

**PREVALENCE OF SHOULDER SUBLUXATION AMONG THE
STROKE PATIENTS ATTENDED AT CRP**

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Bachelor of Science in Physiotherapy (BSc.PT)

Session: 2005-2006

BHPI, CRP, Savar, Dhaka



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We the under signed 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 SHOULDER SUBLUXATION AMONG THE
STROKE PATIENTS AT CRP**

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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 decline that for any publication, presentation or dissemination of information of the study. I would be bound to take written consent of my supervisor.

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ABBREVIATIONS

ADL:	Activities of Daily Living
BHPI:	Bangladesh Health Professions Institute
CRP:	Center for the Rehabilitation of the Paralyzed
CVA:	Cardio Vascular Accident
SPSS:	Statistical Package of Social Science
WHO:	World Health Organization

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Abstract

Purpose: To identify the prevalence of shoulder subluxation among the stroke patients attended at CRP. *Objectives:* To find out the prevalence of shoulder subluxation among the stroke patients, to identify the male female ratio ,to identify the more affected age group, to find the occupation of patients with shoulder subluxation, to find out the past medical history among the patients with shoulder subluxation. *Methodology:* A quantitative cross-sectional study design was chosen to accomplish the objectives of the study. 35 subjects were selected through simple random sampling technique from the outpatient's neurology physiotherapy department of CRP. A structural questionnaire was developed through searching of literature. The participants were requested to answer according to the developed format of the question. The answers were entered into SPSS 16 software and analyzed as descriptive statistics. *Results:* The study showed that 62.85% (n=22) participants had shoulder subluxation among the stroke patients. Their mean age was 54 ± 8.4 . The most of the participants 31.82% (n=7) who had shoulder subluxation in between 53-60 years of age group among them most of the participants 27.27% (n=6) were service holder and 63.64% (n=14) were male. More than half of the participants 54.55% (n=12) came from urban area and 54.55% (n=12) participants had hemorrhagic stroke among stroke patients who had shoulder subluxation. 68.18% (n=15) had the history of hypertension, 31.82% (n=7) had diabetes mellitus, 77.27% (n=17) had no past history of physical exercises and 59.09% (n=13) had history of mal handling among the stroke patients with shoulder subluxation. *Conclusion:* The result of the study demonstrates that the prevalence of shoulder subluxation was 62.85% (n=22) and they had certain positive exposure including diabetes mellitus, hypertension, history of mal handling, no past history of physical exercise.

1.1 Background

The brain is an exciting area in neurology as it is complex in anatomy and in function. With the advancement of age in addition to decay, the brain becomes more prone to get many complicated life threatening diseases, these will need appropriate attention in time. Stroke is one of such condition which is the burning topic in this new millennium since it is not only a major killer but also a cause of disability in the world as well as in Bangladesh (Mohammad, 2011).

“Stroke has afflicted man kind since earliest times. Studying the remains of ancient Egyptian mummies has shown that individuals of this era suffered strokes. In the past, strokes were referred to as apoplexy meaning a sudden shock to the senses. Hippocrates, the father of western medicine, wrote: “It is impossible to remove a stroke attack of apoplexy and not easy to remove a weak attack”, this bleak statement demonstrates the pessimistic view once held about strokes, but much has changed since Hippocrates time. Having a stroke does not mean that one should give up all hope and be resigned to a life of disability. Modern and surgical techniques, state of the art rehabilitation programs and knowledge of risk factors control now make this even truer (Bierman, 2009).

But now, in our country the real situation is totally different. Every year the number of attack is increasing cerebrovascular disease or stroke is the first major cause of death resulted from neurological diseases and the most frequent cause of all death cases. At least 50% of neurological disorders in a general hospital are strokes. A study shows that, stroke is more common in male and above the age of 50 years where male to female ratio is 2.3:1, and death due to stroke is 34.74% of all death cases (Rahman, et al. 2002).

So before taking a critical situation and to prevent disability resulted from stroke a multidisciplinary team approach should start working, where this will consist of 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 a definite role in stroke which should be started as early as possible (Mohammad, 2011).

To manage inferior subluxed hemiplegic shoulder in patient with CVA, physiotherapists use different treatment techniques of different approaches. Two different proprioceptive facilitator's techniques (therapeutic vibration and heavy joint compression) of Roods approach have been selected in this study. Physiotherapists usually use these techniques along with other techniques in the management of subluxed hemiplegic shoulder in patient with CVA. This study examines the effects of therapeutic vibration and heavy joint compression as treatment of inferior subluxed hemiplegic subluxed hemiplegic shoulder in patient with CVA. To identify effectiveness of both heavy joint compression and therapeutic vibration as a treatment in the case of subluxed shoulder of hemiplegic patient. To find out treatment technique that is better for the patient of subluxed shoulder for maximum achievement (Hansen & Atchinson, 2002).

In the case of shoulder subluxation of hemiplegic patient many treatment techniques are applied. The duration to get improvement differs in the case of each of the different techniques. If occupational therapist knows the effectiveness of these two treatment techniques, it will be easy to compare the results and find out which is the better treatment technique. This will be less time consuming as well as helpful for the patient. No research has been found on this area and for the development of profession, this type of clinical study is important situation. It can be used as evidence for using the appropriate treatment technique for the hemiplegic patient with shoulder subluxation. To measure the effectiveness of heavy joint compression and therapeutic vibration as a treatment in the case of subluxed shoulder of hemiplegic patient. To compare both results of heavy joint compression and therapeutic vibration to find out the technique with the maximum outcome (Mohammad, 2011).

1.2 Justification of the study

Although some studies have dealt with shoulder subluxation among the stroke patients in other countries, the exact nature and prevalence of this important health problem has not been studied before in Bangladesh. This study was formulated to fill the gap of knowledge in this area. The aims of the study were to assess the pattern of shoulder among stroke patients and to identify the impact of demographic, occupational, psychological and social factors on them. Beside this it will help to established right guidelines for patients, equipment and environmental conditions which are mandatory for stroke patients. This study will also help to discover the lacking area of a career, especially about their posture before doing any activities. Beside this it will help to professional development which is mandatory for current situation. The identification of prevalence of shoulder subluxation gives proper education about stroke and shoulder subluxation. It will help to discover the role and importance of physiotherapy in every sector of Bangladesh.

1.3 Research Question

What is the prevalence of shoulder subluxation among the stroke patients?

1.4 Study objective

General objective:

- To identify the prevalence of shoulder Subluxation among the stroke patients.

Specific objectives:

- To find out the prevalence of shoulder subluxation among the stroke patients.
- To identify the male female ratio
- To identify the more affected age group.
- To find the occupation of patients with shoulder subluxation.
- To find out the past medical history among the patients with shoulder subluxation.
- To identify the influencing demographic factors for such exposure group in relation to age, sex, occupation, living area, past medical history, past history of mal handling, past history of physical exercises

The importance of the reorganization of the cortico spinal tract (CST) originating from the damaged hemisphere for recovery of hand function has implications for the development of physiotherapy programs for stroke patients. Reorganization within the CNS (central nervous system) must be due to some form of synaptic plasticity. The synaptic changes underlying the recovery process may be similar to those that are responsible for learning. Enhanced synaptic transmission has been postulated as a mechanism for learning and memory processes. Synapses are strengthened when afferent fibers receive repetitive input. The repetitive input induces molecular changes in pre synaptic and post synaptic terminals which in turn change their effectiveness. Similarly, the molecular that occur to change the strength of synapses may also lead to an increase or decrease in the number of pre synaptic terminals. If therapy was directed at repeatedly accessing the corticospinal neurons and their connections remaining in the damaged hemisphere after stroke, the recovery of patients hand function may be improved (Turton, 2010).

Cerebral vascular accident (CVA) or stroke is the most common disabling neurological disease of adulthood. (Pedretti, 2007). It may be defined as an interruption in the blood flow so that an adequate supply of oxygen and nutrients fail to reach portion of the brain. Medical practitioners use the term cerebrovascular accident, often abbreviated as CVA, for stroke. A stroke can occur in any part of the brain the cerebral hemispheres, the cerebellum or the brainstem (Bierman, 2009). A cerebrovascular accident is a rapidly developed clinical sign of a focal disturbance of cerebral function of presumed vascular origin and of more than 24 hours duration (WHO, 1986 cited in Turner, Foster, and Johnson, 1996). Clinical signs of stroke develop suddenly due to interruption of blood flow to the brain and lasts more than 24 hours. Warlow (2010) defined the stroke or CVA as rapidly developing clinical symptoms and or signs of focal time's global loss of cerebral function with symptoms lasting more than 24 hours leading to death with no apparent cause other than that vascular origin. World health Organization (WHO) supports this definition of CVA. When the severity of stroke last less than 24 hours, it is known as transient ischemic

attack (TIA).it is not a stroke but a warning for a forthcoming stroke. In TIA no symptoms are found (Pedretti, 2007). Stroke or cerebrovascular accident (CVA) does not represent a single disorder but rather a variety of disorders characterized by the sudden onset of neurological deficits brought about by vascular injury to the brain (Rolo & Rokey, 1990). The most typical manifestation of CVA is hemiparesis or hemiplegia on the side of the body contralateral to the site of CVA. One study on the people of Bangladesh shows that the 75.59% of all stroke patients are men and 24.1% are women where due to large artery atherosclerosis 21.25%, small artery occlusion 17.32%, cardio embolism 18.1% other determined etiology 26.7% and undetermined causes 16.53% (Hayee et al.,2002). Stroke can be classified into two main types- Ischemic and Hemorrhagic. Ischemic stroke includes atherothrombotic, lacunar and embolic infarction .Hemorrhagic stroke includes intracerebral and subarachnoid hemorrhage (Warlow, 1993).

Ischemic stroke

The most common type of stroke and it is responsible for about 80% of all first ever in a life time stroke (Warlow, 1993). This takes place when a clot blocks blood vessels or become too narrow for blood to flow within the brain due to reduction in blood supply, brain cells die from lack of oxygen (Nayan, 2003).

Atherothrombotic

Cerebral thrombosis occurs when a blood clot forms in one of the arteries supplying the brain, causing vascular obstruction at the point of its formation. The size and location of the infarct depends on which vessel is occluded and the amount of collateral circulation. Thrombosis occurs most frequently in blood vessels that have already been damaged by atherosclerosis (an abnormal condition of the arteries in which a thick, rough deposit forms on the inner wall of the arteries and gradually narrows the passageway so that the blood flow slowed). Large vessel atherosclerosis accounts for 60% of ischemic stroke (Pedretti, 2007).

Lacunar

These are small infarcts usually lying in the deep neocortical parts of the cerebrum and brainstems including the basal ganglia, thalamus , Pons, internal capsule and deep white matter . Within a few months of onset of a lacunar stroke, a small cavity is left. It results from an occlusion of small branches of large cerebral arteries-middle cerebral, posterior cerebral,basilar, and a lesser extent ,anterior cerebral and vertebral arteries. Lacunar infarcts range in size from 2 to 15 mm. due to their small size, usually only minimal neurological symptom result and may go undetected .statistics shows that about 18% of ischemic stroke are lacunar (Warlow, 1993).

Embolism

Embolism occurs when a clot that has been formed elsewhere (thrombus) breaks of (embolus) and travels up the bloodstream until it reaches an artery that is too small for it pass and it blocks the artery. At this point its effects are similar to those produced by thrombosis. Approximately 5% to 14% of strokes appear to be the result of this process (warlow, 1993).

Hemorrhagic stroke

Hemorrhagic strokes are caused by a rupture in a blood vessel or an aneurysm with resultant bleeding into or around cerebral tissue. These types of stroke have a much higher fatality rate than those caused by clots. In a hemorrhagic stroke, the blood vessel burst and the blood spread out over the brain causing damage of the brain cells (Hansen & Atchinson, 2011).

Subarachnoid Hemorrhage

Subarachnoid hemorrhages account for about 7% of all strokes. Their most common cause is leakage of blood from aneurysms. A combination of congenital and degenerative factors, usually at the point of origin or bifurcation of arteries, can participate in formation of an aneurysm. Blood may break through the weak point of the aneurism at any time because of the force of arterial pressure spread quickly into the cerebrospinal fluid surrounding the brain. A subarachnoid hemorrhage may also be caused by bleeding from an arteriovenous malformation, which is an abnormal

collection of vessels near the surface of the brain. Other less common causes of subarachnoid hemorrhages are hemophilia, excessive anticoagulation therapy, and trauma to the skull and brain (Warlow, 1993).

Intracerebral Hemorrhage

Intracerebral hemorrhage accounts for about 10% of all strokes (Warlow, 2010). It usually begins with bleeding from small, deep penetrating vessels under arteriolar or capillary pressure as opposed to arterial pressure as with subarachnoid hemorrhage. Therefore onset of symptoms from intracerebral hemorrhages develops gradually over minutes, hours or sometimes days. Release of blood into brain tissue and surrounding edema will then disrupt the function of that particular brain region. Hypertension is the most common cause of bleeding into the brain. Severity of stroke varies with individual. Every individual does not get stroke with same severity .some experience mild effects, which take a short time to improve. On the other hand some suffer with severe problems, which last for months or years. The effect of stroke will depend on the part of brain that has been injured or damaged. It has been found that person who have experienced a stroke and who are at any one time,10% will fully recover, 40% will be left with a mild disability and 50% will be severely disable which may require institutional care (Bierman, 2009). As no static has been found in aspect of Bangladesh, foreign statistic has been added to feel the effects of stroke. The incidence of stroke is about 1.8 to 2.0 per 1000 of population per annum. About 70% of all strokes occur in people over 70 years of age. Approximately 80% show some useful recovery and are able to return home; 60% of the total number regain independence in activities of daily living (ADL) and 30% are able to resume normal activities. The risk of mortality increases with age and the presence of associated conditions such as heart disease (Jackson, 2006).

Motor disturbances after CVA

One side distribution and includes musculature of the trunk and limb on the affected side: The muscles of face and mouth also may be involved. Increase muscle tone, hypo tonicity may be apparent. Coordination or smooth rhythmic movement is lost. Normal postural control mechanism is disturbed. Normal righting, equilibrium and

protective reactions are lost on the affected side. Loss of adaptive changes of muscle tone as a protection against the forces of gravity. Loss of selective, discriminative and isolated movement occurs after CVA. Inability to dorsiflexion the ankle and toes. Inability to flex knee while hip is extended (Pedretti, Smith, and Pendleton, 2007).

Motor recovery after CVA

Recovery of motor function following a stroke is thought to be complete after 3 to 6 months of a stroke and can be continued for months or years (Ryerson, 2001). Spontaneous recovery of voluntary motor function occurs primarily in the first 3 months after the onset of the CVA. Motor recovery may continue up to 1 year and in rare instances somewhat longer. This fact does not imply that motor behavior cannot be influenced by appropriate therapy after a year. Improvement in functional performance may continue for years following stroke (Pedrett, Smith, and Pendleton, 2007).

In another study it has shown that most recovery occur within the first 8weeks but 10% show some improvement in their walking beyond that and almost 30% show improvement on their activities of daily living score over the initial 6 months and also suggests that further recovery after 6 months is much slower (Wade, 2005). Again another study by Warlow (2010) has shown that the rate of recovery of all impairment is macula in the first few weeks and slows down after 2 or 3 months and probably stops after about 6 to 12 months of stroke (Turner, Foster and Johnson, 1996). The recovery of upper limb function varies on the severity of the symptoms or damage and maximum recovery occur in the initial 2 to 3 months of the stroke. It is typically reported that most potential recovery of the upper limb takes place within 3 months (Wade et al. 2005). The severely affected upper limb functions after demonstrated less recovery. Most reports of upper limb function after acute brain lesion suggests that recovery is minimal of patients with an initially affected limb (Wade et al. 2005). Basmajian and colleagues (2006) put the percentage of patients regarding full arm and hand function after stroke at 5% and the percentage with no functional use at 20%. Gross movement of upper limb comes earlier than fine movements. Turton (2010) stated that shoulder and elbow movements recover earlier than hand

movements and it is common for fine finger movements to remain permanently disrupted (Turner, Foster and Johnson, 1996).

Sensory motor, cognitive and psychosocial components are almost always affected by a cerebro vascular accident. Deficits in these areas and any secondary complications profoundly affect an individual's occupational performance in work, leisure and activities of daily living. Secondary conditions are important manifestations to consider in regards to the patient's recovery and rehabilitation as it may actually be more disabling than the stroke itself. It is important to be aware of these complications so that they may possibly be prevented. There are lots of secondary conditions which make the situation complex and affect improvement (Turner, Foster and Johnson, 1996). Glenohumeral subluxation basically is defined as a partial or incomplete dislocation that usually stems from changes in the mechanical integrity of the joint. Subluxation is a common problem in patient with hemiplegic, especially during the flaccid stage, and often occurs within 3 weeks post stroke (Gould, 2002). Subluxation is a common concern related to motor function involves the shoulder. Common problems include subluxation, pain and immobility (Hansen & Atchinson, 2011). Subluxation is related to a change in the angle of the glenoid fossa (Ryerson, 2001). Glenohumeral joint misalignment and subluxation is reported to occur in patients with little or no voluntary movement after stroke (Sils and Schenkman, 1985). The main feature of the shoulder joint is mobility rather than stability, making a wide range of movement possible. As a result the shoulder is easily traumatized and misalignment is common (Turner, Foster and Johnson, 1996).

Causes of shoulder subluxation

Shoulder occurs when any of the biomechanical factors contributing to glenohumeral joint stability are interrupted Muscle weakness (Ryerson, 2001). Secondarily to spasticity or flaccidity of the glenohumeral and or scapular muscles. Supraspinatus weakness has also been found correlated with radiographic evidence of subluxation (Trombly, 2007). Changes in muscle tone and movement, the position of scapula and joint capsule stability. When the weight of the arm and pull of gravity draws the head of the humerus out of the glenoid fossa of scapula (Hansen & Atchinson, 2011). Can

occur spontaneously when patient start sitting or standing against gravity. The weight of the flaccid arm applying direct mechanical stretch to the joint capsule as well as traction to unsupportive muscles of the shoulder (Gould, 2002). Subluxation is not painful but results in changes of muscle length tension relationships, muscle shortening and permanent of the joint capsule (Ryerson, 2001). Subluxation has been proposed as a contributing factor in the development of shoulder pain (Chaco & Wolf, 2004). The mechanism suggested is one of traction on the rotator cuff and superior joint capsule resulting in stretch causing pain. However there has been no explanation of why this should cause pain and there is no direct evidence linking subluxation with pain. On cause of pain is movement could be the pinching of the lengthened joint capsule, caught between joint surfaces during movement in certain parts of rang. This appears evidence in some patients as a sharp pain, which can relieved by gentle distraction of the joint during assisted movement of the limb (Turner, Foster and Johnson, 1996).

Although subluxation has been implicated in shoulder pain, several studies report patients with subluxation who have no pain, even when subluxation was moderate to severe (Smith et al., 2005). Subluxation has also been reported to be associated with an increased incidence of RSD (Carr & Shepherd, 2000). Subluxation in itself is not painful but is vulnerable and be easily traumatized. A dragging or ache is sometimes reported if limb left hanging, easily rectified with correct positioning.

Mechanism of subluxation

Two thirds of the humeral head is not covered by the glenoid fossa. This lack of stability is partly compensated for by a strong surrounding musculature. In the normal orientation of scapula, there is an upward slope of the glenoid fossa, ethic plays an important role in preventing downward dislocation of the homeruns. The humeral head would have to be moved laterally in order to move downward. Then the arm is adducted, the superior part of the capsule and the coracohumeral ligament are taut, which prevents lateral movement of the humeral head. These safeguard against downward displacement. The supraspinatus muscle reinforces the horizontal tension of the capsule. The infranspinatus and posterior portion of the deltoid also play an

important role in preventing subluxation, because of their horizontal fibers. When the humerus is abducted sideways or flexed forward, the superior capsule becomes lax, eliminating the support and joint stability must then be provided by muscle contraction. The integrity of the joint then depends almost exclusively on the rotator cuff muscles. In hemiplegia, patients have lost the voluntary movement in relative muscles. These include the supraspinatus, infraspinatus and posterior fibers of the deltoid (Hansen & Atchinson, 2011).

In addition, the muscles that support the scapula in its normal alignment are affected, allowing a change in angulations of the glenoid fossa. Subluxation is therefore inevitable (Hansen & Atchinson, 2011). In the frontal plane the scapula is normally held at an angle of 40 degrees. When the slope of the glenoid fossa becomes less oblique and more vertical, the humerus slide down and out of the fossa (Ryerson, 2001).

“In a normal shoulder the glenoid fossa is oriented upward, forward and lateral, so that, the head of humerus remains locked in contact with it, the hemiplegic orientation of the glenoid fossa is downward, backward and medial due to the scapular retraction and downward rotation that are part of the common spastic pattern. This position nullifies the “locking mechanism” and allows gravity to pull the head of the humerus out of the fossa (Trombly, 2007). The mechanism of subluxation is generally considered to include the downward rotation of the scapula caused by the weight of the limb, which positions the scapula more vertically (Carr & Shepherd, 2000). However the downward rotation of the scapula may not be a significant feature and in a recent report no evidence of a relationship between scapula and humeral orientation and glenohumeral subluxation was found (Carr & Shepherd, 2000). Evidence has been shown that low tone in scapular muscles not contribute to downwards rotation of scapula as has been suggested (Devis, 2003). In subluxation the shoulder girdle drops due to decreased tone to elevators of scapula, the scapula is depressed and retracted, so that, scapula lies closer to the vertebra, inferior angle adducted and depressed. Vertebral border of scapula pulled away from ribs and the humerus slips downwards (Turner, Foster & Johnson, 1996).

Types of subluxation

Ryerson and levit (2001) first described three types of subluxation in clients with hemiplegia; inferior, anterior and superior.

Inferior subluxation

The most common type of subluxation is an inferior subluxation. Reported incidences of shoulder subluxation in cerebrovascular accident survivors vary from 17% to 66% (Zorowitz, et al.1995 cited in Morley, 2002). It occurs in clients with severe weakness and is present in the acute stage. Weakness and the weight of a heavy arm result in downward rotation of the scapula. Downward rotation orients the glenoid fossa vertically, the unlocking mechanism of the scapula is lost and the humerus subluxates inferiorly with internal rotation. As the humerus internally rotates, the bicipital tuberosity rolls anteriorly; this anterior prominence is often confused with an anterior subluxation. As subluxation occurs, the shoulder capsule is vulnerable to stretch, especially when the humerus is dependent and resting by the side of the body. In this position, the capsule is taut superiorly, so any downward distraction of the humerus will place an immediate stretch on the upper part of the capsule. The superior portion of the capsule is reinforced by the coracohumeral ligament, which is crucial for shoulder stability. The implications of rupture of this ligament as a result of forced abnormal passive motion as a cause of shoulder pain in subluxation (Hansen & Atchinson, 2002).

Anterior subluxation

It occurs when the humeral head separates anteriorly from the glenoid fossa. Anterior shoulder subluxation occurs when the downwardly rotated scapula elevates and tilts forward on the rib cage and the humerus hyper-extends with internal rotation. In an anterior subluxation, as tension increases on the proximal biceps tendon, the elbow flexes and the forearm supinated. The subluxation is found in clients with atypical patterns of return and trunk rotational asymmetries

Superior subluxation

Superior subluxation occurs when the humeral head lodges under the coracoids process in a position of internal rotation and slight abduction. The humeral is locked in this position, so that every movement of the humerus is accompanied by scapula movement. The scapula position in this subluxation is one of the abduction, elevation and neutral rotation. The forearm abducts across the body as the humeral abduction and elbow flexion. A superior subluxation occurs in clients with inappropriate muscle firing and co-contraction (Ryerson, 2001).

Prevention

Prevention of subluxation requires: Proper assessment of secondary alignment problems (ribs cage/scapula/humeral position). Early reeducation of trunk/arm linked patterns in sitting and standing. Prevention of shoulder capsule stretch, including support and positioning as the client sits, stands and practices walking (Ryerson, 2001). Loading of the glenohumeral joint should be avoided as long as the affected limb is flaccid (Trombly, 2007).

Intervention

The management of the subluxed shoulder in hemiplegia is controversial at best. Treatment methods and prevention techniques advocated for the hemiplegic shoulder include neuromuscular electric stimulation, proprioceptive facilitation techniques, correct positioning, correct handling and avoidance of over vigorous movements (Body, pepin and Hartin, 2009). If subluxation exists, the therapist reduces the subluxation by correcting trunk, scapula and humeral alignment patterns before attempting to re-educate arm movement patterns. As the client learns to move the arm in patterns of functional coordination, subluxation and associated arm posturing decrease (Ryerson, 2001). Treatment should involve correct positioning at all times to help prevent subluxation. Subluxation cuffs, which grip the upper arm and re-approximate the glenohumeral joint by lifting the humerus upwards can be made or purchased (Turner, Foster and Johnson, 1996). Proprioceptive stimulation refers to the facilitation of muscle spindles, Golgi tendon organs, joint receptors and the vestibular apparatus. In general, proprioceptive stimulation gives the therapist more control over

motor response. Proprioceptors adapt more slowly than exteroceptors and can produce sustained postural patterns. There is little or no recruitment in the proprioceptive system. Therefore the motor response lasts as long as the stimulus is applied. There are considerable amount of techniques that are used for facilitation. But, of those, heavy joint compression and therapeutic vibration are widely used in the management of subluxed hemiplegic shoulder in patient with CVA (Hansen & Atchinson, 2011).

3.1 Study design

The purpose of the study was to find out the prevalence shoulder subluxation among the stroke patients. The cross section study was conducted to find out the objectives. This design involves identifying group of people and then collecting the information that researcher requires when they use the particular service. This type of data can be used to assess the prevalence of acute or chronic conditions in a population. Survey research is one of the most common forms of research that involves the asking a large group of people questions about a particular topic or issue and these are related to the interest of the participant. Survey is a method of collecting data which involves the measuring relevant sample variables (often using s questionnaire) without any form of manipulation or systemic intervention .The idea with the survey usually approaches a sample of target group of interest, interviews them or ask them questionnaire .

3.2 Study population and sample population

A population is the total group or set of events or totality of the observation on which a research is carried out. In this study, sample population were selected from the participant of Centre for the Rehabilitation of the paralysed (CRP), Dhaka.

3.3.1 Study site

Centre for the Rehabilitation of paralyzed (CRP).

3.3.2 Study area

Neurological conditions of the patients.

3.4 Sample Size

The expected sample size to conduct the research was 236. But the researcher could manage just 35 subjects because of having resource constrain.

The equation of sample size calculation are given below-

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

Here,

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

$p = 0.81$ (Here $P = \text{Prevalence}$ and $P = 81\%$)

$q = 1 - p$

$= 1 - 0.25$

$= 0.75$

$d = 0.05$

3.5 Inclusion and Exclusion criteria

3.5.1 Inclusion criteria:

- Both male and female selected who had stroke.
- Subject was selected from Centre for the Rehabilitation of the paralyzed (CRP) at Savar, Dhaka.
- All age group was selected.
- Subject who were willing to participate in the study.

3.5.2 Exclusion Criteria

- Medically unstable patient
- Patients who have cognitive problem.
- Patients who are not able to communicate.

3.6 Sampling technique

Samples were selected as simple random sampling from Centre for the Rehabilitation of the paralyzed (CRP) at Savar, Dhaka. There are a lot of patients in Bangladesh, from this population it was selected 35 samples, according to the inclusion and exclusion criteria.

3.7 Data collection tools

Questionnaire, consent forms, pen, papers, pen drive, SPSS (Statistical Package for the Social Sciences) software to analyze data, Harvard Referencing 2012 and computer.

3.8 Data analysis

Data was inserted into SPSS 16 and descriptive statistics was used to analyze the collected data.

3.9 Informed consent

In this study interested subjects were given consent forms and the purpose of the research and consent forms were explained to the subject verbally. They were told that participation is fully voluntary and they have the right to withdraw at any time. They were also told that confidentiality will be maintained. Information might be published in any presentations or writing but they will not be identified. The study results might not have any direct effects on them but the members of Physiotherapy population may be benefited from the study in future. They would not be embarrassed by the study. At any time the researcher will be available to answer any additional questions in regard to the study.

3.10 Ethical consideration

Permission was taken from BHPI ethical committee for research project then permission was taken from physiotherapy department for data collection. The participants were explained the purpose and goals of the study. This study followed the World Health Organization (WHO) & Bangladesh Medical Research Council (BMRC) guidelines and strictly maintained the confidentiality. Meanwhile, it was purely an observation research, so nothing was intervene through which the research is considered as limited ethical issue.

4.1 Age range of the participants

Analysis showed that 22.73% (n=5) participants had shoulder subluxation in between 41-46 years, 22.73% (n=5) was in between 47-52 years, 31.82% (n=7) was between 53-60 years, 22.73% (n=5) was more than 60 years of age out of 35 participants and mean age of the participants was 54 (SD \pm 8.4) years. (Figure-1).

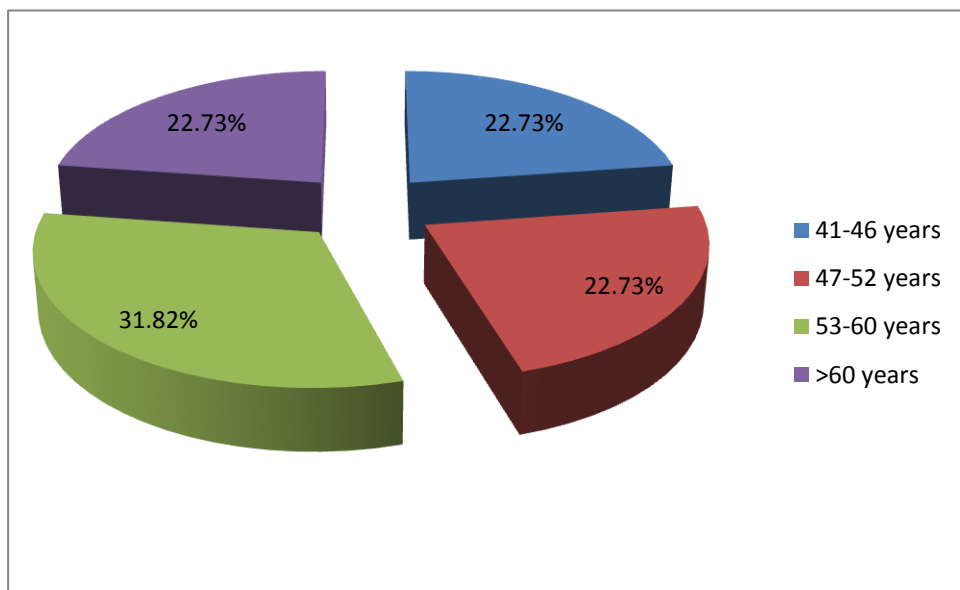


Fig-1: Age range of the participants

4.2 Prevalence of Shoulder subluxation

Outcome reveals that 62.85% (n=22) had shoulder subluxation out of 35 participants (Figure-2).

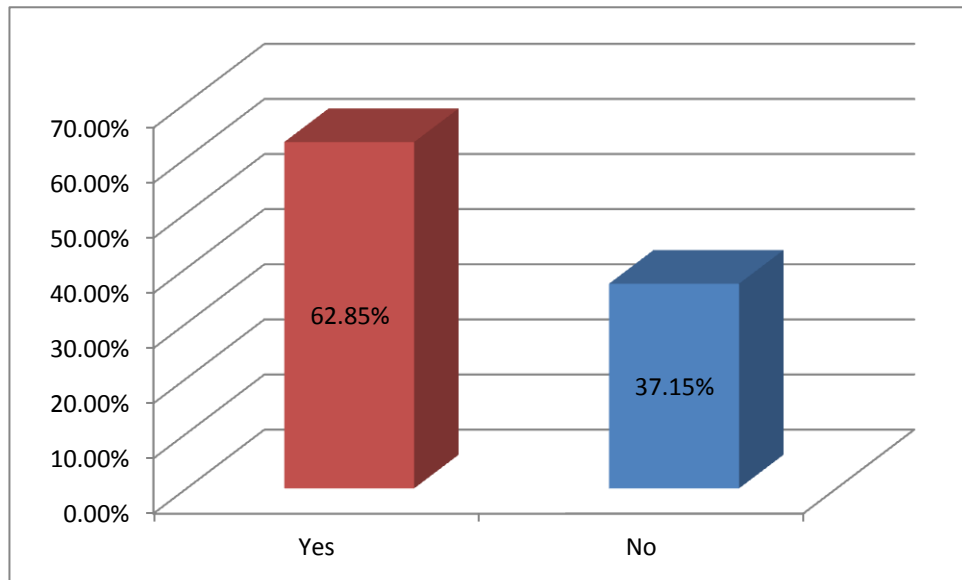


Fig-2: Prevalence of Shoulder subluxation

4.3 Male-Female Ratio

Among the 22 participants with shoulder subluxation 63.64% (14) were male and 36.36% (n=8) were female .Result shows that male is more affected by shoulder subluxation than male (Figure-3).

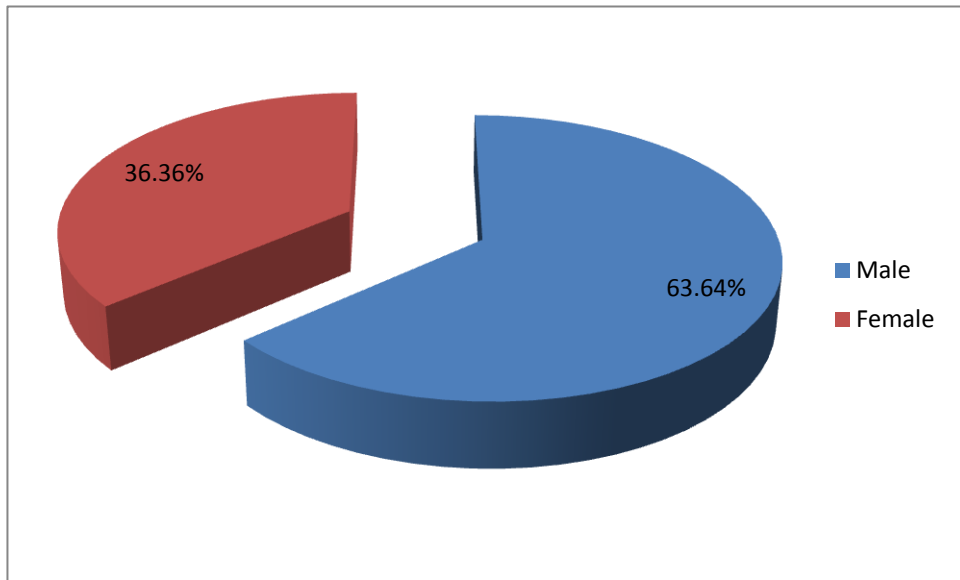


Fig-3: Male-Female Ratio

4.4 Occupation of the patients

Result showed that among the 22 participants who had shoulder subluxation 36.36 % (n=8) were service holder, 27.27% (n=6) were housewife, 22.73% (n=5) were businessman, 13.64% (n=3) were in other occupation (Figure-4).

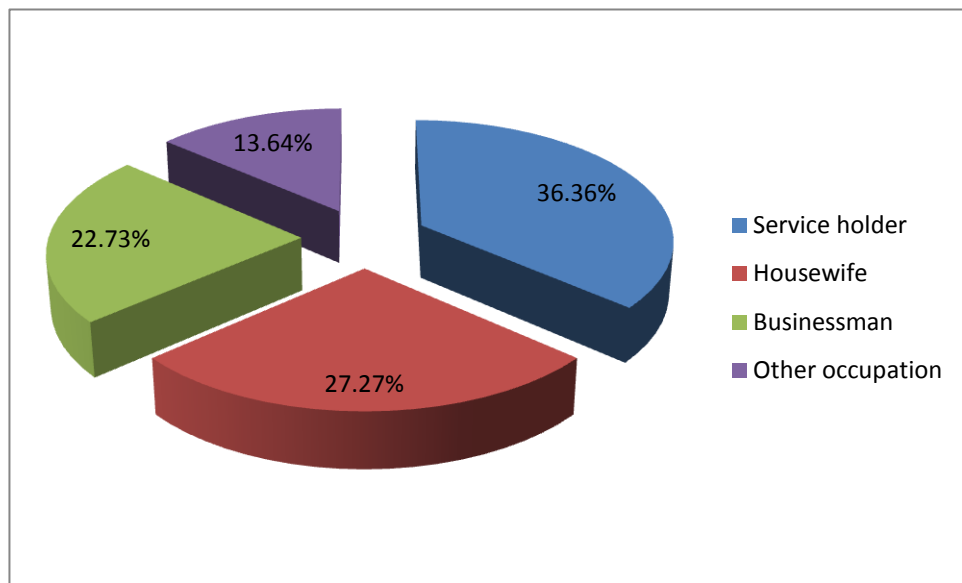


Fig-4: Occupation of the patients

4.5 Living area

Among the 22 participants who had shoulder subluxation 54.55% (n=12) participants came from urban area and rest of them 45.45% (n=10) from rural area (Figure-5).

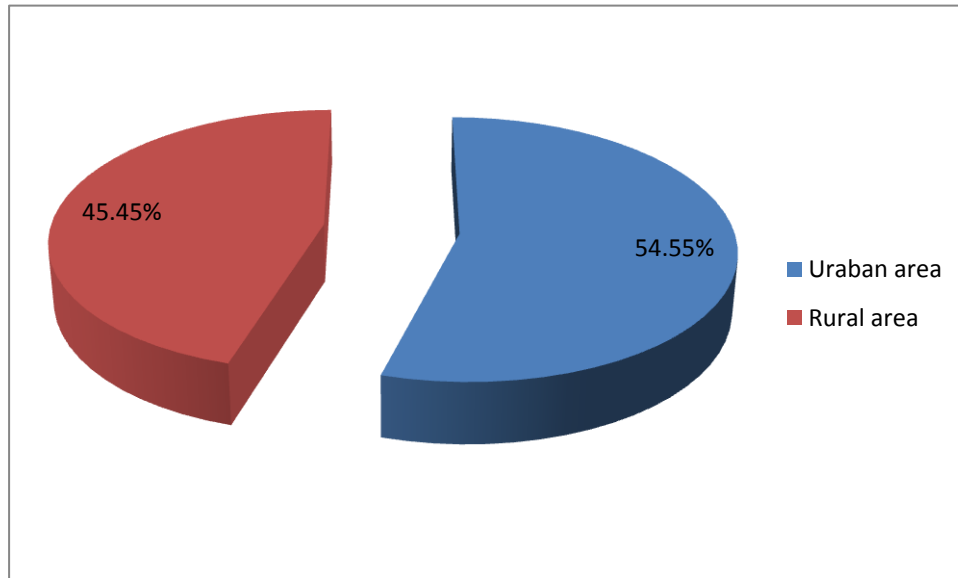


Fig-5: Living area

4.6 Type of stroke

Analysis showed that out of 22 participants who had shoulder subluxation 54.55% (n=12) participants had hemorrhagic stroke whereas 45.45% (n=10) had ischemic stroke (Figure-6).

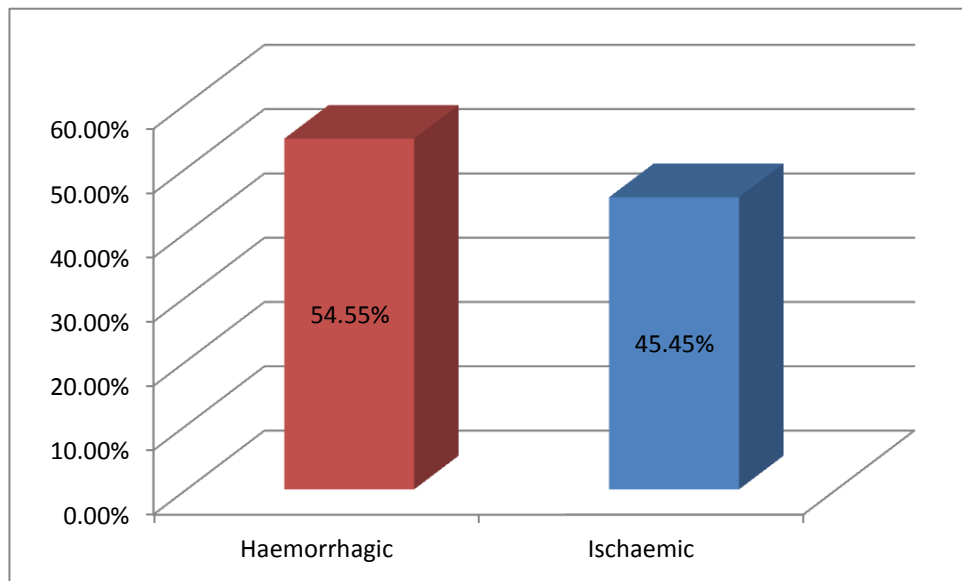


Fig-6: Type of stroke

4.7 Affected side

Research showed that respondents with shoulder subluxation 63.64% (n=14) affected by left side and rest of them 36.36% (n=8) affected by left side (Figure-7).

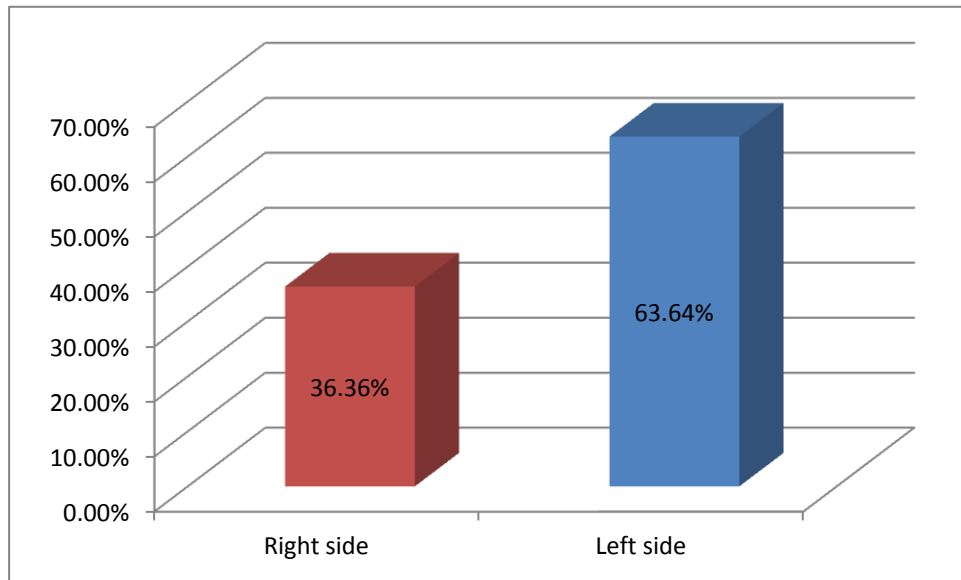


Fig-7: Affected side of shoulder subluxation

4.8 Past medical history

Result showed that 68.18% (n=15) participants had history of hypertension and 31.82% (n=7) had history of diabetes mellitus among the 22 participants who had shoulder subluxation (Figure-8).

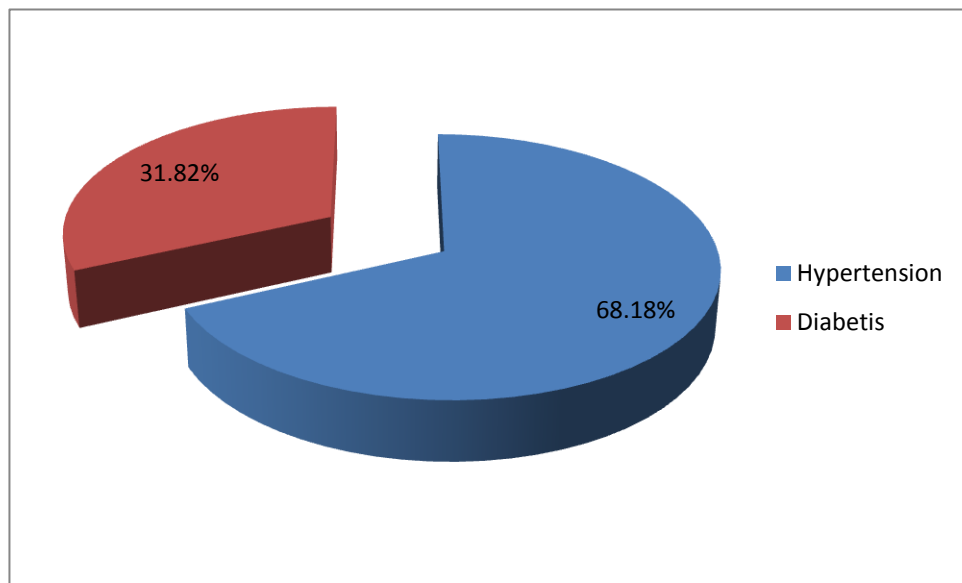


Fig-8: Past medical history

4.9 History of mal handling

Among the 22 participants with shoulder subluxation more than half of the participants 59.09% (n=13) had the history of mal handling (Figure-9).

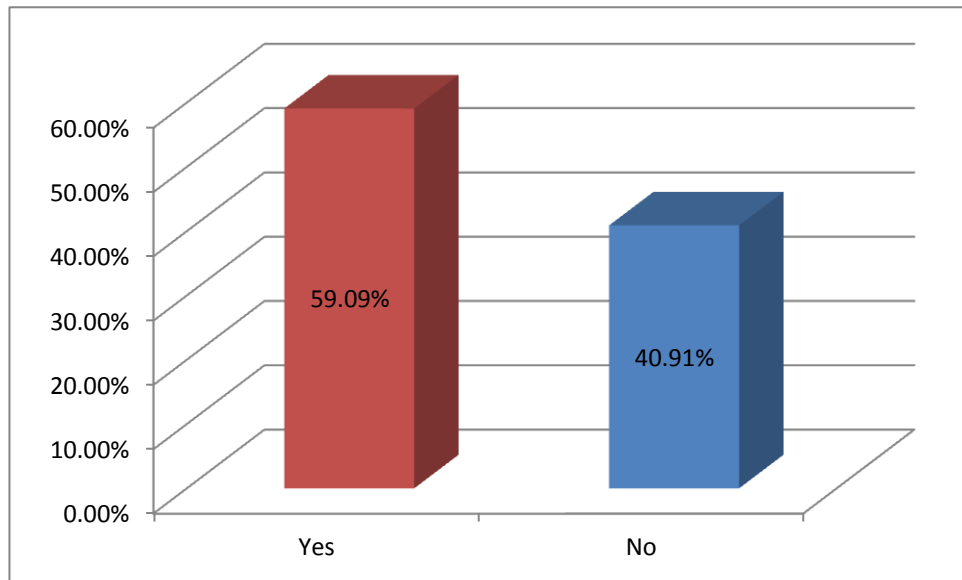


Fig-9: History of mal handling

4.10 Past history of physical exercises

Analysis reveals that most of the participants 77.27% (n=17) had no past history of physical exercise (Figure-10).

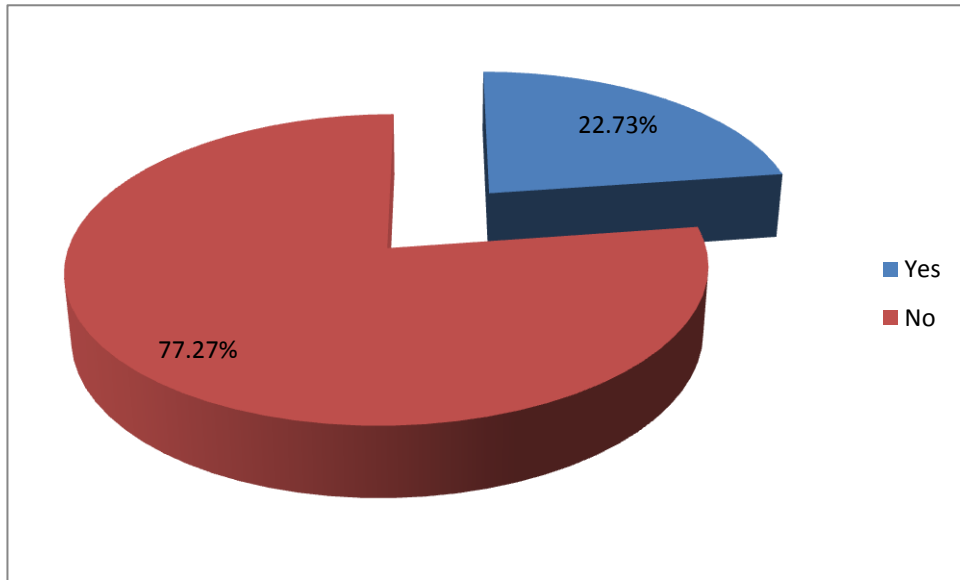


Fig-10: Past history of physical exercises

The objectives of the study was to find out the prevalence of shoulder subluxation among stroke patients attended at CRP along with distribution with age, gender, past exposure and so on. However the study findings show that almost 62.85% of the participants had shoulder subluxation among the stroke patients. Shakoor et al., (2009) stated that the prevalence of shoulder subluxation was 81% among the stroke patients in Sydney.

In this study almost 31.82% of the participants were age group 53-60 years. In United States a study about epidemiology of shoulder subluxation by Zhang and Jordan (2008) shows that the age standardized prevalence of shoulder subluxation after stroke in adults age ≥ 45 was 25.2% among the participants in the Framingham Study and 27.8% in the Johnston County.

Analysis showed that almost 63.4% of the participants were male who had shoulder subluxation among the stroke patients. Reijman et al. (2007) stated that (55%) majority were male who developed shoulder subluxation after stroke.

The study showed that 54.55% the participants came from urban area that had shoulder subluxation. People in urban area are more prone (60%) to stroke than rural area in United States (Gelber et al. 2000).

Result showed that 54.555% participants had hemorrhagic stroke among stroke patients who had shoulder subluxation. Reijman et al. (2007) stated that hemorrhagic stroke were (23%) more common in adults in Netherlands.

Analysis showed that 68.18% participants had the history of hypertension among the stroke patients with shoulder subluxation. Gelber et al., (2000) stated that people who had hypertension had 10% greater chance for developing shoulder subluxation after stroke.

The study showed that 59.09% participants had had the history of mal handling among the participants with shoulder subluxation. Mal handling is more common risk factor for developing shoulder subluxation among the stroke patients (Gelber et al., 2000).

Analysis showed that 77.27% participants had no past history of physical exercises among the stroke patients who had shoulder subluxation. Magee (1997) shown in their research that physically in active person are more (65%) prone to developing shoulder subluxation after stroke.

Analysis showed that 31.32 participant had the history of diabetics mellitus and 45.45% ischemic stroke among the participant with shoulder subluxation.

6.1 Conclusion

From the data base, it was found that two third of the participants had shoulder subluxation among the stroke patients. Percentages of shoulder subluxation were higher in male and among them most of the participants were service holder and one third of the people were in between 53-60 age groups. The participants who had shoulder subluxation, more than half had the history of mal handling and two third of them had no past history of physical exercises.

Physiotherapist should follow some intervention and consider high prevalence factors to avoid and prevent shoulder subluxation. To identify associated factors of this condition would be beneficial in preventive strategy and proper interventions may reduce the impact on the quality of life and functional ability of stroke patients.

6.2 Recommendation

The purpose of the study was to identify the prevalence of shoulder subluxation among the stroke patients. The researcher identified some further step that might be taken into consideration for the better accomplishment of further research. For the ensuring of the generalizability of the research it is recommended to investigate large sample.

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