



Faculty of Medicine
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**COMPARISON OF FUNCTIONAL OUTCOME IN RELATION TO
STANDARD FUNCTIONAL OUTCOME AFTER THE
REHABILITATION OF PEOPLE WITH SCI**

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We the undersigned certify that we have carefully read & recommend to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

**COMPARISON OF FUNCTIONAL OUTCOME IN RELATION TO STANDARD
FUNCTIONAL OUTCOME AFTER THE REHABILITATION OF PEOPLE
WITH SCI**

Submitted by **Md. Abu Bakkar Siddique**, for the partial fulfillment of the requirement for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT).

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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 the Department of Physiotherapy, Bangladesh Health Professions Institute.

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List of Acronyms

ASIA	American Spinal Injury Association
BHPI	Bangladesh Health Professions Institute
BMRC	Bangladesh Medical and Research Council
CRP	Centre for the Rehabilitation of the Paralysed
FIM	Functional Independence Measure
IRB	Institutional Review Board
ISNCSCI	Standards for the Classification of Spinal Cord Injuries
SCI	Spinal Cord Injury
SPSS	Statistical Package for the Social Science
WHO	World Health Organization

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Abstract

Aim: comparison of functional outcome in relation to standard functional outcome after the rehabilitation of people with spinal cord injury. **Objectives:** To assess the functional outcome of tetraplegic and paraplegic patients after the rehabilitation. **Methods:** A cross sectional study design was used. A cross sectional study was chosen as appropriate to achieve the aims. Spinal cord injury unit at centre for the rehabilitation of the paralyzed (CRP) in Bangladesh which is the largest spinal cord injury rehabilitation centre for the patient with spinal cord injury in South Asia. **Results:** Among 60 patients was participant in this study. In the case of age the most participants was attended from 21-40 age group 53.3% (n=32), 85% (n=51) was male and 15% (n=9) was female, In this case of educational level of the participants 13.3%(n=8) were farmer,8.3%(n=5) were day laborer,11.7%(n=7) were service holder,11.7%(n=7) were garments worker,5%(n=3) were driver,5%(n=3) were businessman, 1.7%(n=1) were unemployed, 11.7%(n=7) were housewife, 25.0%(n=15) were students, 76.7% (n=46) were nuclear family, 23.3% (n=14) were extended family, 88.3% (n=53) lived in rural areas, 11.7% (n=7) living urban areas, 53.3%(n=32) were traumatic paraplegic,41.7%(n=25) were Traumatic Tetraplegic, 3.3%(n=2) were Non Traumatic paraplegic, 1.7%(n=1) were Non Traumatic Tetraplegic. Association of Socio-demographic variable, disease related variable with FIM scale. Where was p-values <0.05 and comparison between functional outcome and standard functional outcome. **Conclusion:** In this study, researcher found significant association of Socio-demographic variable, disease related variable with FIM scale, among the 60 participants 31.6%(n=19) participants functional outcome was above the standard functional outcome and 68.34%(n=41) participants functional outcome was below the standard functional outcome.

Key words: Spinal cord injury, tetraplegic, paraplegic, FIM scale.

Word count: 10,777

1.1Background

A spinal cord injury (SCI) is an insult to the spinal cord that causes a change in its normal motor, sensory, or autonomic function, which can be temporary or permanent (Chin, 2018). Damage to the spinal cord has profound and global effects. SCI can also affect the functioning of the sensory, respiratory, cardiovascular, gastrointestinal, genitourinary, and integumentary system (Somers, 2010).

According to World Health Organization (WHO) every year, between 250000 and 500000 persons suffer a spinal cord injury somewhere in the world (SCI). Spinal cord injury (SCI) is a catastrophic condition that affects 12.1–57.8 people per million per year (Rahimi-Movaghar et al., 2013). Every year, about 300 individuals with catastrophic spinal cord injuries are admitted to an Australian spinal cord injury unit (SCI) (Middleton et al., 2012). In Bangladesh, the incidence of SCI has been estimated at 2.5 cases per million (Hoque et al., 2002). Approximately 390 patients with recent spinal cord damage are admitted to the CRP each year (CRP, 2010). In India approximately 20 000 new cases of spinal cord injury are added every year (Singh et al., 2003).

Paraplegia is partial or complete paralysis of both lower limbs and all or part of the trunk as a result of damage to the thoracic or lumbar spinal cord or to the sacral root (Bromley, 2006). Tetraplegia is a type of paralysis caused by a cervical spinal cord injury. This can cause sensory and motor loss in the four limbs and trunk, which can be partial or complete (Spooren Al et al., 2009).

According to World Health Organization (WHO) figures, 10% of the population in the country is disabled. A spinal cord injury or lesion disables about 4.6 percent of the population. (Hoque et at., 2002). Spinal cord injury (SCI), with an incidence of approximately 2500 patients each year in Germany and 10 to 83 patients per million people worldwide, represents a devastating and often disabling condition for the affected

individuals. It most often leads to permanent physical and functional impairments, and a higher incidence has been reported among the young and male population (Jansen et al., 2017). Injuries to the spinal cord occur in around 7,800 people in the United States each year. In this country, there are roughly 220,000 people living with spinal cord injuries (Somers, 2010). Every year, the Ambulance Service of New South Wales (ASNSW) delivers pre-hospital emergency care to more than 20,000 people with suspected spinal cord injuries. Each year, about 70 individuals with traumatically acquired spinal cord injuries are admitted to one of the state's two specialized Spinal cord injury units (SCIUs).

According to World Health Organization (WHO) young adulthood (20-29 years) and later age (70+) are the most vulnerable periods for males. Females in their adolescence (15-19) and later years (60+) are the most vulnerable. Male-to-female ratios of at least 2:1, and occasionally much higher, have been reported in studies among adults. Traumatic SCI is more common in those under the age of 40, while non-traumatic SCI is more common in people beyond the age of 40. Patients with SCI who are older have a higher mortality rate (Chin, 2010). Approximately 40% of patients with SCI present with complete SCI, 40% with incomplete injury and 20% with either no cord or only root lesions (Rizollo et al., 2000).

Spinal cord damage, whether traumatic or non-traumatic, is a life-changing, catastrophic, and crippling neurological condition that has been treated throughout history. With an annual rate of 15-40 cases per million, spinal cord injury is growing increasingly common, with a male predominance and a penchant for striking low-socioeconomic groups. Not only can the disorder cause physical limitations including paralysis, sensory deficiencies, and bowel and bladder problems, but it also has a multitude of other debilitating side effects like pressure sores, autonomic dysreflexia, deep vein thrombosis, stiffness, sexual dysfunction, and pneumonia (Rahman et al., 2017).

A high number of persons seeking SCL therapy have non-traumatic SCL. Non-traumatic SCLs can be caused by spinal stenosis, primary and metastatic tumors, ischemia, infection, and congenital abnormalities. The annual incidence of non-traumatic SCL is up

to 8 per 100,000 persons. Incomplete injuries are more likely to occur in non-traumatic SCL. Epidural compression is the most prevalent sign of a spinal cord tumor. The majority of patients experience bladder or bowel symptoms when they first become weak, and treatment with radiation or surgery, as well as chemotherapy, may help them retain an incomplete damage status when they arrive at the rehabilitation facility (Gupta et al., 2008).

Traumatic injuries to the spinal cord, particularly in the cervical spine, have life-changing effects for the victim. The pathophysiology of traumatic spinal cord injury (SCI) can be separated into two phases conceptually: (1) primary injury caused by spinal cord contusion, dislocation, and sustained compression, followed by (2) secondary mechanisms such as inflammatory processes, edema development, spinal cord ischemia, and related events. A compression of the spinal canal and the neuronal components therein occurs in approximately half of all spinal fractures. Decompression of the afflicted area has been shown in animal tests to reduce primary and secondary damage (Grassner et al., 2016).

Appropriate treatment in the after month of an accident is critical not only for life but also for reducing the likelihood of a long-term neurological deficit or future loss of neurological function. According to The Consortium for Spinal Cord Medicine, early and accurate clinical assessment, hemodynamic and respiratory support, appropriate spinal column stabilization, and timely transfer to a specialist unit are all essential components of the early management of suspected spinal cord injury patients (2008) According to a prior study, patients hospitalized to a spinal unit within 24 hours after their initial injury were more likely to show early neurological improvement than those admitted after 24 hours. Although the role of surgery in improving neurologic outcomes after acute SCI is still debatable, emerging evidence suggests that decompression within the first 24 hours of injury can improve recovery and is generally safe (Middleton et al., 2012).

The International Standards for the Neurological Classification of Spinal Cord Injury were first developed in 1982 for the National SCI Statistical Center Database as the American Spinal Injury Association (ASIA) Standards for the Classification of Spinal

Cord Injuries (ISNCSCI). The American Spinal Injury Association (ASIA) Standards for the Classification of Spinal Cord Injuries were first developed in 1982 for the National SCI Statistical Center Database as the International Standards for the Neurological Classification of Spinal Cord Injury (ISNCSCI) (Kirshblum et al., 2014).

Acute, sub acute, and chronic rehabilitative stages are available for people with SCI. When the acute and sub acute stages are combined, they usually correspond to the natural history of neurorecovery (12-18 months post-injury), whereas the chronic phase is when neurorecovery has reached a halt. The focus of acute and sub acute rehabilitation is on preventing secondary issues, encouraging and strengthening neurorecovery, maximizing function, and creating ideal conditions for long-term health and function maintenance. In the chronic stage, compensatory or assistive measures are widely used, whereas in the acute and sub acute stages, techniques that target underlying deficiencies and support neurorecovery are more commonly used (Burns et al., 2017).

1.2 Rationale of the study

SCI is a common problem in our country and it will increase day by day. SCI affects a large number of young individuals with a significant cost to affected persons, families and societies both in terms in economic and non economic cost. Damage to the spinal cord has profound and global effect (Somers, 2010). Spinal cord injury has been a burning issue now-a-days. The incidence rate is getting raise day by day in the aggressive manner. So it's an obvious that we all need to set our concern on this circumstance and try to find out the possible ways to prevent this deadly phenomenon and also try to figure out the possible paths to get rid of this incidence.

As Bangladesh is a developing country and trying to develop health care system. We should be more conscious about the management. SCI patient needs long time rehabilitation program. The goal of the medical rehabilitation is to enhance patient's quality of daily living and capacity to function independently. In Bangladesh, Physiotherapy is new and very challenging health care profession and CRP is the only place where the SCI patients are rehabilitated by a holistic approach. It is very important to measure the function and independency of a spinal cord injured persons after rehabilitation.

There is no need to mention the importance of assessing the functional outcome of a spinal cord injury patient. It is badly needs for pre determined the patient's conditions and the possible prognosis of patient's current situation. By the means of standard measurements tools and scales assessing the functional outcome of spinal cord injury patient's can easily be done. After getting the proper rehabilitation after the injury the functional outcome can show he ultimate scenario to a patient of his functional abilities and also help patients and patient's care giver to get in knowledge about the patient's ability to perform his activities of his/her daily chores. It is crucial that proper evaluation of the functional outcome can help the physiotherapist to set a long term rehabilitation plan and implement them properly. Being an undergraduate student it is my academic duty to run a research to fulfill my course.

1.3 Research Question

What is the functional outcome in relation to standard functional outcome after the rehabilitation of people with spinal cord injury?

1.4 Aim of the study

The study aims to know the functional outcome in relation to standard functional outcome after the rehabilitation of people with spinal cord injury.

1.5 Study objective

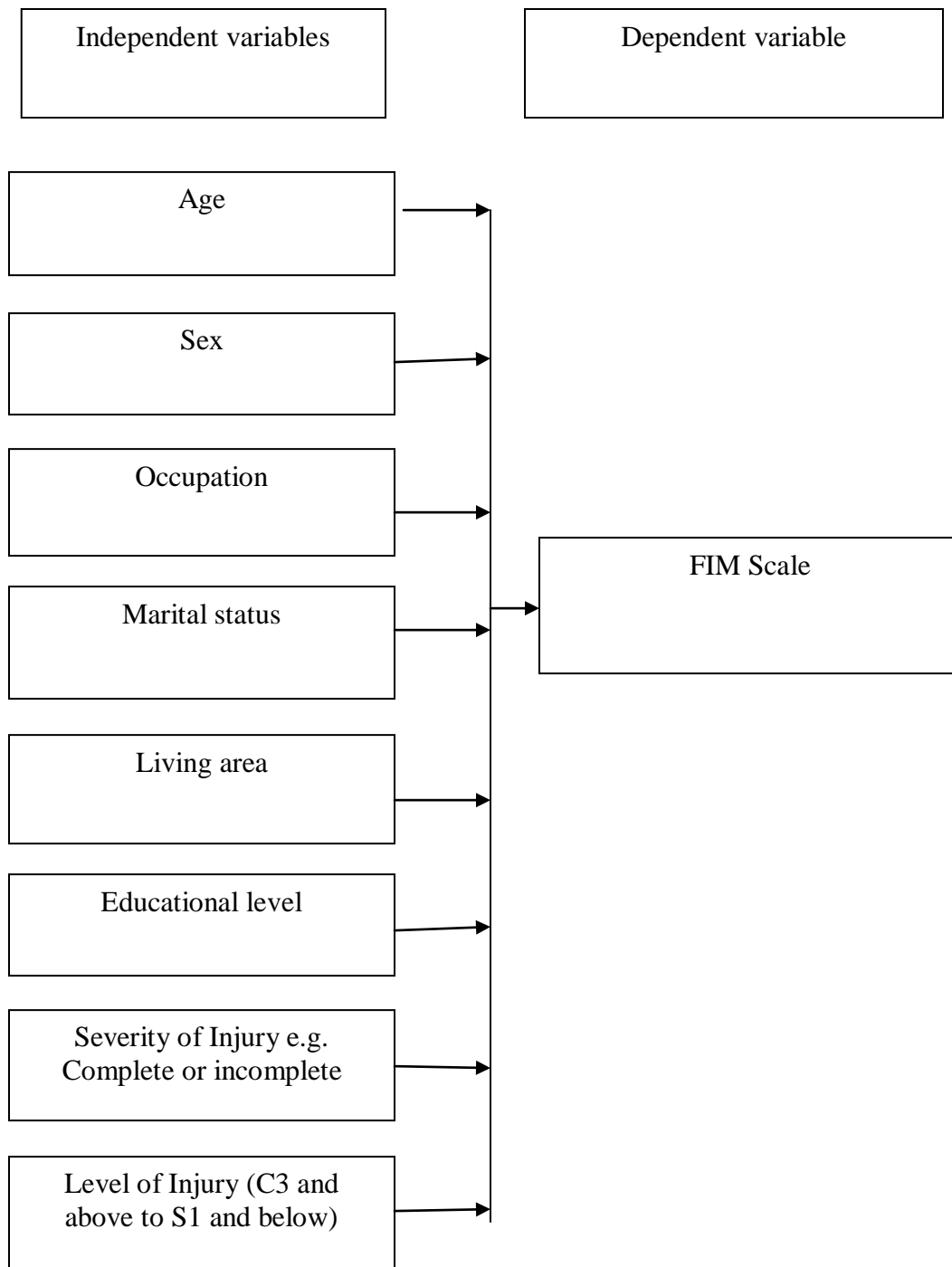
1.5.1 General objective

- To assess the functional outcome of tetraplegic and paraplegic patients after the rehabilitation.

1.5.2 Specific objectives

- To find out the socio-demographic characteristics of tetraplegic and paraplegic SCI patients.
- To perceive the functional outcomes of complete and incomplete tetraplegic, paraplegic SCI patients after the rehabilitation.
- To assess the functional outcomes of tetraplegic paraplegic patients achieved after rehabilitation during discharge.
- To identify the comparison between functional outcome with standard functional outcome.

1.6 Conceptual Framework



1.7 Operational Definitions

Spinal Cord Injury (SCI)

SCI occurs when the spinal cord is injured by any reason, such as trauma or disease, resulting in sensory and motor loss.

Paraplegia

Both legs and the lower portion of the body are paralyzed.

Tetraplegia

Injury to the cervical portion of the spinal cord, causing loss of muscle strength in all four extremities.

Paralysis

Injury or disease to the nervous system can affect the ability to move a particular part of the body. This reduce motor ability is called paralysis.

Complete

In the lowest sacral segments, sensory and motor functions are absent.

Incomplete SCI

Below the level of injury, including the lowest sacral segments, sensory or motor function is preserved.

FIM scale

In the rehabilitation community, the FIM is the most frequently regarded functional assessment measure.

Rehabilitation

Rehabilitation is a type of training that is used to help people with disabilities improve their physical well-being, psychological well-being, social standing, and potential for productive employment.

Functional outcome

Investigate what a person is capable of, how much support he or she requires, and what equipment is required to carry out his or her tasks.

Skeletal level

The level at which greatest vertebral damage is found after radiological examination.

Neurological level

The neurological level of injury is determined by identifying the most caudal segment of the cord with both intact sensation and normal antigravity muscle function strength.

ASIS

American Spinal Injury Association

AIS

Asia Impairment Scale

AIS A Complete

No sensory or motor function is preserved in sacral segments S4-S5.

AIS B Incomplete

Sensory function below neurologic level and in S4-S5, no motor function below neurologic level

AIS C Incomplete

Motor function is preserved below neurologic level and more than half of the key muscles groups below neurologic level have a muscle grade less than 3.

AIS D Incomplete

Motor function is preserved below neurologic level and at least half of the key muscles groups below neurologic level have a muscle grade ≥ 3 .

AIS E Incomplete

Sensory and motor function is normal

Spinal cord injury (SCI) is a dangerous and disabling disorder that affects between 27.11 and 77.0 people per million in the United States each year, resulting in 12,000 to 20,000 new cases. Scivoletto et al. (2003) found that most traumatic SCI occurs in young patients, 20 % of all SCI occur in person aged 65 year or older. Around the world, traumatic SCI affects between 3.6 and 195.4 people per million. Early prediction of the patient's functional outcome following traumatic SCI is crucial in order to guide care strategies that may decrease costs while also providing the patient and family with a better awareness of long-term expectations (Kaminski et al., 2017). To create successful rehabilitation programmed based on realistic goals, the prognosis of impairments, disabilities and handicaps should be clear. In recent years much attention has been paid to the neurological outcome after SCI. In several studies motor and sensory recovery following traumatic SCI has been quantified, based on the initial level of injury. Most of the motor recovery occurs within the first six months after injury. The degree of functional improvement, which is more relevant in predicting rehabilitation outcome, depends on the level and extent of lesion (Schonherr et al., 2008).

Physicians at each site examined lesion characteristics at the start of functional rehabilitation and upon discharge, using the International Standards for Neurological Classification of Spinal Cord Injury. Motor full and incomplete were classed as A and B, respectively, while neurological lesion levels below T1 were classified as paraplegia, while lesion levels at or above T1 were classified as tetraplegia (Post et al., 2005).

The Functional Independence Measure (FIM) is a method for determining how a spinal cord injury affects a person's everyday activities and functions. It supersedes previous editions of this publication's modified Frankel Classification. As a result, the FIM's disability statistics are used to support more traditional neurological and impairment evaluations (Maynard et at., 2011). To fully describe the impact of SCI on the individual and to monitor/evaluate progress associated with treatment, a standard measure of daily-life activities is necessary. The Functional Independence Measure (FIM) is one approach

to functional assessment that has become widely utilized in the U.S. and is gaining acceptance internationally. Self-care, sphincter control, mobility, locomotion, communication, and social cognition are the six areas of functioning covered by the FIM. Two or more particular activities / items are evaluated within each area, for a total of 18 items. The self-care area, for example, consists of six action items (eating, grooming, bathing, dressing-upper body, dressing-lower body, and toileting). On a seven-point scale, each of the 18 items is rated in terms of functional independence: Self-sufficient (no human assistance is required) (Maynard et al., 2011). The FIM motor examines the degree of disability by testing the most common functionally important everyday activities, and it has a strong correlation with the SCI-specific Spinal Cord Independence Measure. Observer ratings or structured interviews were used to acquire FIM motor data, as advised by the creators. During a 5-year follow-up period, the FIM motor Items were measured at four different times: at admission to inpatient therapy (baseline), discharge from inpatient rehabilitation (discharge), first annual examination after SCI (1 year), and 5-year assessment (5 years) after SCI (Kopp et al., 2017).

It is an 18-item, 7-level ordinal scale designed to assess severity of patient disability, estimate burden of care and determine medical rehabilitation functional outcome. The items are rated two times by the physiotherapist, first at admission of rehabilitation and second at discharge of rehabilitation. FIM scores range from one to seven: a FIM item score of seven is categorized as "complete independence" while a score of one is "total assistance" (performs less than 25% of the activity). Scores falling below six require another person for supervision or assistance (Suma, 2015).

Life expectancy after SCI is now approaching that of the able-bodied population, thanks to current therapeutic and rehabilitative practices. This has substantial socioeconomic repercussions, and it is becoming a major driving force behind the development of treatments for function recovery. Interventions that re-innervate disconnected systems or enhance the spontaneous plasticity of the central nervous system to enable the activities of surviving neurons with retained axonal connections with their targets could lead to functional recovery. Several of these ideas are currently being taken from the lab to the bedside (Ellaway et al., 2011).

Early SCI rehabilitation aids motor function by promoting good physical activities of daily life. In the early rehabilitation subgroup, the ASIA impairment scale score improved (Sumida, 2001). Rehabilitation techniques can greatly improve patients' health and quality of life by helping them learn to use their remaining abilities. They start by setting functional goals. Functional goals are a realistic expectation of activities that a person with SCI eventually should be able to do with a particular level of injury. These goals are set during rehabilitation with the medical team. They help the patient with SCI learn new ways to manage his/her daily activities and stay healthy. The SCI units include kitchens and laundry facilities, vocational training center and other equipment so that patients can learn independent living skills, such as cooking meals or ironing clothes (Nesathurai and Shanker, 2000). A spinal cord injury can also affect the nerves and muscles and can cause bowel and bladder problems and skin problems. Special care is needed for the children, especially for teenagers. Parents of spinal cord injured children also need to learn how to take care of their spinal-cord injured child. Having a spinal cord injury does not mean that children have to stop participating in games and enjoyable activities. Most SCI units have recreational therapists on staff to show kids how to play wheelchair basketball, volleyball, and tennis, as well as specially adapted games (Somers, 2010).

A rehabilitation team includes physician, physiotherapist, occupational therapists, recreational therapist, rehabilitation nurse, rehabilitation psychologist, counselor, social workers, nutritionists and other specialists. A case- worker or program manager coordinates care. Physiotherapists focus both upper and lower extremity function and on difficulties with mobility (National Institute of Neurological Disorders and Stroke, 2010). Physiotherapists also help to remain clear the airway of those who has excess secretion in the chest. Occupational therapists addressed upper extremity dysfunction and difficulties in activities of daily living. Rehabilitation nurses are concerned with the issues of bowel and bladder dysfunction and the management of pressure ulcers. Psychologists deal with emotional and behavioral concerns of the newly injured patient and with any potential

cognitive dysfunction. Case manager and social workers are the primary interface among the rehabilitation team, the patient and his/her family (Saulino, 2009).

The patients of SCI are going into the different hospital for the treatment. But every hospital does not have the facilities about the SCI management. In Bangladesh there is only one non government organization CRP has realized the importance of conducting a rehabilitation program for these patients through which the patients can improve their lifestyle and functional independency after disability due to SCL or SCI (Roy, 2006).

Asia impairment scale (modified from Frankel)

The following scale is used in grading the degree of impairment:

A=Complete. No sensory or motor function is preserved in the sacral segments S4-S5

B=Incomplete. Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-S5.

C=Incomplete. Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a muscle grade less than 3.

D=Incomplete. Motor function is preserved below the neurological level, and at least half of key muscles below the neurological level have a muscle grade greater than or equal to 3.

E=Normal. Sensory and motor function is normal (Maynard et al., 2011).

Standard functional outcome for spinal cord injury patients

Level C1-C4:

Self care	
Eating	Total assistance
Grooming	Total assistance
Bathing	Total assistance
Upper body dressing	Total assistance
Lower body dressing	Total assistance
Toileting	Total assistance
Sphincters Control	
Bladder	Total assistance
Bowel	Total assistance
Transfers	
Bed, chair, wheelchair	Total assistance
Toilet	Total assistance
Tub, shower	Total assistance
Locomotion	
Walk/wheelchair	Power control independent, manual dependent
Stairs	Total assistance
Communication	
Comprehension	Moderate assistance / device
Expression	Independent
Social cognition	
Social interaction	Total assistance
Problem solving	Total assistance
Memory	Total assistance

Level: C5

Self care	
Eating	Independent with equipment setup
Grooming	Moderate assistance
Bathing	Total assistance
Upper body dressing	Moderate assistance
Lower body dressing	Moderate assistance
Toileting	Total assistance
Sphincters Control	
Bladder	Total assistance
Bowel	Total assistance
Transfers	
Bed, chair, wheelchair	Total assistance
Toilet	Total assistance
Tub, shower	Total assistance
Locomotion	
Walk/wheelchair	Power control independent, manual near total assist
Stairs	Total assistance
Communication	
Comprehension	Independent with equipment
Expression	Independent
Social cognition	
Social interaction	Modified assistance
Problem solving	Modified assistance
Memory	Modified assistance

Level: C6

Self care	
Eating	Independent with equipment
Grooming	Independent with equipment
Bathing	Moderate assistance
Upper body dressing	Modified independent
Lower body dressing	Moderate assistance
Toileting	Moderate assistance
Sphincters Control	
Bladder	Moderate assistance
Bowel	Moderate assistance
Transfers	
Bed, chair, wheelchair	Moderate assistance
Toilet	Moderate assistance
Tub, shower	Moderate assistance
Locomotion	
Walk/wheelchair	Power control or moderate assist manual
Stairs	Total assistance
Communication	
Comprehension	Independent with equipment
Expression	Independent
Social cognition	
Social interaction	Minimum assistance
Problem solving	Minimum assistance
Memory	Minimum assistance

Level: C7

Self care	
Eating	Independent
Grooming	Independent with equipment
Bathing	Independent
Upper body dressing	Independent
Lower body dressing	Independent with equipment
Toileting	Moderate assistance
Sphincters Control	
Bladder	Minimum assistance
Bowel	Moderate assistance
Transfers	
Bed, chair, wheelchair	Minimum assistance
Toilet	Minimum assistance
Tub, shower	Minimum assistance
Locomotion	
Walk/wheelchair	Total assistance
Stairs	Total assistance
Communication	
Comprehension	Independent
Expression	Independent
Social cognition	
Social interaction	Modified independent
Problem solving	Modified independent
Memory	Modified independent

Level: C8

Self care	
Eating	Independent
Grooming	Independent
Bathing	Independent
Upper body dressing	Independent
Lower body dressing	Independent
Toileting	Independent
Sphincters Control	
Bladder	Modified independent
Bowel	Minimum assistance
Transfers	
Bed, chair, wheelchair	Modified independent
Toilet	Modified independent
Tub, shower	Modified independent
Locomotion	
Walk/wheelchair	Total assistance
Stairs	Total assistance
Communication	
Comprehension	Independent
Expression	Independent
Social cognition	
Social interaction	Independent
Problem solving	Independent
Memory	Independent

Level: T1

Self care	
Eating	Independent
Grooming	Independent
Bathing	Independent
Upper body dressing	Independent
Lower body dressing	Independent
Toileting	Independent
Sphincters Control	
Bladder	Modified independent
Bowel	Minimum assistance
Transfers	
Bed, chair, wheelchair	Modified independent
Toilet	Modified independent
Tub, shower	Modified independent
Locomotion	
Walk/wheelchair	Total assistance
Stairs	Total assistance
Communication	
Comprehension	Independent
Expression	Independent
Social cognition	
Social interaction	Independent
Problem solving	Independent
Memory	Independent

Level: T2-T6

Self care	
Eating	Independent
Grooming	Independent
Bathing	Independent
Upper body dressing	Independent
Lower body dressing	Independent
Toileting	Independent
Sphincters Control	
Bladder	Independent
Bowel	Independent
Transfers	
Bed, chair, wheelchair	Independent
Toilet	Independent
Tub, shower	Independent
Locomotion	
Walk/wheelchair	Modified Independent
Stairs	Moderate assistance
Communication	
Comprehension	Independent
Expression	Independent
Social cognition	
Social interaction	Independent
Problem solving	Independent
Memory	Independent

Level: T7-T12

Self care	
Eating	Independent
Grooming	Independent
Bathing	Independent
Upper body dressing	Independent
Lower body dressing	Independent
Toileting	Independent
Sphincters Control	
Bladder	Independent
Bowel	Independent
Transfers	
Bed, chair, wheelchair	Independent
Toilet	Independent
Tub, shower	Independent
Locomotion	
Walk/wheelchair	Modified Independent
Stairs	Moderate assistance
Communication	
Comprehension	Independent
Expression	Independent
Social cognition	
Social interaction	Independent
Problem solving	Independent
Memory	Independent

Level: L1-L5

Self care	
Eating	Independent
Grooming	Independent
Bathing	Independent
Upper body dressing	Independent
Lower body dressing	Independent
Toileting	Independent
Sphincters Control	
Bladder	Independent
Bowel	Independent
Transfers	
Bed, chair, wheelchair	Independent
Toilet	Independent
Tub, shower	Independent
Locomotion	
Walk/wheelchair	Modified Independent
Stairs	Minimum assistance
Communication	
Comprehension	Independent
Expression	Independent
Social cognition	
Social interaction	Independent
Problem solving	Independent
Memory	Independent

Level: S1-S3

Self care	
Eating	Independent
Grooming	Independent
Bathing	Independent
Upper body dressing	Independent
Lower body dressing	Independent
Toileting	Independent
Sphincters Control	
Bladder	Independent
Bowel	Independent
Transfers	
Bed, chair, wheelchair	Independent
Toilet	Independent
Tub, shower	Independent
Locomotion	
Walk/wheelchair	Modified Independent
Stairs	Modified independent
Communication	
Comprehension	Independent
Expression	Independent
Social cognition	
Social interaction	Independent
Problem solving	Independent
Memory	Independent

(Somers, 2010) (Harvey, 2008) (Spinalwa, 2021)

3.1 Study design

A cross sectional study design was used. A cross sectional study was chosen as appropriate to achieve the aims. A cross-sectional study is a descriptive study in which disease and exposure status is measured simultaneously in a given population. Cross-sectional studies can be thought of as providing a "snapshot" of the frequency and characteristics of a disease in a population at a particular point in time (Environmental Health Investigations branch, 2009).

3.2 Study site

Spinal cord injury unit at centre for the rehabilitation of the paralysed (CRP) in Bangladesh which is the largest spinal cord injury rehabilitation centre for the patient with spinal cord injury in South Asia.

3.3 Study population and sampling

Spinal cord injury patient was the study population who has completed their rehabilitation program at CRP spinal cord injury unit.

3.4 Sampling technique

Sample was taken by using convenience sampling technique. Using convenience sampling methods because it is the easiest, cheapest and quicker method of sample selection. It was be easy to get those subjects according to the criteria concerned with the study purpose through the convenience sampling procedure.

3.5 Inclusion criteria

- I. Both male and female were selected.
- II. All age group of people.
- III. Subject who are willing to participate
- IV. Easy to communicated with subject.
- V. Both tetraplegic and paraplegic patients
- VI. The patients attending at the halfway hostel

3.6 Exclusion criteria

- I. Subject who have psychological problem who may give irrelevant information which will not helpful for study
- II. Who has not complete rehabilitation
- III. Medically unstable

3.7 Sample size:

In this project study, the researcher selected 60 spinal cord injury patients from the spinal cord injury (SCI) unit of CRP through convenience sampling technique.

The equation of finite population correction in case of cross sectional study is:

$$n = \frac{(z^2 pq)}{d^2}$$

Here, n= the desired sample size (eventual sample size).

z = 1.96 which corresponds to the 95% confidence level.

$$z(1 - \alpha/2) = 1.96$$

p= proportion of the target population estimated 50%,

$$P (\text{Prevalence}) = 0.5$$

$$q = 1 - p$$

$$= 1 - 0.5$$

$$= 0.5$$

d= degree of accuracy set at 5% = 0.05.

$$n = \frac{(z^2 pq)}{d^2}$$

$$= \frac{(1.96)^2}{(0.05)^2} \times 0.5 \times 0.5$$

$$= 384.16$$

But as the study was performed as a part of academic research project and there were some limitations. Due to some limitations 60 spinal cord injury patients were selected as the sample of this study.

3.8 Data collection instrument

Questionnaire was designed with mixed question. That was open ended question and close ended question. Data were collect using Functional Independence Measure (FIM) scale, Papers, Pen, Pencil, Diary, laptop and pen drive etc.

3.9 Data collection procedure

The face to face interview technique was used to collect the data from the participants. A structured, semi-structured questionnaire and FIM scale was used for collecting information related to the study. There were socio-demographic questions and questions that find out the objectives of the study and FIM scale questionnaire had been included to find out the functional outcome of the participants. The data collection procedure had been performed after taking the consent of the participants. The researcher collected data from both male and female through individual interviewing. Data collected from half way hostel, CRP, Savar, Dhaka. The duration of data collection was 10-15 min for every individual patient. For this the materials to successfully complete the interview session and collect the valuable data from the participants were used such as- question paper, consent form, pen, file, etc.

3.10 Questionnaire

A structured questionnaire was used for measuring the functional outcome of SCI patients. This questionnaire is developed after reviewing literature about the spinal cord injury and functional outcome. In the questionnaire participant's socio-demographic information including age, sex, occupation, marital status, family type, living area, educational level. Functional improvement including (eating, grooming, bathing, upper body dressing, lower body dressing, toileting, bladder management, bowel management, bed, wheelchair, chair, transfer, toilet, transfer, bath, shower, transfer , Walking , Stairs , comprehension, visual expression, social interaction, problem solving, memory).

3.11 FIM Scale

Functional Independence Measure (FIM) is a functional assessment tool and is used to assess the impact of SCI on the patient's functional abilities. It quantifies the extent of individual disability and complements the neurological assessment by providing scores.

The seven levels rating of FIM are:

7= Complete independence: The activity is typically performed safely, without modification, assistive devices or aids, and within reasonable time.

6= Modified independence: The activity requires an assistive device and/or more than reasonable time and/or is not performed safely. Dependent (human supervision or physical assistance is required).

5= Supervision or setup: No physical assistance is needed, but cuing, coaxing or setup is required.

4= Minimal contact assistance: Subject requires no more than touching and expends 75% or more of the effort required in the activity.

3= Moderate assistance: Subject requires more than touching and expends 50±75% of the effort required in the activity.

2= Maximal assistance: Subject expends 25±50% of the effort required in the activity.

1= Total assistance: Subject expends 0±25% of the effort required in the activity.

3.12 Inform consent

Written consent was taken from all participants to the completion of the questionnaire. The researcher explained about the detail of research questions, aims and objective and about his or her role in this study. The researcher received a written consent form every participants including signature of participants and career. Participants were assured that they could understand about the consent form and their participation was on voluntary basis. The participants were informed clearly that their information would be kept confidential. Participants were assured that the study would not be harmful for them. It was explained that there might not a direct benefit from the study for the participants but in the future SCI patients like them might get benefited from it. The researcher gave the full privacy of participant's related information. The participants have the right to withdraw consent and discontinue participants at any time without prejudice to present or future care at the SCI unit of CRP. Maintain the right, dignity, confidentiality of patients. Data collection of minor participants <18 years were from his/her parents or legal guardians.

3.13 Ethical consideration

The Research proposal was submitted for approval to the Institutional Review Board of Bangladesh Health Professions Institute (BHPI). Bangladesh Medical Research Council (BMRC) and World Health Organization (WHO) guidelines were also followed. Again Before data collection, permission had been taken from the Head of the Physiotherapy Department. The participants, who were interested to participate in the study, were informed verbally about the topic and purpose of study. They were also informed that each interview can take 10-15 minutes for every participant. The researcher maintained privacy issue and confidentiality.

4.1.1. Distribution of patient's age

Among 60 patients was participant, the minimum age 7 years, maximum age 72 . The mean of the age was 32.25, Standard deviation was 14.99 and age range was 65. In the case of age the most participants was attended from 21-40 age group 53.3%(n=32).Among 60 of the participants 28.3%(n=17)participants were in 1-20 age group,13.3%(n=8) participants were in 41-60 age group,5%(n=3) participants were in 61-80 age group.

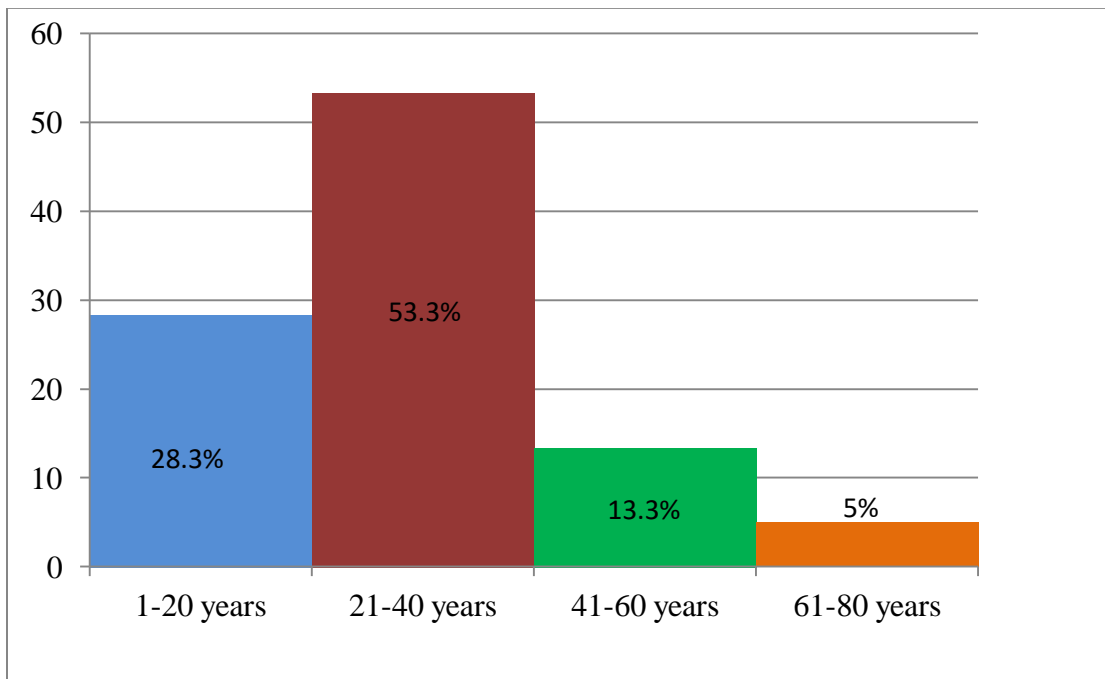


Figure-1: Distribution of patient's age

4.1.2. Distribution of patient's sex

Among 60 participants, the most participants were male. Data showed 85 % (n=51) was male and 15%(n=9) was female.

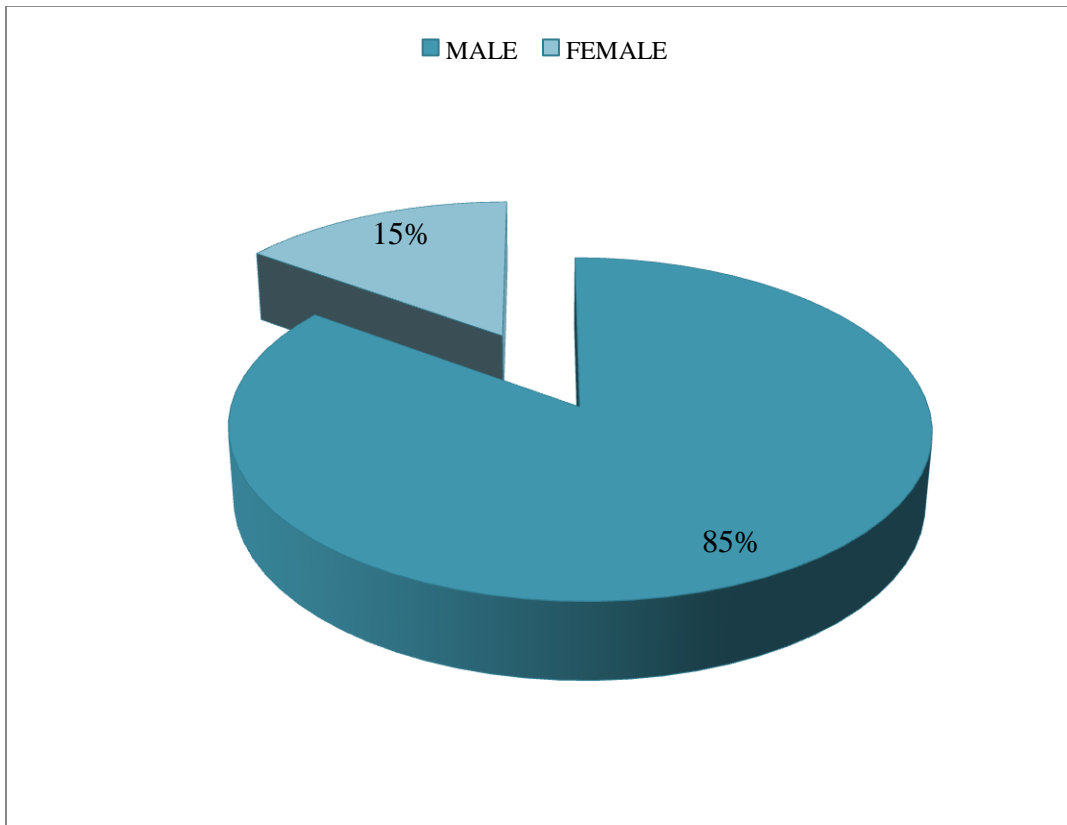


Figure-2: Distribution of patient's sex

4.1.3. Distribution of patient's occupation

In this case of educational level of the participants 13.3%(n=8) were farmer,8.3%(n=5) were day laborer,11.7%(n=7) were service holder,11.7%(n=7) were garments worker,5%(n=3) were driver,5%(n=3) were businessman, 1.7%(n=1) were unemployed, 11.7%(n=7) were housewife, 25.0%(n=15) were students, 6.7% were other occupational.

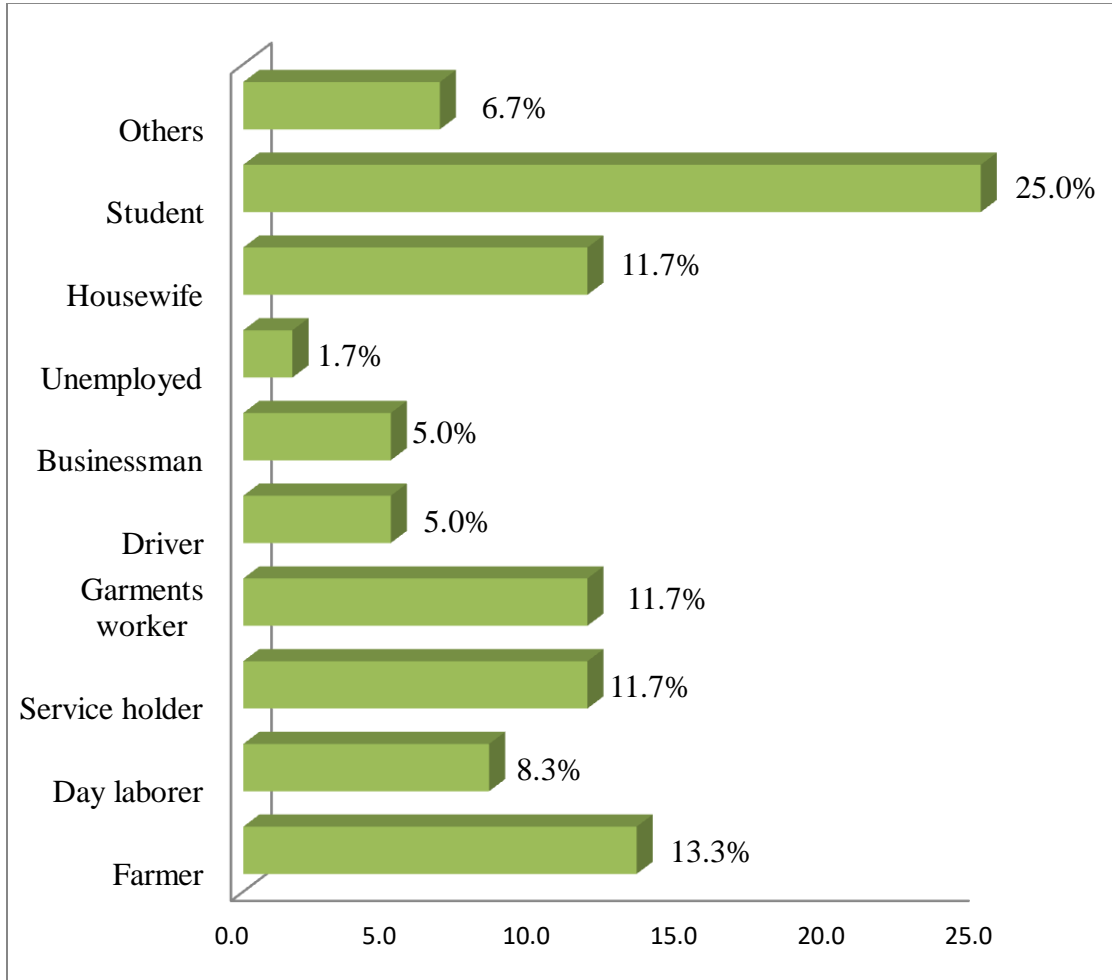


Figure-3: Distribution of patient's occupation

4.1.4. Marital status of patient's

Among 60 participants, most participants were married. Data showed that 66.7% (n=40) were married, 33.3% (n=20) were unmarried.

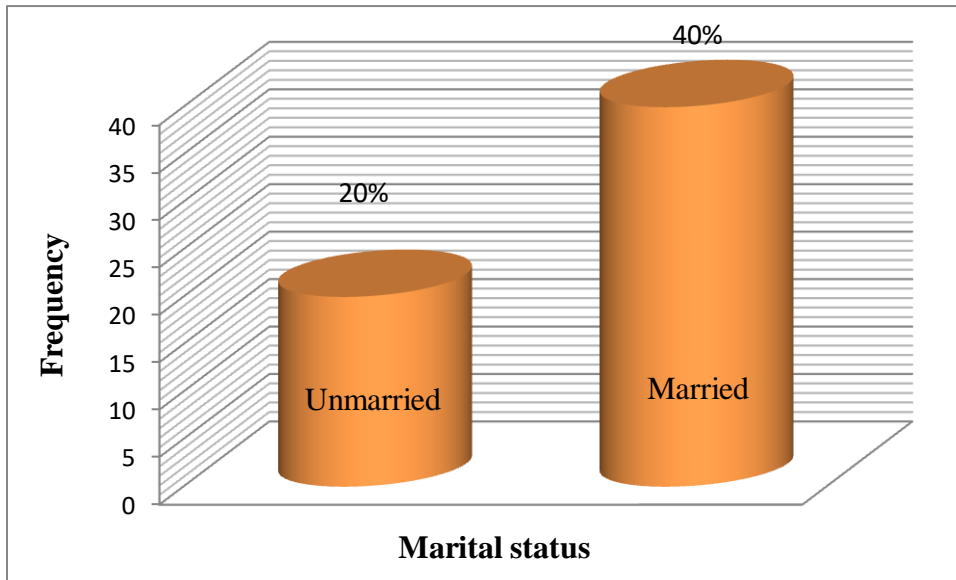


Figure-4: Marital status of patient's

4.1.5. Family type's of patient's

Among 60 participants, most participants were nuclear family. Data showed 76.7% (n=46) were nuclear family, 23.3% (n=14) were extended family.

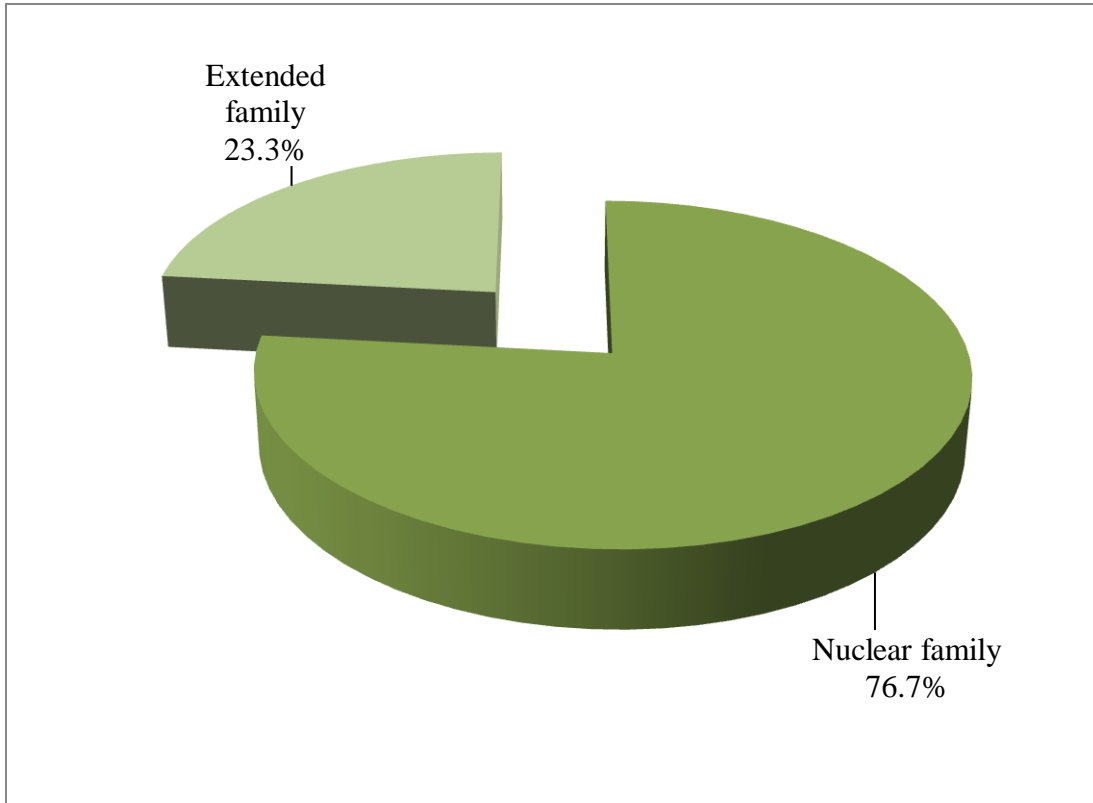


Figure-5: Family type of patient's

4.1.6. Distribution of patient's living area

Among 60 participants 88.3% (n=53) lived in rural areas, 11.7% (n=7) living urban areas.

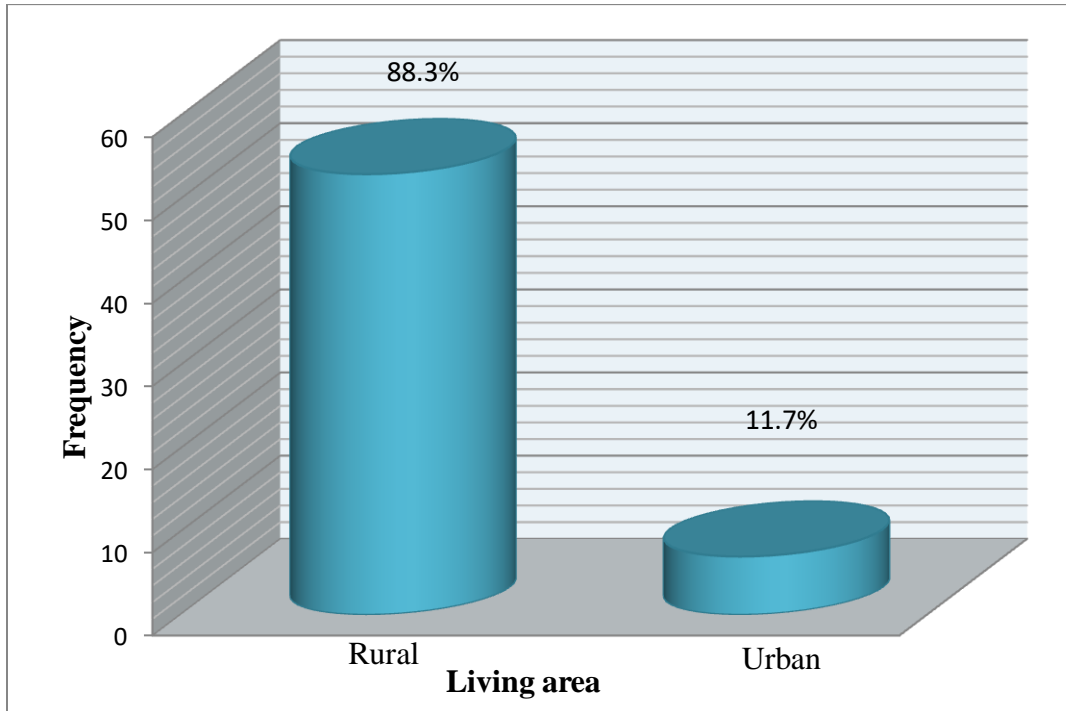


Figure-6: Distribution of patient's living area

4.1.7. Distribution of patient's educational level

In this case of educational level of the participants 13.3%(n=8) participants were illiterate, 61.7%(n=37) participants had primary education, 8.3%(n=5) had S.S.C. education ,10%(n=6) were higher secondary education,6.7%(n=4) were graduated.

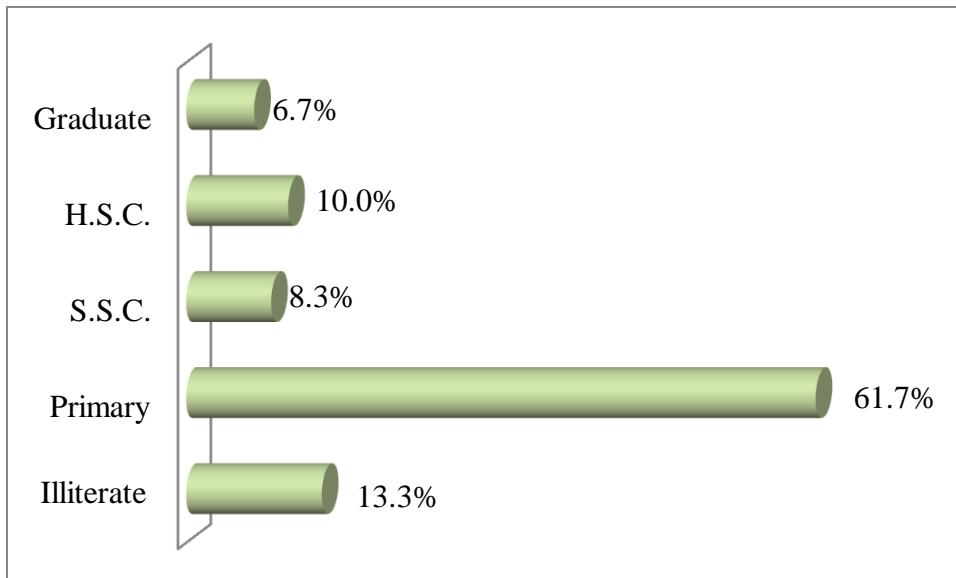


Figure-7: Distribution of patient's educational level

4.1.8. Patient's family monthly income

In this case of monthly family income, 5,000-10,000 range family income was 26.7% (n=16), 10001-20000 range family income was 61.7% (n=37), More than 20000 range family income was 11.7% (n=7).

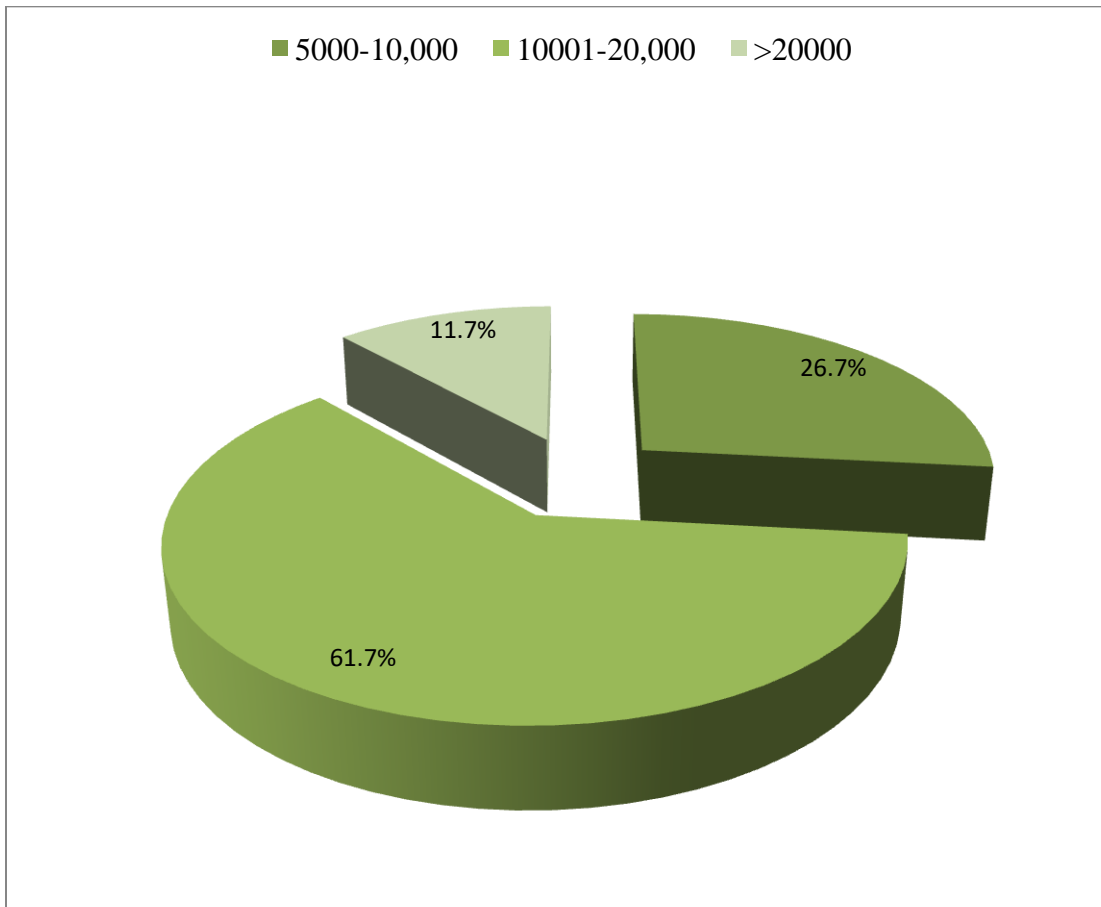


Figure-8: Patient's family monthly income

4.2.1. Diagnosis of patient's

Among 60 participants, most participants were traumatic paraplegic. Data showed 53.3%(n=32) were traumatic paraplegic, 41.7%(n=25) were traumatic tetraplegic, 3.3%(n=2) were non traumatic paraplegic, 1.7%(n=1) were non traumatic tetraplegic.

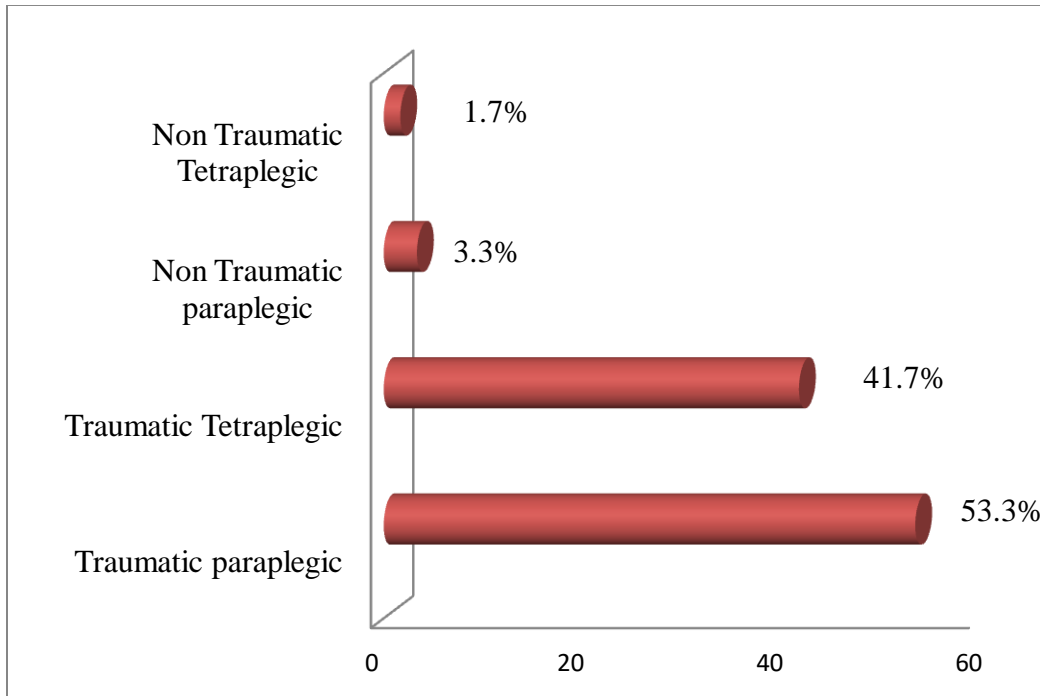


Figure-9: Diagnosis of patient's

4.2.2. Skeletal level of Respondents

Among 60 participants, most participants were T7-T12 level of injury. Data showed 11.7%(n=7) were C1-C4 level of injury,15%(n=9) were C5 level of injury,10%(n=6) were C6 level of injury,5%(n=3) were C7 level of injury, 6.7%(n=4) were T2-T6 level of injury,30%(n=18) were T7-T12 level of injury, 21.7%(n=13) were L1-L5 level of injury.

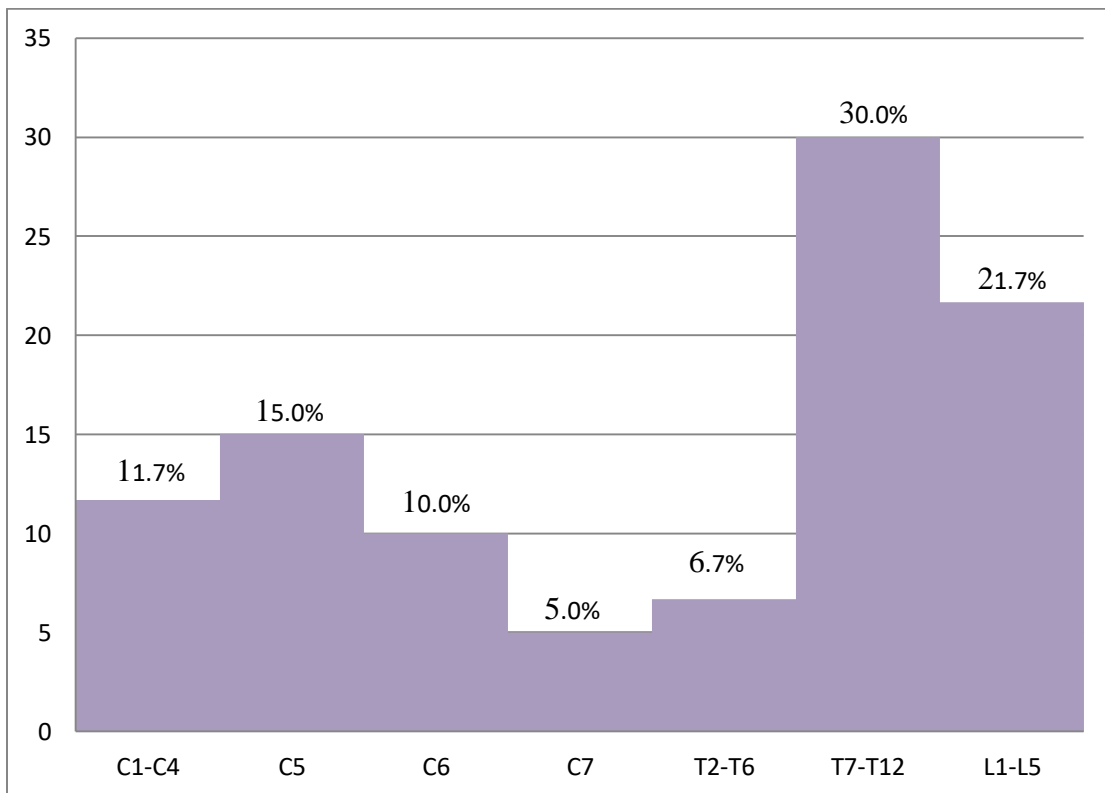


Figure-10: Skeletal level of patient's

4.2.3. Neurological level of Respondents

Among 60 participants, most participants were T7-T12 neurological level of injury. Data showed 18.3%(n=11) were C1-C4 level of injury,8.3%(n=5) were C5 level of injury,3.3%(n=2) were C6 level of injury,8.3%(n=5) were C7 level of injury,1.7%(n=1) were C8 level of injury, 11.7%(n=7) were T2-T6 level of injury,26.7%(n=16) were T7-T12 level of injury, 18.3%(n=11) were L1-L5 level of injury, 3.3%(n=2) were S1-S3 level of injury.

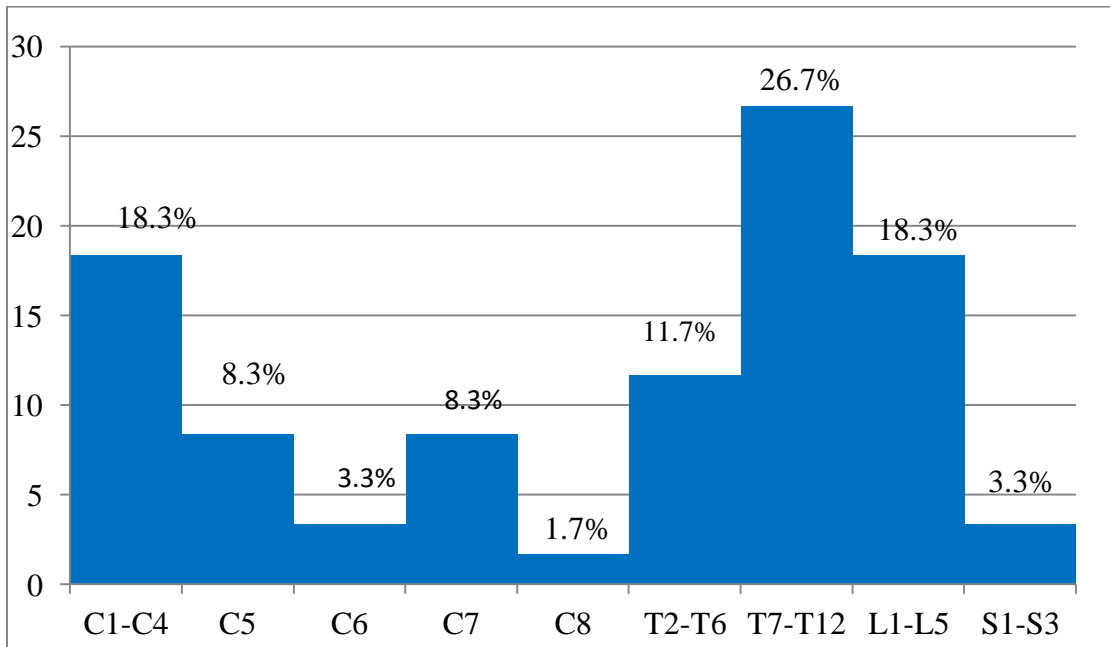


Figure-11: Neurological level of patient's

4.2.4. Distribution ASIA scale of patient's

Among 60 participants, most was complete A in ASIA scale. Data showed 70% (n=42) were complete A, 18.3% (n=11) were incomplete B, 1.7% (n=1) were incomplete C, 10% (n=6) were incomplete D.

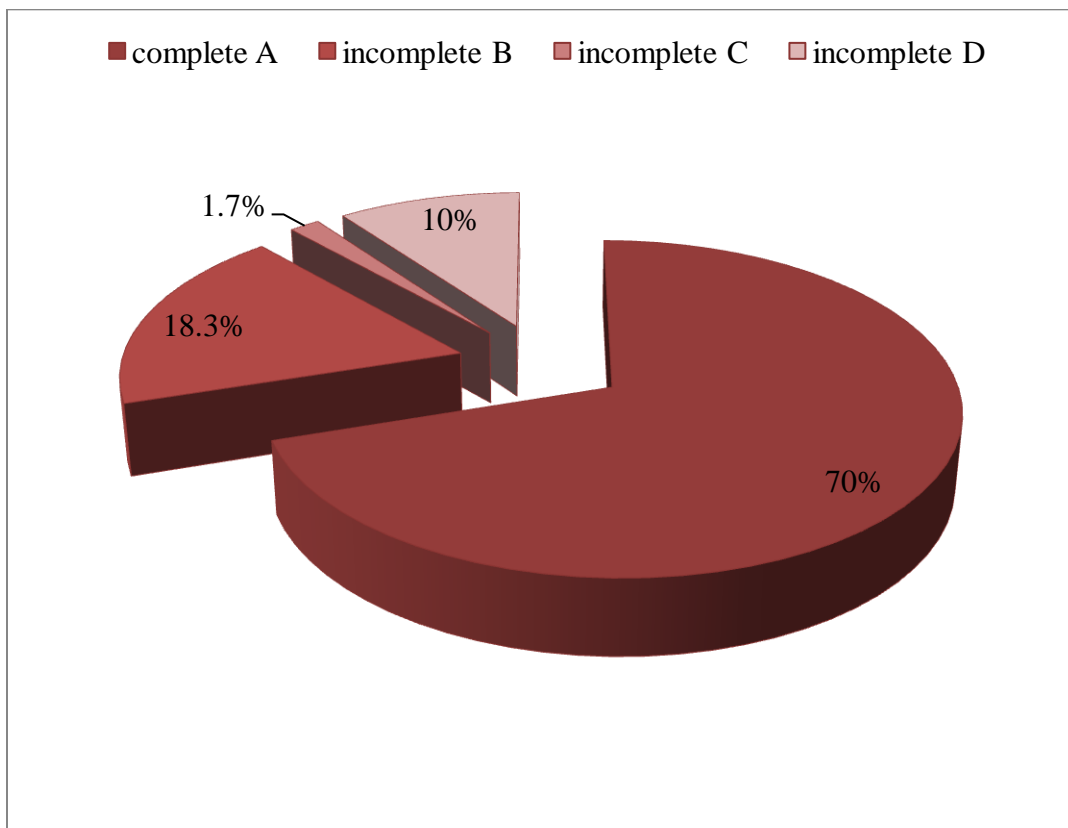


Figure-12: Distribution ASIA scale of patient's

4.3 Function outcome related questions

4.3.1 Functional outcome on eating

	Frequency	Percent (%)
Maximum assistance	3	5.0
Moderate assistance	5	8.3
Minimum assistance	5	8.3
Supervision	1	1.7
Independent	46	76.7
Total	60	100

Table.1: Functional outcome on eating

In this study independent eating were 76.7%(n=46), supervision eating were 1.7%(n=1),minimum assistance needed 8.3%(n=5),moderate assistance needed 8.3%(n=5) and maximum assistance needed were 5%(n=3).

4.3.2 Functional outcome on grooming

	Frequency	Percent (%)
Unable to do	3	5.0
Maximum assistance	3	5.0
Moderate assistance	3	5.0
Minimum assistance	5	8.3
Supervision	2	3.3
Independent	44	73.3
Total	60	100

Table.2: Functional outcome on grooming

In this study independent grooming were 73.3% (n=44), supervision grooming were 3.3% (n=2), minimum assistance needed 8.3% (n=5), moderate assistance needed 5% (n=3), maximum assistance needed were 5% (n=3), and unable to do 5% (n=3).

4.3.3 Functional outcome on bathing

	Frequency	Percent (%)
Unable to do	3	5.0
Maximum assistance	4	6.7
Moderate assistance	6	10.0
Minimum assistance	5	8.3
Supervision	6	10.0
Independent with assisted device	2	3.3
Independent	34	56.7
Total	60	100

Table.3: Functional outcome on bathing

In this study independent bathing were 56.7% (n=34), independent with assisted device 3.3% (n=2), supervision bathing were 10% (n=6), minimum assistance needed 8.3% (n=5), moderate assistance needed 10% (n=6), maximum assistance needed were 6.7% (n=4), and unable to do 5% (n=3).

4.3.4 Functional outcome on upper body dressing

	Frequency	Percent (%)
Unable to do	2	3.3
Maximum assistance	4	6.7
Moderate assistance	6	10.0
Minimum assistance	5	8.3
Supervision	1	1.7
Independent with assisted device	9	15.0
Independent	33	55.0
Total	60	100

Table.4: Functional outcome on upper body dressing

In this study independent upper body dressing were 55% (n=33), independent with assisted device needed 15% (n=9), supervision upper body were 1.7% (n=1), minimum assistance needed 8.3% (n=5), moderate assistance needed 10% (n=6), maximum assistance needed were 6.7% (n=4), and unable to do 3.3% (n=2).

4.3.5 Functional outcome on lower body dressing

	Frequency	Percent (%)
Unable to do	2	3.3
Maximum assistance	5	8.3
Moderate assistance	7	11.7
Minimum assistance	4	6.7
Supervision	1	1.7
Independent with assisted device	17	28.3
Independent	24	40.0
Total	60	100

Table.5: Functional outcome on lower body dressing

In this study independent lower body dressing were 40% (n=24), independent with assisted device 28.3% (n=17), supervision lower body dressing were 1.7% (n=1), minimum assistance needed 6.7% (n=4), moderate assistance needed 11.7% (n=7), maximum assistance needed were 8.3% (n=5), and unable to do 3.3% (n=2).

4.3.6 Functional outcome on toileting

	Frequency	Percent (%)
Unable to do	5	8.3
Maximum assistance	6	10.0
Moderate assistance	8	13.3
Minimum assistance	7	11.7
Supervision	2	3.3
Independent with assisted device	7	11.7
Independent	25	41.7
Total	60	100

Table.6: Functional outcome on toileting

In this study independent toileting were 41.7%(n=25), independent with assisted device 11.7%(n=7), supervision bathing were 3.3%(n=3),minimum assistance needed 11.7%(n=7),moderate assistance needed 13.3% (n=8), maximum assistance needed were 10%(n=6), and unable to do 8.3%(n=5).

4.3.7 Functional outcome on bladder management

	Frequency	Percent (%)
Unable to do	42	70.0
Independent with assisted device	10	16.7
Independent	8	13.3
Total	60	100

Table.7: Functional outcome on bladder management

In this study independent bladder management were 13.3%(n=8), independent with assisted device 16.7%(n=10), and unable to do 70%(n=42).

4.3.8 Functional outcome on bowel management

	Frequency	Percent (%)
Unable to do	42	70.0
Supervision	1	1.7
Independent with assisted device	5	8.3
Independent	12	20.0
Total	60	100

Table.8: Functional outcome on bowel management

In this study independent bowel management were 20% (n=12), independent with assisted device 8.3% (n=5), supervision bowel management were 1.7% (n=1), and unable to do 70% (n=42).

4.3.9 Functional outcome on bed, wheelchair, chair, transfer

	Frequency	Percent (%)
Unable to do	4	6.7
Maximum assistance	7	11.7
Moderate assistance	7	11.7
Minimum assistance	10	16.7
Supervision	1	1.7
Independent with assisted device	10	16.7
Independent	21	35.0
Total	60	100

Table.9: Functional outcome on bed, wheelchair, chair, transfer

In this study independent bed, wheelchair, chair, transfer were 35%(n=21), independent with assisted device 16.7%(n=10), supervision bed, wheelchair, chair, transfer were 1.7%(n=1),minimum assistance needed 16.7%(n=10),moderate assistance needed 11.7% (n=7), maximum assistance needed were 11.7%(n=7), and unable to do 6.7%(n=4).

4.3.10 Functional outcome on toilet transfer

	Frequency	Percent (%)
Unable to do	3	5.0
Maximum assistance	7	11.7
Moderate assistance	13	21.7
Minimum assistance	9	15.0
Supervision	4	6.7
Independent with assisted device	12	20.0
Independent	12	20.0
Total	60	100

Table.10: Functional outcome on toilet transfer

In this study independent toilet transfer were 20%(n=12), independent with assisted device 20%(n=12), supervision toilet transfer were 6.7%(n=4),minimum assistance needed 15%(n=9),moderate assistance needed 21.7% (n=13), maximum assistance needed were 11.7%(n=7), and unable to do 5%(n=3).

4.3.11 Functional outcome on bath, shower, transfer

	Frequency	Percent (%)
Unable to do	3	5.0
Maximum assistance	6	10.0
Moderate assistance	12	20.0
Minimum assistance	7	11.7
Independent with assisted device	9	15.0
Independent	23	38.3
Total	60	100

Table.11: Functional outcome on bath, shower, transfer

In this study independent bath, shower, transfer were 38.3%(n=23), independent with assisted device 15%(n=9), minimum assistance needed 11.7%(n=7),moderate assistance needed 20% (n=12), maximum assistance needed were 10%(n=6), and unable to do 5%(n=3).

4.3.12 Functional outcome on walking

	Frequency	Percent (%)
Unable to do	44	73.3
Maximum assistance	1	1.7
Moderate assistance	1	1.7
Minimum assistance	4	6.7
Independent with assisted device	8	13.3
Independent	2	3.3
Total	60	100

Table.12: Functional outcome on walking

In this study independent walking were 2%(n=3.3), independent with assisted device 13.3%(n=8), minimum assistance needed 6.7%(n=4), moderate assistance needed 1.7% (n=1), maximum assistance needed were 1.7%(n=1), and unable to do 73.3%(n=44).

4.3.13 Functional outcome on stairs

	Frequency	Percent (%)
Unable to do	45	75.0
Maximum assistance	2	3.3
Moderate assistance	2	3.3
Minimum assistance	6	10.0
Independent with assisted device	3	5.0
Independent	2	3.3
Total	60	100

Table.13: Functional outcome on stairs

In this study independent stairs were 2%(n=3.3), independent with assisted device 5%(n=3), minimum assistance needed 10%(n=6),moderate assistance needed 3.3% (n=2), maximum assistance needed were 3.3%(n=2), and unable to do 75%(n=45).

4.3.14 Functional outcome on comprehension

	Frequency	Percent (%)
Independent with assisted device	1	1.7
Independent	59	98.3
Total	60	100

Table.14: Functional outcome on comprehension

In this study independent comprehension were 98.3%(n=59), independent with assisted device 1.7%(n=1).

4.3.15 Functional outcome on visual expression

	Frequency	Percent (%)
Minimum assistance	1	1.7
Independent with assisted device	1	1.7
Independent	58	96.7
Total	60	100

Table.15: Visual expression

In this study independent visual expression were 96.7% (n=58), independent with assisted device 1.7% (n=1), minimum assistance needed 1.7% (n=1).

4.3.16 Functional outcome on social interaction

	Frequency	Percent (%)
Unable to do	4	6.7
Maximum assistance	8	13.3
Moderate assistance	10	16.7
Minimum assistance	11	18.3
Supervision	2	3.3
Independent with assisted device	18	30.0
independent		11.7
Total		100

Table.16: Functional outcome on social interaction

In this study independent social interaction were 11.7% (n=7), independent with assisted device 30% (n=18), supervision needed 3.3% (n=2), minimum assistance needed 18.3% (n=11), moderate assistance needed 16.7% (n=10), maximum assistance needed were 13.3% (n=8), and unable to do 6.7% (n=4).

4.3.17 Functional outcome on problem solving

	Frequency	Percent (%)
Unable to do	3	5.0
Maximum assistance	9	15.0
Moderate assistance	10	16.7
Minimum assistance	12	20.0
Supervision	2	3.3
Independent with assisted device	16	26.7
Independent	8	13.3
Total	60	100

Table.17: Functional outcome on problem solving

In this study independent problem solving were 13.3%(n=8), independent with assisted device 26.7%(n=16), supervision needed 3.3%(n=2), minimum assistance needed 20%(n=12), moderate assistance needed 16.7% (n=10), maximum assistance needed were 15%(n=9), and unable to do 5%(n=3).

4.3.18 Functional outcome on memory

	Frequency	Percent (%)
Minimum assistance	1	1.7
Supervision	1	1.7
Independent	58	96.7
Total	60	100

Table.18: Functional outcome on memory

In this study independent memory were 96.7% (n=58), supervision needed 1.7%(n=1), minimum assistance needed 1.7%(n=1).

4.4.1 Association of neurological level with FIM scale:

Variable	Chi-square value	P value
Eating	63.842	0.001**
Grooming	68.024	0.004**
Bathing	75.285	0.009**
Upper body dressing	93.597	0.000**
Lower body dressing	72.712	0.012*
Toileting	78.311	0.004**
Bladder management	22.386	0.131
Bowel management	39.984	0.021*
Bed, wheelchair, chair, transfer	77.774	0.004**
Toilet, transfer	86.953	0.000**
Bath, shower, transfer	65.421	0.007**
Walking	66.921	0.005**
Stairs	56.578	0.043*
Comprehension	4.530	0.806
Visual expression	7.294	0.967
Social interaction	65.567	0.047*
Problem solving	77.994	0.004**
Memory	7.294	0.967

Table.19: Association of neurological level with FIM scale

Level of Significant: < 0.05

* Significant

** Highly Significant

Association neurological level with eating, grooming, bathing, upper body dressing, lower body dressing, toileting, bladder management, bowel management, bed, wheelchair, chair, transfer, toilet, transfer, bath, shower, transfer , Walking , Stairs , comprehension, visual expression, social interaction, problem solving, memory ,was examined using chi-square test.

Eating,(0.001) grooming,(0.004) bathing,(0.009) upper body dressing(0.000), lower body dressing(0.012), toileting, bowel management(0.021), bed-wheelchair-chair-transfer(0.004), toilet, transfer(0.000), bath-shower-transfer(0.007), Walking(0.005), Stairs(0.043), social interaction(0.047), problem solving(0.004), was significant because p value < 0.05.

Bladder management (0.131), comprehension (0.806), visual expression (0.967), memory (0.967), was not significant because p value >0.05.

4.4.2 Association of skeletal level with FIM scale:

Variable	Chi-square value	P value
Eating	56.936	0.000**
Grooming	52.371	0.007*
Bathing	51.214	0.048*
Upper body dressing	68.781	0.001**
Lower body dressing	58.773	0.010*
Toileting	54.018	0.027*
Bladder management	23.168	0.026*
Bowel management	21.968	0.233
Bed, wheelchair, chair, transfer	59.715	0.008**
Toilet, transfer	80.443	0.000**
Bath, shower, transfer	51.825	0.008**
Walking	46.687	0.027*
Stairs	31.082	0.411
Comprehension	5.763	0.452
Visual expression	8.103	0.777
Social interaction	56.366	0.017*
Problem solving	69.624	0.001**
Memory	8.103	0.777

Table.20: Association of skeletal level with FIM scale

Level of Significant: < 0.05

* Significant

** Highly Significant

Association skeletal level with eating, grooming, bathing, upper body dressing, lower body dressing, toileting, bladder management, bowel management, bed, wheelchair, chair, transfer, toilet, transfer, bath, shower, transfer, Walking, Stairs, comprehension, visual expression, social interaction, problem solving, memory, was examined using chi-square test.

Eating,(0.000) grooming,(0.007) bathing,(0.0048) upper body dressing(0.001), lower body dressing(0.010), toileting, bladder management(0.027), bed-wheelchair-chair-transfer(0.008), toilet, transfer(0.000), bath-shower-transfer(0.008), Walking(0.0027), social interaction(0.017), problem solving(0.001), was significant because p value < 0.05.

Bowel management (0.233), stairs (0.411), comprehension (0.452), visual expression (0.777), memory (0.777), was not significant because p value >0.05.

4.4.3 Association of ASIA with FIM scale:

Variable	Chi-square value	P value
Eating	17.612	0.128
Grooming	25.553	0.043*
Bathing	17.968	0.458
Upper body dressing	16.025	0.591
Lower body dressing	19.337	0.371
Toileting	17.815	0.468
Bladder management	16.730	0.010*
Bowel management	20.465	0.015*
Bed, wheelchair, chair, transfer	14.963	0.665
Toilet, transfer	25.882	0.102
Bath, shower, transfer	16.036	0.380
Walking	24.752	0.054
Stairs	21.202	0.130
Comprehension	0.436	0.933
Visual expression	0.886	0.989
Social interaction	13.127	0.783
Problem solving	52.654	0.000**
Memory	2.279	0.892

Table.21: Association of ASIA with FIM scale

Level of Significant: < 0.05

* Significant

** Highly Significant

Association ASIA scale with eating, grooming, bathing, upper body dressing, lower body dressing, toileting, bladder management, bowel management, bed, wheelchair, chair, transfer, toilet, transfer, bath, shower, transfer, Walking, Stairs, comprehension, visual expression, social interaction, problem solving, memory, was examined using chi-square test.

Grooming (0.043), bowel management (0.010), bladder management (0.015), problem solving (0.000), was significant because p value < 0.05.

Eating (0.128), bathing (0.458), upper body dressing (0.591), lower body dressing (0.371), toileting,(0.102), bed-wheelchair-chair-transfer (0.665), toilet-transfer(0.102), bath-shower-transfer(0.380), Walking(0.054), Stairs(0.130), social interaction(0.783) comprehension (0.933), visual expression (0.989), memory (0.892), was not significant because p value >0.05.

4.4.4 Association of different diagnosis with FIM scale:

Variable	Chi-square value	P value
Eating	41.461	0.000**
Grooming	46.998	0.000**
Bathing	44.478	0.000**
Upper body dressing	52.977	0.000**
Lower body dressing	47.545	0.000**
Toileting	53.664	0.000**
Bladder management	11.250	0.081
Bowel management	6.846	0.653
Bed, wheelchair, chair, transfer	43.196	0.001**
Toilet, transfer	53.457	0.000**
Bath, shower, transfer	50.460	0.000**
Walking	10.503	0.787
Stairs	13.308	0.579
Comprehension	1.424	0.700
Visual expression	2.280	0.892
Social interaction	39.895	0.002**
Problem solving	52.654	0.000**
Memory	2.280	0.892

Table.22: Association of different diagnosis with FIM scale

Level of Significant: < 0.05

* Significant

** Highly Significant

Association different diagnosis with eating, grooming, bathing, upper body dressing, lower body dressing, toileting, bladder management, bowel management, bed, wheelchair, chair, transfer, toilet, transfer, bath, shower, transfer , Walking , Stairs , comprehension, visual expression, social interaction, problem solving, memory ,was examined using chi-square test.

Eating(0.000), grooming(0.000), bathing(0.000), upper body dressing(0.000), lower body dressing(0.000), toileting(0.000), bed-wheelchair-chair-transfer(0.001), toilet-transfer(0.000), bath-shower-transfer(0.000), social interaction(0.002), problem solving(0.000), was significant because p value < 0.05.

Bowel management (0.653), bladder management (0.081) Walking (0.787), stairs (0.579), comprehension (0.700), visual expression (0.892), memory (0.892), was not significant because p value >0.05.

4.4.5 Association of age with FIM scale:

Variable	Chi-square value	P value
Eating	10.928	0.535
Grooming	21.303	0.127
Bathing	21.589	0.251
Upper body dressing	25.864	0.103
Lower body dressing	23.318	0.179
Toileting	14.904	0.669
Bladder management	10.100	0.121
Bowel management	6.113	0.729
Bed, wheelchair, chair, transfer	21.272	0.266
Toilet, transfer	24.001	0.155
Bath, shower, transfer	30.872	0.009**
Walking	9.389	0.856
Stairs	10.048	0.817
Comprehension	0.890	0.828
Visual expression	1.810	0.936
Social interaction	13.761	0.746
Problem solving	18.033	0.454
Memory	3.429	0.752

Table.23: Association of age with FIM scale

Level of Significant: < 0.05

* Significant

** Highly Significant

Association age with eating, grooming, bathing, upper body dressing, lower body dressing, toileting, bladder management, bowel management, bed, wheelchair, chair, transfer, toilet, transfer, bath, shower, transfer, Walking, Stairs, comprehension, visual expression, social interaction, problem solving, memory, was examined using chi-square test.

Bath-shower-transfer (0.009), was significant because p value < 0.05.

Eating(0.535), grooming(0.127), bathing(0.251), upper body dressing(0.103), lower body dressing(0.179), toileting(0.669), bed-wheelchair-chair-transfer(0.266), toilet-transfer(0.155), bowel management (0.729), bladder management (0.121), walking (0.856), stairs (0.817), comprehension (0.828), visual expression (0.936), social interaction(0.746), problem solving(0.454), memory (0.752), was not significant because p value >0.05.

4.4.6 Association of sex with FIM scale:

Variable	Chi-square value	P value
Eating	2.938	0.568
Grooming	2.329	0.802
Bathing	2.553	0.863
Upper body dressing	2.369	0.883
Lower body dressing	2.957	0.814
Toileting	3.604	0.730
Bladder management	2.344	0.310
Bowel management	4.438	0.209
Bed, wheelchair, chair, transfer	0.896	0.989
Toilet, transfer	2.314	0.889
Bath, shower, transfer	2.742	0.740
Walking	7.594	0.180
Stairs	7.451	0.189
Comprehension	0.179	0.672
Visual expression	0.365	0.833
Social interaction	4.175	0.653
Problem solving	5.349	0.500
Memory	0.365	0.833

Table.24: Association of sex with FIM scale

Level of Significant: < 0.05

* Significant

** Highly Significant

Association sex with eating, grooming, bathing, upper body dressing, lower body dressing, toileting, bladder management, bowel management, bed, wheelchair, chair, transfer, toilet, transfer, bath, shower, transfer, Walking, Stairs, comprehension, visual expression, social interaction, problem solving, memory, was examined using chi-square test.

Eating(0.568), grooming(0.802), bathing(0.863), upper body dressing(0.883), lower body dressing(0.814), toileting(0.730), bed-wheelchair-chair-transfer(0.989), toilet-transfer(0.889), bath-shower-transfer(0.740), social interaction(0.653), problem solving(0.500), bowel management (0.209), bladder management (0.310) Walking (0.180), stairs (0.189), comprehension (0.672), visual expression (0.833), memory (0.833), was not significant because p value >0.05.

4.4.7 Association of occupation with FIM scale:

Variable	Chi-square value	P value
Eating	26.231	0.884
Grooming	34.561	0.870
Bathing	46.281	0.763
Upper body dressing	47.638	0.717
Lower body dressing	44.499	0.818
Toileting	57.743	0.339
Bladder management	29.667	0.041*
Bowel management	41.428	0.037*
Bed, wheelchair, chair, transfer	56.177	0.393
Toilet, transfer	58.482	0.314
Bath, shower, transfer	47.537	0.370
Walking	40.848	0.648
Stairs	51.372	0.238
Comprehension	19.322	0.023*
Visual expression	26.995	0.079
Social interaction	59.198	0.292
Problem solving	71.679	0.050
Memory	26.995	0.079

Table.25: Association of occupation with FIM scale

Level of Significant: < 0.05

* Significant

** Highly Significant

Association occupation with eating, grooming, bathing, upper body dressing, lower body dressing, toileting, bladder management, bowel management, bed, wheelchair, chair, transfer, toilet, transfer, bath, shower, transfer, Walking, Stairs, comprehension, visual expression, social interaction, problem solving, memory, was examined using chi-square test.

Bowel management (0.037), bladder management (0.041), comprehension (0.023), was significant because p value <0.05.

Eating(0.884), grooming(0.870), bathing(0.763), upper body dressing(0.717), lower body dressing(0.818), toileting(0.314), bed-wheelchair-chair-transfer(0.393), toilet-transfer(0.314), bath-shower-transfer(0.370), social interaction(0.292), problem solving(0.050), Walking (0.648), stairs (0.238), visual expression (0.079), memory (0.079), was not significant because p value >0.05

4.4.8 Comparison of functional outcome with standard functional outcome

Level of injury Frequency (%)	Value of functional outcome after complete rehabilitation	Standard functional outcome value	Comparison of functional outcome with standard functional outcome
C1-C4 18.3%(n=11)	38, 41, 44, 47, 47 ,53, 54, 55, 58, 65, 77	29	All the values of functional outcome after complete rehabilitation were greater than the standard functional outcome value. So the values functional outcome after complete rehabilitation was applicable for the selected participants.
C5 8.3% (n=5)	48, 63, 64, 76, 80	51	Four values of functional outcome after complete rehabilitation were greater than the standard functional outcome value, and one was less than standard functional outcome value. So Four values of functional outcome after complete rehabilitation were applicable for the selected participants and One was non-applicable.
C6 3.3% (n=2)	70, 94	71	One value of functional outcome after complete rehabilitation was greater than the standard functional outcome value, and

			One was less than standard functional outcome value. So One value of functional outcome after complete rehabilitation was applicable for the selected participants and One was non-applicable.
C7 8.3% (n=5)	66, 71, 78, 79, 79	92	All the values of functional outcome after complete rehabilitation were less than the standard functional outcome values. So the values functional outcome after complete rehabilitation was non-applicable for the selected participants.
C8 1.7% (n=1)	77	108	All the values of functional outcome after complete rehabilitation were less than the standard functional outcome values. So the values functional outcome after complete rehabilitation was non-applicable for the selected participants.
T2-T6 11.7%(n=7)	66, 82, 94, 98, 99, 103, 122	121	Six values of functional outcome after complete rehabilitation were less than the standard functional outcome values, and one was greater than standard functional outcome value. So Six values of functional outcome after complete rehabilitation were non-

			applicable for the selected participants and One was applicable.
T7-T12 26.7%(n=16)	76, 80, 81, 92, 93, 95, 92, 95, 97, 97, 99, 100, 100, 101, 111, 103	121	All the values of functional outcome after complete rehabilitation were less than the standard functional outcome value. So the values functional outcome after complete rehabilitation was non-applicable for the selected participants.
L1-L5 18.3%(n=11)	97, 99, 101, 108, 108, 109, 114, 114, 120, 120, 123	122	Ten values of functional outcome after complete rehabilitation were greater than the standard functional outcome value, and one was less than standard functional outcome value. So Ten values of functional outcome after complete rehabilitation were non-applicable for the selected participants and One was applicable.
S1-S3 3.3% (n=2)	119,125	124	One value of functional outcome after complete rehabilitation was greater than the standard functional outcome value, and one was less than standard functional outcome value. So One values of functional outcome after complete rehabilitation were

			non-applicable for the selected participants and One was applicable.
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Table.26: Comparison of functional outcome with standard functional outcome

Among the 60 participants 31.6% (n=19) participants functional outcome was above the standard functional outcome and 68.34% (n=41) participants functional outcome was below the standard functional outcome.

5.1 Discussion

The purpose of this study was to assess the functional outcome of tetraplegic and paraplegic patients after their completing rehabilitation protocol from Centre for the Rehabilitation program of the Paralyzed (CRP). Out of the participant the mean age of the participants was 28.30(\pm 11.25) years. The range is 45 with minimum age 15 years and maximum 60 years. The number of \leq 30 years were 65% (13) and $>$ 30 were 35% (7) (Suma, 2015). Scivoletto et al., (2003) found that ages ranged from 15 to 60 years with a mean age of the patients were 28.30 years with standard deviation (\pm 11.25). The majority of the patient's were aged between 15-25 years. Most of the patients were young age. All 20 patients had traumatic spinal cord lesions. Dawodu, (2007), found that traumatic SCI is more common in persons younger than 40 years, non-traumatic SCI is more common in persons older than 40 years. Greater mortality is reported in the older patients with SCI. In this study 60 participants were selected who had completed their rehabilitation from CRP. In the case of age the most participants was attended from 21-40 age group 53.3%(n=32).Among 60 of the participants 28.3%(n=17)participants were in 1-20 age group,13.3%(n=8) participants were in 41-60 age group,5%(n=3)participants were in 61-80 age group.

The study population consisted of 52 males (86.7%) and 8(13.3%) females. National SCI statistical centre found that males accounts for 82% of all spinal cord injuries and females for 18%.

Male was predominantly higher than female. Majority of the patient were lives in rural area same situation also seen in India (Singh et al., 2003). Suma, (2015) found that 20 participants 85% (17) were male and 15% (3) were female. Male were predominantly higher than female. The participants with SCI most had secondary level education and second most majority educational level was primary. Day laborer was the common occupation where spinal cord injury seen. More than 80% of the population lives in villages and 65% of the total labors forces are employed in agriculture.

In this case of educational level of the participants 13.3%(n=8) were farmer,8.3%(n=5) were day laborer,11.7%(n=7) were service holder,11.7%(n=7) were garments worker,5%(n=3) were driver,5%(n=3) were businessman, 1.7%(n=1) were unemployed, 11.7%(n=7) were housewife, 25.0%(n=15) were students, 6.7% were other occupational. Data showed that 66.7% (n=40) were married, 33.3% (n=20) were unmarried, 76.7% (n=46) were nuclear family, 23.3% (n=14) were extended family, 88.3% (n=53) lived in rural areas, 11.7% (n=7) living urban areas.

The skeletal level of thoracic was most common than lumber level. The skeletal level of thoracic were 75% (n=15) and lumber 25% (n=5). In thoracic level, thoracic 12 were most common (Suma, 2015). Rizzollo et al., (2000) found the most common 65% (n=13) impairment grading in ASIA scale was complete-A 15% (n=3) were incomplete B, 15% were incomplete C. Approximately 40% of patients with spinal cord injury (SCI) present with complete SCI, 40% with incomplete injury, and 20% with either no cord or only root lesions. In this study among 60 participants, most participants were T7-T12 level of injury. Data showed 11.7%(n=7) were C1-C4 level of injury,15%(n=9) were C5 level of injury,10%(n=6) were C6 level of injury,5%(n=3) were C7 level of injury, 6.7%(n=4) were T2-T6 level of injury,30%(n=18) were T7-T12 level of injury, 21.7%(n=13) were L1-L5 level of injury, 53.3%(n=32) were traumatic paraplegic,41.7%(n=25) were Traumatic Tetraplegic, 3.3%(n=2) were Non Traumatic paraplegic, 1.7%(n=1) were Non Traumatic Tetraplegic.

Suma, (2015) found FIM scale shows that among 20 participants 15 patient became independent in rolling. In lying to sitting and sitting to lying most of them 75% patients became independent. 70 % of participants show independent in prone lying, the study shows that 70% (n=14) of the participants became independent in wheelie. In wheelchair skills in rough ground 85% (n=17) participants gain 7 from FIM rating scale, walking in flat surface most of the patient 70% and in rough surface most of the patient 70% were unable to do. It means they needed total assistance in gait. Somers (2009) and Atrice et al. (2001) claim in the section of wheelchair propelling in rough surfaces the goal is to gain total independence. According to the FIM scale among 20 participant 80% (n=15) participants were independent in sitting balance. Somers (2009) suggest that in the

section of rolling, prone lying and sitting balance the goal is to become total independent. Roy, (2006) found that 60 participants, FIM rating scale show 56 patients became independent in rolling. In lying to sitting and sitting to lying most of them 56 and 55 patients became independent. 83.3% of participants show independent in prone lying. Most of them 98.3% (n=59) achieved 7 from FIM rating scale in sitting balance. In the section of transferring from wheelchair to bed and bed to wheelchair among 60 participants, 86.7% (n=52) of them achieved 7 from FIM rating scale. That means they could perform transferring from wheelchair to bed and bed to wheelchair total independently without any assistive device, walking in flat surface most of the patient 55% and rough surface most of the patient 56.7% unable to do, from admission to discharge. Schonherr, (2008) found that lesions in 100% of patients with tetraplegia and 96% of patients with paraplegia remained complete. Significant progress in independence was made in self-care, ambulation and bladder and bowel care. Differences were found in the extent of functional improvement between subgroups of patients with different levels and extent of lesion. Contrary to expectations based on theoretical models, patients with complete paraplegia did not achieve maximal independence in self-care. Independent walking was only attained by patients with incomplete lesions. Regarding outcome of bladder and bowel care, poor results were found, especially the independence in defecation and toilet transfers.

In this study independent eating were 76.7%(n=46), supervision eating were 1.7%(n=1),minimum assistance needed 8.3%(n=5),moderate assistance needed 8.3%(n=5) and maximum assistance needed were 5%(n=3), independent grooming were 73.3% (n=44), supervision grooming were 3.3%(n=2),minimum assistance needed 8.3%(n=5),moderate assistance needed 5% (n=3), maximum assistance needed were 5%(n=3), and unable to do 5%(n=3), independent bathing were 56.7% (n=34), independent with assisted device 3.3%(n=2), supervision bathing were 10%(n=6),minimum assistance needed 8.3%(n=5),moderate assistance needed 10% (n=6), maximum assistance needed were 6.7%(n=4), and unable to do 5%(n=3), independent upper body dressing were 55% (n=33), independent with assisted device needed 15%(n=9), supervision upper body were 1.7%(n=1),minimum assistance needed

8.3%(n=5),moderate assistance needed 10% (n=6), maximum assistance needed were 6.7%(n=4), and unable to do 3.3%(n=2), independent lower body dressing were 40%%(n=24), independent with assisted device 28.3%(n=17), supervision lower body dressing were 1.7%(n=1),minimum assistance needed 6.7%(n=4),moderate assistance needed 11.7% (n=7), maximum assistance needed were 8.3%(n=5), and unable to do 3.3%(n=2), independent toileting were 41.7%(n=25), independent with assisted device 11.7%(n=7), supervision bathing were 3.3%(n=3),minimum assistance needed 11.7%(n=7),moderate assistance needed 13.3% (n=8), maximum assistance needed were 10%(n=6), and unable to do 8.3%(n=5), independent bladder management were 13.3%(n=8), independent with assisted device 16.7%(n=10), and unable to do 70%(n=42), independent bowel management were 20%(n=12), independent with assisted device 8.3%(n=5), supervision bowel management were 1.7%(n=1), and unable to do 70%(n=42), independent bed, wheelchair, chair, transfer were 35%(n=21), independent with assisted device 16.7%(n=10), supervision bed, wheelchair, chair, transfer were 1.7%(n=1),minimum assistance needed 16.7%(n=10),moderate assistance needed 11.7% (n=7), maximum assistance needed were 11.7%(n=7), and unable to do 6.7%(n=4), independent toilet transfer were 20%(n=12), independent with assisted device 20%(n=12), supervision toilet transfer were 6.7%(n=4),minimum assistance needed 15%(n=9),moderate assistance needed 21.7% (n=13), maximum assistance needed were 11.7%(n=7), and unable to do 5%(n=3), independent bath, shower, transfer were 38.3%(n=23), independent with assisted device 15%(n=9), minimum assistance needed 11.7%(n=7),moderate assistance needed 20% (n=12), maximum assistance needed were 10%(n=6), and unable to do 5%(n=3), independent walking were 2%(n=3.3), independent with assisted device 13.3%(n=8), minimum assistance needed 6.7%(n=4),moderate assistance needed 1.7% (n=1), maximum assistance needed were 1.7%(n=1), and unable to do 73.3%(n=44), independent stairs were 2%(n=3.3), independent with assisted device 5%(n=3), minimum assistance needed 10%(n=6),moderate assistance needed 3.3% (n=2), maximum assistance needed were 3.3%(n=2), and unable to do 75%(n=45), independent comprehension were 98.3%(n=59), independent with assisted device 1.7%(n=1), independent visual expression were 96.7% (n=58), independent with assisted device 1.7% (n=1), minimum

assistance needed 1.7% (n=1), independent social interaction were 11.7%(n=7), independent with assisted device 30%(n=18), supervision needed 3.3%(n=2), minimum assistance needed 18.3%(n=11), moderate assistance needed 16.7% (n=10), maximum assistance needed were 13.3%(n=8), and unable to do 6.7%(n=4), independent problem solving were 13.3%(n=8), independent with assisted device 26.7%(n=16), supervision needed 3.3%(n=2), minimum assistance needed 20%(n=12), moderate assistance needed 16.7% (n=10), maximum assistance needed were 15%(n=9), and unable to do 5%(n=3), independent memory were 96.7% (n=58), supervision needed 1.7%(n=1), minimum assistance needed 1.7%(n=1).

5.2 Limitation of the Study:

- The first limitation of the study was population selected purposively from a selected specialized rehabilitation centre of the country. There are many patients not coming to CRP for treatment after spinal cord lesion. So, the finding might be area specific and might not necessarily represent the national situation.
- This study was done in a short period.
- This interview schedule did not allow in depth information and also not focus all aspect of spinal cord lesion.
- The study was done on a convenient sample size of 60.

6.1 Conclusion

High proportion of SCL in Bangladesh was due to traumatic causes, which were preventable. SCL, a disability-oriented injury seems to occur mostly in young males of low social status, in terms of education, occupation and income in their productive years, demolishing their physical and earning capability leading to grievous problem at individual, family and social level. There has been little effort to prevent and provide appropriate rehabilitation services. The CRP is the only organization in Bangladesh to provide specialized services for people with SCL. In future, it will be too difficult for CRP to handle the volume of the patients. Moreover, there is lack of proper early management after spinal cord injury, which has significant impact on neurological status of the injured with SCL. This necessitates the need for prompt initiative by the government and service providers to focus on prevention and early management of SCL in Bangladesh to ensure better quality of life for patients with SCL in Bangladesh. To overcome this acute problem, pragmatic policy and program needs to be launched. A country-wide prevalence study is recommended to estimate the magnitude of the problem. It is very important to measure the function and independency of a spinal cord injured person after rehabilitation program which maybe measure through functional independence measure (FIM). Early rehabilitation is required for patients with spinal cord injury. The aim of rehabilitation is to teach patients with SCI how to achieve an optimal independent and satisfying lifestyle in their own community. Fortunately, most patients go home after rehabilitation and a significant number achieve functional independence.

The results of this study provided more insight into the functional outcome of patients with spinal cord injury. More research is needed to evaluate the rehabilitation program for these patients. In this study, researcher found significant association of Socio-demographic variable, disease related variable with FIM scale, among the 60 participants 31.6%(n=19) participants functional outcome was above the standard functional outcome and 68.34%(n=41) participants functional outcome was below the standard functional outcome.

6.2 Recommendation

Spinal cord injury is a major disabling condition that could bring severe changes in one life. However, most of the traumatic spinal cord injury is preventable with appropriate community based interventions. Therefore there is urgent need for appropriate community based prevention program at community level targeting the rural areas of Bangladesh as majority of the spinal cord injured patients are coming from rural areas. The study findings resembles that people with spinal cord lesion are mostly earning members of their families and are mostly from lower economic class in Bangladesh. Immediate management after spinal cord lesion not found in Bangladesh. Therefore, appropriate strategy should be developed to ensure immediate management people with spinal cord lesion at different levels of service delivery. Moreover CRP is the only specialized rehabilitation centre for the people with spinal cord lesion in Bangladesh. Although it is providing excellent services with it meager resources, CRP cannot adequately address the needs of the whole country. In this study, the investigator took the sample from CRP SCI unit; it was small area to take available sample. So for further study investigator strongly recommended to include the person with SCI from the community or all over the Bangladesh.

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Appendix-A

CONSENT FORM

Assalamualaikum/Namasker, my name is, Md.Abu Bakkakr Siddique I am conducting this study for a B. Sc in Physiotherapy project study dissertation titled “comparison of functional functional outcome inrelation to stander functional outcome after the rehabilitation of people with SCI ” under Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related information regarding Spinal cord injury. You will perform some tasks which are mention in this form. This will take approximately 30-40 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 Spinal cord injury area, so your participation in the research will have no impact on your present or future treatment in this area (Spinal cord injury unit). All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous and also all information will be destroyed after completion of the study. Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview.

If you have any query about the study or your right as a participant, you may contact with me, researcher and/or Md. Shofiquel Islam , Associate Professor & Head, department of physiotherapy, CRP, Savar, Dhaka. Do you have any questions before I start?

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

Yes

No

Signature of the Participant _____

Signature of the Interviewer _____

Appendix-B

সম্মতি পত্র

আসলামুআলাইকুম/নমস্কার,

আমার নাম মোঃ আবু বক্কর সিদ্দিক, আমি এই গবেষণা প্রকল্পটি বাংলাদেশ হেলথ প্রফেশন ইনস্টিটিউট (বি এইচ পি আই) এ পরিচালনা করছি যা আমার ৪র্থ বর্ষ বি এস সি ইন ফিজিওথেরাপী কোর্সের অধিভুক্ত। আমার গবেষণার শিরোনাম “মেরুদণ্ডের আঘাতে আক্রান্ত ব্যক্তিদের পুনর্বাসনের পরে স্ট্যাভার কার্যকরী ফলাফলের সাথে কার্যকরী ফলাফলের তুলনা” আমি এক্ষেত্রে আপনার কিছু ব্যক্তিগত এবং আনুষঙ্গিক প্রশ্ন মেরুদণ্ড ক্ষতিগ্রস্ত সম্পর্কে করতে চাচ্ছি। এতে আনুমানিক ৩০-৪০ মিনিট সময় নিবো।

আমি আপনাকে অনুগত করছি যে, এটা আমার অধ্যয়নের অংশ এবং যা অন্যকোন উদ্দেশ্যে ব্যবহার হবে না। গবেষক সরাসরি এই স্নায়ুজ্ঞান অধ্যয়নের সাথে অন্তর্ভুক্ত নয়। তাই এই গবেষণায় আপনার অংশগ্রহণ বর্তমান ও ভবিষ্যৎ চিকিৎসায় কোন প্রকার প্রভাব ফেলবেনা। আপনি যে সব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং আপনার প্রতিবেদনের ঘটনা প্রবাহে এটা নিশ্চিত করা হবে যে এই তথ্যের উৎস অপ্রকাশিত থাকবে।

এই অধ্যয়নে আপনার অংশগ্রহণ স্বৈচ্ছাপ্রণোদীত এবং আপনি যে কোন সময় এই অধ্যয়ন থেকে কোন নেতিবাচক ফলাফল ছাড়াই নিজেই 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 অথবা /এবং মোঃ সফিকুল ইসলাম, সহযোগী অধ্যাপক এবং ফিজিওথেরাপি বিভাগের প্রধান, সিআরপি, সাভার, ঢাকা-১৩৪৩-তে যোগাযোগ করতে পারেন।

সাক্ষাৎকার শুরু করার আগে আপনার কি কোন প্রশ্ন আছে?

আমি আপনার অনুমতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি।

হ্যাঁ...

না...

১। অংশগ্রহণকারীর স্বাক্ষর.....।

২। সাক্ষাৎগ্রহণকারীর স্বাক্ষর.....।

Appendix-C

English questionnaire

Personal details

Code no:	
Name of participant:	
Address:	Village/house no..... Post office..... Thana..... District.....
Contact number:	
Date of interview:	

1. Socio demographic information:

Age:	years
Sex:	<input type="checkbox"/> 1= male <input type="checkbox"/> 2= female
Occupation :	<input type="checkbox"/> 1= Farmer <input type="checkbox"/> 2= Day laborer <input type="checkbox"/> 3= Service holder <input type="checkbox"/> 4= Garments/ Factory worker <input type="checkbox"/> 5= Driver <input type="checkbox"/> 6= Businessman <input type="checkbox"/> 7= Unemployed <input type="checkbox"/> 8= Housewife <input type="checkbox"/> 9= Student <input type="checkbox"/> 10= Other

	(Specify).....
Marital status:	<input type="checkbox"/> 1= Married <input type="checkbox"/> 2= Unmarried
Family type:	<input type="checkbox"/> 1= Nuclear family <input type="checkbox"/> 2= Extended family
Living area:	<input type="checkbox"/> 1= Rural <input type="checkbox"/> 2= Urban
Educational level:	<input type="checkbox"/> 1 = Illiterate <input type="checkbox"/> 2= Primary <input type="checkbox"/> 3= S.S.C <input type="checkbox"/> 4=H.S.C. <input type="checkbox"/> 5= Graduate <input type="checkbox"/> 6= Post Graduate
Monthly family income: Taka

Participant related information

Diagnosis:	
Date of injury:	
Skeletal Level:	
Date of Admission to CRP:	
Neurological level:	
ASIA scale (Impairment Grading):	<input type="checkbox"/> 1= Complete A <input type="checkbox"/> 2= Incomplete B <input type="checkbox"/> 3= Incomplete C

	<input type="checkbox"/> 4= Incomplete D <input type="checkbox"/> 5= Normal E
--	----------------------------------------------------------------------------------

Functional Progress Rating Scale:

- 7=Independent
- 6=Independent with assisted device
- 5=Supervision
- 4=Minimal assistance
- 3=Moderate assistance
- 2=Maximal assistance
- 1=Unable to do

Functional Improvement

Activities	Scores
Self care	
Eating	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Grooming	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do

<p>Bathing</p>	<p><input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do</p>
<p>Upper body dressing</p>	<p><input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do</p>
<p>Lower body dressing</p>	<p><input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do</p>
<p>Toileting</p>	<p><input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do</p>

Sphincter control	
Bladder management	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Bowel management	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Transfers	
Bed, chair, wheelchair transfer	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Toilet transfer	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance

	<input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Bath/shower transfer	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Locomotion	
Walking/wheelchair	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Stairs	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Communication	
Comprehension	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision

	<input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Auditory /visual expression	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Social cognition	
Social interaction	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Problem solving	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do

Memory	<input type="checkbox"/> 7=Independent <input type="checkbox"/> 6=Independent with assisted device <input type="checkbox"/> 5=Supervision <input type="checkbox"/> 4=Minimal assistance <input type="checkbox"/> 3=Moderate assistance <input type="checkbox"/> 2=Maximal assistance <input type="checkbox"/> 1=Unable to do
Total score	

Appendix-D

বাংলা প্রশ্নাবলী ব্যক্তিগত তথ্যাবলী

পরিচিতি নং	
অংশগ্রহনকারীর নামঃ	
ঠিকানাঃ	গ্রাম/বাসা..... ডাকঘর..... থানা..... উপজেলা..... জেলা.....।
মোবাইল নম্বরঃ	
সাক্ষাৎকার গ্রহণের তারিখঃ	

আর্থ-সামাজিক তথ্যাবলী

বয়সঃ	বছর
লিঙ্গঃ	<input type="checkbox"/> ১=পুরুষ <input type="checkbox"/> ২=মহিলা
পেশাঃ	<input type="checkbox"/> ১=কৃষক <input type="checkbox"/> ২=দিন মজুর <input type="checkbox"/> ৩=চাকরিজীবী <input type="checkbox"/> ৪=কারখানা শ্রমিক /গার্মেন্টস <input type="checkbox"/> ৫=গারি চালক <input type="checkbox"/> ৬=ব্যবসায়ী <input type="checkbox"/> ৭=বেকার <input type="checkbox"/> ৮=গৃহিণী <input type="checkbox"/> ৯=ছাত্র <input type="checkbox"/> ১০=অন্যান্য
বৈবাহিক অবস্থাঃ	<input type="checkbox"/> ১=অবিবাহিত <input type="checkbox"/> ২=বিবাহিত
পরিবারের ধরনঃ	<input type="checkbox"/> ১=একক পরিবার <input type="checkbox"/> ২= যৌথ পরিবার

বসবাসের এলাকাঃ	<input type="checkbox"/> ১=গ্রাম <input type="checkbox"/> ২=শহর
শিক্ষাগত যোগ্যতাঃ	<input type="checkbox"/> ১=নিরক্ষর <input type="checkbox"/> ২ =প্রাথমিক <input type="checkbox"/> ৩ =এস এস সি <input type="checkbox"/> ৪ =এইচ এস সি <input type="checkbox"/> ৫ =স্নাতক <input type="checkbox"/> ৬ =স্নাতকোত্তর
পরিবারের মাসিক আয়ঃটাকা

অংশগ্রহনকারী সম্পর্কিত তথ্যবলী

রোগের ধরনঃ	
আঘাত প্রাপ্তির তারিখঃ	
মেরুদণ্ডের আঘাত প্রাপ্ত অংশঃ	
ভর্তির তারিখঃ	
স্নায়ুতন্তুর অবস্থাঃ	
অ্যামেরিকান স্পাইনাল অ্যাসোসিয়েশন স্কেল	<input type="checkbox"/> ১=সম্পূর্ণ এ <input type="checkbox"/> ২=অসম্পূর্ণ বি <input type="checkbox"/> ৩=অসম্পূর্ণ সি <input type="checkbox"/> ৪=অসম্পূর্ণ ডি <input type="checkbox"/> ৫=সাধারণ

কার্যকরী ফলাপলের সম্পর্কিত প্রশ্নাবলিঃ

১। আপনি কি নিজে নিজে খেতে বা পান করতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

২। আপনি কি নিজে নিজে পরিষ্কার ,পরিচ্ছন্ন হতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

৩। আপনি কি নিজে নিজে গোসল করতে পারেন পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

৪। আপনি কি নিজে নিজে শার্ট/গেঞ্জি/পাঞ্জাবি, পরতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

৫। আপনি কি নিজে নিজে প্যান্ট/পাজামা/লুঙ্গি পরতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান

- ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

৬। আপনি কি নিজে নিজে শৌচকার্য করতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

৭। আপনি কি মূত্রাশয় ব্যবস্থাপনা করতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

৮। আপনি কি অল্প ব্যবস্থাপনা করতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

৯। আপনি কি বিছানা থেকে চেয়ার বা ছইলচেয়ার স্থানান্তর হতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

১০। আপনি কি হুইলচেয়ার থেকে টয়লেটে স্থানান্তর হতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

১১। আপনি কি গোসলের জন্য ঝরনা/ টাবের কাছে যেতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

১২। আপনি কি নিজে নিজে হাটতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

১৩। আপনি কি নিজে নিজে সিঁড়ি দিয়ে উঠতে/নামতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

১৪। আপনি যখন কথা বলেন বা শুনেন তখন আপনার মুখের ভাব কেমন থাকে ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান

- ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

১৫। আপনাকে যখন কেউ কিছু বলে / দেখেন তা কি উপলব্ধি করতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

১৬। আপনার কি সামাজিক যোগাযোগ করতে পারেন?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

১৭। আপনি কি সমস্যা সমাধান করতে পারেন ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম


১৮। আপনি কোন কিছু মনে রাখতে পারেন কিনা ?

- ৭=স্বয়ংসম্পূর্ণ ৬=সাহায্যকারী ডিভাইস/সহায়ক ৫=তত্ত্বাবধান
 ৪=আল্প সাহায্য ৩=বেশি সাহায্য ২=খুব বেশি সাহায্য
 ১=অক্ষম

মোট স্কোরঃ

Appendix-E

IRB Permission Letter



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)
(The Academic Institute of CRP)

Ref: CRP/BHPI/IRB/03/2022/575 Date: 02/03/2022

Md.Abu Bakkar Siddique
4th Year B.Sc. in Physiotherapy
Session: 2016 – 2017
BHPI, CRP, Savar, Dhaka- 1343, Bangladesh

Subject: Approval of the research project proposal “Comparison of functional outcome in relation to stander functional outcome after the rehabilitation of people with spinal cord injury” by ethics committee.

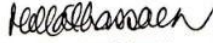
Dear Md.Abu Bakkar Siddique,
Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator and Md. Shofiqul Islam as thesis supervisor. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Dissertation Proposal
2	Questionnaire (English and Bengali version)
3	Information sheet & consent form.

The purpose of the study is to comparison of functional outcome in relation to stander functional outcome after the rehabilitation of people with spinal cord injury. Since the study involves questionnaire that takes maximum 30-40 minutes and have no likelihood of any harm to the participants, the members of the Ethics committee approved the study to be conducted in the presented form at the meeting held at 09:00 AM on 12 October, 2021 at BHPI (30thIRB Meeting).

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,


Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404
E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd, www.crp-bangladesh.org

Appendix-F

Permission letter

Date: 13-03-2022

The Head of Department

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343.

Through: Head, Department of Physiotherapy, BHPI

Subject: Seeking permission for data collection of 4th year physiotherapy research project.

Respected Sir,

With due respect and humble submission to state that I am Md. Abu Bakkar Siddique, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project entitled on "**Comparison of functional outcome in relation to standard functional outcome after the rehabilitation of people with SCI**" under the supervision of Md. Shofiqul Islam, Associate Professor & Head, department of physiotherapy, CRP, Savar, Dhaka-1343, Bangladesh. Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. I want to collect data for my research project from the patients of spinal cord injury unit, department of Physiotherapy, CRP, Savar, Dhaka. So, I need permission for data collection from the spinal cord injury unit of Physiotherapy department of CRP, Savar, Dhaka. I would like to assure that anything of my study will not be harmful for the participants.

May I, therefore pray and hope that you would be kind enough to grant my application & give me permission for data collection and oblige thereby.

Yours obediently,

Md. Abu Bakkar Siddique

Md. Abu Bakkar Siddique

4th professional B.Sc. in Physiotherapy

Roll: 29, Session: 2016-17, ID No: 112160354

Bangladesh Health Professions Institute (BHPI)

(An academic Institute of CRP)

CRP, Chapain, Savar, Dhaka-1343.

Forwarded & Recommended

Shofiq

13.03.2022

Md. Shofiqul Islam
Associate Professor & Head
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

Approved
12/03/22

Appendix-G

The Chairman
Institutional Review Board (IRB)
Bangladesh Health Professions Institute (BHPI), CRP
Savar, Dhaka-1343, Bangladesh.

Subject: Application for review and ethical approval.

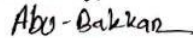
Dear sir,

With due respect, I am Md. Abu Bakkar Siddique, student of final year B.Sc. in Physiotherapy program at Bangladesh Health Professions Institute (BHPI) the academic institute of Centre for the Rehabilitation of the Paralyzed (CRP) under the Faculty of Medicine, University of Dhaka. As per the course curriculum, I have to conduct a research project entitled “**Comparison of functional outcome in relation to standard functional outcome after the rehabilitation of people with spinal cord injury**” under the supervision of Md. Shofiqul Islam, Associate Professor & Head, Department of Physiotherapy, BHPI.

The purpose of the study is to gain in-depth insight and understandings from people with spinal cord injury in order to understand their own experiences and perspectives on functional outcome after the rehabilitation. The study involves face-to-face and by over phone interview by using questionnaire to explore the perception of people with spinal cord injury who are complete rehabilitation programmed at Centre for the Rehabilitation of the Paralyzed (CRP) hospital in Savar that may take 30 to 40 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. Related information will be collected from the patients' guide books. Data collectors will receive informed consent from all participants and the collected data will be kept confidential.

Therefore, I look forward to having your kind approval for the research project and to start data collection. I can also assure you that I will maintain all the requirements for study.

Sincerely,



Md. Abu Bakkar Siddique
Final Year B.Sc. in Physiotherapy
Session: 2016 – 2017,
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Thesis presentation date: 17th October 2021



Head of Department
B.Sc. in Physiotherapy, BHPI.

Md. Shofiqul Islam
Associate Professor & Head
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapaini, Savar, Dhaka-1343

Recommendation from the Supervisor



Md. Shofiqul Islam
Associate Professor & Head
Department of Physiotherapy, BHPI.