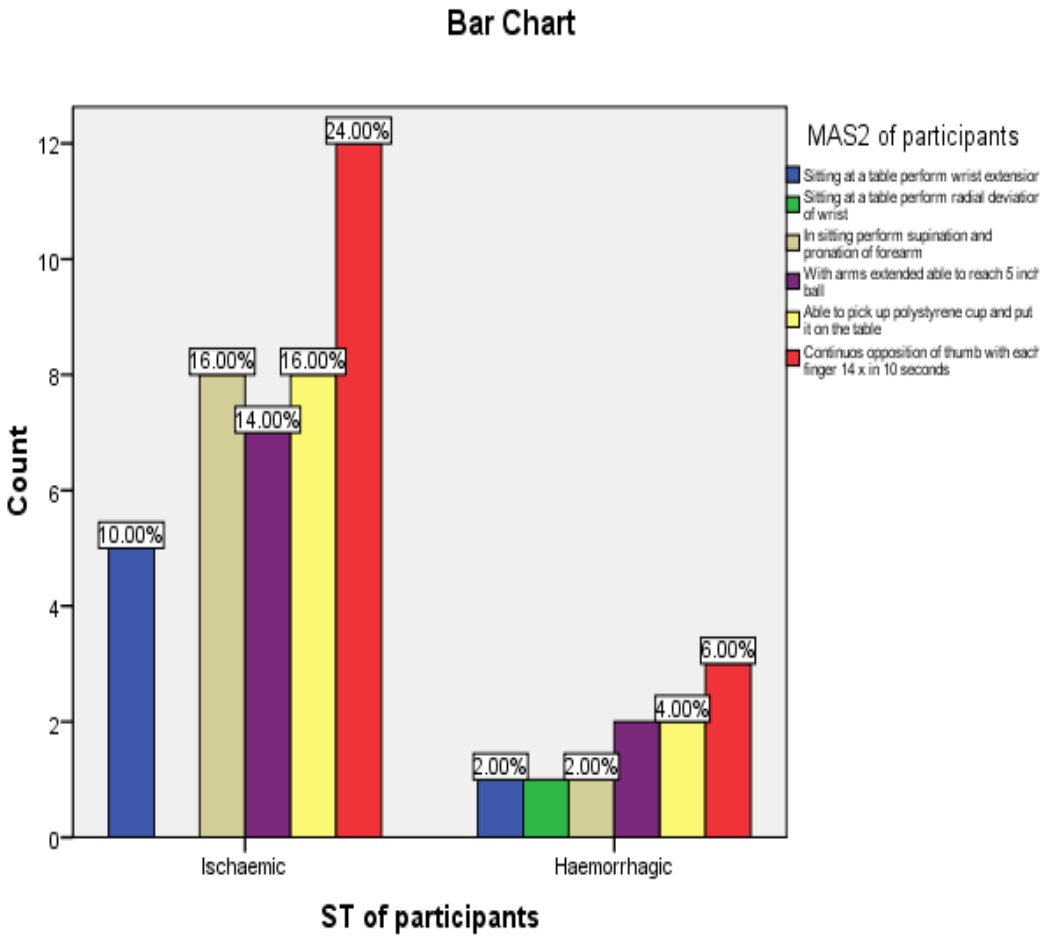


Figure 19: Eelation of stroke type and MAS2

4.20 Relation of stroke type and MAS3

Among the 50 stroke patients, 40 ischaemic stroke patients present and from them 10% was obtained score 0, 10% was obtained score 1, 2% was obtained score 2, 14% was obtained score 3, 8% was obtained score 4, 12% was obtained score 5, 24% was obtained score 6. In 10 haemorrhagic participants 2% was obtained score 0, 2% was obtained score 1, 2% was obtained score 2, 4% was obtained score 3, 2% was obtained score 4, 6% was obtained score 5, 2% was obtained score 6. So, 26% participants was obtained higest score 6 and 18% participants was obtained score 5 in MAS3 in both type of stroke participants.

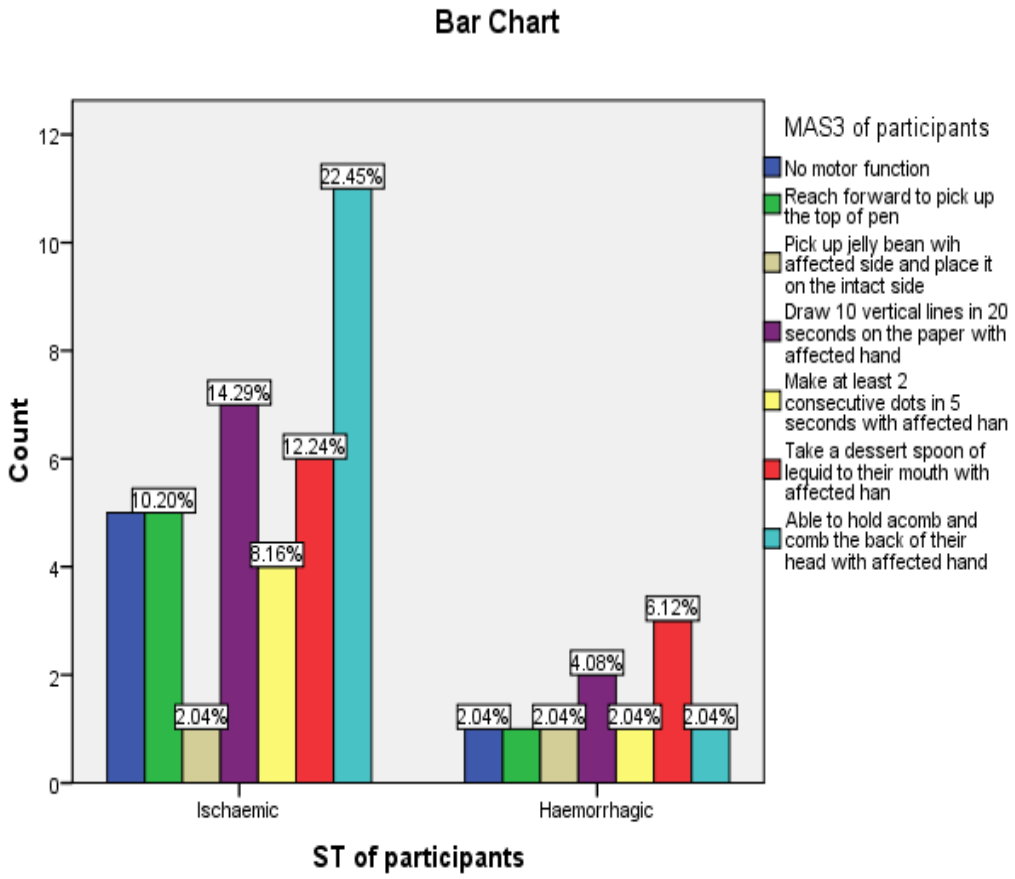


Figure 20: Relation of stroke type and MAS3

CHAPTER-V: DISSCUSSION

This study is tried to explore the improvement of activity of daily living after receiving physiotherapy treatment and current physiotherapy practice for the upper arm function, hand movements and advanced hand activities of upper limb after stroke.

From table 1, shown that stroke occurance rate is high in 41-50 age range populations and it is about 32%. From bar chat 1, 2 and 3, in this age range 18% participant was obtain maximum score 6 in upper arm function, 12% participant was obtain maximum score 6 in hand movements and 14% participant was obtain maximum score 6 in advanced hand activities. Literature also shows that, strokes occur rarely in children, and the causes are different from those in adults (Gabis et al., 2002). Stroke is generally considered to be a condition that occurs in elderly individuals. For every 5 individuals who experience stroke 1 is under the age of 65years (Graham et al., 2011). From table 1, stroke occurance rate is high in male than female participants and it is about 66%. The ratio of male and female patients was 1.94:1 at ages of 31-70 years. From bar chart 4, 5 and 6, 14% male participant was obtain maximum score 6 in upper arm function, 12% participant was obtain maximum score 6 in hand movements and 6% participant was obtain maximum score 6 in advanced hand activities. It is increasingly recognized that histological and functional outcomes after stroke are shaped by biologic sex (Yuan et al., 2009). Cerebral infarct volume is typically smaller in premenopausal females than in age-matched males after ischemic stroke, but the underlying mechanism are poorly understood (Brait et al., 2010). The epidemiology of ischemic stroke is sexually dimorphic in that ischemic events occur with greater frequency in men than women until advanced age (Sudlow and Warlow, 1997). From Arterain Medical, Men's stroke incidence rates are greater than women's. The male/female incidence ratio was 1.25 at ages 55–64. Based on studies from Western Europe, showed that stroke incidence was about 30% higher in men than in women (Appelros et al., 2009).

Low socioeconomic status is a reliable correlate of poor physical health. Individuals who are less educated, have lower-status jobs, and earn less or no incomes are at greater risk for poor health than their higher socioeconomic status counterparts (Matthews and Gallo, 2011). From International Task Force for Prevention of Coronary Heart Disease, as expected overall incidence rates in women aged 35-64 years were lower than rates

observed with men of the same age. Education and income were used as indicators of socioeconomic status. Education was measured as years of schooling completed, and income as household income in the year. Lower socioeconomic status was associated with a higher stroke incidence the standardized stroke incidence rates in those with low education or income were twice as high as in those with high education (Avendano et al., 2006). In a large sample of middle-aged adults, individuals who had more education reported more stressors than those with less education on end-of-the-day interviews (Almeida et al., 2005). Sometimes stroke resulted for increased knowledge of stroke in some people (Mazor and Billings, 2003). From table 3, shown that stroke occurrence rate was high in primary level educated participants, it is about 36%. But from table 4, stroke rate was more in middle income level and it is 40% in monthly 10,001-15,000 taka incoming participants. From bar chart 7, 8 and 9 shown that, 12% primary level educated participant was obtain maximum score 6 in upper arm function, 10% participant was obtain maximum score 6 in hand movements and 10% participant was obtain maximum score 6 in advanced hand activities.

In table 5, the percentages of ischemic stroke were 80% and haemorrhagic stroke was 20%. From bar chart 10,11and 12 shown that, 36% ischemic stroke participants were obtain maximum score 6 in upper arm function, 24% participant was obtain maximum score 6 in hand movements and 24% participant was obtain maximum score 6 in advanced hand activities. From Arterain Medical, of all strokes, 87% are ischemic, 10% are intra cerebral haemorrhage, and 3% are subarachnoid haemorrhage. From International Task Force for Prevention of Coronary Heart Disease, the populations from Europe, Australia and the United States compared in the International Stroke Incidence Collaboration (3.5 million person-years, 5575 strokes) most strokes were of ischemic origin.

It is estimated that 50% to 75% of individuals who experience a stroke have persistent impairment of the affected upper limb (Henderson et al., 2007). Form the upper arm function the study shows that it was improved by taking physiotherapy treatment. From table 6, 42% participants showed best recovery by achieving score 6. In upper limb hand movements in the stroke participants from table 7 shown that, 30% patients obtain maximum score 6. In advanced hand activities from table 8 shown that, 26% stroke

patients obtain maximum score 6. The scored 6 on these three upper limb subtests of the MAS, indicating a good recovery of upper limb function.

In the Australian rehabilitation centres commonly used measure is the Motor Assessment Scale (MAS), which combines elements of impairment and disability. To date there have been few systematic studies utilising the MAS to measure recovery after stroke, especially in regard to upper limb function. It is a reliable and valid outcome measure that can be used for most stroke patients when recording their level of impairment and capacity to perform functional tasks (Williams et al., 2001). Improvements in upper extremity movement kinematics in the participants with chronic stroke by using Upper Extremity Motor Assessment scores (Combs et al., 2012).

In our sample, significant improvement was demonstrated in some subjects for all upper limb outcome measures after rehabilitation of stroke patients. This study shows that the MAS provide valuable qualitative information about recovery after stroke. It is vital that physiotherapists use standardised measures of impairment, such as the MAS, to obtain information about recovery after stroke. This will enable them to best predict and optimise patient outcome and allocate resources appropriately.

CHAPTER-VI: CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Bangladesh is very poor country in the world. Education, economy and other social aspects are very low level. People are not fully concerned about basic health care. Heath services in Government and Non Government sector are not sufficient, for that most of the people in our country not get proper treatment facilities. Some private clinic and hospitals are now trying to provide latest medical services, but nothing to be mentioned about physiotherapy treatment. People in our country think physiotherapy treatment is some form of exercise. But it plays a great role in medical sector and many people become disable due to lack of awareness of physiotherapy. Physiotherapy is considered as an important treatment process in the developed countries. Stroke is a major cause of disability, and there is a need to identify effective physiotherapy interventions that will increase upper limb functioning in patients with hemiparesis. The main aim of this study is to findout upper limb functional outcome of stroke patient. This study hightlighted the significant improvement of upper limb outcome measures after rehabilitation of stroke patients. Without proper physiotherapy treatment the proper recovery of stroke patients can not achieve. Physiotherapy provides opportunities for an individual to regain optimal skilled performance to functional actions, increase levels of strength and effective to improve functional independency.

6.2 Recommendation

The objective of this study was to find out the functional recovery of affected upper limb followed by stroke patient during discharge in CRP neurology outdoor and the result that the researcher found from the study has fulfilled the target of this research project. The researcher recommended the following things-

- The next generation of Physiotherapy members continue regarding this area which may involve of survey study of functional recovery of affected upper limb followed by stroke patient.
- Should take more samples for generalizing the result and make the research more valid and reliable.
- Should take more samples for pilot study to establish the accuracy of questionnaire.
- Sample should collect from different hospital, clinic, institute and organization in different area of Bangladesh to generalize the result.

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APPENDIX

মৌখিক অনুমতি পত্র

(অংশগ্রহণকারাকে পড়ে শোনাতে হবে)

আস্‌সালামু আলাইকুম/ নমস্কার, আমার নাম তানিয়া পাশা, আমি এই গবেষণাটি বাংলাদেশ হেলথ্ প্রফেশনস ইনস্টিটিউট (বি এইচ পি আই)-এ করছি যা আমার কোর্সের অধিভূক্ত। যার শিরোনাম হল- 'স্ট্রোক এর কারনে আক্রান্ড় শরীরের উপরের অংশের (হাতের) প্রায়গিক নিরাময় লাভ।' আমি এক্ষেত্রে কিছু ব্যক্তিগত এবং আনুষঙ্গিক প্রশ্ন স্ট্রোক সম্পর্কে জানতে চাচ্ছি। যা আনুমানিক ২০-৩০ মিনিট সময় নিবে। আমি আপনাকে অবগত করছি যে, এটা আমার অধ্যয়নের সাথে অন্ড় র্ভুক্ত। তাই এই গবেষণায় অংশগ্রহণ আপনার বর্তমান এবং ভবিষ্যৎ চিকিৎসায় প্রভাব ফেলবে না । আপনি যে সব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং আপনার প্রতিবেদনের ঘটনাপ্রবাহে এটা নিশ্চিত করা হবে যে, এই তথ্যে উৎস অপ্রকাশিত থাকবে।

এই অধ্যয়নে আপনার অংশগ্রহণ স্বেচ্ছাপ্রণোদীত এবং আপনি যে কোন সময় এই অধ্যয়ন থেকে কোন নেতিবাচক ফলাফল ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন। এছাড়াও কোন নির্দিষ্ট প্রশ্ন অপছন্দ হলে উত্তর না দেয়ার এবং সাক্ষাৎকারের সময় কোন উত্তর না দিতে চাওয়ার অধিকারও আপনার আছে।

এই অধ্যয়নে অংশগ্রহণকারী হিসেবে যদি আপনার কোন প্রশ্ন থাকে তাহলে আপনি আমাকে
এবং / অথবা ওবায়দুল হক, কোর্স সমন্বয়কারী, ফিজিওথেরাপী বিভাগে যোগাযোগ করতে পারেন।

এটা শুর করার আগে আপনার কি কোন প্রশ্ন আছে?

আমি আপনার অনুমতি নিয়ে এই সাক্ষাৎকার শুর করতে চাচ্ছি।

হ্যাঁ ☐

না ☐

সাক্ষাৎকারীর স্বাক্ষর ঃ.....

VERBAL CONSENT STATEMENT

(Please read out to the participant)

Assalamualaikum/Namasker, my name is *Tania Pasha*, I am conducting this study for a Bachelor project study titled "Functional recovery of upper limb affected patient followed by stroke" from Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related questions 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. The researcher is not directly related with this neurology area, so your participation in the research will have no impact on your present or future treatment. All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous.

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 or your right as a participant, you may contact with Tania Pasha, researcher and/ or Md. Obaidul Haque, Course Coordinator, Department of Physiotherapy.

Do you have any questions before I start?
So may I have your consent to proceed with the interview?

YES ☐

NO ☐

Signature of the Interviewer _____

প্রশ্নাবলী

- অংশগ্রহণকারীর নাম ঃ পরিচিতি নং
- বয়স ঃ মোবাইল নং ঃ
- লিঙ্গ ঃ ☐ পুরুষ = ১ মহিলা = ২
- পেশা ঃ
- ঠিকানা ঃ
- আবাসস্থল ঃ ☐ শহর = ১ গ্রাম = ২
- স্ট্রোকের ধরন ঃ ☐ ইসকেমিক = ১ হেমোরহেজিক = ২
- স্ট্রোকে আক্রান্ড় হওয়ার তারিখ ঃ ☐ দিন / মাস / বছর
- আপনার শিক্ষাগত যোগ্যতা কি? ☐

  অশিক্ষিত = ১ প্রাথমিক = ২ এস.এস.সি = ৩

  এইচ.এস.সি = ৪ স্নাতক = ৫ স্নাতোকত্তর এবং এর বেশি = ৬
- আপনার পরিবারে উপার্জনক্ষম সদস্য কতজন আছেন? ☐
- আপনার মাসিক আয় কত? ☐

  ৩,০০০-৫,০০০ = ১

  ৫,০০১-১০,০০০ = ২

  ১০,০০১-১৫,০০০ = ৩

  ১৫,০০১ বা অধিক = ৪
- আপনি কতদিন ধরে ফিজিওথেরাপী চিকিৎসা নিচ্ছেন? ☐

  দিন / মাস / বছর
- স্ট্রোক এর পূর্ব বিবরণঃ ☐

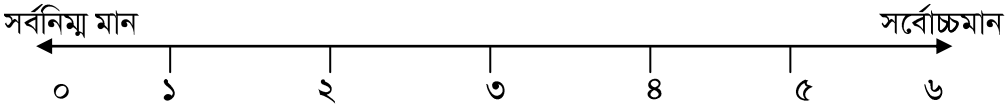
  ধূমপান = ১ তামাক চাবানো = ২ মধ্যপান = ৩ উচ্চ রক্তচাপ = ৪

  হৃদরোগ = ৫ ডায়বেটিক = ৬ অশান্ড় জীবনধারা = ৭ অন্যান্য = ৮

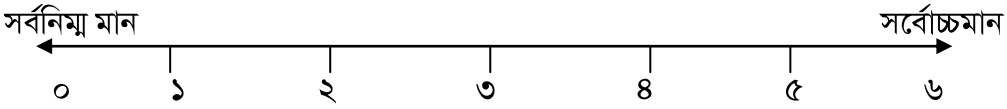
- মটর এসেসমেন্ট স্কেল ব্যবহার করে স্ট্রোক রোগীদের আক্রান্ত শরীরের উপরের অংশের (হাতের)

  অর্জিত পয়েন্ট ঃ

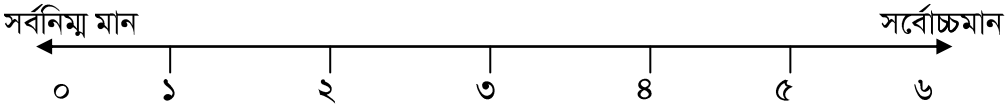
১. আপার আর্ম ফাংশন ঃ ☐



২. হ্যান্ড মুভমেন্টস ঃ ☐



৩. এডভান্স হ্যান্ড একটিভিটিস ঃ ☐



QUESTIONNAIRE

Patient's

- Name: Cell no:
- Age: ID:
- Sex: ☐

  1= Male 2= Female
- Occupation:
- Adress:
- Living area: ☐

  1= Urban

  2= Rural
- Type of stroke: ☐

  1= Ischemic 2= Haemorrhagic
- Date of incidence of stroke: ☐

  DD / MM / YY
- What is your educational level?

  1= Illiterate

  2= Primary

  3= S.S.C

  4= H.S.C

  5= Graduate

  6= Masters and above
- How many earning member in your family?
- What is about your monthly family income? ☐

  1= 3000-5000

  2= 5001-10,000

  3= 10,001-15,000

  4= 15,001- Above
- How long you have received physiotherapy treatment?

  DD / MM / YY

- Past Medical History:

  1= Smoking

  2= Tobacco chewing

  3= Alcohol consumption

  4= Hypertension

  5= Heart disease

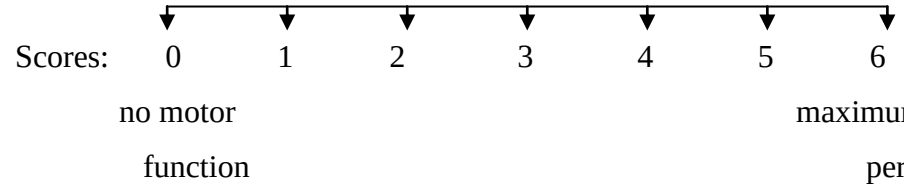
  6= Diabetics

  7= Stressful lifestyle

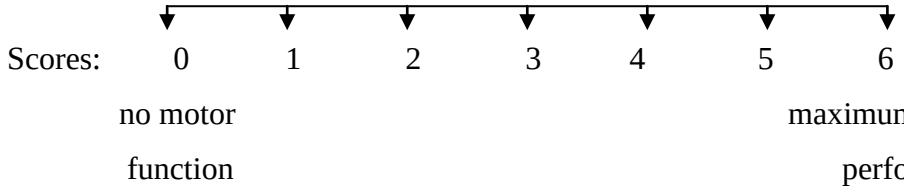
  8= Others

- What are the scores of affected upper limb stroke patient by using MAS scale?

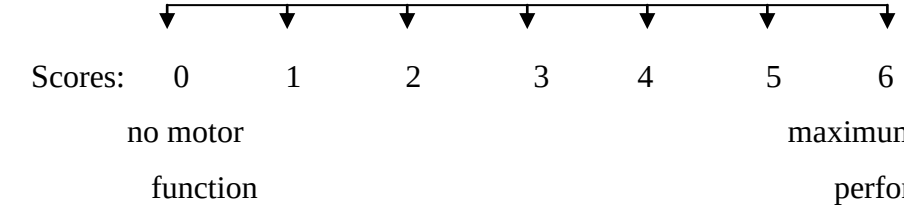
  1. Upper-Arm Function: ☐



  2. Hand Movements: ☐



  3. Advanced Hand Activities: ☐



April 12, 2011

To
Head of the Department
Department of Physiotherapy
CRP-Chapain, Savar
Dhaka-1343

Subject: Application for permission of data collection at Physiotherapy Neurology outdoor patient.

Sir,

I respectfully state I am Tania Pasha a student of 4th year B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). In 4th year course curriculum we have to do a research project. I have chosen a research title that is "Functional recovery of upper limb affected patient followed by stroke". For this reason, I need permission for collect data from the CRP Physiotherapy Neurology outdoor patient.

Therefore, I pray and hope that you would be kind enough to grant my application and give me permission for collect data from Physiotherapy Neurology outdoor patient.

Please discuss with me.

12/04/2011

MD. ANWAR HOSSAIN
Physiotherapist
Assistant Professor (BHPI) and
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