STANDING BALANCE (BOTH STATIC AND DYNAMIC) AMONG STROKE PATIENTS DURING DISCHARGE ATTENDENT 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 declare that for any publication, presentation or dissemination of information of the study. I would be bound to take written consent from my supervisor.

Signature: **Date:**

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Abbreviations

ADL:	Activities of Daily Living
AVM:	Artero Venous Malformation
BOS:	Base of Support
COM:	Centre of Mass
COG:	Centre of Gravity
CT:	Computed Tomography
CVA:	Cerebro Vascular Accident
DVT:	Deep Venous Thrombosis
ESR:	Erythrocytic Sedimentation Rate
EMG:	Electro Myo Graphy
MRI:	Magnetic Resonanace Imaging
TIA:	Transient Ischaemic Attack
WHO:	World Health Organization

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Abstract

Purpose: To find out the state of standing balance among stroke patient. *Objective:* To explore socio-demography information, to assess the ability to perform static and dynamic standing balance, to identify the risk of fall and to know the information about relation between the variables. *Methodology:* Cross sectional study design was selected for this study. A prospective survey method has been done to accomplish the research purpose. Total 50 samples were selected as purposive sampling from Physiotherapy Neurology outdoor patient of Centre for the Rehabilitation of the Paralysed (CRP). A mixed type of questionnaire was used to collect data and standing balance was measured by Berg Balance Scale. The data was analyzed through descriptive statistics by using table, pie chart and bar chart. *Result:* The data showed that among 50 participants response rate was 100% and 56% had low fall risk. From the results it is interpreted that 56% had improved their standing balance after discharge. *Conclusion:* This information would assist the professional to justify the improvement of balance after stroke.

CHAPTER-I: INTRODUCTION

1.1 Background

The American Heart Association (AHA) estimates that ≈780 000 strokes occur each year; 600 000 of these are new strokes, and ≈180 000 are recurrent strokes (Summers et al., 2009). Worldwide, stroke is the second leading cause of death, responsible for 4.4 million (9 percent) of total 50.5 million deaths each year (Sudlow et al., 1999). Stroke is currently the second leading cause of death in the western world ranking after heart diseases and before cancer and causes 10% of deaths worldwide (Braunwald et al., 2003). It has been reported that the mean stroke incidence rate in Western countries is 94 per 100.000 person years (Eijk et al., 2010). According to the World Health Organization, 15 million people suffer stroke worldwide each year (Taylor, 2010; Eijk et al., 2010). Of these, 5 million die and another 5 million are permanently disabled (Engstrom et al., 2001). High blood pressure contributes to over 12.7 million strokes worldwide (Mensah, 2007). Strokes affect blacks more often than whites and are more likely to be fatal among blacks (Sergeev, 2011).

Strokes is the third leading cause of death and the leading cause of serious, long term disability in the United States behind heart diseases (with which it is closely linked) and cancer (Sudlow et al., 1999). In 2007, the overall mortality rate from stroke was 273 000, which makes stroke the third-leading cause of death in the United States (Summers et al., 2009). About 750,000 new strokes occur in United States each year (Sudlow et al., 1999) approximately one person every 45 seconds (Salbach et al., 2006) and of these, approximately 150,000 (25%) are fatal. About 600,000 of these are first attacks and 185,000 are recurrent attacks (Ferri et al., 2011). The incidence of stroke is higher in African Americans than Caucasians (Sergeev, 2011).

Stroke cause ~200,000 deaths each year in the United States and are a major cause of disability. The incidence of cerebrovascular diseases increases with age and the number of strokes is projected to increase as the elderly population grows, with a doubling in stroke deaths in the United States by 2030 (Boon et al., 1999). In 2000, stroke accounted for 7% of all deaths – 15,409 Canadians (Salbach et al., 2006). Stroke is the second most common cause of death in Australia – around 60,000

strokes happen every year (Mensah, 2007). The crude annual incidence rate was 1.74 per 1000 (1.47 for men and 2.01 for women) (Rabas et al., 1998).

The incidence rises steeply with age, and in many developing countries, the incidence is rising because of the adoption of less healthy lifestyles (Boon et al., 1999). Bangladesh is a South Asian country and one of the most densely populated country in the world. Stroke is the 3rd leading cause of death in Bangladesh (Haque, 2003). Stroke is the most common cause of adult disability (Tyson et al., 2007). Stroke incidence typically increases with age and, due to the ageing of the population, stroke incidence rates are expected to rise (Eijk et al., 2010). Stroke in older age incidence- 2/3rd of stroke patients aged over 60 years (Boon et al., 1999). Stroke is 2nd leading cause of death for the people above the age of 60 and the 5th leading cause in people aged 15 to 49 (Goljar et al., 2010). However, stroke can occur at any age, including in childhood. (Blam et al., 2008). Although approximately two thirds of the affected patients are above 65 years, a stroke may occur at all ages, even in very young children, and can have many causes (Tyson et al., 2007).

Stroke occurs at an equal rate in men and women, but women are more likely to die. (Mensah, 2007). Although men are more often affected than women due to a younger age of onset, this gender difference becomes smaller with increasing age (Eijk et al., 2010). After age-adjustment to the European population, the incidence rate was 1.34 per 1000 (1.48 for men and 1.25 for women) (Rabas et al., 1998). Stroke was an underlying cause in 63.6% of female deaths and 54.1% of male deaths from stroke in Australia (1977- 2002). Among adults age 20 and older, the prevalence of stroke in 2005 was 6,500,000 (about 2,600,000 males and 3,900,000 females) (Mensah 2007). Of all strokes, 87 percent are ischemic, 10 percent are intracerebral hemorrhage, and 3 percent are subarachnoid hemorrhage (Summers et al., 2009; Carr and Shepherd, 2003). Ischemic stroke occurs more frequently in people over age of 65 and hemorrhagic stroke is more common in younger people (Carr and Shepherd, 2003). The annual crude incidence rate of cerebral infarction was 1.37/1000, intracerebral hemorrhage 0.24/1000, subarachnoid hemorrhage 0.06/1000, and unspecified stroke 0.08/1000 (Rabas et al., 1998).

Stroke is one of the major causes of permanent disability with an incidence of approximately 1.75% per year (Tyson et al., 2007). Stroke is a common medical emergency with an annual incidence of between 180 and 300 per 100 000 (Boon et al., 1999). Between 1979 and 2005, the annual number of hospital discharges with stroke as the diagnosis was ≈900 000 in USA (Summers et al., 2009). A person's risk of dying if he or she does have a stroke also increases with age (Blam and Bitemley, 2008). About one-fifth of patients with an acute stroke will die within a month of the event, and at least half of those who survive will be left with physical disability (Boon et al., 1999). Stroke accounted for about one of every 17 deaths in the United States in 2005. Stroke mortality for 2005 was 143,579 (56,586 males, 86,993 females). Every seven minutes, a Canadian dies of heart diseases or stroke. Europe averages approximately 650,000 stroke deaths each year (Braunwald et al., 2003). Overall case fatality at 28 days was 19.4%, at 3 months it was 28.5%, and at 1 year 37.3% (Rabas et al., 1998). Stroke was responsible for 5.7 million (16.6%) deaths, and 87% of these deaths occurred in low-income and middle-income counties (Shah and Jayavant, 2006).

1.2 Justification of the study

Stroke is a common neurological condition, mostly seen in developing country. Day by day there is increasing the number of stroke patient, in different areas. In this condition, only medical management is not enough rather than the therapeutic management which is also essential for people stroke management. Stroke rehabilitation mainly completed by multi-disciplinary team. Physiotherapy is a significant part of this multi-disciplinary team. As the physiotherapy profession is newly introduced in Bangladesh, many people are not aware of its purpose. But it is an important part of health care to prevent diseases as well as to improve or maximize independence in people with disabilities. Therefore, physiotherapy can play an absolute role in the management of the people with stroke which is essential to strengthen our profession. Eventually, other professionals as well as general public will become aware about this service and this will be helpful to establish this profession at different institution, hospitals and clinics to fulfill the health care needs of the patient.

Balance dysfunction is a common feature of all stroke patients. They are prone to fall while standing due to their imbalance. Learning to balance in standing requires the opportunity to practice voluntary action in the acute stage of stroke. Specifically, standing balance will determine the activities of daily living. The researcher would like to conduct this study in order to develop an evidence to improve standing balance in relation to physiotherapy intervention of stroke patient, so that after doing this study patient will be aware of physiotherapy management.

In Bangladesh, most of the patient come at later stage and their improvement are not satisfactory. It is thought, if we can identify the specific factors, then we can give concentration on that specific factors for the better outcome of the people who are suffering stroke; will get maximum benefit from physiotherapy treatment. The goals of physiotherapy are to provide opportunities for an individual to regain optimal skilled performance of functional actions and to increase levels of strength, endurance and physical fitness. As a result it will improve the functional outcome, reducing limitation of activity. A proper outcome aims to provide the evidence for the stroke

person with standing balance deficit and thus help to improve quality of service of physiotherapy.

1.3 Research Question:

What is the state of standing balance among stroke patient after discharge?

1.4 Objectives:

1.4.1 General Objective:

To find out the state of standing balance among stroke patient.

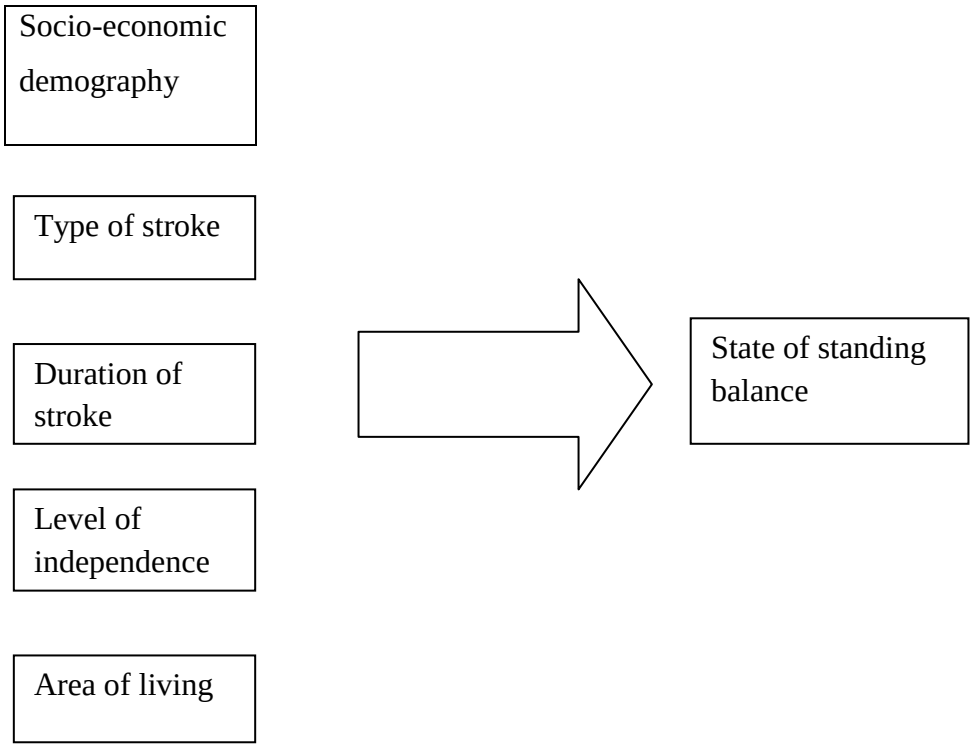
1.4.2 Specific Objective:

- To assess the ability to perform static and dynamic standing balance
- To identify the risk of fall.
- To know the information about relation between the variables.

1.5 List of variables:

Independent Variables

Dependent Variable



1.6 Operational Definition:

Disable – Who is not able to perform normal body function.

Fall – Cannot maintain balance.

Balance – Maintain equilibrium.

Standing balance – Maintain equilibrium of the body in standing position.

Postural control – Sustaining in a normal posture without any swing.

Weight Distribution – Sharing body weight by both lower limbs.

Hemi neglect – Ignore of one side of body.

Hemiplegia – Paresis of one side of body including both upper limb and lower limb.

Ischaemic – Lack of blood supply due to accumulation of blood within the blood vessel.

Haemorrhagic – Loss of blood due to tearing of blood vessel.

Infarct – Lack of oxygen to the tissue due to ischaemia.

Hypertension – Increase of blood pressure above normal limit.

Diabetes – Increase of glucose level above normal limit.

Tobacco chewing – Chewing tobacco, betel, betel nut.

Smoking - Using cigarette as an addiction.

Illiterate – Those who can not write but can read.

Primary – Those who studied upto class five or upto class eight.

CHAPTER-II: LITERATURE REVIEW

Stroke is synonyms with cerebrovascular accident (CVA) and is a clinical definition. The World Health Organization (WHO) definition of stroke is a rapidly developed clinical sign of focal disturbance of cerebral function of presumed vascular origin and of more than 24 hrs duration. This definition does not include `transient ischaemic attacks` (Stokes, 1998).

Transient Ischaemic Attack (TIA)s are episodes of stroke symptoms that last only briefly; the standard definition of duration is <24 h, but most TIAs last <1 h. The standard definition of TIA requires that all neurologic signs and symptoms resolve within 24 h regardless of whether there is imaging evidence of new permanent brain injury; stroke has occurred if the neurologic signs and symptoms last for >24 h (Braunwald et al., 2003). It is the most frequent clinical manifestation of diseases of the cerebral blood vessels (Boon et al., 1999).

Cerebrovascular diseases include some of the most common and devastating disorders: ischemic stroke, hemorrhagic stroke, and cerebrovascular anomalies such as intracranial aneurysms and arteriovenous malformations (AVMs). The clinical manifestations of stroke are highly variable because of the complex anatomy of the brain and its vasculature (Boon et al., 1999).

A stroke is a brain attack, or a CVA is a sudden death of brain cause by a lack of supply in oxygen to the brain. There are 2 main types of stroke-

- Ischaemic stroke or cerebral infarct (80% of strokes) results from a blockage or a reduction of blood flow in artery that supplies brain. They are caused either by a clot (thrombus) which blocks the blood vessel or by the buildup of plaque often due to cholesterol within the arteries which narrows vessel resulting in a loss of blood flow.
- Haemorrhagic stroke are due to the rupture of an artery within the brain triggering an intracerebral haemorrhage (15% of strokes) or to the rupture of aneurysm or AVM entailing sub arachnoid haemorrhage (5% of strokes) (Braunwald et al., 2003).

Risk factors of stroke can be divided into two factors. They are modifiable and non-modifiable factor. Non- modifiable factors are; age, gender (male > female, except in

the very young and very old), race (Afro-Caribbean > Asian > European), heredity, previous vascular event, e.g. myocardial infarction, stroke or peripheral embolism, high fibrinogen and modifiable factors are; high blood pressure, heart disease (atrial fibrillation, heart failure,endocarditis), diabetes mellitus, hyperlipidaemia, smoking, excess alcohol consumption, polycythaemia, oral contraceptives, social deprivation (Boon et al., 1999).

A consequence of stroke differs depending on the part of the brain injured, the severity of the injury and the persons general health (Boon et al., 1999). Hemiplegia is the paralysis of muscles on one side of the body, contralateral to the side of the brain in which the CVA occurred (Braunwald et al., 2003). Spasticity, stiffness, painful muscle spasm. loss of sensation of one side of body, problem in balance and co-ordination, difficulties in activities of daily living (ADL) (Boon et al., 1999). Problem with language, including difficulty understanding speech or writing (aphasia) and knowing words but has difficulty to saying them clearly (dysarthria), problem with memory, thinking, attention or learning, possible inability to recognize object, recognize body parts of the body that is affected or understand instructions. Difficulty in swallowing (dysphagia) (Edwards, 1996). Problem in bowl and bladder control.Fatigue Depression Loss of body function, along with dependency to others (Stokes, 1998).

Chest infection**,** epileptic seizures, DVT (Deep Venous Thrombosis), pulmonary embolism, contracture (the development of soft tissue shortening and contractures due to disuse, immobility and spasticity will inevitably affect motor function), painful shoulder (shoulder pain is common in patients with stroke and has been reported to affect rehabilitation. A number of causes of shoulder pain in hemiplegia have been suggested and include trauma, altered muscle tone, glenohumeral subluxation, contracture of capsular structures and shoulder hand syndrome, pressure sore, urinary tract infection, constipation**,** depression and anxiety (the incidence of depression may be greater in stroke patients admitted to hospital than in those who remain at home. This difference may be a function of severity of stroke and reflect the greater likelihood of being admitted to hospital with a severe stroke. Some patients may have had episodes of depression prior to the stroke). Other psychological problems include: depression, unrealistic state, labile state and personality changes.

Diagnostic Question	**Investigation**
Vascular lesion	CT/MRI
Ischaemic/Haemorrhagic	CT/MRI
Sub arrachnoid haemorrhage	CT/Lumbar puncture
Risk factor	Full blood count, blood glucose, Cholesterol
Unusual cause	ESR, Clotting/thrombophilia screen

Table - 1: Investigation of a patient with an acute stroke (Boon et al., 1999)

Subarrachnoid haemorrhage, haematoma is surgically treated, if treatment is conservative then with prolong bed rest (4-6 weeks), perhaps medication to prevent clot lysis. In some cases of ischaemic CVA a secondary deterioration occurs 2-3 days after the initial event, usually due to evolving oedema around the infarct. There are no drugs that reduce infarct size influentially. Severe hypertension should be treated cautiously and biomechanical abnormalities corrected. Most recovery occurs within the first 8 weeks (Boon et al., 1999).

Hamorrhagic and ischaemic stroke present with different patterns of initial recovery. Characteristically, ischaemic infarct lesions present suddenly and the full extent of the initial insult is apparent. In contrast, with haemorrhagic strokes the extent of impairment initially seems more extensive due to localized inflammation surrounding the site of the bleed. Some of the initial recovery in haemorrhagic stroke can be attributed to the resolution of inflammation (Boon et al., 1999). Some stroke patients fail to regain consciousness within the first 24 hours following the CVA and it is considered widely that the majority will not regain consciousness. In patients who regain consciousness within 24 hours, the first 3 months are a critical period when greatest recovery is thought to occur, although potential for improvement may exist for many months (Carr and Shepherd, 2003).

The neurological deficit is usually maximal at the outset and if not severe, the patient can be managed at home satisfactorily. In practice, many patients are admitted to hospital for a short period of treatment and investigation. Patients with more severe

stroke will require admission to hospital (Edwards, 1996). Recovery is related to the site, extent and nature of the lesion, the integrity of the collateral circulation and the premorbid status of the patient (Braunwald et al., 2003).

Hemiplegia as a most common physical consequence of stroke is considered to be a recovering neurological condition. Other sequelae of stroke could include cognitive, perceptual, sensory and communication problems. Although the process of recovery remains unclear, it may be related to one or more of the following: The site and extent of the initial lesion, the age of the patient, the capacity to achieve a motor goal related to functional movement, the capacity of the nervous system to reorganize, the premorbid status of the status, the motivation and attitude of the patient towards the recovery. Whilst the specific effects of physiotherapy during rehabilitation remain uncertain, there is increasing evidence that early physiotherapy can maximize physical recovery (Stokes, 1998).

The physical management process aims to maximize functional ability and prevent secondary complications to enable the patient to resume all aspects of life in his or her own environment (Braunwald et al., 2003).

The physiotherapist plays a major role in the physical management of stroke using skills acquired during education and professional development, to identify and manage problems of stroke using scientific principles (Carr and Shepherd, 2003). Operating as a clinical movement scientist, the physiotherapist is able to identify and measure the disorders of movement and to design, implement and evaluate appropriate therapeutic strategies. This process includes dealing with the social and psychological factors which affect the stroke patient (Edwards, 1996).

Within the multidisciplinary team (MDT) of health care professionals, the main roles of the physiotherapist include: restoration of function, prevention of secondary complication such as shortening of soft tissues and the development of painful shoulder and research. Areas which research is required include development of scientific measurement and assessment techniques, evidence based intervention strategies, and valid and reliable outcome measures. The prevalence of is approximately 2 per 1000, with the outcome being death within the first 3 weeks in approximately 30% of cases, full recovery in 30% and residual disability in 40% (Stokes, 1998).

Balance is essential for optimal functioning of the locomotor system (Nayak et al., 2010) and the performance of many activities of daily living (Blam and Bitemley, 2008). Individuals with chronic stroke, balance problems, especially during performance of complex tasks, have been identified as the strongest predictor of falling may lead to reduced activity and sedentary lifestyle, which further disrupt function and health status (Vilnai and Kartin, 2010).

Stroke often results in impaired balance (Blam and Bitemley, 2008) Stroke resulting in hemiparesis often affects balance demanding activities, limiting independence in ADL (Hammer et al., 2008). Stroke is the greatest risk factor for falls among the elderly. 37% of all inpatient stroke patients fell at least once during rehabilitation and even more fell after discharge. Two-thirds of the survivors have difficulty in walking immediately after suffering from stroke, and 6 months later over 30% (Goljar et al., 2010). The specific causes of balance disorders in hemi paretic patients after stroke can be various (Chang and Gung, 2000). Balance can be affected in various ways which include joint motion limitation, weakness, altered muscular tone, (Oliviera et al., 2008) sensory deficits, (Bayouk et al., 2006) anomalous postural reactions (Hammer et al., 2008) and cognitive problems, neurological deficits, vestibular deficits, (Tyson and Connell, 2009) loss of sensation, visual defects, proprioceptive defects, co-ordination defecits, loss of attention. (Chun et al., 2002).

Principles of standing balance include- The feet should be positioned a few inches apart, the hips should be positioned in front of the ankle, position the shoulders over the hips and the head balanced over the shoulders, spine should be straight (Paillex and So, 2005). A typical posture of stroke patient in standing position of lower extremity- pelvis is posteriorly tilted, hip is internal rotated, adducted, extended; knee is extended, ankle is plantar flexed, inverted, toe is flexed (Nayak et al., 2010).

The assessment of balance is an integral part of the examination of patients with stroke because of the various balance impairments that can follow a stroke (Pyo¨ria et al., 2004). Standing balance deficits are common in individuals after stroke (Goddard et al., 2005). Balance is a complicated process which involves modification of both axial and limb muscle function to compensate for the effects of gravity and alterations in body position and load centre of gravity (COG) in order to prevent the person from falling (Cheng et al., 2001).This process involves input from a variety of sensory modalities (visual, vestibular proprioceptive), processing by the cerebellum and brain

stem, and output via a number of descending pathways (e.g. vestibulospinal, rubrospinal and reticulospinal tracts). The process also results in a cognitive perception of 'vertical' which is mediated through the cerebral cortex (Boon et al., 1999).

Afferent and efferent information is combined by a central integration mechanism (Goddard et al., 2005). Balance in patients with stroke hemiparesis is frequently related to deficits of central integration of afferent inputs (somatosensory, visual, and vestibular) (Bayouk et al., 2006). Several structures of the central nervous system seem to be involved in sensory integration such as the visual and vestibular cortex, the posterior or parietal cortex, the dorsolateral prefrontal cortex, the basal ganglia, the limbic system the cerebellum and the reticular system (Chang and Gung, 2000). In normal adult subjects, the visual, vestibular and somatosensory systems are all involved in balance control and make up the system of coordinates on which the body's postural control is based (Hammer et al., 2008). For instance, in the static standing position, healthy adults normally use somatosensory information which globally comes from the lower limbs (feet pressure receptors, ankle joint receptors, muscle proprioceptors) in order to build the main reference coordinates for balance (Enrique et al., 2010). When lower limb somatosensory information is inadequate (e.g. under a compliant surface support condition), other sensory systems are involved (Goddard et al., 2005). Recent studies have reported that this process can be disturbed in patients with stroke (Leurer et al., 2006). In particular, these patients present major difficulties during tasks that requires integration of somatosensory information from the lower extremities (such as during maintenance of equilibrium under a compliant surface support condition), and unlike normal adults, they tend to place disproportionately greater reliance upon visual input in order to maintain balance (Smania et al., 2008) when other input sources are reduced (Chang and Gung, 2000). Under these very critical conditions, the ability to analyze, compare and select the relevant sensory information is very important in order to avoid falling (Cheng et al., 2001). Considering the possible effects of attention on standing balance, it is important to recognize that attention deficits might influence the recovery of both postural symmetry and stability from stroke (Bayouk et al., 2006). Indeed, patients with hemineglect exhibited a relatively high degree of asymmetry. Reduction of hemineglect may, thus, lead to balance recover (Geurts et al., 2004).

Although the importance of postural control and balance in standing, sitting and walking is obvious, there is no universal definition for these terms (Leman et al., 2005). Balance is a complex motor skill requiring central processing of vestibular, visual and somatosensory information to activate the musculoskeletal system to produce coordinated eye movements, posture, stance and locomotion (Nayak et al., 2010). It has been suggested that the concept of balance is an umbrella concept covering four subdivisions of motor skills: (i) postural control on a stationary basis; (ii) postural control in voluntary movements; (iii) postural control in involuntary movements; (iv) postural control in external perturbations. Loss of postural control has been recognized as a major health problem in individuals with stroke resulting in a high incidence of falls both during rehabilitation and thereafter, particularly in those patients with both motor and sensory deficits (Geurts et al., 2004).

For clinical and research purposes, the concept of balance needs to be prepared into measurable and observable events (Hammer et al., 2008). A variety of balance scales have been developed for the examination of aspects of postural control (Panzer et al., 1995). Some balance tests are used to measure the ability of a person to maintain the body's center of gravity within the base of support and to maintain stance when his or her balance is not perturbed (Pyo¨ria et al., 2004). It is necessary to have optimal understanding of the potential mechanisms underlying natural balance recovery and compensatory mechanisms to provide interventions to improve the speed and extent of balance recovery following stroke (Jayne et al., 2003). Rapid and optimal movement of postural control in patients with stroke is, therefore, essential to their independence, social participation and general health. Of all sensori-motor consequences of stroke, impaired postural control probably has the greatest impact on independence and gait (Geurts et al., 2004). A majority of the survivors from stroke have a combination of sensory, motor, cognitive and emotional impairments leading to restrictions in their capacity to perform basic ADL (Jayne et al., 2003). Impaired balance early after stroke is strongly associated with future function and recovery (Vilnai and Kartin, 2010).

Post-stroke physical rehabilitation interventions have been used to reduce pain and spasticity, as well as to increase range of motion (ROM), muscle force, mobility, walking ability, functional status, physical fitness, and quality of life (Goljar et al., 2010). Good balance is utmost importance for independence in ADL (Jayne et al.,

2003) and walking. (Enrique et al, 2005). As balance problems are common after stroke and (Jayne et al., 2001) treatment of balance continues to be standard of care in stroke rehabilitation (Goljar et al., 2010).

In both strength training and skill development, repetition is an important aspect of practice (Carr and Shepherd, 2003). Repetitive exercise and practice of an action facilitates the contraction of the muscles (Diane et al., 2005) is necessary to increase muscle strength and train co-ordination of the muscular synergies that move the segmental linkage (Nayak et al., 2010). Restoration of paretic leg muscle functions may determine the standing balance gains in patients with stroke (Geurts et al., 2004). The ability of muscles, particularly the lower limbs, to produce force rapidly and at the appropriate time, and muscle which are extensible, i.e. not stiff or short (Hatton et al., 2010). The system involved need to be adaptive, since balance control requires the ability to adapt our movements to changes occurring both internally and in our external environment (Carr and Shepherd, 2003).

The standing balance problems of patients following a stroke are often related to uneven weight distribution (Cheng et al., 2001) and difficulties in muscle use (Dalia et al., 2011) which increase postural sway during standing (Pyo¨ria et al., 2004). The capacity to voluntarily transfer body weight while maintaining standing balance over a fixed base of support and adopt a different stance position is a prerequisite of safe mobility (Carr and Shepherd, 2003). Improvement of weight bearing symmetry is traditionally regarded as primary goal rehabilitation and has been associated with better motor functioning in post acute phase of stroke (Hatton et al., 2010).

Movements of the legs are a source of disturbance of balance because they are involved in body support, and thus a displacement of the COG is observed immediately before and after movement onset (Tessem et al., 2007). Control of the centre of gravity shift toward a new position, compatible with equilibrium during movement, may be related both to anticipatory and responsive postural adjustments (Dalia et al., 2011). It is worth noting that sensory input integration is very important for maintaining equilibrium, especially during conditions of disturbed balance (Smania et al., 2008).

Lower extremity weight-bearing under various standing conditions in independently ambulatory patients with hemiparesis are found that patients bore significantly more

weight on their non-paretic than on their paretic lower limb during comfortable standing (Diane et al., 2005). When transferring as much weight as possible from one side to the other, patients could also bear significantly more weight on their non-paretic extremity than on their paretic extremity (Cheng et al., 2001). Thus, it is well recognized that the static characteristic of weight distribution following stroke is the inability to transfer body weight onto the affected leg in standing (Fujisawa et al., 2006).

The possible efficacy of repetitive sit to stand training using biofeedback on dynamic standing balance skills, especially sit to stand transfers is of lower limb strength training on making sit to stand transfer need further support (Cheng et al., 1998). In addition, targeted balance training during visual deprivation may be more effective to improve stance stability under complex sensory conditions than the same training with full vision (Carr and Shepherd, 2003).

Stepping and grasping movements of the limbs also appear to play an important functional role in maintaining upright stance (Pyo¨ria et al., 2004). Stepping requires relatively little muscle force even if maintaining a fixed base of support that stepping responses are even more vital to persons who suffer from impaired equilibrium reactions and muscle force, such as patients with stroke (Eng and Chu, 2002). As a consequence, patients with stroke will only use a small part of their base of support for voluntary weight displacements (Paillex and So, 2005). To rely on equilibrium reactions to keep the centre of mass well within the limits of actual base of support (BOS) instead, it may need to execute a stepping response to adjust the base of support to the movement of the centre of mass to prevent a fall (Carr and Shepherd, 2003). Change in the movement pattern of side-step motion occurs with neurological disease such as hem paresis (Dalia et al., 2011). Consequently, the maximum side-step length of these patients' decreases as the range of hip, knee and ankle joint movement increases with increments of the side-step length (Fujisawa et al., 2005).

The issue of evidence-based balance-improving interventions is of importance to physiotherapists engaged (Boudewijn et al., 2009) in the treatment of stroke patients in order to facilitate clinical decision-making, striving to use treatments founded on high-quality research (Chang and Gung, 2000). Today, the importance of evidence-

based medicine as a guide for the clinical decision-making process is increasingly being recognized by physical therapists (Van et al., 2004).

Patient care in comprehensive stroke units followed by rehabilitation services improves neurologic outcomes and reduces mortality. Proper rehabilitation of the stroke patient includes early physical, occupational, and speech therapy (Carr and Shepherd, 2003). It is directed toward educating the patient and family about the patient's neurologic deficit, preventing the complications of immobility (e.g., pneumonia, DVT and pulmonary embolism, pressure sores of the skin, and muscle contractures), and providing encouragement and instruction in overcoming the deficit (Boon et al., 1999). The goal of rehabilitation is to return the patient to home and to maximize recovery by providing a safe, progressive regimen suited to the individual patient suggesting that physical therapy can recruit unused neural pathways (Braunwald et al., 2003). These include the comprehensive assessment of medical problems, impairments and disabilities; active physiological management; early mobilization and avoidance of bed rest; skilled nursing care; early setting of rehabilitation plans involving carers; and early assessment and planning for discharge needs (Van et al., 2004). To deliver rehabilitation effectively, predictions need to be made about the patients' expected degree of recovery to set suitable therapeutic goals, devise effective treatment plans, and facilitate discharge planning (Carr and Shepherd, 2003).

Balance status is also one of the predictors of length of stay in inpatient rehabilitation facilities (Fujisawa et al., 2006) and of the outcome of stroke rehabilitation (Chang and Gung, 2000). Patients with balance problems appear to take longer to reach the same level of functional gain than patients without balance problems (Pyo¨ria et al., 2004). Restoring balance and mobility is an important of stroke rehabilitation (Smania et al., 2008). The restoration of balance is considered a key aspect of stroke rehabilitation because balance is believed to be an essential precursor of the restoration of independence in activities of daily living (ADLs), functional mobility (Jayne et al., 2001) and prevention of falls (Tyson et al., 2007). The rehabilitation process aims to restore function and the ability to participate socially in the community and to avoid secondary complications such as falls and contractures (Hammer et al., 2008).

Recovery and improvement of function following a stroke vary very much during the first year after the stroke (Pyo¨ria et al., 2004). Standing balance recovery from stroke may show considerable inter individual variability depending on the initial sensori-motor and cognitive deficits (Enrique et al., 2005). From a perspective of neural plasticity is that substantial recovery of standing balance and related ADL also occurs (Tyson et al., 2007).

CHAPTER-III: METHODOLOGY

3.1 Study Design: Cross sectional study were selected for the manipulative of the study.

3.2 Study Site: Centre for the Rehabilitation of the Paralyzed (CRP) was chosen for this study.

3.3 Study Area: Neurology Unit of Physiotherapy department was preferred to accomplish this study.

3.4 Study population and sampling: Stroke patient are the study population and the sample will be selected by using purposive sampling.

3.5 Selection criteria:

Inclusion criteria-

- Patient with medically stable.
- Age range 35-75 years.
- Both sexes are incorporated.
- Patient had CVA with standing balance deficit.
- Duration of onset more than 1 month to 1 year.
- Both right and left hemiplegic patient are included.
- Both ischaemic and haemorrhagic stroke are integrated.
- Patient who had received physiotherapy from neurology unit of C.R.P.
- Patient who is able to communicate with physiotherapist.
- Patient who willingly participate in this study.
- Patient who is discharged by neurology unit of C.R.P.

Exclusion criteria-

- Patient who are medically unstable.
- Age range below 35 or above 75 years.
- Duration of onset less than 1 month or more than 1 year.
- Patient who has other type of neurological disorder.

- Any deformities or contractures present in lower limb.
- History of any orthopedic or surgical condition in lower limb.
- Any spinal deformities that affect the normal alignment of the patent.
- Patient who do not take regular treatment at C.R.P.
- Patient who has cognitive, visual or hearing problem which lead to communication difficulties.
- Patient and care giver who are not voluntarily agreed to participate in the study.
- Patient who is not discharged.

3.6 Sample size: 50 samples were collected according to the inclusion and exclusion criteria.

3.7 Data collection methods and tools: Data collection method is questionnaire and tools are pen, papers, consent form, Berg Balance Scale, stop watch, tape measure, software analyze data, SPSS, Harvard reference system 2011, pen drive, computer.

3.8 Informed consent: Participants were selected for this study according to selection criteria and informed properly by using consent form. Patient and researcher signed willingly and voluntarily into the project. Participants were informed that they were completely free to decline answering any question during the study and free to withdraw their agreement and participation at anytime from the study. They were also told that the confidentiality would be maintained and the benefits of the study to future subject and therapist were explained.

3.9 Ethical consideration: It should be ensured by the researcher that it would maintain the ethical issue at all aspects of the study. Because it is a crucial part of all form of research. At first to conduct this study, ethical committee will check the proposal and grant approval. Permission will also be taken from the head of physiotherapy department. The researcher will give detail and clear information about the purpose of the study of the participant of the research verbally in Bengali and written in English. During the course of the study, interested subject will be given consent form. For this study, the researcher will not interfere with their clients and clinical practice. They will inform that their participation is fully voluntary and they have the right to withdraw or discontinue from the research at any time without any hesitation or risk. Confidentiality of information will be maintained and client code

will be used to make clients identity invisible. They were assured that taking part in this study would cause them no harm. They would not be embarrassed by the study. But in future new generation of physiotherapy will be benefited from this study. At any time researcher will be available to answer any additional question in regard to the study.

3.10 Limitation of the study:

- The main limitation of the study was its short duration that may have affected the result of the study. For better it would take more time.
- Sample selected from Neurology outdoor of C.R.P due to limitation of time and accessibility. But it needed to collect samples from different places and organizations in Bangladesh to make it generalized.
- Total number of sample was 50 which were very small in number to generalize the result.
- There may also be many other unmeasured variables between the participant and such as marital status, family type etc.

CHAPTER-IV: RESULTS

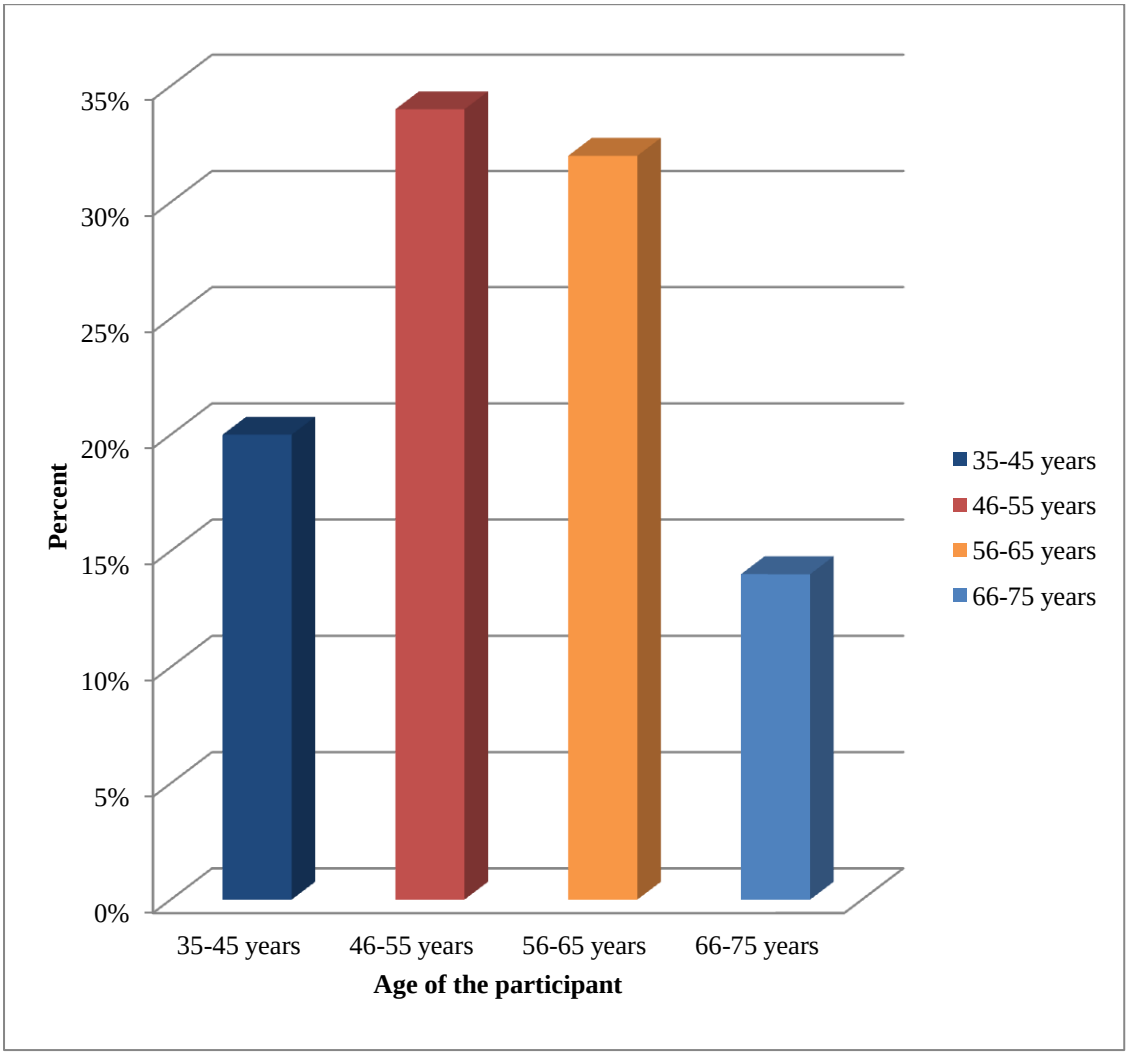


Figure-1: Age of the participant

Fig: 01 shows the age range in bar chart where the samples are represented. Among them 20% were 35-45 years, 34% were 46-55 years, 56-65 years were 32% and 14% were 66-75 years.

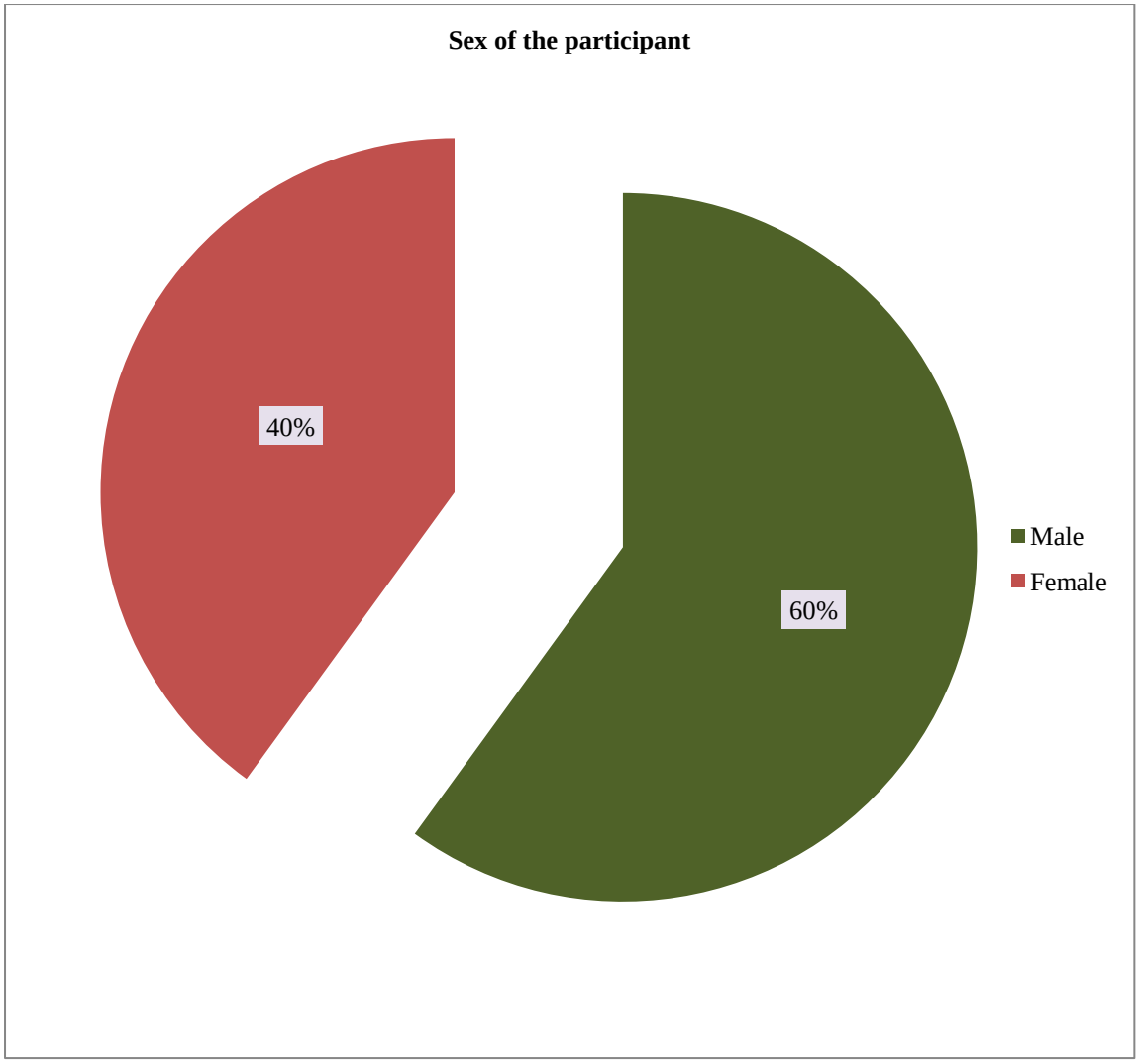


Figure-2: Sex of the participant

Fig: 02 shows that 50 subjects were used for this survey. Among them 30 were male and 20 were female. So, the ratio of Male: Female is 3:2 and the percentage was male 60% and female 40%.

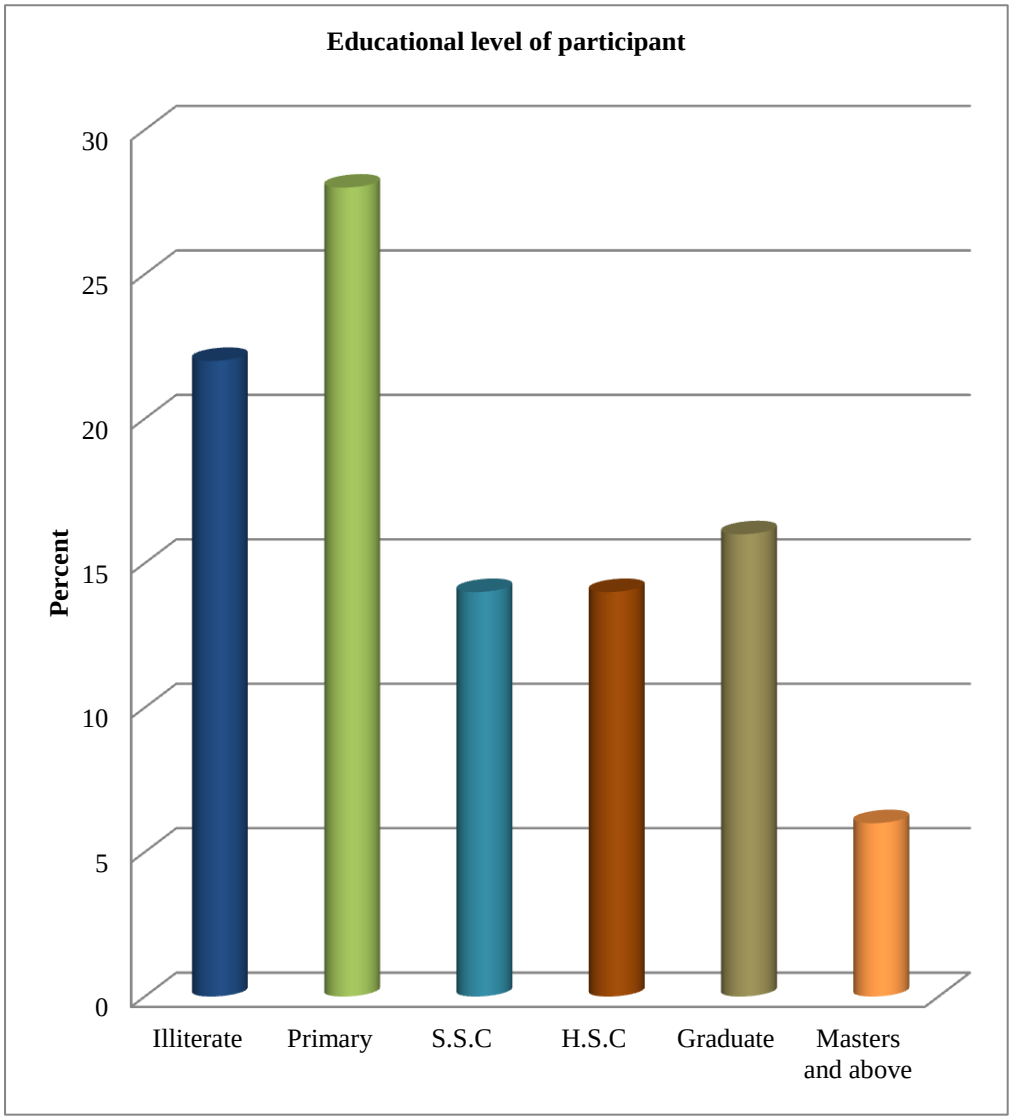


Figure-3: Educational level of the participant

Fig: 03 in bar chart shows that 22% were illiterate, 28% were primary, 14% were S.S.C, 14% were H.S.C, 16% were graduate and 6% were masters and above among the participants educational status.

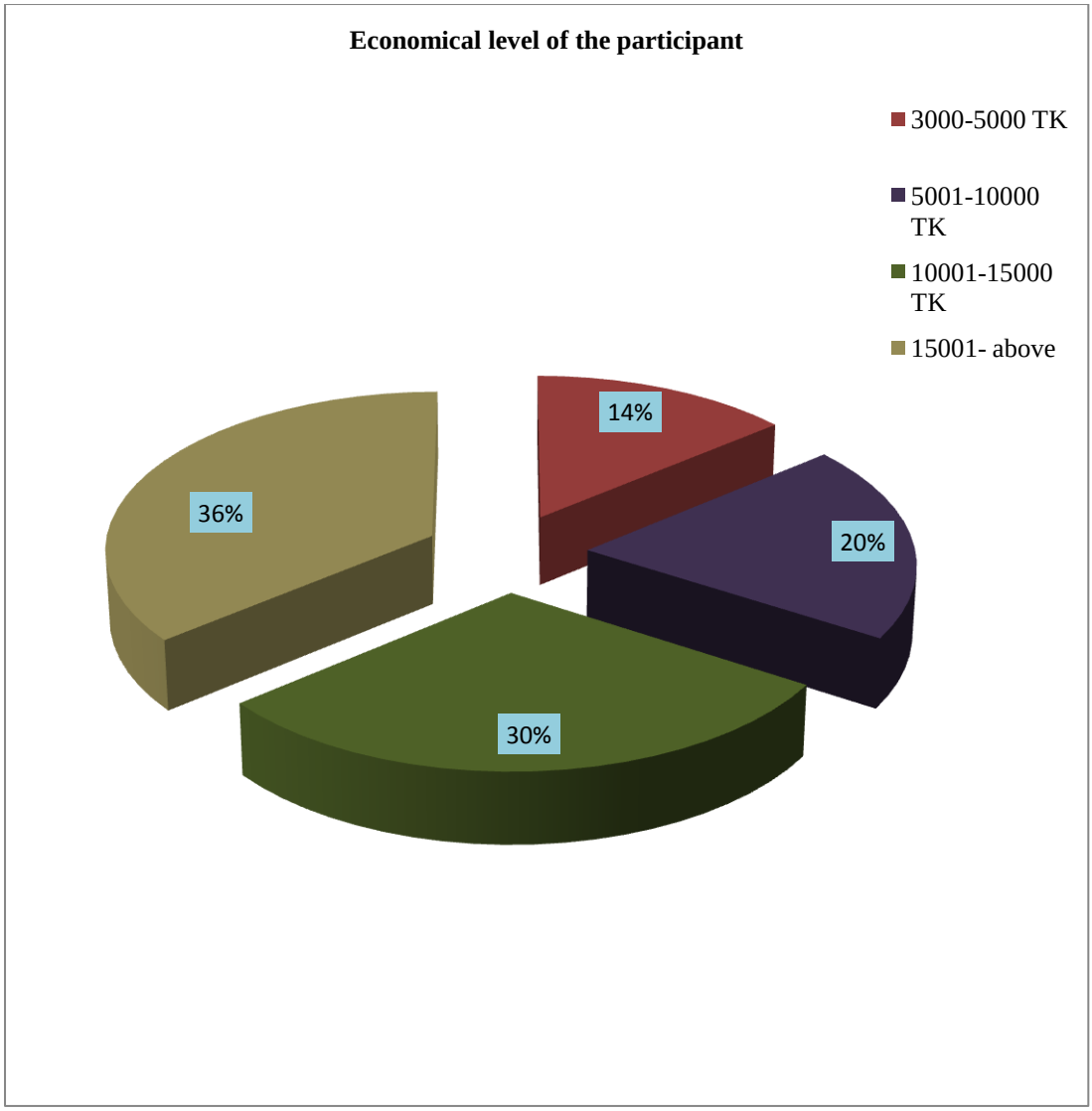


Figure-4: Economical level of the participant

Fig: 04 shows the economical status among the participant in percentage where 14% were very low, 20% were low, 30% were poor and 36% were high economic condition.

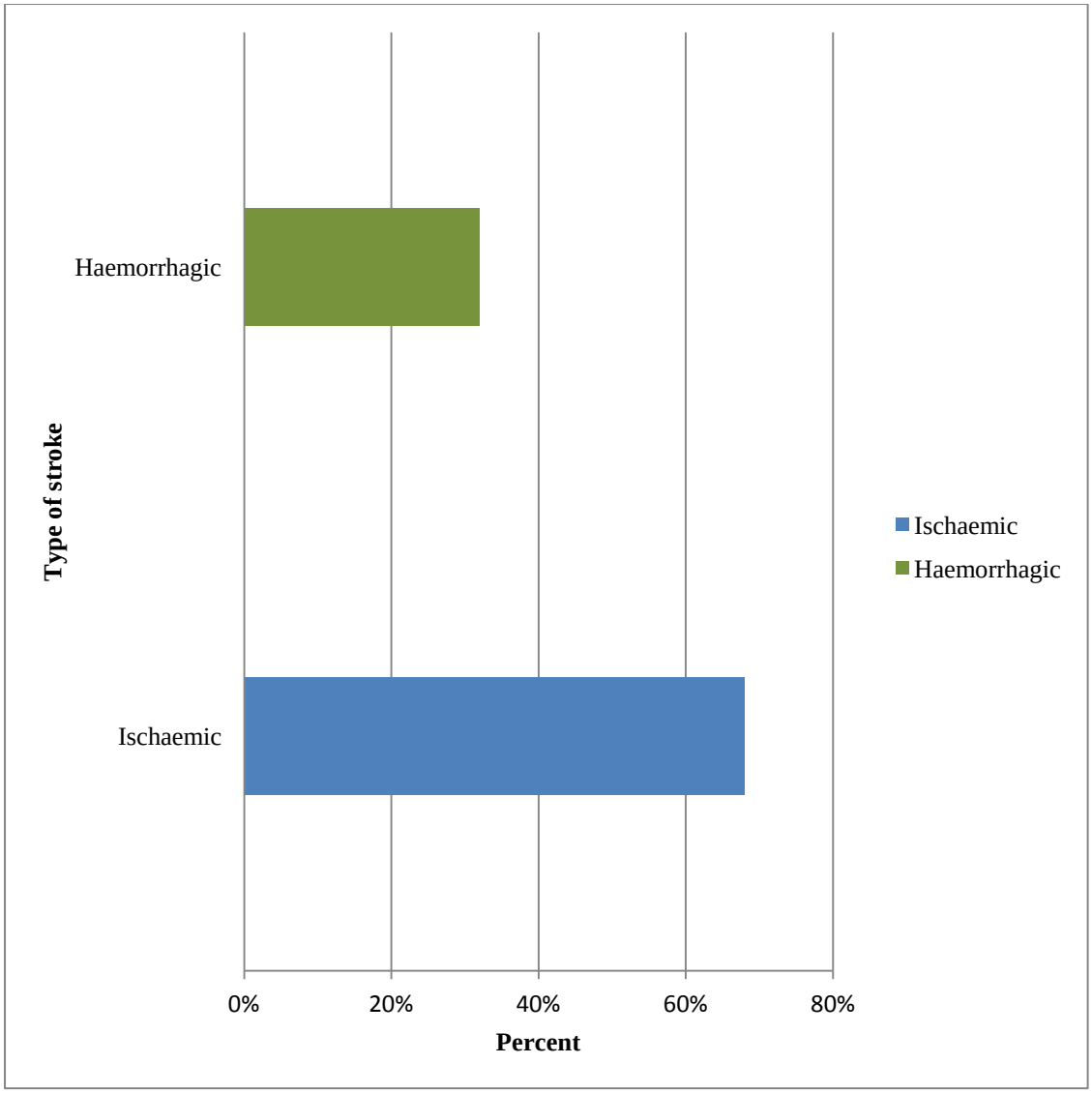


Figure-5: Types of stroke

Fig: 05 shows type of stroke in bar chart where 68% were ischaemic and 32% were haemorrhagic stroke among participant.

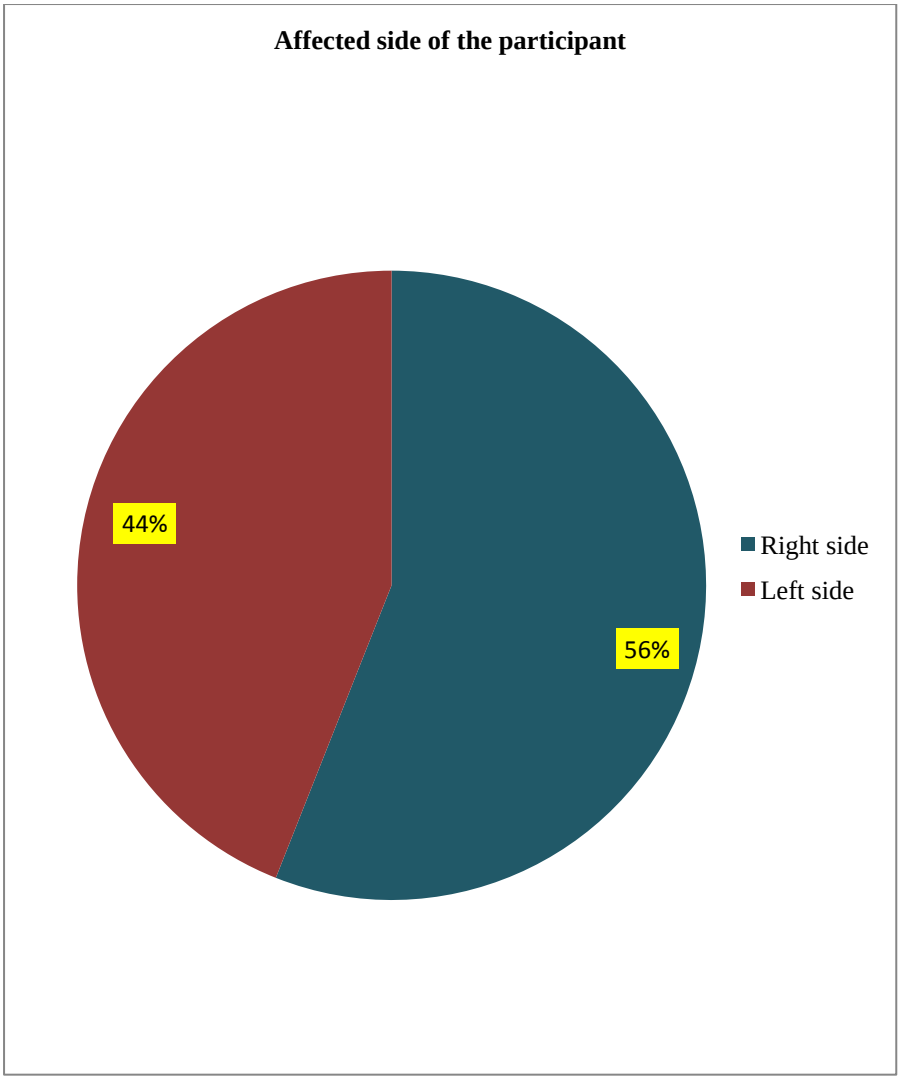


Figure-6: Affected side of the participant

Fig: 06 shows the percentage of affected side in pie chart where 56% were right sided hemiplegia and 44% were left sided hemiplegia.

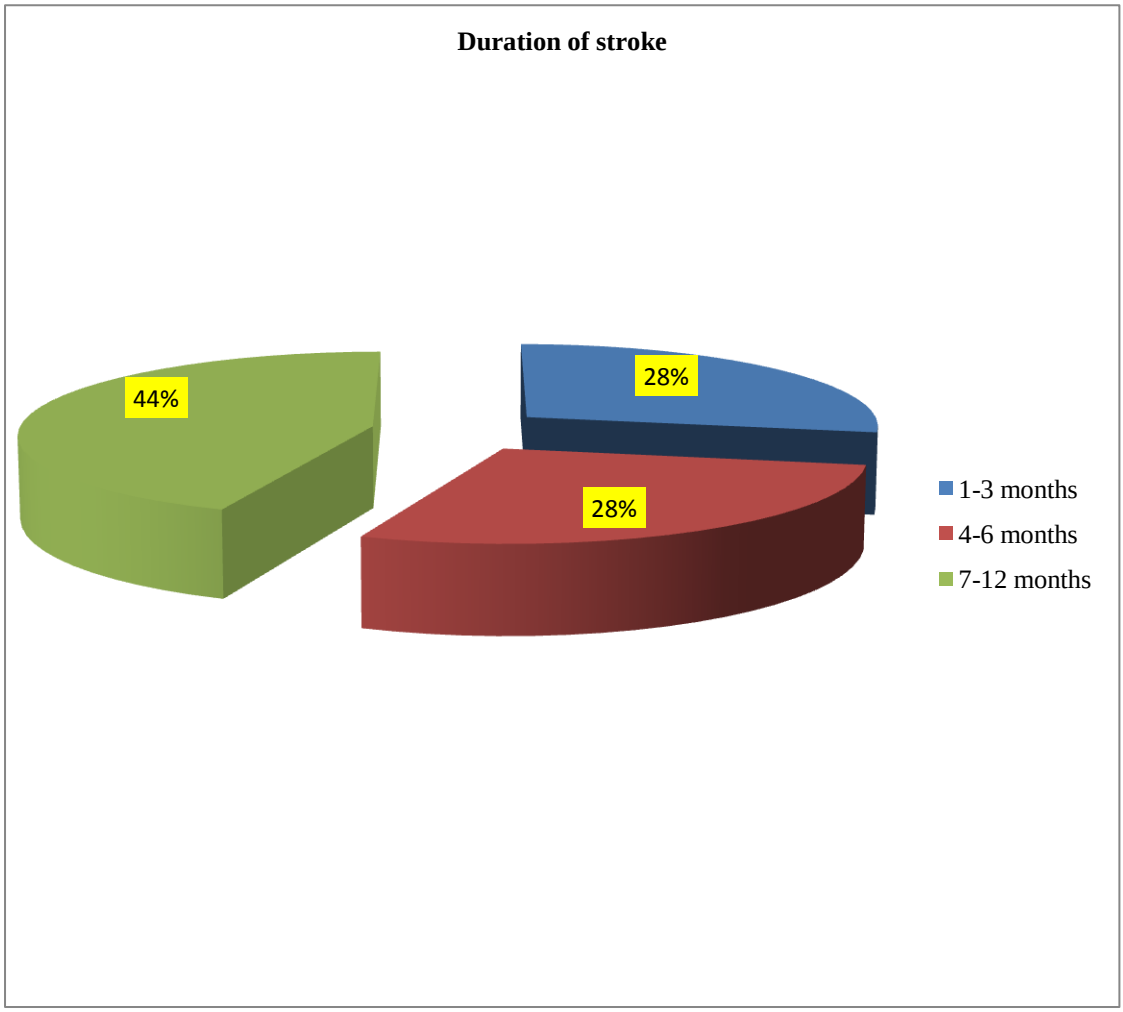


Figure-7: Duration of stroke

Fig: 07 shows the duration of stroke where 28% were 1-3 month, 28% were 4-6 month, 44% were 7-12 month in pie chart.

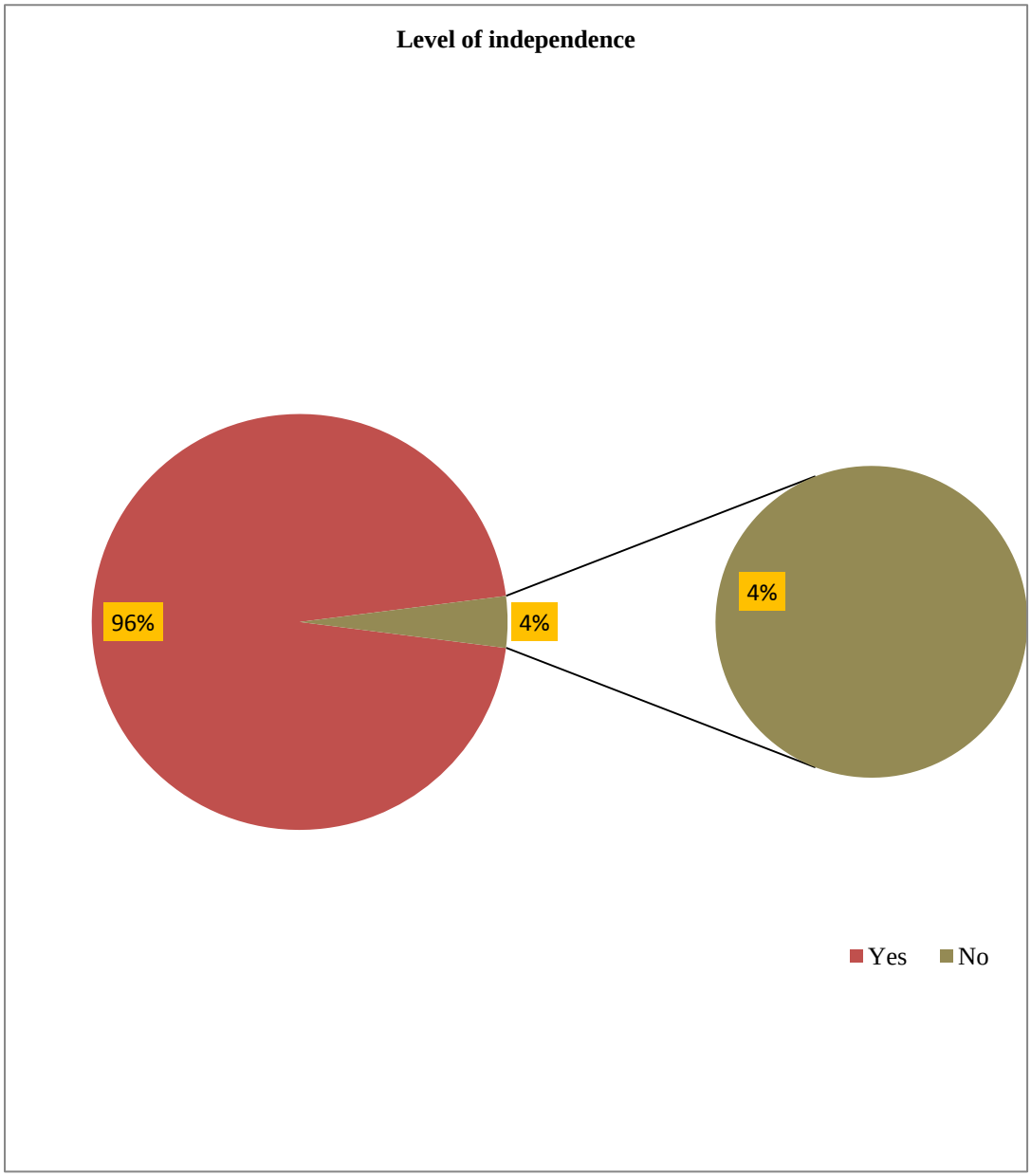


Figure-8: Level of independence of the participant

Fig: 08 show that the level of independence in percentage where yes 96% indicates dependency and no 4% indicates independency.

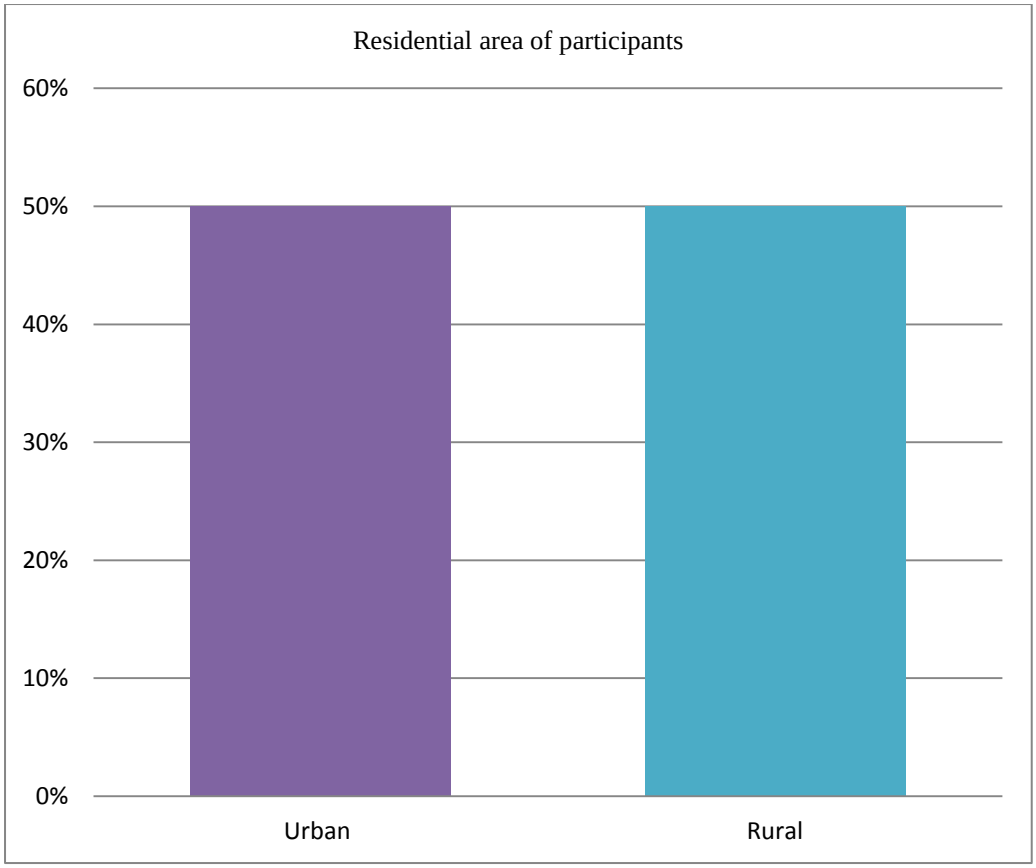


Figure-9: Residential area of the participant

Fig: 09 shows the residential area of participant where 50% were from urban and 50% were from rural area.

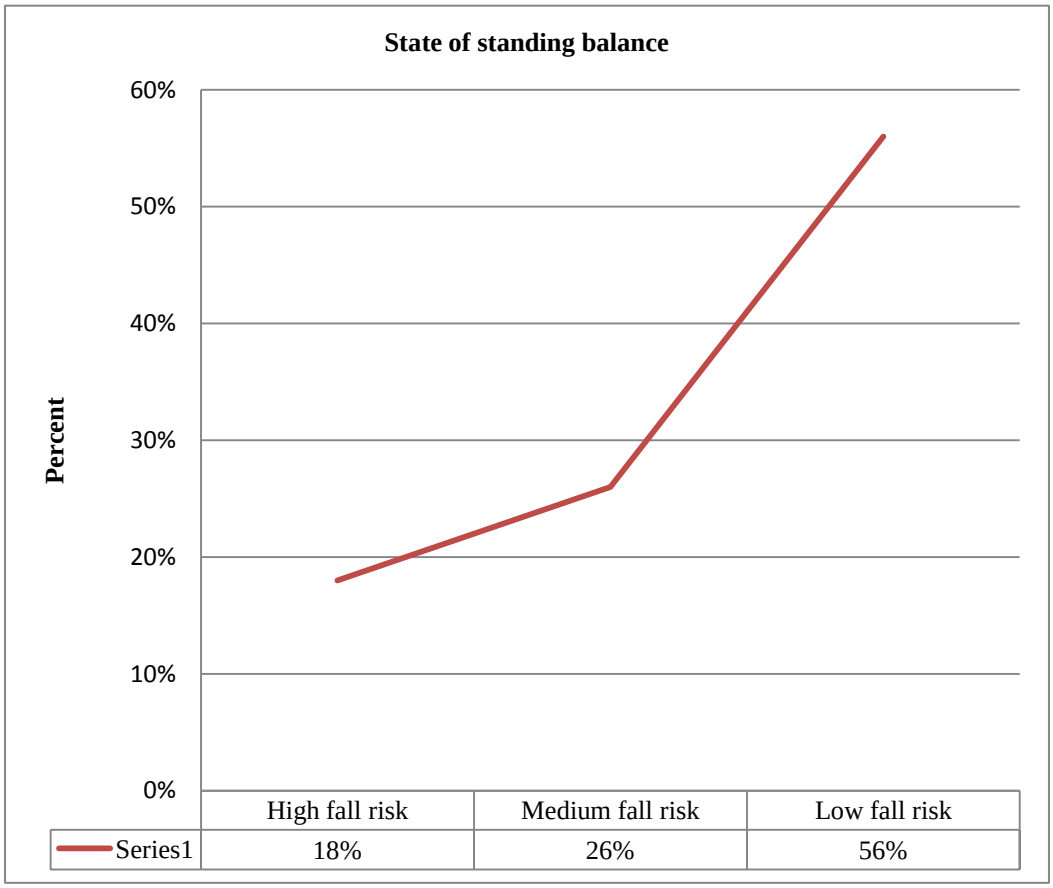


Figure-10: State of standing balance among stroke patient

Fig: 10 shows that among 50 subject 100% participant viewed that the state of standing balance in Berg balance scale where i8% are in high fall risk, 26% are in medium fall risk and 56% are in low fall risk.

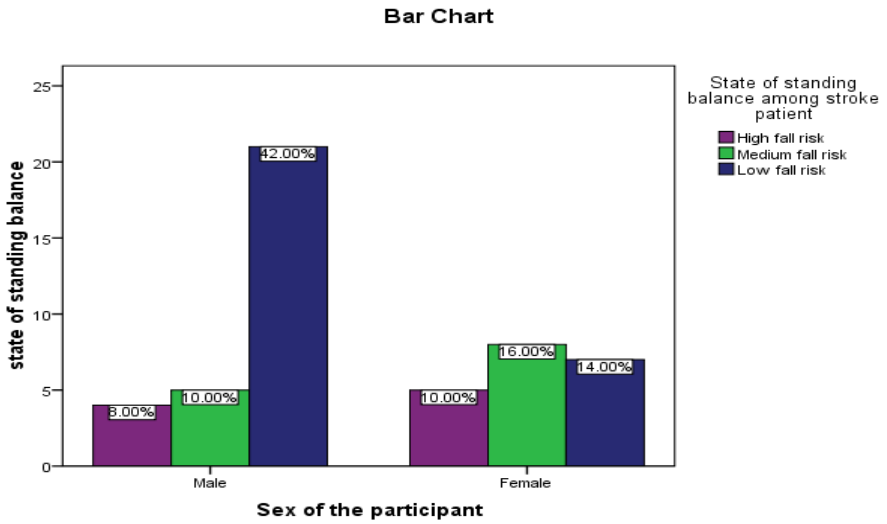


Fig 13: Relationship between sex and state of standing balance

In Fig: 13, among 60% male, 42% have low fall risk, 10% have medium and 8% have high fall risk

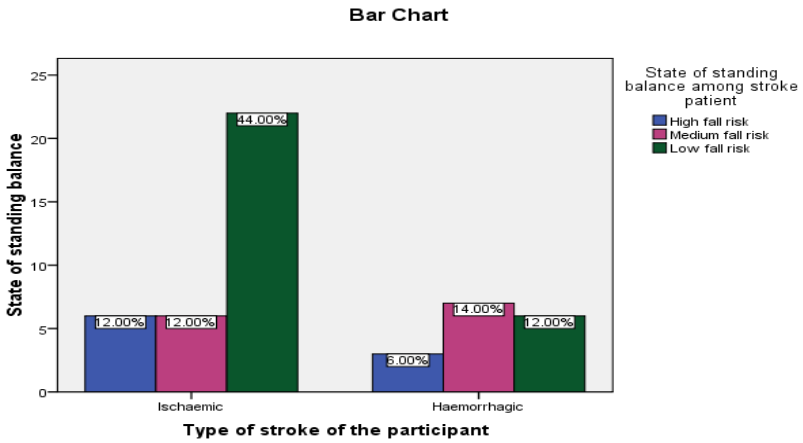


Fig14: Relation between type of stroke and state of standing balance

Fig: 14 shows that among 68% ischaemic stroke patient, 44% have low fall risk, 12% have medium and 12% have high fall risk and among 32% haemorhagic stroke patient, 12% have low fall risk, 14% medium and 6% have high fall risk.

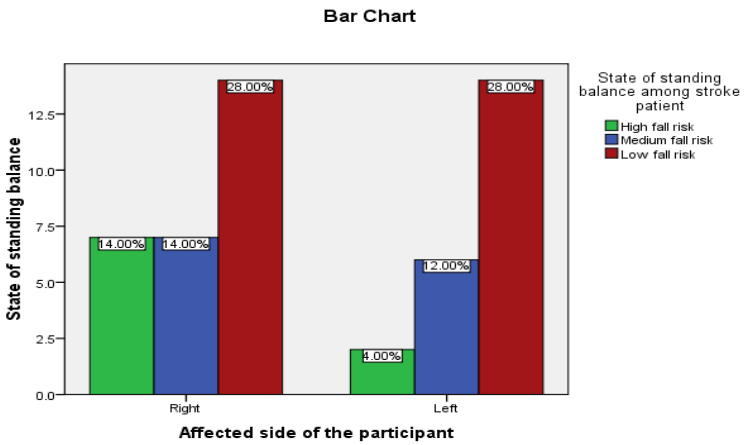


Fig 15: Relationship between rihgt and left sided hemiplegia and state of standing balance

Fig: 15 shows that, among 56% right sided hemiplegia, 28% have low fall risk, 14% medium and 14% have high fall risk. In, 44% left sided hemiplegia 28% have low fall risk, 12% medium and 4% have high fall risk.

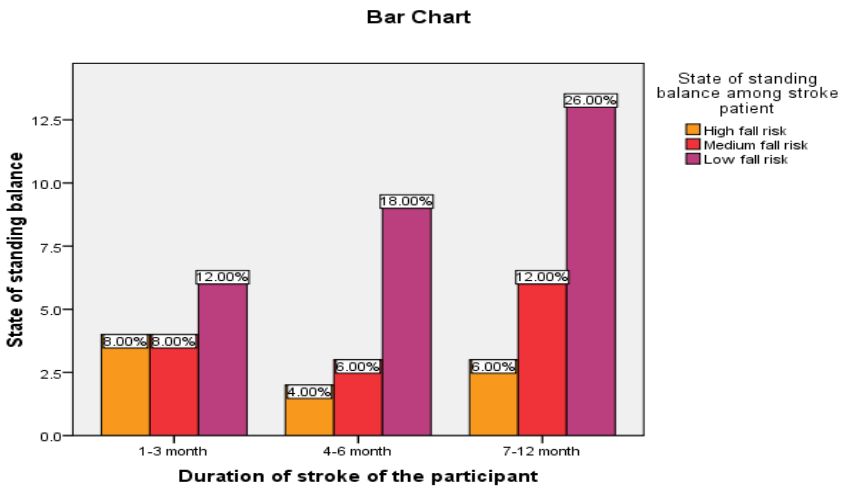


Fig 16: Relationship between duration of stroke and state of standing balance

Fig: 16 shows, among 28% stroke occurred in 1-3 month, where 12% have low fall risk, 8% medium and 8% have high fall risk; 28% stroke occurred in 4-6 month, where 18% have low fall risk, 6% medium and 4% have high fall risk; within 7-12 month stroke occurred in 44% case, where 26% have low, 12% have medium and 6% have high fall risk

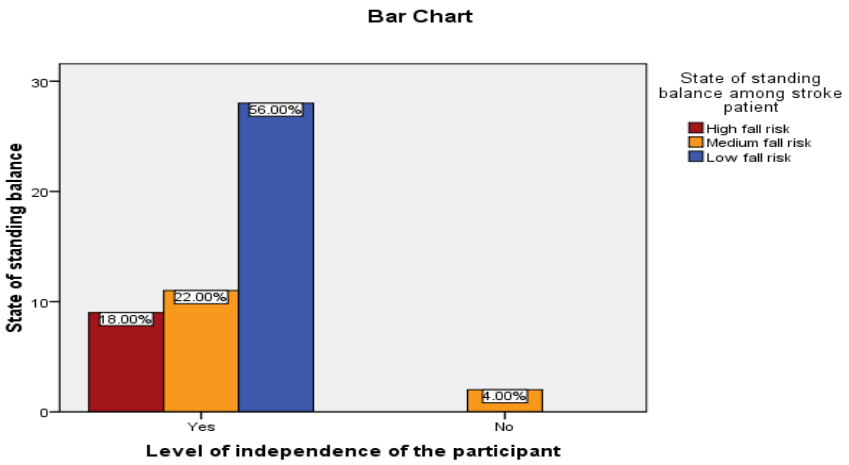


Fig 17: Relationship between level of independence and state of standing balance

Fig: 17 shows that 96% stroke patient had carer, where 56% have low fall risk, 22% medium and 18% have high fall risk; 4% had no carer and have medium fall risk.

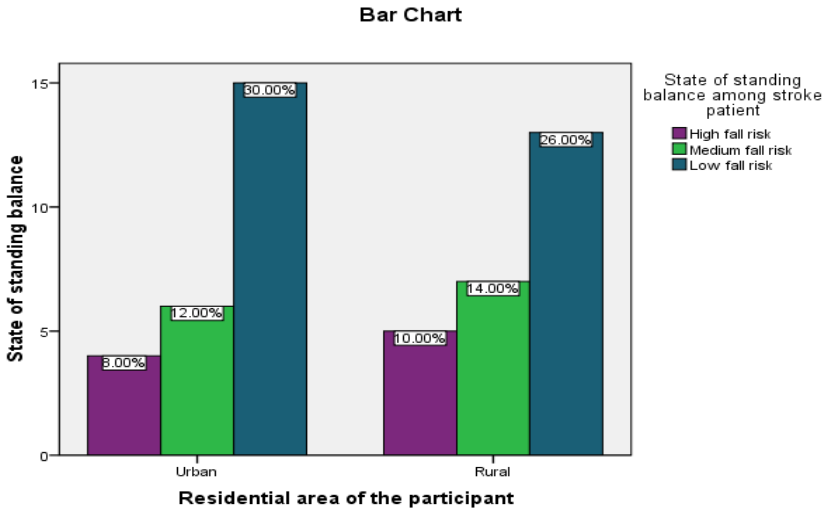


Fig 18: Relationship between residential area and state of standing balance

Fig: 18 shows that, among 50% urban patient have low fall risk (30%), medium fall risk (12%), high fall risk (8%) and among 50% rural patient have low fall risk (26%), medium fall risk (14%), high fall risk (10%).

CHAPTER-V: DISCUSSION

The study was conducted to evaluate standing balance among stroke patients. The main focus of this study was patient's static and dynamic performance estimating on Berg balance scale.

Age is one of variable in this study. Here the mean age is 55.50 years; other study in Taiwan (Chen et al., 2002) shows mean age 55.33 years. In Switzerland median age of 53.5 years (Paillex and So, 2005). In Thailand, mean age is 53.3 with SD 8.77 (Bovonsunthonchai et al., 2011). (Akbari et al., 2006) shows mean aged 52.41 ± 6.19 years and (Shah and Jayavant, 2006) also shows mean age in 51.7years. Mean age is 58.97 years (Niam et al., 1999), mean age 58.74±9.73 (Olagun et al., 2011) in Nigeria, mean age 59.7_12.3 years (Ilse et al., 2006) in Netherlands, mean age in Kuwait is 59.17 years (Ahmed et al., 2008) where mean (SD) age of 57.6 ±11 (Kluding and Gajewski, 2009), mean age of the study population was 46.06 ± 11.19 years (Srivastava et al., 2010). Another studies reported that, mean age, 60.5 years (Ryerson et al., 2008), in America, mean age is 60.4 years, in USA (Geiger et al., 2001), in Canada mean age, 64.2±13.7 years (Jayne et al., 2001), in Japan mean age 67,SD 11 years(Fujisawa et al., 2005),in Africa (61.38 ± 6.04) years (Kolapo and Funmilao, 2002), in Taiwan (Mao et al., 2002) mean age of 69 years (SD, 11.3). Age in years mean (SD) 68.64 (14.2) in Ontario (Salter et al., 2010).The mean age in Brazil 65 years (Oliviera et al., 2008), mean age 66 years in (Michael et al., 2006) and (Moriello et al., 2011) shows in Canada, mean age is 67.0 ± 12.3. Mean age is 66.7 years (SD 12.5) in (Tyson and Lorraine, 2004), mean age is 71.5 years (SD=12.2), (Tyson et al., 2006) and mean age 70.7 (SD 12.6) years (Tyson et al., 2007). Mean age _ SD (y) 70.0_8.7 (Enrique et al., 2005) in Spain, mean Age in years 73.5 (7.0) (Stevenson, 2010) in Australia, mean age (y) 72_11 (Salbach et al., 2006) shows in America, mean age 71 years in Netherlands (Bos et al., 2002), mean of 76±8 years in Canada (Wee et al., 2003).

Ratio of male: female = 3:2, where male is 60% and female is 40% where male 18 (60%) Female 12 (40%) ratio is same in (Niam et al., 1999). In Tanzania, study shows (Walker et al., 2000) male 61% and female 39%, patients (46%) were women

and patients (66%) were men (Bos et al., 2002) in Netherlands, (Salbach et al., 2006) shows in America, male 63 and female 37 and 52 women and 60 men participated in Taiwan (Mao et al., 2002), male 56% and female 44.% in Spain (Enrique et al., 2005) male 56% and women 44% in (Vemmos et al., 1999) in Greece. Male 73 and female 61 participated in Ontario (Salter et al., 2010) and male 43, female 20 (Moriello et al., 2011) shows in Canada, 41 males and 9 females (Olagun et al., 2011) in Nigeria. Male 11 and female 9 (Ryerson et al., 2008) in America, male 19 and female 7 (Oliviera et al., 2008) in Brazil and male 31 and female 22 in (Michael et al., 2006). 313 subjects included, in Canada (Wee et al., 2003) where 162 were men and 151 were women. Gender (M:F) = 24:24 is eual in (Stevenson, 2010) in Australia. Male stroke incidence rate was 33% higher and stroke prevalence was 41% higher than the female (Appelros et al., 2009) in Sweden.

In this study, 22% were illiterate, 28% were primary, 14% were S.S.C, 14% were H.S.C, 16% were graduate and 6% were masters and above among the participants educational status. Here (Salbach et al., 2006) shows in America 29% were none primary, secondary 37% and college-university 34%. Here, among participants14% were very low, 20% were low, 30% were poor and 36% were high economic condition. In America (Salbach et al., 2006) shows that monthly income insufficient 18%, adequate 28%, ample 54%.

These study shows 68% were ischaemic and 32% were haemorrhagic stroke among participant. Other study (Cabral et al., 2009) shows 62% ischaemic and 16% haemorrhagic stroke. 89% patients had an ischemic stroke reported in (Tyson et al., 2007). In Netherlands (Bos et al., 2002) indicated Ischemic 85%, hemorrhagic 15%;in America (Salbach et al., 2006) shows Ischemic 84% and Hemorrhagic 16 %, (Ahmed et al., 2008), in Kuwait shows ischemic 76.2 % and hemorrhagic 23.8% , in Spain participant of stroke survivors categorized as ischemic 19 and hemorrhagic 7 (Enrique et al., 2005) and in (Moriello et al., 2011) shows in Canada ischemic 53 and hemorrhagic 10 in number.

Cerebral infarction was diagnosed in 81% of cases, intracerebral hemorrhage in 16%, and subarachnoid hemorrhage in 2% in (Vemmos et al., 1999) in Greece. Lacunar infarction 19%, sub cortical infarction 53%, intracerebral haemorrhage 13% (Ilse et al., 2006) in Netherlands.72.5% were cerebral infarction, 14.5% were intracerebral

hemorrhage, 4.3% were subarachnoid hemorrhage, and 8.7% were stroke of undetermined type (Thrift et al., 2001) in Australia. (Oliviera et al., 2008) in Brazil presented infarct 20 and hemorrhagic stroke 6 in number.

Hemorrhage 12 and ischemic 18 (Bovonsunthonchai et al., 2011) in Thailand. Infarct 120 and haemorrhage 14 in number of stroke participant in Ontario (Salter et al., 2010). 31(62%) had haemorrhagic stroke while 19(38%) had ischaemic type (Olagun et al., 2011) in Nigeria showing different than other study.

In this study, 56% were right sided hemiplegia and 44% were left sided hemiplegia. Other study (Salbach et al., 2006) shows 56% right sided hemiplegia and 43% left sided hemiplegia and 1% bilateral stroke. CVA Location (Stevenson, 2010) in Australia, right 19 and left 26 and in Kuwait (Ahmed et al., 2008) reported left hemisphere 61.9% and right hemisphere 38.1% and also in Netherlands (Bos et al., 2002) left hemisphere 52% and right hemisphere 48%. Hemiplegic side, right 56.7% and left 43.3% (Niam et al., 1999). Stroke location right 69 and left 47 in Ontario (Salter et al., 2010). Lesion side, 57% had a left hemiplegia (Tyson and Lorraine, 2004), 65 patients had left-sided weakness (Tyson et al., 2007), 61% had left hemiplegia (Tyson et al., 2006).

In Spain, side of hemiparesis, right 49.0% and left 50.5% (Enrique et al., 2005). Affected Side right 25 and left 32 in (Moriello et al., 2011) shows in Canada. Lesion side right 9 and left 12 (Ryerson et al., 2008) in America. Twenty four (48%) stroke survivors had right hemiparesis while 26 (52%) had left hemiparesis. (Olagun et al., 2011) in Nigeria. Affected side of participant in stroke is left 22 and right 8 in (Bovonsunthonchai et al., 2011) in Thailand. One hundred twenty-nine subjects had right hemisphere strokes, 129 had left hemisphere strokes in Canada (Wee et al., 2003).

This study shows the duration of stroke where 28% were 1-3 month, 28% were 4-6 month, 44% were 7-12 month. Level of independence in percentage where yes 96% indicates dependency and no 4% indicates independency. In rural China (71.4%) and rural India (87.5%) has care giver (Ferri et al., 2011). 40% were independent in Auckland study (Bonita et al., 1997). 61.5% had regained their independence (Cabral et al., 2009) in Brazil. 66% percent of stroke survivors needed help with at

least 1 activity of daily living in Africa (Connor, 2004**)** where 45% stroke survivors need care on activities of daily living (ADL) (Bos et al., 2002) in Netherlands.

Study shows the residential area of participant where 50% were from urban and 50% were from rural area and other study (Sergeev et al., 2011) rural stroke increase with age. Stroke prevalence in rural South Africa is higher than previously documented in Africa (Connor, 2004**).** A prevalence study of 14 010 participant living in Bombay showed 842 cases/100 000, whereas in rural Kashmir only 143/100 000 were found (Walker et al., 2000). Here, this study shows that, right sided hemiplegia is 56% and left sided hemiplegia 44% where low fall risk is equal that is 28%. Other study shows that no difference was found in balance control between patients with right and left hemiparesis (Dalia et al., 2011). So, total 56% has regained their balance. Another study shows that, right hemispheric stroke patients had better balance function than left hemispheric patients in Taiwan (Chen et al., 2002). There was no significant difference in balance function measures (ordinal scale) between left and right hemiparesis with mean of 50.33±9.13 and 51.69±7.67 (Akbari et al., 2006)

CHAPTER-VI: CONCLUSION AND RECOMMENDATION

6.1 Conclusion

In the world, stroke is considered as the 3rd leading cause of death and it is becoming a major threat of Neurological disability in population of Bangladesh. Bangladesh is a developing country with low socio-economic condition where people are not enough concerned about health. Health services are not sufficient in the Government and non-government sector. So, most people are suffering from lack of proper treatment. Now a day's different private clinics and hospital are trying to bring latest medical facilities in our country. But there is nothing to be mentioned about physiotherapy services. In Bangladesh the physiotherapy started after liberation war. But the people along with other health care professional are still confused about the effectiveness of physiotherapy for the recovery of stroke in Bangladesh. Most of the people are not enough familiar about physiotherapy. They consider it only as exercise. To make a bright future of physiotherapy it is essential to increase awareness about physiotherapy and effectiveness of early physiotherapy interventions for patient. In Bangladesh physiotherapy is a developing professions which is dominated by other health professionals due to lack of standard manpower. For this reason it is important to develop local evidence based practice. Evidence based practice is significant to find out the absolute reason of achieving the treatment goals and improvement. Last of all, this research has tried to represent strong evidence on improved state of standing balance among stroke patient after discharge.

6.2 Recommendation

The aim of this study was to explore state of standing balance among stroke patient after discharge and the result that the researcher found from the study has fulfilled the aim of this research project. The researcher recommended the following things-

- Should take more samples for generating the result and make more valid and reliable.
- Should take more samples for pilot study to establish the accuracy of the questionnaire.
- Sample should collect from different hospital, clinic, institute and organization in different district of Bangladesh to generalize the result.
- This study can also accomplish with other individual functional problems.
- To find out an effective and efficient result in generalized form, other measurement scale should be used in consideration.
- To achieve more improvement more time with greater concentration of physiotherapy was needed.

This is an undergraduate study and doing the same study at graduate level will give more precise output. There were some limitation of this study mentioned at the relevant section; it is recommended to overcome those limitations during further study.

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APPENDIX

মৌখিক অনুমতি পত্র

(অংশগ্রহণকারীকে পড়ে শোনাতে হবে)

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

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

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

এটা শুরু করার আগে আপনার কি কোন প্রশ্ন আছে?

আমি আপনার অনুমতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি?

হ্যাঁ ☐

না ☐

সাক্ষাৎকারীর স্বাক্ষর ঃ.....

VERBAL CONSENT STATEMENT

(Please read out to the participant)

Assalamualaikum/Namasker, my name is *Tanzina Kabir*, I am conducting this study for a Bachelor project study titled "State of standing balance among stroke patient after discharge." from Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related questions about Stroke. This will take approximately 20 - 30 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. The researcher is not directly related with this neurology area, so your participation in the research will have no impact on your present or future treatment. All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous.

Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview.

If you have any query about the study or your right as a participant, you may contact with Tanzina Kabir, researcher and/ or Md. Obaidul Haque, Course Coordinator, University of Dhaka.

Do you have any questions before I start?

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

YES ☐

NO ☐

Signature of the Interviewer _____

প্রশ্নাবলীঃ

পরিচিতি নং ঃ মোবাইল নং ঃ

অংশগ্রহণকারীর

নাম ঃ

ঠিকানা ঃ গ্রাম/বাড়ি নং- থানা-

ডাকঘর- জেলা-

আবাসস্থল ঃ [ ] ১= শহর ২= গ্রাম

বয়স ঃ ..... বছর

লিঙ্গ ঃ ১= পুরুষ ২=মহিলা

পেশা ঃ [ ]

রোগ নির্ণয় ঃ

স্ট্রোকের ধরণ ঃ [ ] রক্তাল্পতাজনিত ২=রক্তক্ষরণজনিত

স্ট্রোকে আক্রান্ড় হওয়ার তারিখ ঃ দিন/মাস/বছর .....

পূর্ব চিকিৎসার বিবরণ ঃ [ ]

১= উচ্চ রক্তচাপ ২= হৃদরোগ ৩= ডায়বেটিক ৪=ধূমপান

৫= তামাক চাবানো ৬= মদ্যপান ৭= অশান্ড় জীবনধারা ৮=অন্যান্য

সাক্ষাৎকারের তারিখ ঃ দিন/মাস/বছর .....

আপনার শিক্ষাগত যোগ্যতা কি? [ ]

১= অশিক্ষিত ২= প্রাথমিক ৩= এস.এস.সি

৪= এইচ.এস.সি ৫=স্নাতক ৬=স্নাতোকত্তর এবং এর বেশি

আপনার বৈবাহিক অবস্থা কি? [ ]

১ = বিবাহিত ২= অবিবাহিত ৩= বিপত্নীক

৪=তালাকপ্রাপ্ত

আপনি কি ধরনের পরিবারে বাস করেন? [ ]

১ = একক পরিবার ২= যৌথ পরিবার

আপনার কি কোন তত্ত্বাবধানকারী আছেন? [ ]

১ = হ্যাঁ ২ = না

আপনার পরিবারে কতজন উপার্জনক্ষম সদস্য আছেন? ☐

১ = শুধু একজন ২ = একজনের বেশি

আপনার মাসিক পারিবারিক আয় কত?

১ = ৩০০০-৫০০০ ২=৫০০১-১০০০০ ☐ ৩=১০০০১-১৫০০০ ৪=১৫০০০-বেশি

আপনি কতদিন ধরে ফিজিওথেরাপী চিকিৎসা নিচ্ছেন? ☐

১= ৬ সেশন ২=৪ সেশন ৩=১০ সেশন ৪= >১০ সেশন

বার্গ ব্যালেন্স স্কেলে দাড়িয়ে থাকার ভারসাম্যতা স্কোর কত? ☐

১. বসা থেকে দাঁড়ানো অবস্থায় (০/১/২/৩/৪)

২. সহায়তা ছাড়া দাঁড়ানো অবস্থায় (০/১/২/৩/৪)

৩. দাঁড়ানো থেকে বসা অবস্থায় (০/১/২/৩/৪)

৪. স্থানান্ড়রের সময় (০/১/২/৩/৪)

৫. চোখ বুঁজে সহায়তা ছাড়া দাঁড়ানো অবস্থায় (০/১/২/৩/৪)

৬. দুই পা একসাথে করে দাঁড়ানো অবস্থায় (০/১/২/৩/৪)

৭. বাহু প্রসারিত করে দাঁড়ানো অবস্থায় সামনের দিকে হাত বাড়ানো (০/১/২/৩/৪)

৮. দাঁড়ানো অবস্থায় মেঝে থেকে বস্তু তুলে নেয়া (০/১/২/৩/৪)

৯. কাঁধের ডানে ও বামে ঘুরে পেছনে তাকানো (০/১/২/৩/৪)

১০. ৩৬০° ঘুরানো (০/১/২/৩/৪)

১১. সহায়তা ছাড়া দাঁড়ানো অবস্থায় পর্যায়ক্রমিকভাবে দুই পা সিঁড়িতে অথবা পিঁড়িতে রাখা (০/১/২/৩/৪)

১২. এক পা সামনে রেখে সহায়তা ছাড়া দাঁড়ানো অবস্থায় (০/১/২/৩/৪)

১৩. একপায়ে দাঁড়ানো অবস্থায় (০/১/২/৩/৪)

QUESTIONNAIRE

- ID: Cell no:

  Participant's
- Name:
- Address:

  Village/House no- Thana-

  Post office- District-
- Residential area: ☐

  1= Urban 2= Rural
- Age: ……. years
- Sex: ☐

  1= Male 2= Female
- Occupation:
- Diagnosis:
- Type of stroke: ☐

  1= Ischemic 2= Haemorrhagic
- Date of incidence of stroke: DD/MM/YY……
- Past Medical History: ☐

  1= Hypertension 5= Tobacco chewing

  2= Heart disease 6= Alcohol consumption

  3= Diabetics 7= Stressful lifestyle

  4= Smoking 8= Others

- Date of interview: DD/MM/YY……
- What is your educational level? ☐

  1= Illiterate 4= H.S.C

  2= Primary 5= Graduate

  3= S.S.C 6= Masters and above

- What is your marital status? ☐

  1= Married 3= Widow

  2= Unmarried 4= Divorced

- What type of family you are living? ☐

  1= Nuclear family 2= Extended family

- Do you have any carer? ☐

  1= Yes 2= No

- How many earning member in your family? ☐

  1= only one 2= more than one

- What is about your monthly family income? ☐

  1= 3000-5000 3= 10,001-15,000

  2= 5001-10,000 4= 15,001- Above

- How long you have received physiotherapy treatment? ☐

  1= 6 session 3= 10 session

  2=8 session 4= > 10 session

- What are the scores of standing balance by using Berg Balance Scale?
  1. Sitting to standing (0/1/2/3/4)
  2. Standing unsupported (0/1/2/3/4)
  3. Standing to sitting (0/1/2/3/4)
  4. Transfers (0/1/2/3/4)
  5. Standing unsupported with eyes closed (0/1/2/3/4)
  6. Standing unsupported with feet together (0/1/2/3/4)
  7. Reaching forward with outstretched arm while standing (0/1/2/3/4)
  8. Pick up object from the floor from a standing position (0/1/2/3/4)
  9. Turning to look behind over left and right shoulders (0/1/2/3/4)
  10. Turn 360 degrees (0/1/2/3/4)
  11. Place alternate foot on step or stool while standing unsupported (0/1/2/3/4)
  12. Standing unsupported one foot in front (0/1/2/3/4)
  13. Standing on one leg (0/1/2/3/4)

April 13, 2011

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 Physiotherapy Neurology outdoor patient.

Sir,

I respectfully state that I am Tanzina Kabir student of fourth year B. Sc in Physiotherapy at Bangladesh Health Professions Institute (BHPI). In fourth year course curriculum we have do a research project. I have chosen a research title that "Standing balance (both static and dynamic) among stroke patients during discharge attendant at CRP". For this reason, I need permission for collect data from the CRP Physiotherapy Neurology outdoor patient.

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

Yours faithfully

Tanzina Kabir

Tanzina Kabir
4th year B.Sc in Physiotherapy
Session: 2005-2006
BHPI, CRP, Savar, Dhaka-1343

Given Permission for Data collection. Please consult with Rumana Sharmin. (Lecturer)
13/04/11