# PREVALENCE OF PAINFUL SHOULDER AMONG THE HEMIPLEGIC PATIENTS WITH CEREBROVASCULAR ACCIDENT (CVA)

**Abdullah Al Masud**

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

Session: 2007-2008

BHPI, CRP, Saver, Dhaka-1343

**Bangladesh Health Professions Institute (BHPI)**

Department of Physiotherapy

CRP, Saver, Dhaka-1343

Bangladesh

February, 2013

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

# PREVALENCE OF PAINFUL SHOULDER AMONG THE HEMIPLEGIC PATIENTS WITH CEREBROVASCULAR ACCIDENT (CVA)

Submitted by **Abdullah Al Masud**, for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT).

………………………….

**Muhammad Rezaul Karim**
B. Sc. PT (Hons.), Dip. Ortho. Med.
Lecturer
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka
Supervisor

………………………….

**Mohammad Anwar Hossain**
B. Sc. PT (Hons.), Dip. Ortho. Med, MPH
Associate Professor, Physiotherapy, BHPI &
Head of the Department, PT
CRP, Savar, Dhaka

…………………………..
**Nasirul Islam**
B. Sc. PT (Hons.), MPH
Assistant Professor &
Course Coordinator of M Sc. in PT
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

| …………………………….. | ………………………………… |
|---|---|
| **Md. Shofiqul Islam** | **Md. Obaidul Haque** |
| B.Sc. PT (Hons.), MPH | B.Sc. PT (Hons.), Dip. Ortho. Med., MPH |
| Assistant Professor | Associate Professor of Physiotherapy & |
| Department of Physiotherapy | Head of the Department of Physiotherapy |
| BHPI, CRP, Savar, Dhaka | BHPI, CRP, Savar, Dhaka |

## Declaration

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

**Signature:**                                                                    **Date:**

**Abdullah Al Masud**

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

Session: 2007-2008

BHPI, CRP, Savar, Dhaka-1343

# Contents

# Acknowledgement

First of all, I would like to pay my gratitude to Almighty Allah who given me the ability to complete this project in time with great success. I would like to pay my gratitude towards my parents who constantly encouraged me to carry out this project. My deepest great-fullness goes to my honorable supervisor Muhammad RezaulKarim, Lecturer, Department of Physiotherapy, Bangladesh Health Professions Institute (BHPI), CRP, Savar, Dhaka, for his keen supervision.

I would also like to express my gratitude to my respected teacher Md. Shofiqul Islam, Assistant Professor, BHPI, Department of Physiotherapy, for his tireless effort with excellent guidance and support without which I could not able to complete this project.

I would like to thanks all Physiotherapy staffs and placement students of the Neurology Department for helping me at the time of data collection.

I would like to thanks Dosta Mohammad, ChinmoyBarua, MoazzemHossain and MahmudulHasan 4th year Bsc in Physiotherapy for their help in computer work throughout the project.

Finally, I would also like to thanks librarian of Bangladesh Health Professions Institute (BHPI) and their associates for their kind support to find out related books, journals and also access to internet.

## Acronyms

| | |
|---|---|
| **ADL** | Activities of daily Living |
| **BHPI** | Bangladesh Heath Professions Institute |
| **CRP** | Center for the Rehabilitation of the Paralyzed |
| **CVA** | Cerebrovascular Accident |
| **GHJ** | Glenohumeral Joint |
| **HSP** | Hemiplegic Shoulder Pain |
| **SPSS** | Statistical Package of Social Science |
| **UE** | Upper Extremity |
| **VAS** | Visual Analogue Scale |
| **WHO** | World Health Organization |
| **NPR** | Numerical pain rating scale |

# List of tables

# List of figures

# Abstract

*Purpose*: To identify the prevalence of painful shoulder among the hemiplegic patients with CVA. *Objectives:* To find out the prevalence of painful shoulder among the hemiplegic Patients with CVA; to identify the socio-demographic information; to explore the patient's nature and behavior of pain and to clarify the socio-demographic factors for such exposure group in relation to age, sex, occupation, living areas. *Methodology:* The study design was cross-sectional. Total sixty two samples were selected conveniently for this study from the selected area at neurology unit of CRP. Data was collected by using mixed type of questionnaire. Descriptive statistic was used for data analysis which focused through table, pie chart and bar chart.*Results:* The finding of the study was that the 77.4% patients had shoulder pain. Most of them had been suffered from intermittent pain 71% and males (n=36) 75% were more affected than females.59.7% patients took treatment for their shoulder pain among this only 12.9% took physiotherapy, 25.8% took medication and 21% took both medication & physiotherapy.*Conclusion:* Shoulder pain after stroke is common, especially in patients with severe sensory motor deficits, diabetics and those living at home. Appropriate management may reduce the rate of occurrence. This result of this study also provided background information about shoulder pain that may be useful in prevention and treatment of shoulder pain after CVA, thereby reducing its prevalence.

| CHAPTER-I: | INTRODUCTION |
|---|---|

## 1.1 Background

CVA is a neurological disease (Hossain et al., 2011) and a world-wide major health problem with incidence ranging from 0.2 to 2.5 per thousand per year according to WHO Collaborative Study in 12 countries (Joy et al., 2012), which are so prevalent that their impact, in economic, social and healthcare terms, is considerable. In the last few decades, there have been initiatives to promote treatment during the acute phase of a stroke and progress has been made toward understanding stroke physiopathology, despite the considerable strides which have been made, stroke is still the leading cause of disability in developed countries (Murie-Fernandez et al., 2012). In UK Stroke is the most common condition with an annual incidence of more than 100,000 new events. It is the third commonest cause of death and is the single largest cause of severe adult disability (Gamble et al., 2002).

Shoulder pain among hemiplegic patients following CVA is a common and distressing complication, may be present for a variety of reasons relating to the effects of stroke or to pre-existing conditions, which interfere with both function and quality of life. If shoulder joint is very painful the patient may prefer not to move, or may withdraw from active rehabilitation, which may not interfere only with upper limb function, but with balance, walking, transfers and performance of self-care activities and may therefore impede the process of rehabilitation and has been associated with poorer outcomes and increased length of stay in hospital (Turner-Stokes et al., 2002). Those patients who do continue in rehabilitation may keep the shoulder protected and immobile, this in turn interfering with maintenance of balance and performance of self-care, transfer activities and walking (Van Langenberghe et al., 1988).

Shoulder pain is often used to describe as a collection of complex problems and diagnosis, because its causes have not been clearly identified and is inherently difficult to define. The onset of hemiplegia can adversely affect the normal mechanics of the shoulder complex through three mechanisms including loss of motor control and the development of abnormal movement patterns, secondary changes to surrounding soft tissue and glenohumeral joint subluxation (Ryerson et al., 1997) and

these changes compromise the stability of the shoulder complex and place individual joints at risk, if any attempts to move the upper limb can result in inefficient movement patterns or damage to surrounding soft tissue (Bender et al., 2001).

Ward (2007) argued that Shoulder pain is a common problem after stroke, its incidence is variable in up to 70% of patients and it often appears in the first few days and 75% of patients complain of pain at some time in the first 12 months following a stroke. The mechanisms for the development of pain are sometimes unclear but, since the attachment of the upper limb to the trunk is muscular rather than directly skeletal, any disruption of muscular action is likely to give biomechanical problems around the shoulder, which can lead to pain. Painful shoulder is associated with a reduced pinch grip and shoulder shrug strength, with abnormal muscle tone, but most importantly, with sensory inattention and sensory loss.

So, before taking a critical situation and to prevent disability resulted from a stroke multidisciplinary team approach should start working, where this will consists Neurologist, Physiotherapist, Occupational therapist, Psychologist, Nurse and Social workers, this will be required as, rehabilitation is the ultimate aim of treatment and therapist, each have definite role in stroke which should be started as early as possible (Mohammad, 2001).

## 1.2 Rationale

Cerebrovascular disease is a common neurological condition, which is a major cause of death and disability in worldwide. The incidence of CVA increases with age and affect many people in their golden years. It is third most common cause of death in developed countries (Hossain et al., 2011). Patients with CVA may suffer from a range of pain types such as shoulder pain, musculoskeletal Pain and headache. Among them painful shoulderis the most common complications. Now a day's shoulder pain is a common problem in our country after CVA and it is increasing day by day and affects a large number of people. In recent past some studies have dealt with painful shoulder among the CVA patients in other countries, the exact nature and prevalence of this important health problem has not been studied in Bangladesh. This study formulates to fill the gap of knowledge & ideas in this area. The purposes of the study were to assess the pain pattern of shoulder among CVA patients & to identify the impact of demographic & social factors on them. This study also helps to explore the patient's nature and behavior of pain. Beside this, it helps to established right guidelines for patients. This study also helps to discover the lacking area of a career, especially before doing any activities. By doing this research, the problem may be drawn out & gives proper education about CVA. This study would be helpful in making physiotherapist to aware about the pain in shoulder of CVA patient. Physiotherapy plays a vital role in the management of shoulder painamong hemiplegic patient. So itwould be helpful for physiotherapist in working in this area for delivering treatment service. As a result patients become more benefited. Thus the study might create a future prospect of physiotherapy profession in Bangladesh.

So, my personal interest to work in this area and to aware the people and professionals about the painful shoulder among hemiplegic patients. Ithelps to discover the role and importance of physiotherapy in every sector of Bangladesh.

**1.3 Research question**

What is the Prevalence of painful shoulder among thehemiplegic patients with CVA?

**1.4 Study objectives**

**1.4.1 General objective**

To find out the prevalence of painful shoulder among the hemiplegic Patients with CVA.

**1.4.2 Specific objectives**

- To calculate the number of patients with painfulshoulderand percentage of this proportion.
- To identify the socio-demographic information of painful shoulder of CVA patients.
- To explore the patient's nature and behavior of pain of CVA patients.
- To clarify the socio-demographic factors for such exposure group in relation to age, sex, occupation, living areas.

## 1.5 List of Variables

### CONCEPTUAL FRAMEWORK

**Independent Variables**

**Socio-demographic factors:**
- Age
- Sex
- Occupation
- Residential area
- Education

**Systemic/Metabolic Disorders:**
- Diabetes
- Hypertension

**Others:**
- Shoulder subluxation
- Previous injury
- Over head activity

**Dependent variable**

Painful shoulder
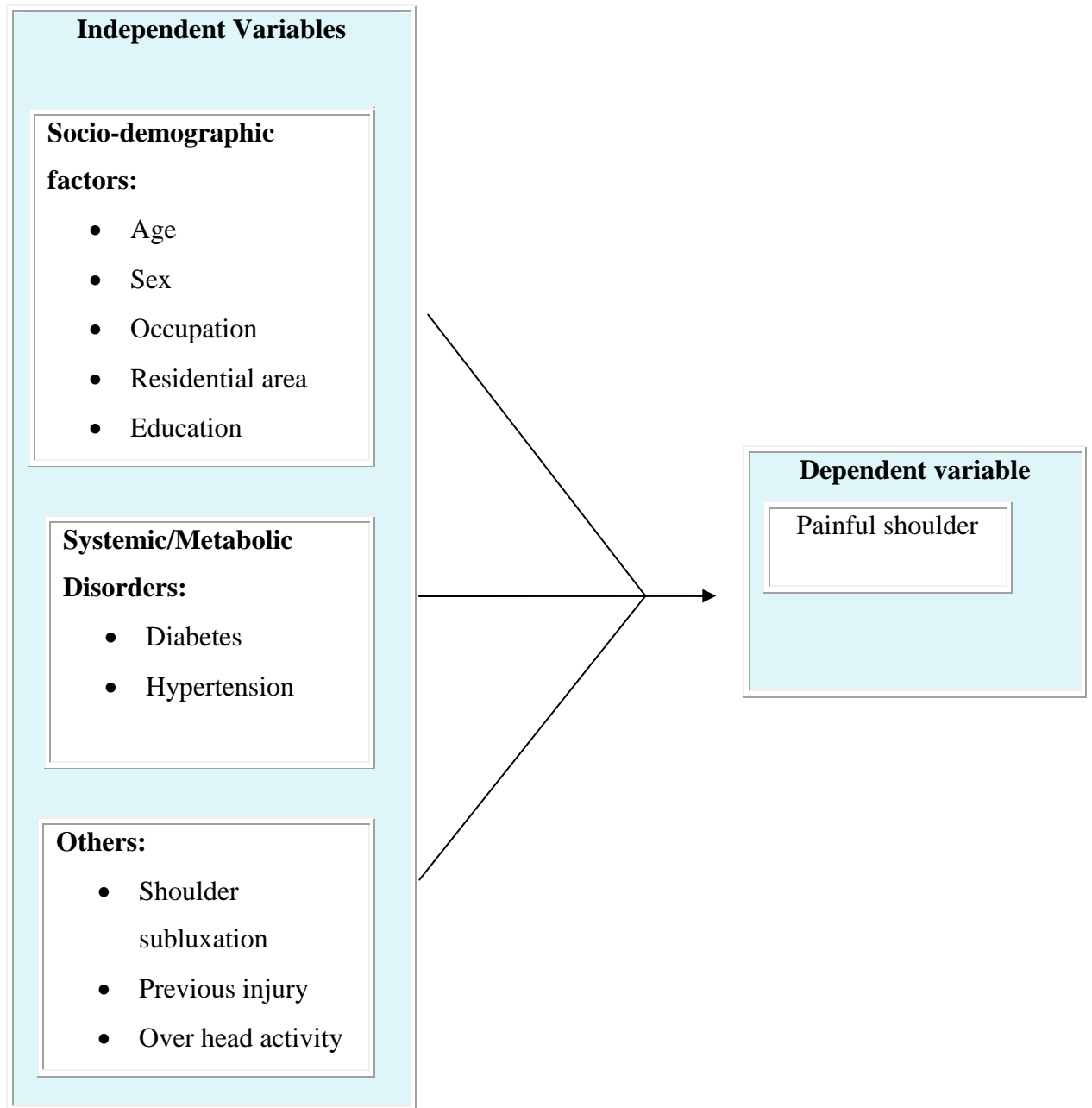
## 1.6 Operational definition

**Prevalence**

Prevalence specifically refers to the all current case (old & new) existing at a given point time, over a period of time in a given period of population.

**Shoulder Pain**

Shoulder pain includes any pain that arises in or around shoulder and may originate in the joint itself, or from any of the many surrounding muscles, ligaments or tendons. Shoulder pain usually worsens with activities or movement of arm or shoulder.

**Activities of daily living**

Task that enable individual to meet basic needs in style.

**Stroke**

Stroke, or a cerebral vascular accident, is the sudden death of brain cells due to inadequate blood flow. The WHO clinically defines stroke as the rapid development of clinical signs and symptoms of a focal neurological disturbance lasting more than 24 hours or leading to death with no apparent cause other than vascular origin.

CVA is a leading cause of serious long-term disability which can impact areas of cognitive, psychosocial and physical functioning. Cognitive impairments after CVA are largely dependent on lesions of localization, which can impair executive, language, visuo-spatial, learning and memory domains. Depression is also common after stroke and can further tax already vulnerable neuro-cognitive functions. Physically, post-stroke hemiplegia may result in unilateral upper extremity (UE) weakness, reduced active range of movement and arm function and consequently, diminished independence in performing activities of daily living (Rabin et al., 2012).

Klit et al. (2011) reported CVA is currently the third leading cause of death and the major cause of long-term disabilities, such as hemiparesis, language problems and cognitive deficits, in the world ranking countries after heart diseases and before cancer and causes 10% of deaths worldwide. Approximately 20 million people each year will suffer from stroke and of these 5 million will die and in developing countries account for 85% of global deaths from strokes, which is also a leading cause of functional impairments, with 20% of survivors requiring institutional care after 3 months and 15% - 30% being permanently disabled (Taylor, 2010).

Hossain et al. (2011) have described that, Stroke is defined by WHO as a clinical syndrome consisting of rapidly developing clinical signs of focal (at times global) disturbance of cerebral function lasting for more than 24 hours or leading to death, with no apparent cause other than that of vascular origin. The incidence of stroke increases with age and affect many people in their golden years. It is third most common cause of death in developed countries. The age adjusted annual death rate from stroke is 116 per 100000 populations in the USA and some 200 per 100000 in UK. In Bangladesh there is no adequate data on incidence and mortality from stroke. Among stroke, ischaemic infraction constitute 85% to 90% and 15% to 10% is caused by intracranial hemorrhages in the western world, while hemorrhages constitute a larger percentage in Asia.

In another study Bamford et al. (1988) reported that the incidence of first stroke in Oxford shire to be 2 per 1000. Ages specific rates were produced and are helpful in predicting rates in other populations in the UK. Warlow et al. (1996) argue that stroke prevalence is difficult to measure and uninteresting. As most strokes occur in the elderly, who may suffer from other disabling conditions such as arthritis and dementia, it can be argued that the greater the time elapsed since an acute stroke the less important disease-specific services become. Prevalence of disability is more useful in planning Long-term services. Out of approximately 500 new stroke cases per year in an average Health District population of 250000, it is estimated that approximately 30% will die within three weeks, 30% will recover completely and 200 new cases per year will be left with disability (Rice-Oxley et al., 1999).

Stroke is divided into two broad categories, ischemic strokes and hemorrhagic strokes. Ischemia which used to describe as loss of blood supply to the brain and brain cells are deprived of the glucose, oxygen & nutrients. Hemorrhagic stroke is defined when an artery in the brain bursts, blood spews out into the surrounding tissue & upsets not only the blood supply but the delicate chemical balance neurons require to function.In most studiesIschaemic strokes were the most common & accounted for 50%−85% of all strokes worldwide due to sudden occlusion of arteries supplying the brain, either due to a thrombus at the site of occlusion or formed in another part of the circulation, whereas haemorrhagic strokes were seen in 1%−7% and 7%−27% respectively of all strokes worldwide due to subarachnoid haemorrhage − bleeding from one of the brain's arteries into the brain tissue or intra-cerebral haemorrhage - arterial bleeding in the space between meninges (Singh et al., 2012).

The shoulder joint is a complex joint, which allow a large degree of freedom of motion, which is achieved by a small bony contact area and a loose joint capsule, with its integrity depending on mostly muscular and ligamentous tension. After the onset of stroke there was usually a period of lowered muscle tone, clinically known asflaccidity, this state is usually temporary and is replaced by increased muscle tone or spasticity. The anatomy of the shoulder joint makes it particularly vulnerable when muscle tone is altered, because of lack of normal protective voluntary and reflex muscular activity (Van Langenberghe et al., 1988).

The shoulder complex consists of four separate joints, which afford it incredible mobility in all planes of motion, but at the expense of its stability. The glenohumeral joint (GHJ) relies on the integrity of muscular and capsuloligamentous structures rather than bony conformation for its Stability. Injury or paralysis of muscles around the shoulder complex may lead to GHJ subluxation, which may lead to shoulder pain (Paci et al., 2005).

Pain and spastic shoulder are frequent in hemiplegic stroke patients, among them shoulder pain is a major problem for these patients, interfering with physiotherapy, sleep and daily activities. It is usually occurring due to local causes like algoneurodystrophy also known as shoulder–hand syndrome, capsulitis, glenohumeral subluxation and also spasticity because of the prolonged muscular contracture and possible tendinopathies (Yelnik et al., 2007).

Painful Shoulder following stroke is a common phenomenon after a cerebrovascular accident, with an estimated incidence of between 16% to 84%. Shoulder pain has been shown to affect stroke outcome in a negative way, it interfere with balance, walking, transfers, performance of self-care activities, quality of life and markedly hinder rehabilitation. The occurrence is probably not related to age and gender and may be related to the severity of the paresis (Niessen et al., 2008).

Hemiplegic shoulder pain results in limited shoulder movement in stroke patients because they are unable to tolerate passive or active shoulder movements, patient may well prefer not to move and may even withdraw altogether from active rehabilitation. Patients who do continue in rehabilitation may keep the shoulder protected and immobile, thus lessening the effectiveness of any motor recovery techniques. Many reports have documented the negative impacts of HSP in stroke patients, including obstruction of the rehabilitation process, delay of motor recovery in the upper extremities, decrease in the functional performance of daily activities, and prolongation of hospital stay (Pong et al., 2012).

The cause of shoulder pain is not fully understood; the following processes have all been responsible as causes of a painful hemiplegic shoulder: glenohumeral subluxation, spasticity of shoulder muscles, impingement, soft tissue trauma, rotator

cuff tears, glenohumeral capsulitis, bicipital tendinitis, and shoulder hand syndrome (Walsh, 2001). In other study showed that, some factors which may contribute to the appearance of painful hemiplegic shoulder can be categorised as those having to do with the shoulder joint itself: rotator cuff injury or subluxation of the humeral head and those related to a neurological disorder like lack of sensation, initial flaccid paralysis, hemispatial neglect and spasticity (Murie-Fernandez et al., 2011).

Joy et al. (2012) reported that according to involvement of anatomical structures, the causes of HSP may be due to rotator cuff tear, over-stretching of ligaments and muscles, like supraspinatus and deltoid, spasticity, muscle trigger points, subacromial bursitis, tendinitis of long head of biceps tendon, adhesive capsulitis, impingement syndromes, reflex sympathetic dystrophy, brachial plexopathy and central pain syndromes.

Pain on shoulder during movement of the upper limb has been recognized as an important predictor of poor recovery of power and function of the arm, and of length of stay in hospital for stroke patients. Shoulder pain following stroke raises problems for clinicians and therapists because of poor understanding of etiology, prevention and treatment strategies (Ratnasabapathy et al., 2003).

Griffin (1986) described that Shoulder pain and stiffness are frequently occurring in hemiplegic patient. The patient frequently has severe paralysis; glenohumeral joint subluxation or edema of the wrist and hand also may exist, Pain may be localized to the shoulder or can radiate to include the elbow and hand. Localized tenderness over the biceps brachii and supraspinatus tendons frequently is present. Although pain may be present at rest, the patient complains of increased pain with attempted passive motion or with a dependent position of the arm. The most painful and limited shoulder movement is usually lateral (external) rotation, which is followed in severity by abduction.

Duration of hemiplegia appears to be significantly related to hemiplegic shoulder pain, although hemiplegic shoulder pain can develop in the early weeks after stroke. In a longitudinal study Brocklehurst et al. (1978) noted that pain and stiffness were present in 16% of the patients two weeks after the stroke and had developed in an

additional 27% after one year. Incidences at the time of patient admission into rehabilitation programs have varied from 28% to 67%. Development of hemiplegic shoulders Pain during the rehabilitation phase has been reported and one group of investigators noted that 72% of their patients developed hemiplegic shoulders Pain during rehabilitation (Griffin, 1986). In another study Kalichman et al. (2011) reported prevalence of HSP is approximately 22%-23% in the general population of stroke survivors and approximately 54%-55% among stroke patients in rehabilitation settings.

The mobility of the recovering stroke patient is dependent on the assistance of nurses, therapists, doctors, other ancillary staff, and family members. It is also dependent on patient's own efforts. Positioning, handling and transferring on a day-to-day basis can exert great stress on the vulnerable shoulder. The problem may be exacerbated by the patient's sensory and perceptual deficits. There has been concern that trauma to the constituent components of the shoulder joint may be caused by poor handling of the patient's affected arm (Walsh, 2001).

In patients with flaccid shoulders, inappropriate stretching during rehabilitation or transferring in daily life, poor protectionof the paralytic shoulder girdle, or extended pulling due to gravity while standing or walking may lead to soft tissueinjuries after stroke(Huang et al., 2010).Shoulder subluxation is considered to be a problem because it causes shoulder pain and hinders the recovery of upper limb function. It has been suggested that subluxation causes shoulder pain by overstretching the soft tissues such as the capsule, ligaments and muscles surrounding the shoulder (Ada et al., 2002).

Glenohumeral joint subluxation due to lack of muscular activity around the shoulder is common after stroke. Trauma to the glenohumeral joint may also arise from inappropriate exercise such as overhead pulleys or inappropriate handling of the patient by staff during transfers which can produce shoulder pain (Dean et al., 2000).

An optimal treatment approach has not yet been established among painful shoulder in hemiplegic patients and this is due in part to lack of consensus regarding pain aetiology. PHS treatment is complex preventive measures should be taken

immediately after the stroke. This normally falls to the neurologist in the stroke unit who is responsible for the patient. Early passive movement and providing support and protection for the shoulder during its flaccid phase are considered important in order to minimize the risk of painful hemiplegic shoulder and maintaining the upper limb in the correct position is fundamental to treating painful hemiplegic shoulder. Careful positioning of the shoulder serves to minimize subluxation and eventually, muscle contractures as well (Murie-Fernandez et al., 2012).

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).

The physiotherapist's plays a major role in the physical management of stroke, using skills to identify and manage the problems of stroke by using scientific principles. The association between painful shoulder and muscle imbalance suggests that a treatment approach designed to improve range of motion for a hemiplegic shoulder should lessen pain. However, aggressive exercises with a wide range of motion provoke much more intense pain than that experienced when doing exercises with a more limited range of motion, while active exercises are preferable to passive ones, exaggeratedly aggressive programmes may result in a higher incidence of painful hemiplegic shoulder compared with more moderate exercise programmes (Murie-Fernandez et al., 2012).

In United Kingdom (UK) a study of 297 patients with possible stroke were screened and stroke diagnosed in 205 cases. The 152 patients entered the study of which 123 patients were assessed up to 6 months. 52 (40%) patients developed shoulder pain on the same side of their stroke. There was a strong association between pain and abnormal shoulder joint examination, ipsilateral sensory abnormalities and arm weakness (Gamble et al., 2002).

In the Wellington region of New Zealand a study of 76 acutely admitted stroke patients, in this study the frequency of shoulder pain in the initial 12 weeks following stroke was assessed. Shoulder pain was assessed both at rest and on movement using vertically aligned visual analogue scales. 72% of patients experienced pain at some time in the first 12 weeks. The highest incidence (24% at rest and 58% on movement) was found at 10 weeks post-stroke, while the lowest incidence occurred in the first week following stroke 12% at rest and 35% on movement (Bender et al., 2001).

In Auckland a total of the 1761 people registered with a stroke, 1474 (83%) were alive and interviewed at one week, 1336 (76%) at one month and 1201 (68%) at six months. The proportion of people with stroke reporting shoulder pain increased as time passed from 256 (17%) at one week, to 261 (20%) at one month and 284 (23%) at six months. The survivors after one week who reported shoulder pain at one or more time points in the six months after stroke were 529/1349 (39%). Those with sensory motor deficit showed higher prevalence of shoulder pain when compared with those without sensory motor deficit: 225/1246 (18%) at one week, 208/873 (24%) at one month and 221/690 (32%) at six months (Ratnasabapathy et al., 2003).

In Sweden Shoulder pain onset within 4 months after stroke was reported by 71 patients (22%). Among the 61 patients able to score the visual analog scale, 79% had moderate–severe pain. Shoulder pain restricted daily life often or constantly when dressing for 51%/31% and when ambulating for 29%/13% of the patients at 4 and 16 months, respectively (Lindgren et al., 2006).

| CHAPTER-III: | METHODOLOGY |
|---|---|

## 3.1 Study design

A cross sectional study design was used. A cross sectional study was chosen as appropriate to find out the objectives. This design involved identifying group of people and then collecting the information that requires when they use the particular service. All the measurements on each person were made at one point in time. The data were collected all at the same time or within a short time frame. A cross-sectional design provided a snapshot of the variables included in the study, at one particular point in time (Fraenkel, 2000). The data was collected from the Neurology unit of physiotherapy department of CRP through a standard questionnaire.

## 3.2 Study site

The study was conducted at the Centre for the Rehabilitation of the Paralyzed (CRP) in Bangladesh.

## 3.3 Study area

The study was conducted at the Neurology unit of physiotherapy department ofCentre for the Rehabilitation of the Paralyzed (CRP).

## 3.4 Study population and Sample population

A population was the total group or set of events or totality of the observation on which a research was carried out. It was the group of interest to the research, the group whom the researcher would like to generalize the result of the study (Bailey, 1997). In this study the CVA patients in CRP was chosen as a sample population to carry out this study.About 62 samples were selected for this study.

## 3.5 Sampling technique

Sampling refers to the process of selecting the subjects/individual (Hicks, 1999). The convenience sampling method was used to draw out the sample from the population.

## 3.6 Sample size

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

Here,

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

P= 0.55

q = 1-p

  = 1-0.55

  = 0.45

d = 0.05

$\frac{z(1-\alpha/2)}{d}$ =confidence level at 95% (standard value of 1.96).

n = required sample size

p = prevalence of painful hemiplegic shoulder in literature 55%

q= (1-p)

d = margin of error at 5% (standard value of 0.05)

According to this formula of sample size calculation, the actual sample size was about 380 but due to the limitation of time only 62samples conveniently from the population for this study were selected.

## 3.7 Inclusion criteria

- Patient had stroke with hemiplegic shoulder were included.

## 3.8 Exclusion criteria

- Mentally ill & medically unstable patient.
- Patient suffered from serious pathological disease e.g. tumors, tuberosclerosis etc.

## 3.9 Data collection tools

Data was collected by using a standard questionnaire. In that time some other necessary materials are needed like pen, pencil, and white paper, clip board & note

book. Data was analyzed with the software named Statistical Package for Social Science (SPSS) version 16.0. Data was presented by using bar graph, pie chart and table.

## 3.10 Data management and analysis plan

The data that was collected is descriptive data. The graph technique were used for analyzing data, calculated as percentages, and presented this using bar and pie charts by SPSS (Statistical Package of Social Science) software version 16.0.SPSS is a comprehensive and flexible statistical analysis and data management solution. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and conduct complex statistical analysis.

## 3.11 Inform consent

Written consent (appendix) was given to all participants prior to completion of the questionnaire. The investigator explained to the participants about his or her role in this study. The investigator received a written consent form every participants including signature. So the participant assured that they could understand about the consent form and their participation was on voluntary basis. The participants were informed clearly that their information would be kept confidential. The investigator assured the participants that the study would not be harmful to them. It was explained that there might not a direct benefit from the study for the participants but in the future cases like them might get benefit from it. The participants had the rights to withdraw consent and discontinue participation at any time without prejudice to present or future care at the neurology unit of CRP. Information from this study was anonymously coded to ensure confidentiality and was not personally identified in any publication containing the result of this study.

## 3.12 Ethical consideration

A research proposal was submitted to the physiotherapy department of BHPI for approval and the proposal was approved by the faculty members and gave permission initially from the supervisor of the research project and from the course coordinator before conducting the study. The necessary information has been approved by the

ethical committee of CRP and was permitted to do this research. Also the necessary permission was taken from the in-charge of the rehabilitation division of CRP. The participants were explained about the purpose and goal of the study before collecting data from the participants. Pseudonyms were used in the notes, transcripts and throughout the study. It was ensured to the participants that the entire field notes, transcripts and all the necessary information was kept in a locker to maintain confidentiality and all information was destroyed after completion of the study. The participants were also assured that their comments will not affect them about any bad thing.

## 3.13 Limitations

In this study there were some limitations or barriers to consider the result of the study as follow:

The study took only 62 CVA patientsto find out the prevalence of painful shoulder among the hemiplegic patients, But this was very small number of sample size, as it is not possible to generalize the result for a wider population. A very few researches had been done on a few of neurological disorders, So there was little evidence to support the result of this project study in the context of Bangladesh. As the study was conducted at Centre for the Rehabilitation of the paralyzed (CRP) which may not represent the whole country.

The Purpose of this study was to explore the prevalence of Painful shoulder among thehemiplegic patients with CVA. Data were numerically coded and analysis the data by using an SPSS 16.0 version software program and the result captured in Microsoft Excel and calculated as percentages and presented by using bar chart, pie chart and in table.

**Prevalence of shoulder Pain**

In this study 62 participants with CVA were selected. Out of the 62 participants, 48 participants $(77.4\%)\left(\frac{48\times100}{62}\right)$ had shoulder pain and 14 participants $(22.6\%)$ had no shoulder pain.
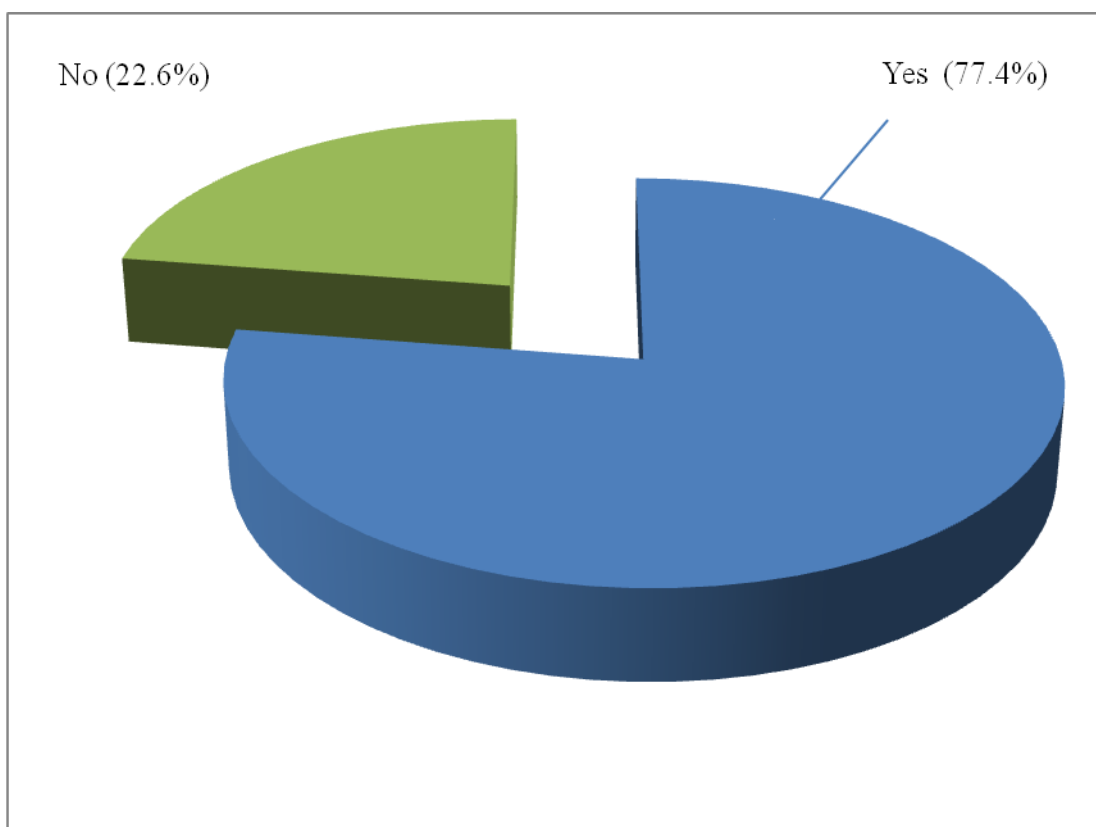


**Figure-1**: Prevalence of shoulder Pain among the participants

## Age group

62 participants with CVA were selected. Among them 48 (77.4%) participants had shoulder pain and mean age of the participants was 55.17 (±10.40) years. The age range of participants is (40-80) years. The vulnerable age range is (51-60) years for the development of pain among CVA patients.

Out of 62 participants 14 (22.6%) participants were pain free shoulder and mean age were 61.14 (±11.0) years.

| Age Group | Unaffected participants (n=14) | | Affected participants (n=48) | |
|---|---|---|---|---|
| | Number | Percentage (%) | Number | Percentage (%) |
| 40-50 | 3 | 4.8 | 16 | 25.7 |
| 51-60 | 5 | 8.1 | 21 | 34 |
| 61-70 | 2 | 3.2 | 8 | 12.9 |
| >70 | 4 | 6.5 | 3 | 4.8 |
| **Total** | **14** | **22.6** | **48** | **77.4** |

**Table-1:** Age range of the participants

**Gender**

The proportions of male subjects were higher than female. Out of 62 participants 48 participants had shoulder pain. Here 36 (75%) were male and 12 (25%) were female. Also 14 participants had no shoulder pain and here 12 (85.7%) were male and 2 (14.3%) were female. The study showed that male participants were more vulnerable then female participants.

| Gender | Unaffected participants (n=14) | | Affected participants (n=48) | |
|---|---|---|---|---|
| | Number | Percentage (%) | Number | Percentage (%) |
| Male | 12 | 85.7 | 36 | 75 |
| Female | 2 | 14.3 | 12 | 25 |
| **Total** | **14** | **100** | **48** | **100** |

**Table-2:** Gender distribution

**Cross tabulation between Age & Sex**

Among the 48 participants majority of the participants age range were 40 to 60 years and the number were 37 (77%) in which the proportions of male subjects were higher than female in number males 30 (62.5%) & females 7 (14.5%) and in age range between 61 to 80 years 11 (23%) participants were affected, among them 6 (12.5%) were males & 5 (10.5%) were females.

| Age Group | Gender | | Total | Percentage (%) |
|---|---|---|---|---|
| | Male | Female | | |
| 40 to 60 years | 30 | 7 | 37 | 77 |
| 61 to 80 years | 6 | 5 | 11 | 23 |
| **Total** | **36** | **12** | **48** | **100** |

**Table-3**: Cross tabulation between Age & Sex

**Religion**

Among the 48 participants41 participants were Islam, 6 participants were Hinduism and 1 participant was Buddhist. In percentage 85.4% participants were Islam, 12.5% participants were Hinduism and 2.1% participant was Buddhist.
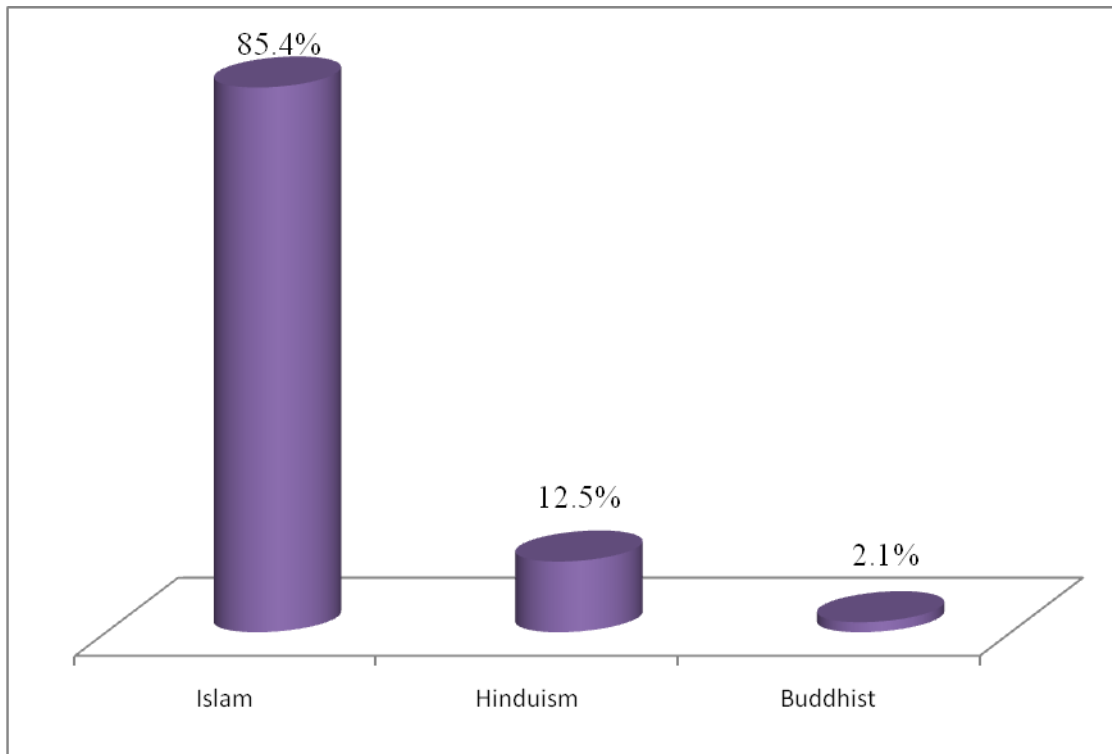


**Figure-2**: Religion of the Participants

## Severity of pain on numerical pain rating scale

48 participants had shoulder pain from CVA, the severity of pain in numerical pain rating scale was in between 1-4 was 83.3% (n=40) of affected group, 5-7 was 10.4% (n=5) and 8-10 was 6.3% (n=3) of affected participants.

| Severity in numerical pain ratingscale | Number (n) | Percentage (%) |
|---|---|---|
| 1-4 | 40 | 83.3 |
| 5-7 | 5 | 10.4 |
| 8-10 | 3 | 6.3 |
| **Total** | **48** | **100** |

**Table-4**: Severity of pain on numerical pain rating scale

## Behavior of pain

Among the 62 participants, majority of the participantshad intermittent shoulder painand the numbers were 44 (71.0%), 4 (6.4%) participants had constant shoulder pain and 14 (22.6%) participantshad no shoulder pain.

| Behavior of pain | Number (n) | Percentage (%) |
|---|---|---|
| Intermittent | 44 | 71 |
| Constant | 4 | 6.4 |
| Nopain | 14 | 22.6 |
| **Total** | **62** | **100** |

**Table-5:** Behavior of pain

**Cross tabulation between Severity of pain and behavior of pain**

Among the participants, majority of the participants had intermittent shoulder pain and the numbers were 44 and 4 participants had constant shoulder pain and in case of severity of pain in numerical pain rating scale 40 (83.3%) participants had (1-4) mild pain, 5 (10.4%) participants had moderate pain and 3 (6.3%) participants had severe (8-10) shoulder pain.

| Severity of pain on numerical pain rating scale | Behavior ofPain | | Total | Percentage (%) |
|---|---|---|---|---|
| | Intermittent | Constant | | |
| Mild (1-4) | 40 | 0 | 40 | 83.3 |
| Moderate (5-7) | 4 | 1 | 5 | 10.4 |
| Severe (8-10) | 0 | 3 | 3 | 6.3 |
| **Total** | **44** | **4** | **48** | **100** |

**Table-6:** Cross tabulation between Severity of pain and behavior of pain

**Educational Status**

Among the 48 participants had shoulder pain, majority of the participants had Junior school certificate and Bachelor or above and the numbers were 10 (20.8%) followed by those who had higher secondary education 9 (18.8%) and others 4 (8.3%) participants never attended school, 7 (14.6%) participants completed primary education, 7 (14.6%) participants completed secondary education and 1 (2.1%) participants had Masters or above.

Among unaffected participants 3 (21.4%0 participants hadno formal schooling, 1 (7.1%) participants had primary education, 2 (14.3%) participants completed JSC, 3 (21.4%) participants had completed SSC, 2 (14.3%) participants completed HSC, 2 (14.3%) participants had completed Bachelor and 1 (7.1%) participants had Masters completed.

| Educational level | Unaffected participants (n=14) | | Affected participants (n=48) | |
|---|---|---|---|---|
| | **Number** | **Percentage (%)** | **Number** | **Percentage (%)** |
| Illiterate | 3 | 21.4 | 4 | 8.3 |
| Primary | 1 | 7.1 | 7 | 14.6 |
| JSC | 2 | 14.3 | 10 | 20.8 |
| S.S.C | 3 | 21.4 | 7 | 14.6 |
| H.S.C | 2 | 14.3 | 9 | 18.8 |
| Bachelor | 2 | 14.3 | 10 | 20,8 |
| Masters | 1 | 7.1 | 1 | 2.1 |
| **Total** | **14** | **100** | **48** | **100** |

**Table-7:** Educational status of the participants

## Occupation

Result showed that among 48 participants who had shoulder pain 6.2% (n=3) were Agriculture, 2.1% (n=1) was driver, 22.9% (n=11) were businessman, 2.1% (n=1) were in day laborer,6.2% (n=3) were unemployed, 22.9% (n=11) were in house wife, 14.6% (n=7) were in teacher, 20.8% (n=10) were in job and 2.1% (n=1) were in factory workers,

And among the unaffectedparticipants 21.4% (n=3) were Agriculture, 21.4% (n=3) were businessman, 14.3% (n=2) were in house wife, 7.1% (n=1) were in teacher, 7.1% (n=1) were in rickshaw puller 28.6% (n=4) were in job.

| Occupation | Unaffectedparticipants (n=14) | | Affected participants (n=48) | |
|---|---|---|---|---|
| | Number | Percentage | Number | Percentage |
| Agriculture | 3 | 21.4 | 3 | 6.2 |
| Driver | 0 | 0 | 1 | 2.1 |
| Businessman | 3 | 21.4 | 11 | 22.9 |
| Day laborer | 0 | 0 | 1 | 2.1 |
| Unemployed | 0 | 0 | 3 | 6.2 |
| Housewife | 2 | 14.3 | 11 | 22.9 |
| Teacher | 1 | 7.1 | 7 | 14.6 |
| Rickshaw Puller | 1 | 7.1 | 0 | 0 |
| Factory Workers | 0 | 0 | 1 | 2.1 |
| Job | 4 | 28.6 | 10 | 20.8 |
| **Total** | **14** | **100** | **48** | **100** |

**Table-8:** Occupation of the participants

**Frequency of taking treatment**

Among the affected participants who had shoulder pain following CVA, 59.7% (n=37) participant took treatment and remaining 40.3% (n=25) participants did not take any treatment for their pain. Among participants who took treatment for their shoulder pain, 25.8% (n=16) affected participants took only medication, 12.9% (n=8) took only physiotherapy, 21% (n=13) affected participants took medication and physiotherapy, 40.3% (n=25) were not took any treatment.

| Treatment take or not | Type of treatment | Number (n) | Percentage (%) | Total |
|---|---|---|---|---|
| Yes | Medication | 16 | 25.8 | 59.7% |
| | Physiotherapy | 8 | 12.9 | |
| | Medication and Physiotherapy | 13 | 21 | |
| No | | 25 | 40.3 | 40.3% |

**Table-9:** Information about the available treatment for Shoulder pain among the participants

## Living areas

Among the affected participants who had shoulder pain from CVA, 62.5% (n=30) participants lived in rural area and 37.5% (n=18) participants lived in urban area.
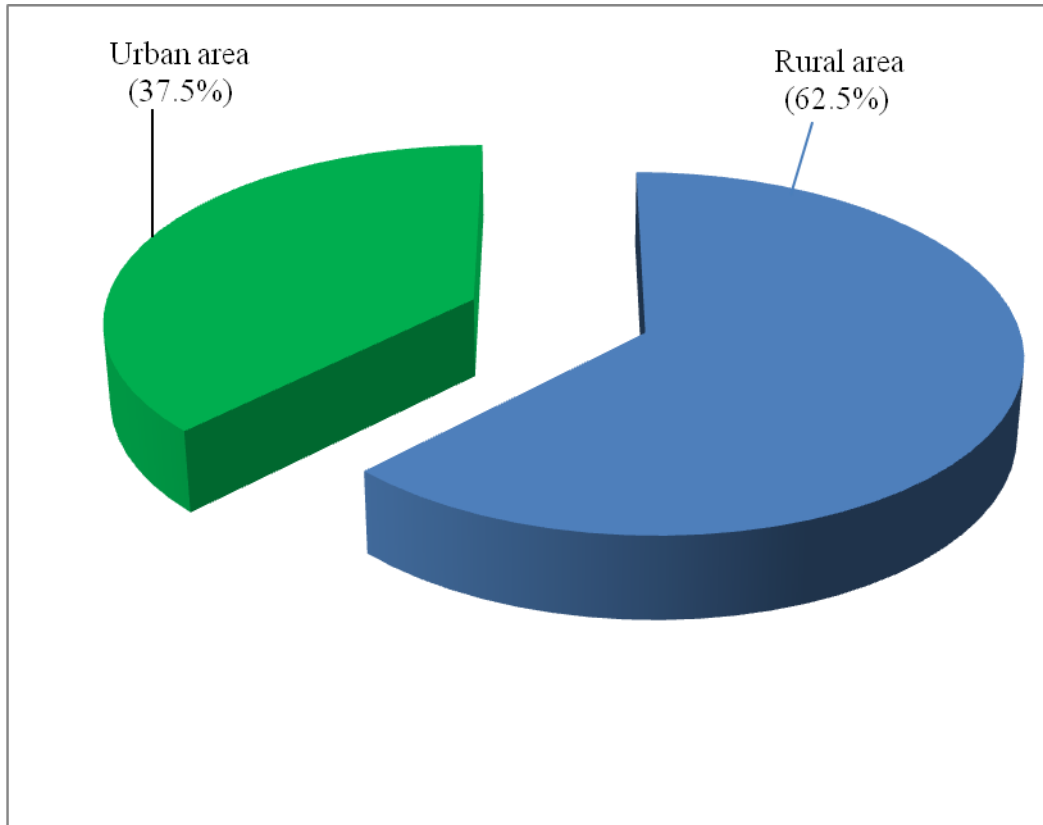
Urban area
(37.5%)

Rural area
(62.5%)

**Figure-3:** Living area of the participants

## Affected side

Among the 48 participants who had shoulder pain from CVA, 25 (52.1%) participants had left sided pain and 23 (47.9%) participants had Right side pain.
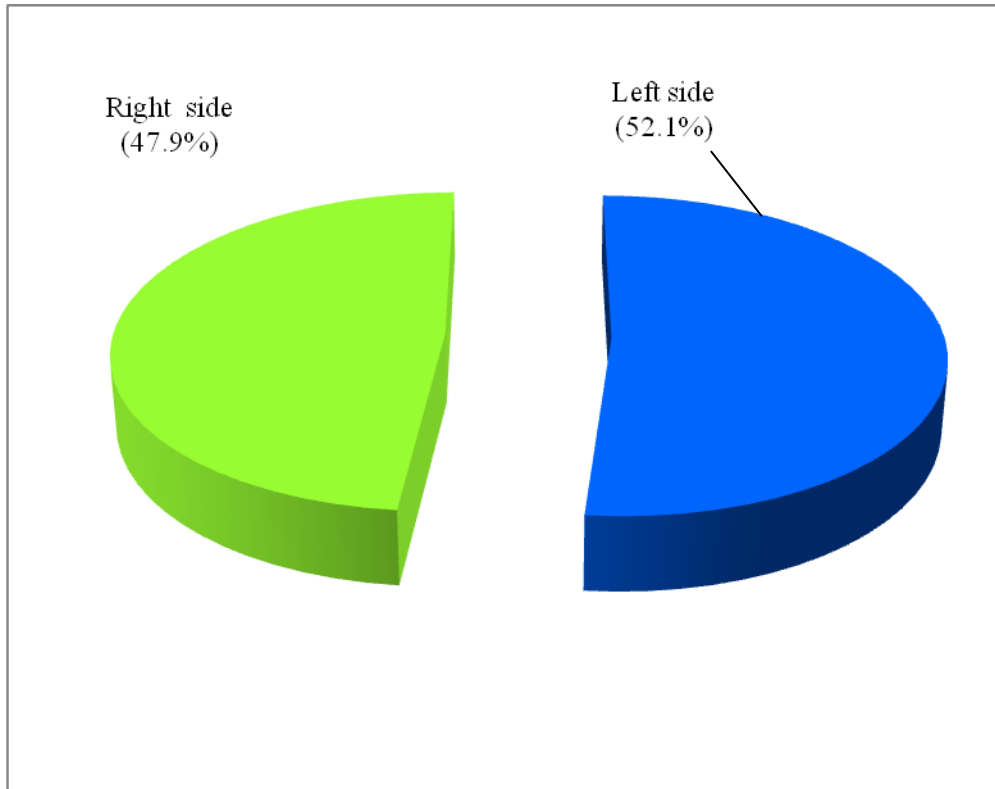


**Figure-4:** Affected side of the Participants

**Marital status**

Among the affected participants who had shoulder pain from CVA, 4.2% (n=2) were unmarried and 95.8% (n=46) were married.
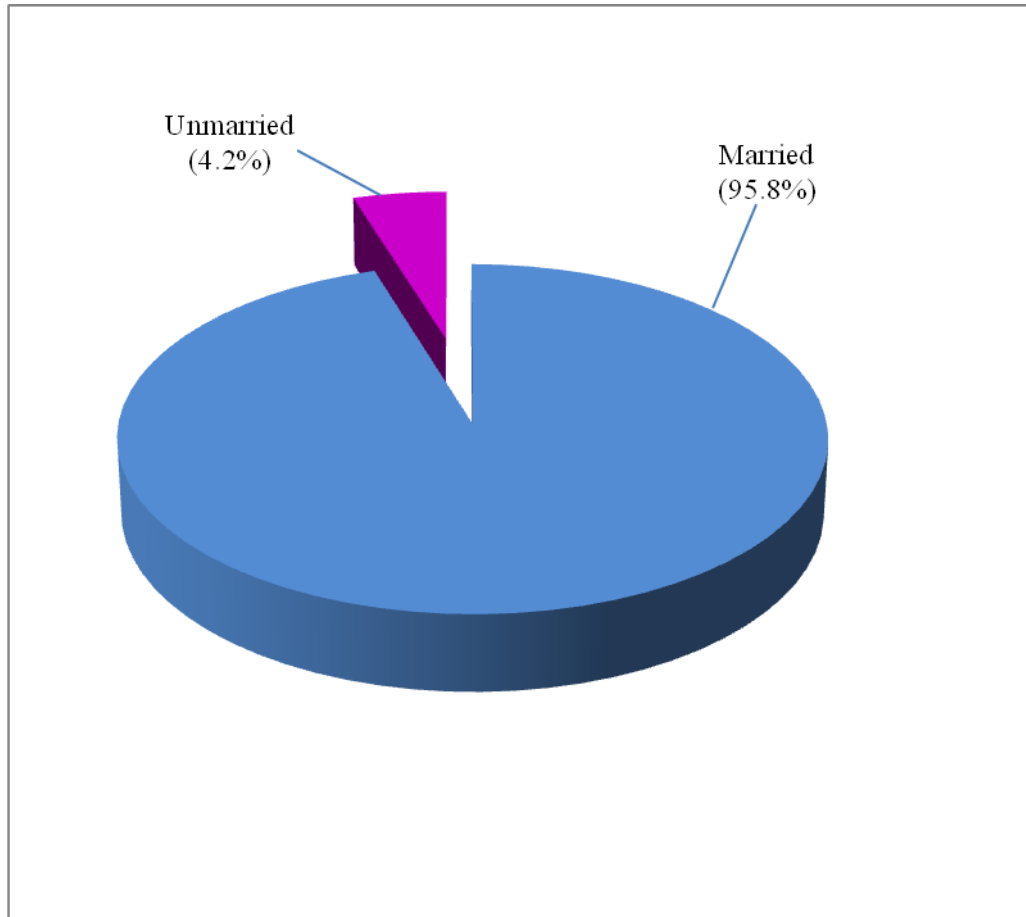


**Figure-5:** Marital status of the participants

## Past Medical history

Among the 48 participants, 70.8% (n=34) participants had history of hypertension and 2.1% (n=1) had only history of diabetes mellitus and 27.1% (n=13) had history of both hypertension & diabetes mellitus.
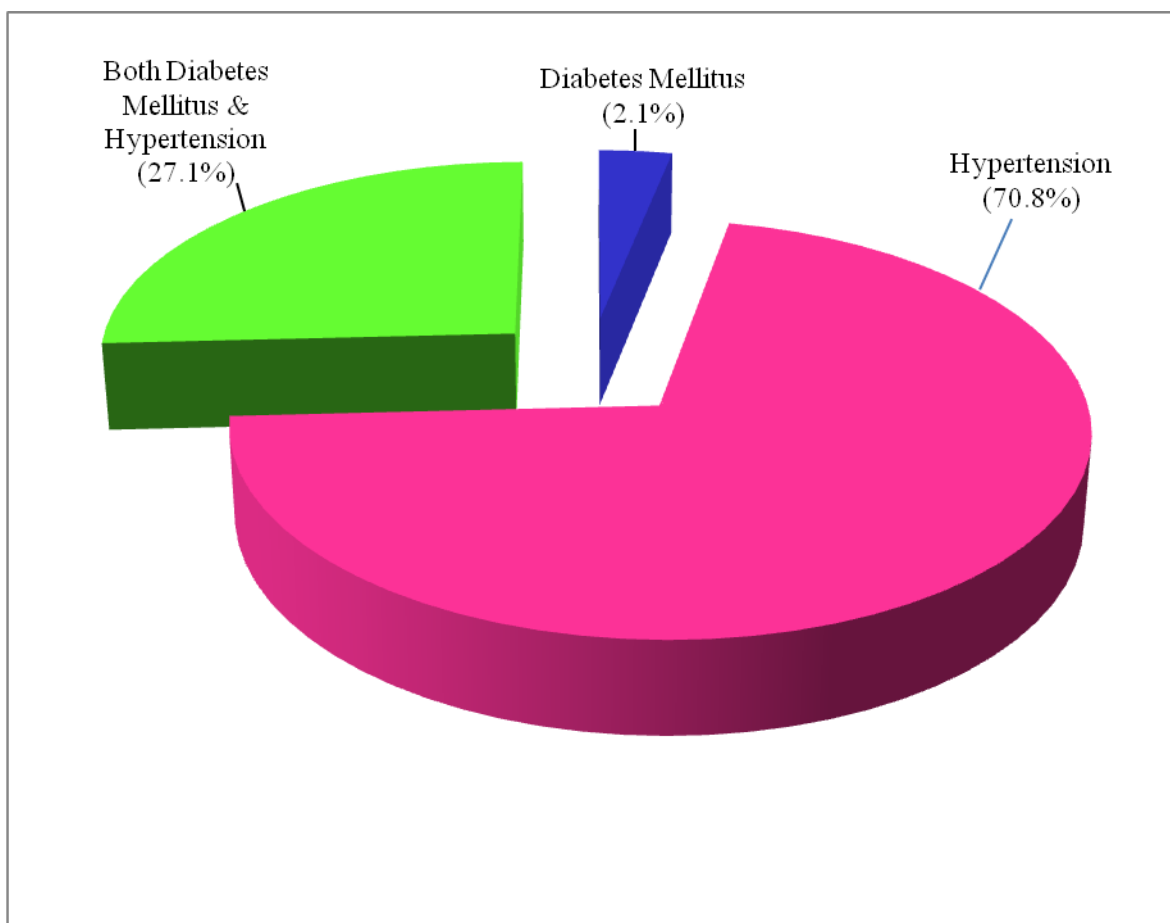


**Figure-6:** Past Medical history of the participants

| CHAPTER-V: | DISCUSSION |

A cross sectional study was used to find out the prevalence of shoulder pain among the patient with CVA.The result of this study showed that 77.4% patients had shoulder pain following CVA in neurology unit of CRP during the course of the study. Bender et al. (2001) stated that the prevalence of shoulder pain was 72% among the CVA patients in Wellington of New Zealand. In another study in UK showed that, among the123 patients with CVA, the prevalence of shoulder pain was 40% (Gamble et al., 2002).

In this study it was found thatamong the affected group most, of the CVA persons had intermittent shoulder pain and the numbers were 44 (71.0%), 4 (6.4%) participants had constant shoulder pain. In case of severity which was measured by using numerical pain rating scale, 1-4 (mild pain) was 83.3% (n=40) of affected group, 5-7 (moderate pain) was 10.4% (n=5) and 8-10 (severe pain) was 6.3% (n=3) of affected participants. The majority of participants who suffered from shoulder pain during the study severity of pain were mild in numerical pain rating Scale. At Lund University Hospital in Sweden a study about Prevalence and intensity of pain after stroke by Jonsson et al. (2006) showed that 30% participants had constant pain and 68% participants had intermittent pain. In NPR scale Moderate to severe pain was reported by 96 patients (32%) only 62 patients (21%) had moderate to severe pain.

This study showed that the rural participants were more affected than the urban, among the affected group 62.5% (n=30) participants lived in rural and 37.5% (n=18) participants lived in urban area.A hospital based cross sectional study was carried out at Faridpur Medical College in Bangladesh reported that Patients in urban areas are more prone (54%) to stroke than rural (46%) areas (Hossain et al., 2011).

Analysis showed that Male were predominantly higher than female. Out of 48 participants n=36 (75%) were male and n=12 (25%) were female, who had shoulder pain after CVA. English et al. (2008) stated that majority of participants were male 41 (60.3%) who had shoulder pain and 27 (39.7%) female in Australia.

In this study it was found that shoulder pain among the CVA patients was more common in ≤6o years and the number were n=37 (77%) and ≥60 were n=11 (23%). Out of the participants the mean age of the participants was 55.17 (±10.40) years. The range is 40 with minimum age 40 years and maximum 80 years. Joy et al. (2012)stated thatfrequency of shoulder pain among stroke patient's rises exponentially with increasing ages. A Hospital Based Study was carried outin India among the 109 patients reported that 61.5% (n=67) were males while 38.5% (n=42) were females. Mean age group was 55.2 (±10.4) years. The range is (41-80) years. Maximum number of patients belonged to the age group 51-60 years 34%(n=21)while minimum was in the age group > 70 years 4.8% (n=3).

The study showed that majority of the participants had some secondary education and Bachelor or above and the numbers were 10 (20.8%) followed by those who had higher secondary education 9 (18.8%) and others 4 (8.3%) participants were Illiterate those who had shoulder pain after CVA. Hossain et al. (2011) stated that service holder (28%) and retired person (21%) were the highest groups and most of the study subjects were literate (63%) in Bangladesh.

Analysis showed that 70.8% (n=34) participants had history of hypertension and 2.1% (n=1) had only history of Diabetes Mellitus and 27.1% (n=13) had history of both Hypertension & Diabetes Mellitus among the CVA patient with shoulder pain. A hospital based cross sectional study was carried out in Bangladesh reported that 63% of the stroke patients were suffering from hypertension (Hossain et al., 2011).

This study showed that left sided painful shoulder among hemiplegic patients were more affected than right side hemiplegic patients. In percentage Left side 52.1% (n=25) and right side 47.9% (n=23). According to Joy et al. (2012) stated that Left sided hemiplegia was seen more than the right side in India. In percentage Left side 58.8% and right side 42.2%.

# CHAPTER-VI:    CONCLUSION AND RECOMMENDATIONS

## 6.1 Conclusion

CVA is one of the foremost 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 crystal clear that, this devastating condition not only affects the patient but also their family. Hemiplegic shoulder pain (HSP) is a major problem in stroke patients. It tends to occur within two weeks of the cerebral event. Literature showed that 16%-72% patients developed shoulder pain after CVA. The prevalence and consequences of shoulder pain is higher in the working group in comparison with the non-working population and most of them were males. From this study, it was found that (77.4%) patients suffer from shoulder pain after stroke in our country. Among these most of them had been suffered from mild to moderate pain 83.3%, rather than the severe shoulder pain and males (75%) were more affected than females. 59.7% patients took treatment for their shoulder pain among this only 12.9% took physiotherapy and 25.8% took medication and 21% took both medication & physiotherapy. The investigator had tries to show the prevalence and characteristic of shoulder pain among the CVA patients and the possible risk factors for the shoulder pain according to participants view. According to the participant view some socio-demographic characteristic (age, living area and marital status) among the CVA patients.

## 6.2 Recommendations

The purpose of the study was to find out the prevalence of shoulder pain among the CVA patients. Though the study had some limitations but some further step that might be taken for the better accomplishment of further research.The main recommendations would be as follow:

- The random sampling technique rather than the convenient would be chosen in further in order to enabling the power of generalization the results.
- The duration of the study was short, so in future wider time would be taken for conducting the study.
- Only 62 participants as the sample of this study were selected, in future the sample size would be more.
- The ratio of rural and urban participants were not equal, in case of further the equality of the rural and urban participant should be maintained for the accuracy of the result.
- In this study, the patients were selected only from one selected area of CRP as a sample for the study. So for further study investigator strongly recommended to include the patients from all over the Bangladesh to ensure the generalizability of this study.

# REFERENCES

- Ada, L., and Foongchomcheay, A., (2002). Efficacy of electrical stimulation in preventing or reducing subluxation of the shoulder after stroke: A meta-analysis. Australian Journal of Physiotherapy,48: 257-267.

- Bailey, D.M., (1997). Research for the health professional: A Practical Guide, 2nd edition, Philadelphia.

- Bamford, J., Sandercock, P., Dennis, M., Warlow, C., Jones, L., Mcpherson, K., Vessey, M., Fowler, G., Molyneux, A., Hughes, T., Burn, J., and Wade, D., (1988). A prospective study of acute cerebrovascular disease in the community: the Oxfordshire Community Stroke Project, Methodology, demography and incident cases of first-ever stroke. Journal of Neurology, Neurosurgery & Psychiatry, 51: 1373–80.

- Bender, L., and Mckenna, K., (2001). Hemiplegic shoulder pain: defining the problem and its management. Disability and Rehabilitation, 23(16):698-705.

- Brocklehurst, J.G., Andrews, K., and Richards, B., (1978). How much physical therapy for patients with stroke? British Medical Journal, 1:1307-1310.

- Dean, M.C., Mackey, H.F., and Katrak, P., (2000). Examination of shoulder positioning after stroke: A randomised controlled pilot trial. Australian Journal of Physiotherapy, 46: 35-40.

- English, C., Hillier, S., and Stiller, K., (2008). Incidence and severity of shoulder pain does not increase with the use of circuit class therapy during inpatient stroke rehabilitation: a controlled trial. Australian Journal of Physiotherapy, 54:41-46.

- Fraenkel, J.R., (2000). How to design and evaluate research in education, 4th edition, McGraw-Hill Company.

- Gamble, E.G., Barberan, E., Laasch, H., Bowsher, D., Tyrrell, J.P., and Jones, P.K.A., (2002). Poststroke shoulder pain: a prospective study of the association and risk factors in 152 patients from a consecutive cohort of 205 patients presenting with stroke. European Journal of Pain, 66:92-96.

- Griffin, W.J., (1986). Hemiplegic Shoulder Pain. American Journal of Physical Therapy, 66:1884-1893.

- Hicks, C.M., (1999). Research methods for clinical therapists, applied project design and analysis, 3rd edition, Churchill Livingstone.

- Hossain, A.M., Ahmed, N.U., Rahman, M., Islam, M.R., Sadhya, G., and Fatema, K., (2011). Analysis of Sociodemographic and Clinical Factors Associated with Hospitalized Stroke Patients of Bangladesh. Journal of Faridpur Medical College, 6(1):19-23.

- Huang, Y., Liang, P., Pong, Y., Leong, C., and Tseng, C., (2010). Physical findings and sonography of hemiplegic shoulder in patients after acute stroke during rehabilitation. Journalof RehabilitationMedicine, 42:21–26.

- Jonsson, A., Lindgren, I., Hallstrom, B., Norrving, B., and Lindgren, A., (2006). Prevalence and intensity of pain after stroke: a population based study focusing on patients'perspectives. Journal of Neurology, Neurosurgery & Psychiatry, 77:590–595.

- Joy A.K., Ozukum, I., Nilachandra, L., Khelendro, T., Nandabir, Y., and Kunjabasi, W., (2012). Prevalence of Hemiplegic Shoulder Pain in Post stroke Patients – A Hospital Based Study. Indian Journal of Physical Medicine and Rehabilitation, 23(1):15-9.

- Kalichman, L., and Ratmansky, M., (2011). Underlying pathology and associated factors of hemiplegic shoulder pain. AmericanJournal of Physical Medicine &Rehabilitation,90: 768–80.

- Klit, H., Finnerup, N., Overvad, K., Andersen, G., and Jensen, T., (2011). Pain Following Stroke: A Population-Based Follow-Up Study. Open accesspeer-reviewedscientific journal, 6(11):27607.

- Lindgren, I.,Jonsson, A.,Norrving, B., and Lindgren, A., (2006). Shoulder Pain After Stroke A Prospective Population-Based Study. Journal of American Stroke Association, Available: <http://ingrid.a. lindgren@skane.se> [accessed on 15 April 2013].

- Masiero, S., Celia, A., Rosati, G., Armani, M., (2007). Robotic-assisted rehabilitation of the upper limb after acute stroke. Archives of PhysicalMedicine and Rehabilitation, 88:142.

- Mohammad, Q.D., (2001). Stroke: Prevention and treatment in the new millennium.1st National Conference and scientific seminar, 1st Dhaka Sheraton Hotel, Bangladesh, 4th May Society of Neurologist of Bangladesh.

- Murie-Fernandez, M., Iragui C.M., Gnanakumar, V., Meyer, M., Foley, N., and Teasell, R., (2012). Painful hemiplegic shoulder in stroke patients: Causes and management.Neurologia, 27(4):234—244.

- Niessen, M., Janssen, T., Meskers, C., Koppe, P., Konijnenbelt, M., and Veeger, J.D., (2008). Kinematics of the Contralateral and IpsilateralSholder: a Possible Relationship with Post-stroke Shoulder Pain. Journal of Rehabilitation Medicine, 40: 482–486.

- Paci, M., Nannetti, L., and Rinaldi. A.L., (2005). Glenohumeral subluxation in hemiplegia: An overview. Journal of Rehabilitation Research & Development, 42 (4):557–568.

- Pong, Y., Wang, L., Huang, Y., Leong, C., Liaw, M., and Chen, H., (2012). Sonography and physical findings in stroke patients with hemiplegic shoulders: A longitudinal study. Journal of Rehabilitation Medicine, 44: 553–557.

- Rabin, A.B., Burdea, C.G., Roll, T.D., Hundal, S.J., Damiani, F., and Pollack, S., (2012). Integrative rehabilitation of elderly stroke survivors: The design and evaluation of the Bright Arm Technology. Disability and Rehabilitation: Assistive Technology, 7(4):323–335.

- Ratnasabapathy, Y., Broad, J., Baskett, J., Pledger, M., Marshall, J., and Bonita, R., (2003). Shoulder pain in people with a stroke: a population-based study. Clinical Rehabilitation, 17:304.

- Rice-Oxley, M., and Turner-Stokes, L., (1999). Effectiveness of brain injury rehabilitation. Clinical Rehabilitation, 13:7.

- Ryerson, S., and Levit, K., (1997). The shoulder in hemiplegia. In Donatelli Physical therapy of the shoulder, 3rd edition. New York: Churchill Livingstone, 205 - 227.

- Singh, D., Pokhriyal, B., Joshi, M.Y., and Kadam, V., (2012). Prevalence, Symptoms, Risk factors and Maintenance of Cerebral Stroke: A Review. International Journal of Research in Pharmacy and Chemistry, 2(3): 2231-2781.

- Taylor, C.F., (2010). Stroke in India. South Asia Network for Chronic Disease, Available: <http//www.sancd.org/uploads/pdf/factsheet_Stroke.pdf> [accessed on 22 Jan 2013].

- Turner-Stokes, L., and Jackson, D., (2002). Shoulder pain after stroke: a review of the evidence base to inform the development of an integrated care pathway Clinical Rehabilitation, 16:276.

- Van Langenberghe, H.V.K., Partridge, C.J., Edwards, M.S., andMee, R., (1988).Shoulder pain in hemiplegia-a literature review. Physiotherapy Practice, 4:155-162.

- Walsh, K., (2001). Management of shoulder pain in patients with stroke. Postgraduate Medical journal, 77:645-649.

- Ward, (2007). Hemiplegic shoulder pain. Journal of Neurology Neurosurgery and Psychiatry,78:789.

- Warlow, C., Gijn, J., Dennis, M., Wardlaw, J., Bamford, J., Hankey, G., Sandercock, P., Rinkel, G., Langhorne, P., and Rothwell, P., (1996). Stroke: a practical guide to management. Oxford: BlackwellScience.

- Yelnik, P.A., Colle, M.F., Bonan, V.I., and Vicaut, E., (2007). Treatment of shoulder pain in spastic hemiplegia by reducing spasticity of the subscapular muscle: a randomised, double blind, placebo controlled study of botulinum toxin A. Journal of Neurology, Neurosurgery & Psychiatry, 78:845–848.

## Permission letter

To

Head of the Department

Department of Physiotherapy

Center for the Rehabilitation of the Paralyzed (CRP),

Savar, Dhaka -1343.

Subject: Application for permission of data collection at Neurology unit.

Sir,

I respectfully state that I am Abdullah Al Masud student of fourth year B. Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). In to do fourth year course curriculum we have do a research project. I have chosen a research title that is "Prevalence of painful hemiplegic shoulder among the patient with Cerebrovascular Accident (CVA)". For this reason, I need permission for collect data from the CRP Neurology unit at Savar.

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

Yours faithfully

*Abdullah Al Masud.*

Abdullah Al Masud

4th year B.Sc. in Physiotherapy

Session: 2007-2008

BHPI, CRP, Savar, Dhaka-1343

Date: *24 March, 2013*

# VERBAL CONSENT STATEMENT

## (Please read out to the participants)

Assalamualaikum/Namasker, my name is Abdullah Al Masud, I am conducting this study for a Bsc in Physiotherapy project study dissertation titled "Prevalence of Painful shoulder among thehemiplegic patient with CVA" under Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related information regarding Stroke. You will perform some tasks which are mention in this form. This will take approximately 15-20 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. The study is not directly related with this stroke area, so your participation in the research will have no impact on your present or future treatment in Neurology unit. 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 and also all information will be destroyed after completion of the study. 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 me, and/orMuhammad RezaulKarim, Lecturer Department of Physiotherapy, CRP, Savar, Dhaka.

Do you have any questions before I start?

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

Yes ☐

No ☐

Signature of the Participant _____ Date _____

Signature of the Interviewer _____Date _____

# Title: Prevalence of painful shoulder among the hemiplegic patient with Cerebrovascular Accident (CVA)

## Questionnaire

| Interview Schedule | | |
|---|---|---|
| **Part I : Patient's Identification** | | |
| (to be provided by patient or attendant) | | |
| Identification number:Date of interview: | | |
| Name: | | |
| Address :                           Contact number: | | |
| **Part II : Patient's Socio-demographic Information** | | |
| (To be collected from Record/ Care provider) | | |
| **QN** | **Questions and filters** | **Responses** |
| **2.1** | Age (in years): | \|__\|__\| yrs |
| **2.2** | Sex: | 1=Male<br>2=Female |
| **2.3** | Marital status: | 1=Married<br>2=Unmarried<br>3=Divorced<br>4=Separated<br>5=Widow |
| **2.4** | Religion: | 1=Islam<br>2=Hinduism<br>3=Christianity<br>4=Buddhist |
| **2.5** | Educational status: | 1=Illiterate<br>2=Literate<br>3=Primary<br>4=Junior school certificate (JSC)<br>5=Secondary school certificat(SSC)<br>6=Higher secondary certificate(HSC)<br>7=Bachelor or above<br>8=Masters or above<br>9=Other (Specify)…. |

| 2.6 | Occupations: | 1=Rickshaw puller |
|------|--------------|-------------------|
| | | 2=Agriculture |
| | | 3=Factory/garments worker |
| | | 4=Driver |
| | | 5=Businessman |
| | | 6=Day laborer |
| | | 7=Unemployed |
| | | 8=Housewife |
| | | 9=Student |
| | | 10=Teacher |
| | | 11=Other (Specify):_____ |
| 2.7 | Average monthly family income: | _____ (*Taka*) |
| 2.8 | Earning member: \|__\|__ | 1=Himself |
| | | 2=Others (specify)………………… |
| 2.9 | Residential Area: | 1=Rural |
| | | 2=Urban |
| 3.0 | Family type: | 1=Nuclear family |
| | | 2=Extended family |
| **Part-III: Physiotherapy related Information** | |
| | **(To be collected from patient/ Care provider/Clinical examination)** | |
| 3.1 | Types of stroke: | 1= Hemorrhagic |
| | | 2= Ischemic |
| 3.2 | Affected side: | 1=Right |
| | | 2=Left |
| 3.3 | Have you feel any pain on your affected shoulder? | 1= Yes |
| | | 2= No |
| 3.4 | How long do you suffer your current shoulder pain? | DD/MM/YY |
| | | 1=Days……………. |
| | | 2=Months…………. |
| | | 3=Years…………… |

| 3.5 | What is the behavior of your pain? | 1=Intermittent<br>2= Constant<br>3= Not applicable |
|-----|-----------------------------------|---------------------------------------------------|
| 3.6 | How severe is your pain on NPR scale? | 1=1-4<br>2=5-7<br>3=8-10<br>4=Not applicable |
| 3.7 | Do you feel any pain during over head activity | 1=Never<br>2=Sometime<br>3=Often<br>4=All time |
| 3.8 | Does the Pain hamper on your work? | 1= yes<br>2= No<br>**If answer is Yes, please answer 3.9** |
| 3.9 | How long you off work due to pain? | DD/MM/YY<br>1=Days…………….<br>2= Months………….<br>3=Years…………… |
| 4.0 | Past medical history | 1=Diabetes Mellitus<br>2=Hypertension<br>3=Previous shoulder injury |
| 4.1 | Did you get any treatment for Shoulder pain after stroke? | 1= Yes<br>2=No<br>**If answer is Yes, please answer 4.2** |
| 4.2 | What type of Intervention have you taken? | 1=Medication<br>2=Physiotherapy<br>3=Other (Specify……..) |

-------------------------------------------------

**Thank you for your assistance……….**