Faculty of Medicine

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IMPACT OF PHYSIOTHERAPY INTERVENTION TO INCREASE SPINAL CORD INDEPENDENCE MEASURE ON SCI PATIENTS

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IMPACT OF PHYSIOTHERAPY INTERVENTION TO INCREASE SPINAL CORD INDEPENDENCE MEASURE ON SCI PATIENTS.

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DECLARATION

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This work has not previously been accepted in substance for any degree and isn't concurrently submitted in candidature for any degree. This dissertation is being submitted in partial fulfillment of the requirements for the degree of B.Sc. in Physiotherapy. I confirm that, if anything identified in my work that I have done plagiarism or any form of cheating will directly be awarded a file and I am subject to disciplinary actions of authority. I confirm that the electronic copy is identical to the bound copy of the Thesis. In case of dissemination of the finding of this project for future publication, the research supervisor will be highly concerned, it will be duly acknowledged as a graduate thesis and consent will consent taken from the physiotherapy department of Bangladesh Health Professions Institute (BHPI).

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CONTENTS

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Acronyms

ASIA	American Spinal Injury Association
BHPI	Bangladesh Health Professions Institute
BMRC	Bangladesh Medical Research Council
CRP	Centre for the Rehabilitation of the Paralysed
DU	University of Dhaka
IRB	Institution Review Board
SCIM	Spinal Cord Independence Measure
SCI	Spinal Cord Injury
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
SCL	Spinal Cord Lesion
US	United States
WHO	World Health Organization

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Abstract

Purpose*:* The purpose of this study was to determine the Impact of physiotherapy intervention to increase spinal cord independence measure on SCI patients. **Objectives:** To assess the impact of physiotherapy intervention to increase spinal cord independence measure on SCI patients and find out about any association between spinal cord independence measure (SCIM) and socio-demographic characteristics. **Methods**: The study design was cross-sectional. A total of 65 samples were selected conveniently for this study from Centre for the Rehabilitation of the Paralyzed (CRP) in Bangladesh. Data was collected by using a questionnaire, and the SCIM-III Scale. Descriptive statistics using SPSS software version 20 were used for data analysis. **Results:** In this study, among 65 participants the mean age of the participants was 31.92±12.730 years. Among them males were predominantly higher than female, males were 86.2%(n=54) and females were about 13.8%(n=9). Majority of the participants were come from rural area 64.6%(n=42) and their monthly family income mean were 10518.08±16223.596. Complete A 72.3%(n=47) was the most common impairment in ASIA grading scale. In this study, the majority of participants 52.3%(n=34) were get admitted within a month after their injury and there have a highly significant (p=0.002) result with the admission date after injury. This study showed that there had a correlation between increasing SCIM score with admission after injury. **Conclusion**: The results of this study provided more insight into the increase of SCIM of a group of patients with traumatic spinal cord injury. More research is needed to evaluate the rehabilitation program for these patients.

Keywords: *Physiotherapy intervention, Spinal cord injury, SCIM.*

Word Count: 11,095

| CHAPTER-I | INTRODUCTION |

1.1 Background

Injury to the spinal cord from the foramen magnum to the conus medullaries and cauda equina is known as spinal cord injury (SCI Acute injury of spinal cord are among the most common cause of sever disability & death. The disruption of nerve transmission caused by a spinal cord injury (SCI) can have serious physical and emotional effects (Eng & Miller, 2006).

Damage to the spinal cord is known as a spinal cord injury. The spinal cord transmits messages from the brain to all areas of the body, as well as from the body to the brain. It is a severe form of physical trauma that is likely to have a long-term and considerable influence on most elements of daily life. People with SCI have a variety of physical issues and complications with their bodies. (Hoque et al., 2018). SCI is a catastrophic illness that causes significant functional disability and necessitates intense and specialized clinical rehabilitation. SCI affects many people at a young age and their life expectancy has risen in recent years. SCI develops frequently at a young age and people with SCI have risen their life expectancy in recent decades (Siddall et al., 2017).

The American Spinal Injuries Association Impairment Scale and the International Standards for the Neurological Classification of SCI (AIS). AIS A denotes complete lesions, while AIS B, AIS C, AIS D, or AIS E denote incomplete lesions. This categorization method was created in 1982 to replace the Frankel system, which classed a person as having an incomplete SCI if they had any motor or sensory preservation more than three levels below the level of injury (Waring et al., 2010). Spinal cord injury is becoming more common with an annual rate of 15-40 instances per million, with a male predominance and a proclivity for harming the poor socioeconomic category. The epidemiology of spinal cord injury differs from country to country, necessitating diverse and detailed investigations in each. Bangladesh is a thriving but impoverished country. A spinal cord injury (SCI) is a lesion of neural components of the spinal cord that has a

significant influence on a person's life. The country of South Asia experiences a large lot of socio-economic problems as a result of spinal cord injury (Quadir et al., 2017).

SCI-related disability alters the patient's situation and lowers their quality of life. Traumatic SCI affects young patients, with those 65 years of age or older accounting for 20% of all SCI cases. In the UK, SCI most typically affect younger persons between the ages of 16 and 30, with age 19 being the most prevalent (Kennedy and Rogers, 2000). Patients with SCI have unique characteristics in terms of the cause, sex, and neurological traits and consequences. In the US, there are around 11,000 new cases of SCI each year. 82% of all SCI are male, while 18% are female. The global prevalence of spinal cord injury (SCI) is estimated to be 223–755 per million inhabitants, with an annual incidence of 10.4–83 per million inhabitants. Each year, roughly 10,000 people in the United States suffer a spinal cord injury that necessitates hospitalization. Every year, 90 million people worldwide suffer from varied degrees of spinal cord injury. Many countries are unaware of the prevalence of spinal cord damage. It is calculated that the yearly incidence of spinal cord injury (SCI) in the United States is roughly 40 instances per million people, excluding those who die at the scene of the accident (Singh et al., 2014).

SCI alters the patient's circumstances and reduces their quality of life. Non-traumatic SCI is more prevalent in those over 40, while traumatic SCI is more common in people under 40. Older SCI patients have been observed to have higher fatality rates (Kirshblum et al., 2011). The majority of traumatic SCI occurs in young patients, according to the findings. SCI affects 20% of those aged 65 and up. Most SCI occurs in the United Kingdom. Younger persons aged 16 to 30, with the most common age being 19 years. SCI patients have a variety of characteristics, etiology, gender, neurological features, and complications (Scivoletto et al., 2003). In Sweden, the annual rate of spinal cord injury is 1.5-2 per 100,000. Every year, approximately 1200 persons in the United Kingdom are paralyzed due to a spinal cord injury (Seema TA, 2019). Every year, roughly 20 000 new spinal cord injury cases are reported in India (Singh et al., 2014).

In Bangladesh, it is a major public health issue. The incidence of SCI has been estimated at 2.5 cases per million, in Bangladesh. Patients with spinal cord injuries in Bangladesh either do not survive or do not have access to medical care. SCI as a result of falls from a

height and falls while bearing a heavy weight on the head is on the rise (Momin, 2003). The Spinal Cord Independence Measure (SCIM) was developed specifically for people with SCI and assesses their ability to perform routine daily tasks. The validity, reliability, and benefits of the first two versions (SCIM I and SCIM II) have been demonstrated in a number of publications, demonstrating that SCIM II can be used for clinical purposes and outcome assessment in research and thus contributes to evidence-based practice with SCI patients (Popovic et al., 2006).

SCIM II clinical use has been accompanied by statistical analysis via Rasch modeling, and has been enriched by comments from staff members who used it, as well as expert opinions from multiple countries. As a result, the third version of SCIM was developed (SCIM III), which consists of three complementary subscales: 'Selfcare' (with a score range of $0 - 20$) including six tasks; 'Respiration and sphincter management' (with a score range of $0 - 40$) including 4 tasks; and 'Mobility' (with a score range of $0 - 40$) including nine tasks. The mobility subscale consists of two subscales: one for 'room and toilet' and the one for 'indoors and outdoors, on even surface'. Total score ranges between 0 and 100 (Popovic et al., 2006).

People with SCI require continual access to wheelchair-friendly surroundings, as well as adequate homecare, equipment, transportation, employment, and financial support. SCI patients require extensive care from a variety of healthcare providers, organizations, and government agencies. Physiotherapists treat a wide range of SCI-related issues that affect many different body systems, even also which condition is with neurological (Harvey, 2015).

 The most common age group of patients (10-40 years) represents Bangladesh's socioeconomic situation. The male: female ratio of SCI patients (7.5:1.0) is linked to socioeconomic status and society's traditional culture. More than 80% of SCI patients are men, and 55% of SCI victims are between the ages of 16 and 30 (Siddall et al., 2017).

Bangladesh is a developing country that is both poor and densely inhabited. More over 80% of the population lives in villages, while agriculture employs 65% of the entire labor force. 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 (Momin, 2003).

During the rehabilitation phase, physiotherapy concentrates on motor task goals such as walking, pushing a wheelchair, transferring, and using the upper limbs. Based on physiotherapists' assessments of patients at the time of admission to rehabilitation, a recent study looked at they are able to predict to the chance of patients walking (and doing a variety of other motor tasks) three months and one year after injury. After 45 days (IQR 31 to 73), the forecasts were made. The study comprised 50 of the 67 people that were theoretically eligible. According the findings of this study, physiotherapists were good at estimating the possibility of walking after one year. Patients expected to achieve a higher level of mobility than their physiotherapists projected, which was surprising but not unexpected. This is absolutely proved that there's have a significant role to physiotherapists must play in informing the media about the situation (Harvey, 2016).

The difficulties for a physiotherapist working in the field of SCI is the absence of high-quality direct evidence as well as the broad scope of treatment. Physiotherapists working in SCI for example address pain and respiratory issues, utilize electrical stimulation to treat pressure ulcers, develop fitness training programs, encourage people with SCI to live healthy lifestyles, and teach disability sports; Provide orthotics, splints, and assistance to patients; prescribe wheelchairs; counsel patients on how to avoid shoulder pain and pressure sores; and give various electrotherapeutic procedures. As a result, physiotherapists who work with persons who have SCI require a wide range of clinical abilities. Another issue for physiotherapists working in this field is keeping an open mind regarding emerging interventions like stem cell therapy and robotics while resisting the urge to embrace them before high-quality evidence confirms their efficacy. The following sections will concentrate on three major issues: weakness, contractures, and inadequate motor control (Lee et al., 2015).

The goal of this study was to describe how a group of traumatic spinal cord injury patients recovered from their impairments and disabilities after discharge. The goal of this study was to examine the functional independence of the population with SCI in order to determine if they are self-sufficient or require entire support in ADLs.

1.2 Rationale

SCI is a growing concern in our country. SCI affects a significant number of young people, resulting in enormous financial and non-economic costs to afflicted individuals, families, and societies. Damage to the spinal cord has profound and global impacts. SCI patients frequently experience paraplegia. Our interventions were restricted to prevention, good initial resuscitation, minimal pharmacotherapy, and nursing care. Enhancing the patient's quality of life and ability to operate independently is the aim of medical rehabilitation. Physiotherapy is a young and difficult field of medicine in Bangladesh. Bangladesh is a developing country that is attempting to develop a health-care system. We need to be more careful and aware of management. A long-term rehabilitation program is required for a SCI patient. The purpose of rehabilitation is to improve the patient's ability to function independently and improve their quality of life. Physiotherapy is a relatively new and difficult health-care profession in Bangladesh, and CRP is the only institution where SCI patients are treated holistically. After rehabilitation, it's critical to assess a person's function and independence. Functional independence measurement in SCI patients is an important part of the rehabilitation process and has a number of uses in patient care and clinical research. The therapy program collects measures based on the assessment of the functional gain. The documenting of functional abilities must be accurate, just like all other components of the test. The study will look into the functional result of people who have completed their rehabilitation at CRP. It will also assist in determining the functional independence SCI patients so that a more successful rehabilitation program may be developed. As a physiotherapist our goal is to help individuals with SCI achieve maximum functional independence and outcomes. As a result, we must establish specified functional activities that patients can do. The findings will aid in determining a SCI patient's functional independence or outcome when doing tasks.

1.3 Research Question

What are the impact of physiotherapy intervention to increase spinal cord independence measure on SCI patients?

1.4 Aim of the study

The study aims to know the impact of physiotherapy intervention to increase spinal cord independence measure on SCI patients.

1.5 Study objective

1.5.1 General objective

To assess the impact of physiotherapy intervention to increase spinal cord independence measure on SCI patients.

1.5.2 Specific objectives

- To determine the correlation between the socio-demographic and injury related information of SCI patients.
- To find out about the patient's physical activities and secondary complications.
- To explore the impact of physiotherapy intervention of complete and incomplete SCI patients.
- To identify any association between spinal cord independence measure (SCIM) scale score and socio-demographic characteristics.

1.6   Conceptual framework

Dependent Variables

Independent Variable

Socio demographic variables like age, sex, living area, education, occupation etc.

Severity of Injury e.g. Complete of incomplete

Level of injury

Self-care, Respiration and sphincter management, Mobility (room and toilet)

Spinal cord injury (SCI)
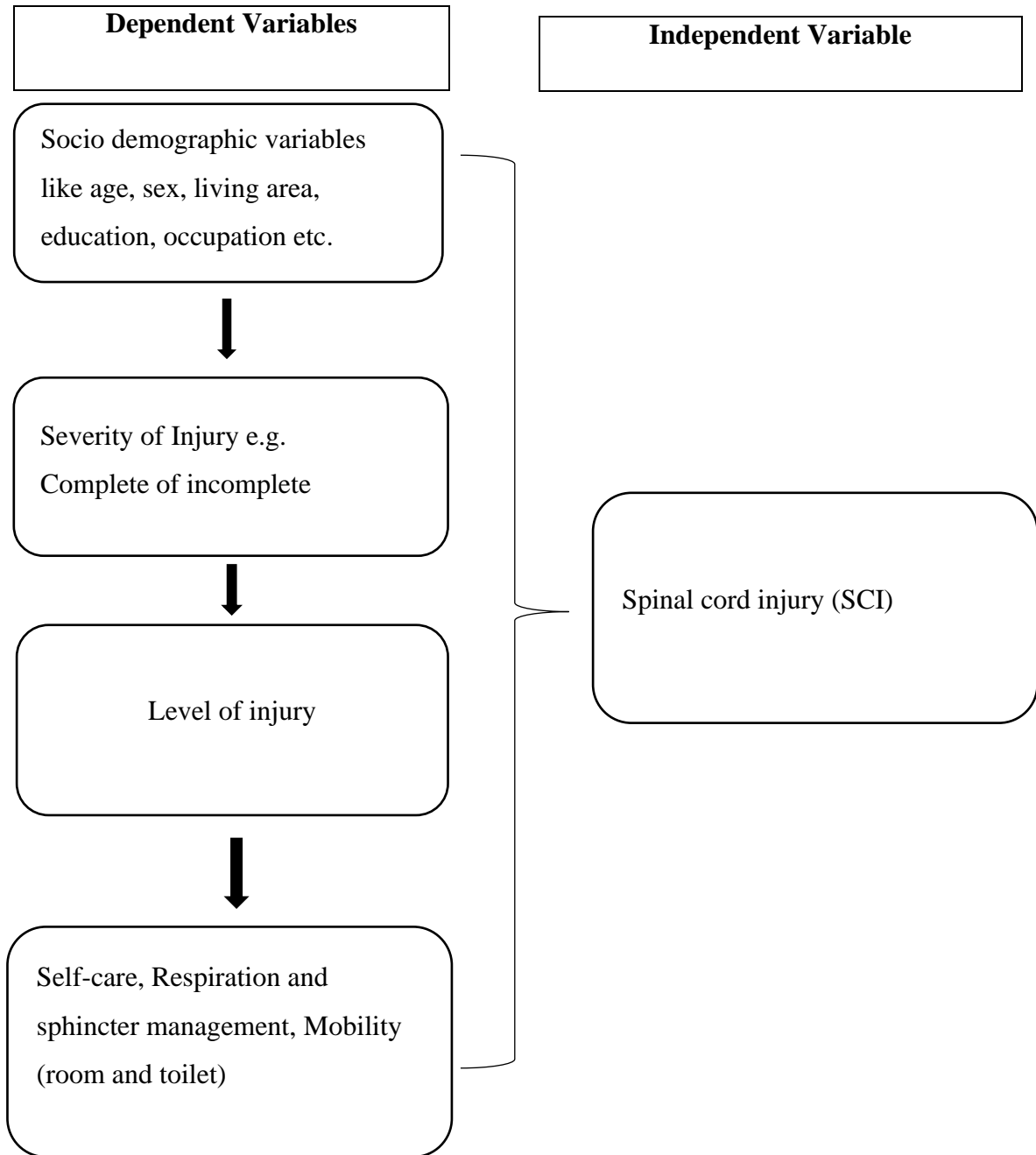
1.7 Operational Definitions of Terms

Spinal Cord Injury (SCI)

When the spinal cord is damaged by any causes like trauma or disease that result sensory and motor loss is called SCI.

Paraplegia

Paralysis of lower portion of the body and of both legs.

Tetraplegia

Injury to the spinal cord in the cervical region, with associated loss of muscle strength in all 4 extremities

Complete SCI

Absence of sensory and motor functions in the lowest sacral segments.

Incomplete SCI

Preservation of sensory or motor function below the level of injury, including the lowest sacral segments.

SCIM scale

The SCIM scale is the most widely accepted to measure of independence with spinal cord injury patients. The SCIM was created to address three distinct areas of function in spinal cord injury patients (SCI). Self-care (feeding, grooming, washing, and clothing), breathing and sphincter control, and a patient's movement abilities (bed and transfers, indoors/outdoors) are all examined. The SCIM can also be used to assist physicians in setting treatment goals and objectives for patients who have a SCI (Catz A et al., 2007).

Rehabilitation

Rehabilitation is the course of training that is required to develop who some disability illness their physical progress, psychological well-being, social status and capacity for gainful occupational according to their capability.

Physiotherapy Intervention

Physiotherapy interventions are evidence-based interventions that help individuals improve movement, reduce pain, restore function and prevent future disability and loss of mobility before it occurs. The Core values of physical therapy interventions include; promoting the patient's ability to move (Harvey et al., 2014).

Literature review is an exploration, critical evaluation and synthesis of earlier work that is relevant to the research topic. The goal of the literature review was to distinguish between what has been done and what needs to be done, to define the context of the topic, to connect concepts and theories to issues and questions, to identify significant variables related to the subject, to synthesize and gain a wider perspective, to connect ideas and theory to problems and challenges, and to identify the main methodologies and data collection tools that have been used (Hart, 2018).

The spinal cord serves as the major conduit for all incoming and outgoing reflex impulses from the higher center to the periphery, as well as providing traffic management for the muscular system (Hardy, 2021).

Spinal cord injury (SCI) is defined as damage to the spinal cord that temporarily or permanently causes changes in its function. SCI is divided into traumatic and non-traumatic etiologies (Noonan et al., 2013). SCI is a damage to the spinal cord that causes a disruption in its normal motor, sensory, or autonomic function, either temporarily or permanently (Van et al., 2011).

Any injury to the spinal cord resulting by trauma rather than disease is referred to as a spinal cord injury (SCI). Symptoms range from pain to paralysis to incontinence, depending on where the spinal cord and nerve roots are injured. Spinal cord injuries are classified as "incomplete" at various levels, ranging from having no effect on the patient to a "complete" injury resulting in total loss of function (Singh et al., 2014). Spinal cord damage has much more consequences. The sensory, respiratory, cardiovascular, gastrointestinal, and genitourinary systems can all be affected by SCI (Ahuja et al., 2017)

Although spinal cord injury (SCI) is not as common as other types of injuries, its physical and psychological consequences are devastating. Only a small percentage of people recover completely from SCI. A significant proportion of SCIs result in complete and tetraplegic neurological deficits. The lifetime costs of managing SCI and related secondary conditions are staggering, imposing a significant burden on people with SCI, their families, and society. Depending on how much of the patient's spinal cord has been damaged, any

remaining spare parts are maximized. Physical therapy can help people with spinal cord injuries move around in their beds, transfer from one place to another, move around in wheelchairs, and do other activities of daily life (ADLs). The performance of ADLs may be difficult for someone with a spinal cord injury. However, persons with SCI may be able to live independently in the community with or without full-time attendant care, depending on the extent of their injury and their progress during the rehabilitation process (Cao et al., 2011).

Lateral bending, dislocation, rotation, axial stress, and hyperflexion or hyperextension of the cord or cauda equina are the most common causes of spinal cord injuries. SCIs are most commonly caused by motor vehicle accidents, but they can also be caused by falls, work-related accidents, sports injuries, and penetrations such as knife or gunshot wounds. Non-traumatic causes of SCIs include cancer, infection, intervertebral disc disease, vertebral injury, and spinal cord vascular disease (Cao et al., 2011).

Paraplegia refers to impairment or loss of motor and/ or sensory function in the thoracic, lumbar or sacral (but not cervical) segments of the spinal cord, secondary to damage of neural elements within the spinal canal (Itzkovich et al., 2002).

Tetraplegia refers to impairment or loss of motor and/ or sensory function in the thoracic, lumbar or sacral (but not cervical) segments of the spinal cord, secondary to damage of neural elements within the spinal canal (Roberts et al., 2017).

 In a complete lesion, there is total absence sensory and or motor function in the lowest sacral segment (S4-S5). Complete injuries often damage the nerve root in the foramen. In incomplete lesion there is a partial preservation of sensory and/or motor function below the neurological level and in the lowest sacral segment (Umphred, 2001).

The literature demonstrates that SCI frequently results in respiratory issues, such as a deficiency in respiratory muscles, decreased vitality, and inefficiency cough, decreased compliance of the chest wall and lungs, and inhaling more oxygen costs more. Because of these issues, respiratory failure, pneumonia, and atelectasis are the most common prevalent respiratory problems in SCI patients. The literature demonstrates that SCI frequently results in respiratory issues, such as a deficiency in respiratory muscles, decreased vitality, and

inefficiency cough, decreased compliance of the chest wall and lungs, and inhaling more oxygen costs more. Because of these issues, respiratory failure, pneumonia, and atelectasis are the most common prevalent respiratory problems in SCI patients (Tollefsen & Fondenes, 2012).

In the same way as other issues, urological dysfunctions following long-term consequences are also more likely with SCI. And lessen the mental and social health of the patient. Urinary system issues could result from SCI and bladder dysfunction is one of the specific effects (Hagen et al., 2011).

Spasticity is typical secondary disability following SCI marked by hypertonus, more frequent short-term or consistently occurring somatic reflexes (hyperreflexia), Painful muscular spasms and clonus. The impact of spasticity SCI affects 70% of patients and causes significant becoming disabled for many (Rabchevsky & Kitzman, 2011).

Chronic pain is one of the most common complications up to 80% of SCI patients reported suffering from it. Chronic pain can cause it Affects functional impairment and emotional discomfort, negative impact on community participation and quality life (Rekand et al., 2012).

Depression, anxiety, physical symptoms, and decreased life satisfaction in patients with SCI. Isolation, loss of identity and role changes were also regularly reported negatively Spinal Cord Injury patients. A variety of interventions (family training, problem-solving training, support groups, etc.) have been shown to benefit families and their quality of life (Lynch & Cahalan, 2017).

Pressure ulcers are a serious and potentially life-threatening secondary complication of spinal cord injury. They can lead to further dysfunction and fatal infections, which may require surgical intervention. Skin disorders (including pressure ulcers) were most often reported as the second most common cause of readmission intervals (years 1, 10, 15, 20) in a multicenter analysis of patients with SCI (Regan et al., 2009).

In 1982, ASIA issued the International Standards for Neurological and Functional Categorization of Spinal Cord Injury, which was the first international classification of spinal cord injury. It is based on neurological reactions, touch and pinprick sensations in

each dermatome, and muscle strength in 10 essential muscles on both sides of the body (Roberts et al., 2017).

However, ASIA scales have either a low sensitivity to changes in the functions that are most important for SCI patients or a limited suitability for a specific SCI subgroup. To address this issue, the Spinal Department of Loewenstein Rehabilitation Hospital developed the SCIM, which is tailored to SCI patients, accounts for the shortcomings of previous scales, and is simple to use. The SCIM's original 1997 version was revised in 2001. The SCIM-II was found to be more reliable and sensitive to functional changes in SCL patients than the Functional Independence Measure (FIM), and it is now the most commonly used disability scale in the world. SCIM II, a second version, was created with improved changes to some of the first version's components. Then, for specific functions, it was systematically found to be more reliable than the original version (Al-Habib et al., 2011).

SCIM III was then published in 2007. It was originally intended to be completed through clinical observation, but in recent years, the version has been completed through interview. The SCIM III scale of patients with SCI evaluates three specific and highly relevant functional areas. These are the following areas: self-care (six items with scores ranging from 0 to 20), respiration and sphincter management (four items with scores ranging from 0 to 40), and mobility (nine items, scores range from 0 to 40). Each sub-score is appropriately scored based on its balanced weight in the patient's overall activity. The scale is based on a total of 100 points, with higher scores indicating greater functional independence. The item scores are weighted based on the clinical relevance assumed. Health-care professionals evaluate patients and collect information from them by observing them, interviewing them, and also interviewing their caregivers.

It has been a popular study method for evaluating therapy response in people with SCI. To address the abilities of people with spinal cord injuries, a disability scale was established to help people with spinal cord injuries do fundamental daily activities independently (Kalsi-Ryan et al., 2014). SCIM-III is quickly becoming one of the most widely used research instruments for the SCI population and it also has great therapeutic relevance for

individuals with traumatic/non-traumatic or complete/incomplete SCI for the suitable and appropriate rehabilitation program (Harvey et al., 2014).

Physical rehabilitation is a standard methodology of recovery or restoring function from SCI. It's frequently used after major surgery, an accident, or any other incident that limits a person's mobility or function. This type of rehabilitation links the patient with skilled professionals who assist him or her in regaining as much of his or her previous physical abilities. By assisting patients in learning to use their residual abilities, rehabilitation procedures can significantly enhance their health and quality of life. They begin by establishing functional objectives. Functional goals are realistic expectations of what a person with SCI should be able to do with a given level of disability in the future. These objectives are set in conjunction with the medical team during recovery. They assist the SCI patient in learning new ways to manage everyday activities and maintain his or her health. Kitchens and laundry facilities, as well as a vocational training center and other equipment, are available in the SCI units so that patients can acquire self-care skills like cooking and ironing (Harvey et al., 2014).

Physicians, physiotherapists, occupational therapists, recreational therapists, rehabilitation nurses, rehabilitation psychologists, counselors, social workers, dietitians, and other specialists make up a rehabilitation team (Chowdhury et al., 2015). Care is coordinated by a caseworker or program manager. Physiotherapists concentrate on upper and lower extremity function as well as mobility issues by assisting patients in regaining use of their residual talents, rehabilitation treatments can significantly enhance their health and quality of life. They begin by establishing practical objectives. Functional objectives are reasonable expectations of what an individual with SCI should eventually be able to perform at a given level of impairment. These objectives are established throughout recovery with the medical staff. They assist the SCI patient in acquiring new skills for controlling everyday tasks and maintaining good health. The SCI units provide kitchens, laundry rooms, vocational training centers, and other amenities so that patients may practice independent living skills like food preparation and clothing ironing. In addition to affecting the muscles and nerves, a spinal cord injury can also result in bowel and bladder issues (National Spinal Cord Injury Statistical Center, 2015).

Physiotherapists can also help people with excess secretion in the chest keep their airways free Also upper and lower extremity dysfunction and problems in daily tasks were addressed by physiotherapists. Rehabilitation nurses are concerned with bowel and bladder dysfunction as well as pressure ulcer treatment. Psychologists deal with the newly damaged patient's emotional and behavioral issues, as well as any potential cognitive malfunction. Physical therapy is a typical method of the healing process. It is frequently used following major surgery, an accident, or any other circumstance that limits a person's movement or functionality. With the assistance of skilled professionals, the patient can regain as much of his or her prior physical abilities through this type of therapy (Saulino & Vaccaro, 2009).

CHAPTER-III:	METHODOLOGY

3.1 Study design

A cross-sectional study was used to conduct the study. A cross-sectional study is a descriptive study that measures disease and exposure status in a given population at the same time. Cross-sectional studies provide a "snapshot" of the prevalence and features of a disease in a community at a specific point in time. All of a person's measurements are taken at the same time. The most significant benefit of cross-sectional studies is that they are generally rapid and inexpensive. Because there is no follow-up, the study requires fewer resources. If the problem is straightforward and unambiguous, quantitative methods are applicable (Jacobsen, 2020).

3.2 Study site

The study was conducted at the Centre for the Rehabilitation of the Paralysed (CRP) in Bangladesh which is the largest spinal cord injury rehabilitation center for the patient with spinal cord injury in South Asia.

3.3 Study population

The patients with spinal cord injuries who have continue their rehabilitation program at the CRP spinal cord injury facility in Savar, Dhaka, were the target population.

3.4 Inclusion Criteria

   i.   Persons with SCI attending at CRP and those are already taken physiotherapy intervention for one month.

  ii.   15 years of age and older.

 iii.   Both Paraplegia and Tetraplegia are included (Harvey et al., 2021).

  iv.   Both males and females are included.

   v.   Time since injury (<1 year, 1–3 years, and >3 years) (Harvey et al., 2021).

3.5 Exclusion Criteria

i. Any concomitant impairment that might influence everyday function (such as cognitive or mental impairment)

ii. The SCI patients who are already discharged from CRP.

iii. Undiagnosed injury.

iv. Head injury.

v. Any other major disease except SCI.

3.6 Sampling Procedure

Because convenience sampling was the simplest, cheapest, and fastest method of sample selection, it was used in this investigation (Gupta et al., 2013). It will be simple to obtain those people who meet the criteria for the study's objective using the convenience sampling approach.

3.7 Sample Size

A sample is a group of subjects that will be selected from the population, who are used in a piece of research. A sample is a smaller group taken from the population. Sometimes the sample size may be big and sometimes it may be small, depending on the population and the characteristics of the study (Bettany & Paz-Lourido, 2012).

Prevalence formula was adopted for the sample size estimation

$$n= \frac{Z^2 P(1-P)}{T^2}$$

Here,

Z is the level of significance that corresponds to a 95% confidence level.

That is,

Z (confidence interval) = 1.96

P (prevalence) = 50% (Geyh et al., 2010)

And, T (tolerance error) = 0.05

$$n = \frac{1.96^2(0.5)(1-0.5)}{(0.05)^2} = 384$$

The actual sample size was n= 384.

Because the study was part of a fourth professional academic research project, it was self-funded and data was obtained from a single specialized hospital and due to the time limitation 65 samples were chosen to conduct the study.

3.8 Data collection

Face-to-face interviews will be used to ask the questions. It is beneficial because it ensures that the researcher obtains the necessary information while also allowing participants to comment and illustrate topics.

3.9 Data analysis

Statistical package of social science (SPSS) version 20 was used to conduct the statistical analysis. The researcher identified the variables in a list and created a computer-based data definition record file consisting of an ordered list of variables. The researcher defined the types, values, decimal, label alignment and measurement level of data in the variable view of SPSS. The last stage consisted of cleaning fresh data files to verify that all data from the questionnaire sheet were appropriately entered into the SPSS data view. The raw data were then ready for SPSS analysis. The information was gathered using frequency and contingency tables. Using the mean plus the standard deviation (SD) for variables, central tendency measurements were conducted. Chi-squared test was used to evaluate the relationship between numerical variables. The data were analyzed using descriptive statistics and displayed using tables, bar graph, pie charts, histogram etc. To decorate the bar graph and pie charts, Microsoft office Excel 2016 was utilized. This study's findings comprised of quantitative data. This study collected a great deal of data.

3.10 Level of Significance

The "p" value was determined to determine the study's relevance. The p values refer to the probability of the experimental study's results. A p-value is the level of significance for an experiment, and in health care research, a p-value of 0.05 was considered significant.

3.11 Ethical consideration

The researcher maintained some ethical considerations: The research proposal including methodology was submitted to the Institutional Review Board (IRB) of Bangladesh Health Professions Institute (BHPI) for oral presentation and defense was done in front of IRB. Then IRB approved the proposal. A researcher had followed the Helsinki guideline of the world medical association. This protocol presentation was first submitted to the Institutional Review Board (IRB) of BHPI and initial permission was taken. Permission was taken from the Head of the Department of Physiotherapy, BHPI, CRP before data collection. Permission was taken from the In-Charge of SCI Unit, CRP for data collection from the patients. The researcher maintained the confidentiality of the collected data from the individuals. The researcher ensured the confidentially of participants and shared the information only with the research supervisor. All rights of the participants were reserved and the researcher was accountable to the participant to answer any type of study-related question. The participants would be informed before inviting participation in the study. The ethical consideration was obtained through an informed consent letter to the participant. Consent was obtained by providing each participant a clear description of the study purpose, the procedure involved in the study and also informing them that if they wish they could withdraw themselves any time from the study. The necessary information had been kept secure place to ensure confidentiality. All kinds of confidentiality are highly maintained. They were also assured that it would not cause any harm. The researcher also ensured that the organization (CRP) was not hampered by the study. Then they signed the consent form.

3.11.1 Inform consent

Written consent (appendix) was given to all participants before the completion of the questionnaire. The researcher explained to the participants about the his or her role in this study and the aims and objectives of this study. In addition, they were informed that each interview can take 20-25 minutes for every participant. The researcher received written consent from every participant including signature. So, the participant assured that they could understand the consent form and their participation was voluntary. The researcher assured the participants that the study would not be harmful to them. The participants had the right to withdraw consent and discontinue participation at any time without prejudice to present or future care at the spinal cord injury (SCI) unit of CRP. Information from this study was anonymously coded to maintain the rights, dignity and ensure confidentiality. Parents or legal guidance needed during data collection procedure if minor participants (aged <18 years) were interviewed. Furthermore, the study was not personally identified in any publication containing the result of this study.

4.1 Socio- demographic characteristic

4.1.1 Age

Among 65 participants, the mean age of the respondents was 32 years with a standard deviation of ±12.730 years. Among them, 1.5% (n=1) were in the age group between the range of <10 years. Also, 16.9% (n=11) of the respondents were found in the age group between 11-20 years and 32.3% (n=21) of them were in the age group between 21-30 years and 29.2% (n=19) of them were in the age group between 31-40 years and also 10.8% (n=7) of them were in the age group between 41-50 years and 7.7% (n=5) of them were in the age group between 51-60 years where the highest age range is 66 and the lowest is 8 (Figure-1).

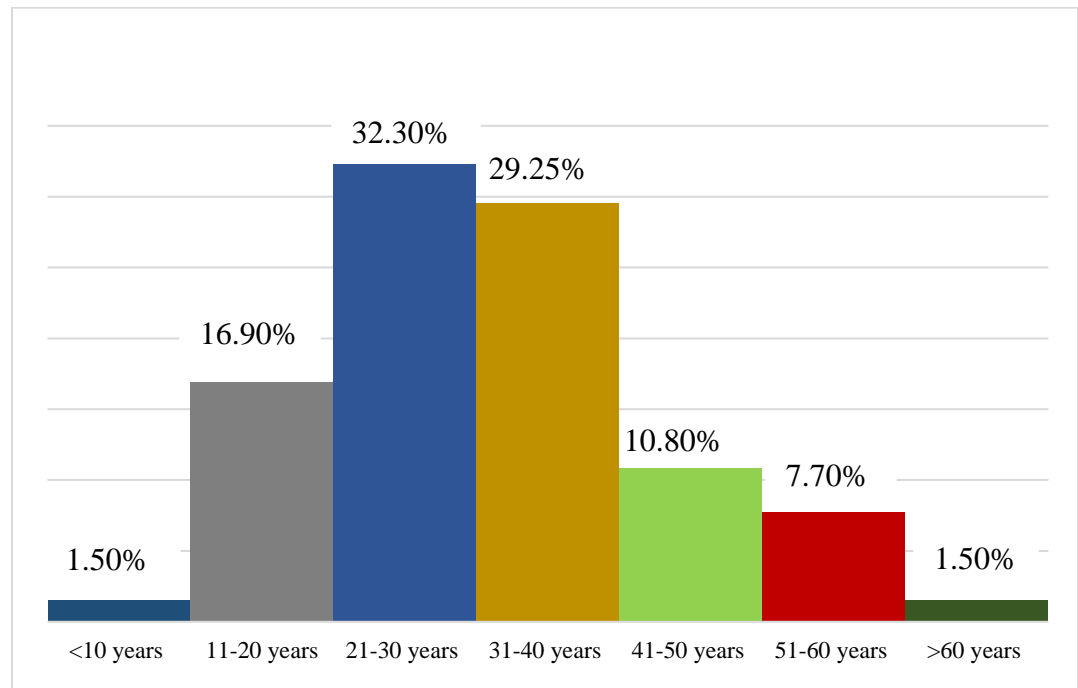

Figure 1: Age of the participant

4.1.2 Gender

Male was predominantly higher than female. Out of 65 participants 86.2% (n=56) were male and 13.8% (n=9) were female (Figure-2).
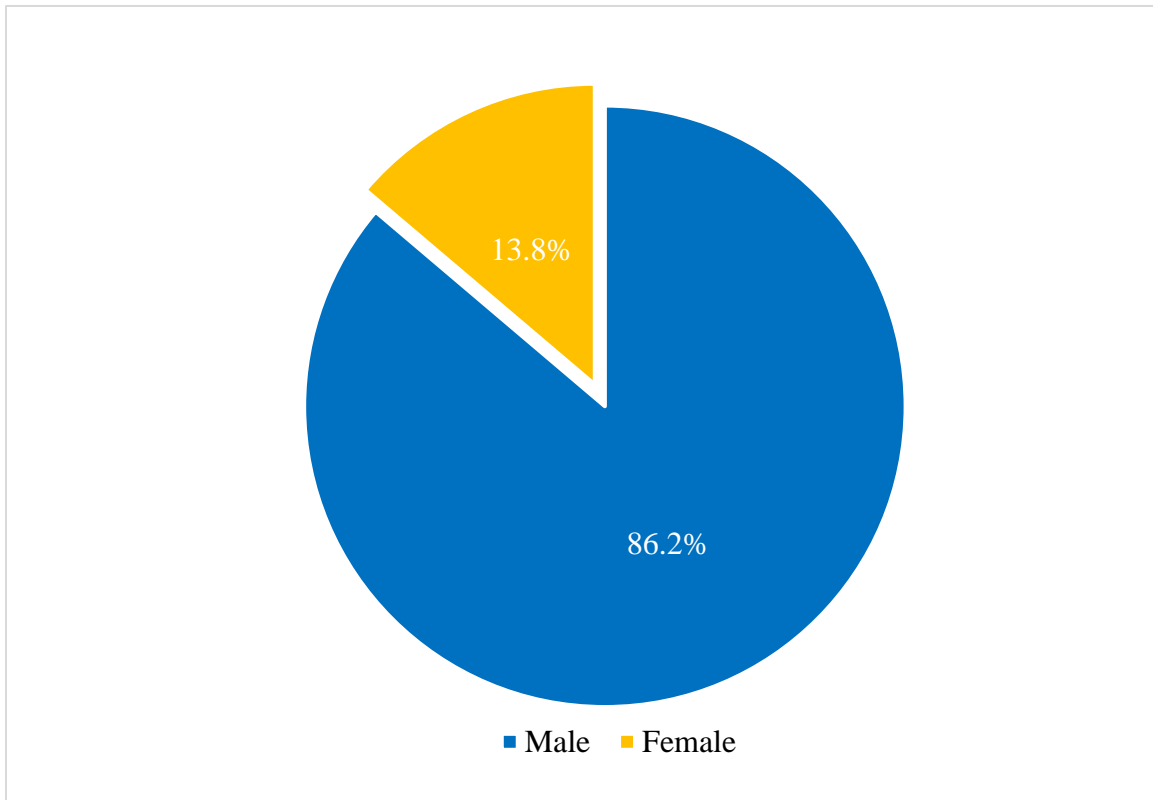

Figure 2: Gender of the participant

4.1.3 Marital status

Around 65 participants researcher found married person 63.1% (n=41) unmarried person 36.9 % (n=24) (Figure-3).
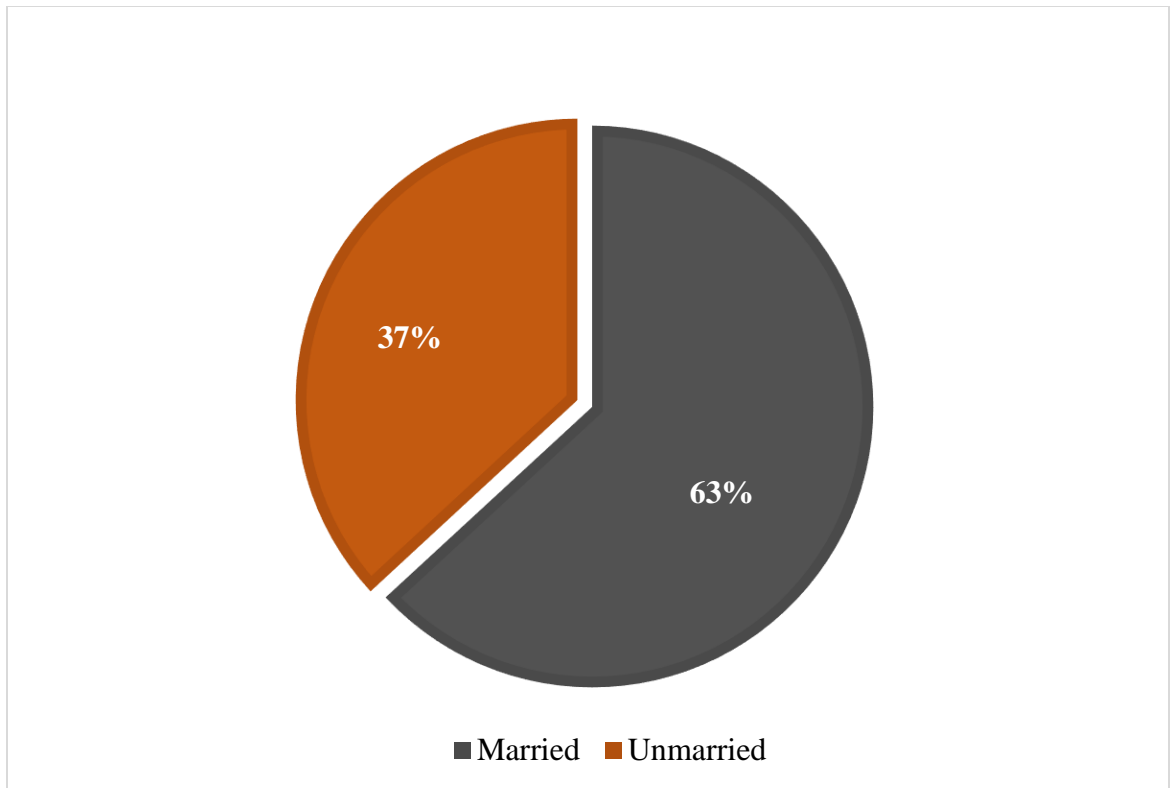
Figure 3: Marital status

4.1.4 Educational status

Among 65 participants the frequency of literacy shows, least percentage of the participants, only 13.8% (n=9) are illiterate. The approximate percentage of literacy is 40%(n=26) of the participants completed primary education, 18.5% (n=12) of the participants completed junior school certificate level education and 13.8%(n=9) of the participants completed secondary education and 9.2%(n=6) of the participants completed higher secondary education which is the basic education level according to Bangladesh. Other percentages show a higher level of literacy rather than a basic level where 4.6% (n=3) of the participants completed Honors or Masters (Figure-4).
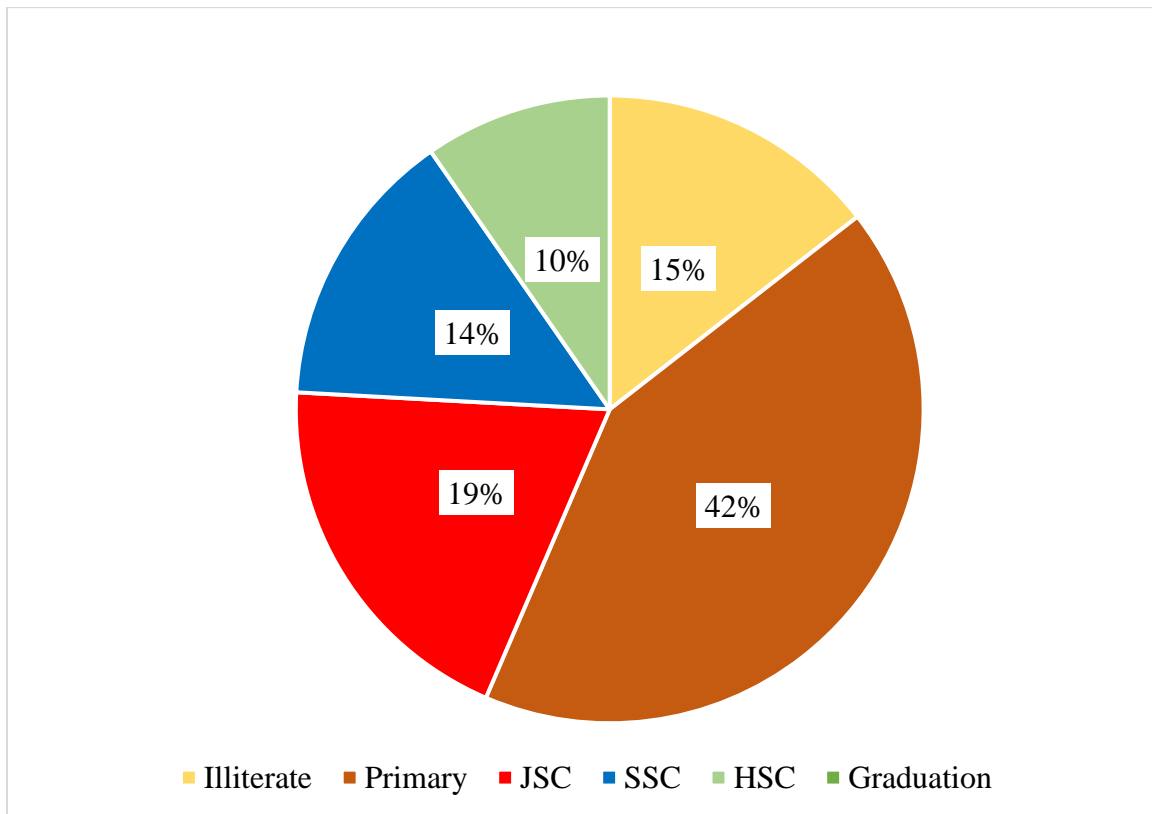
Figure 4: Educational status

4.1.5 Occupation

The chart shows that the number of 3.1% (n=2) are Service Holder, 10.8%(n=7) are Businessman,4.6%(n=3) are housewife,13.8%(n=9) are day labor,21.5%(n=14) are students and other professionals are 46.2%(n=30) which is more than other professions, second most common are student 21.5%(n=14) (Figure-5).
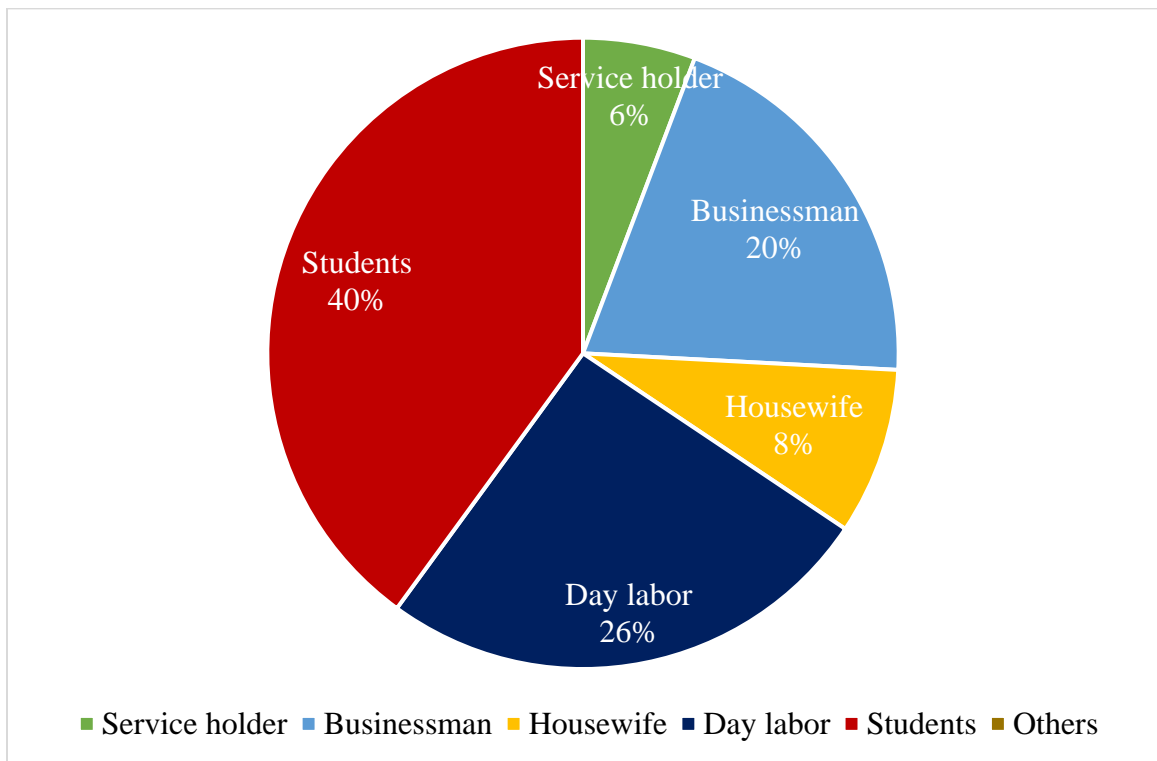
Figure 5: Occupation

4.1.6 Residual area

Most of the respondents who are suffering from spinal cord injury were from rural Areas 64.6% (n=42), 20%(n=13) are from semi-urban and 15.4% (n=10) were from urban area (Figure-6).
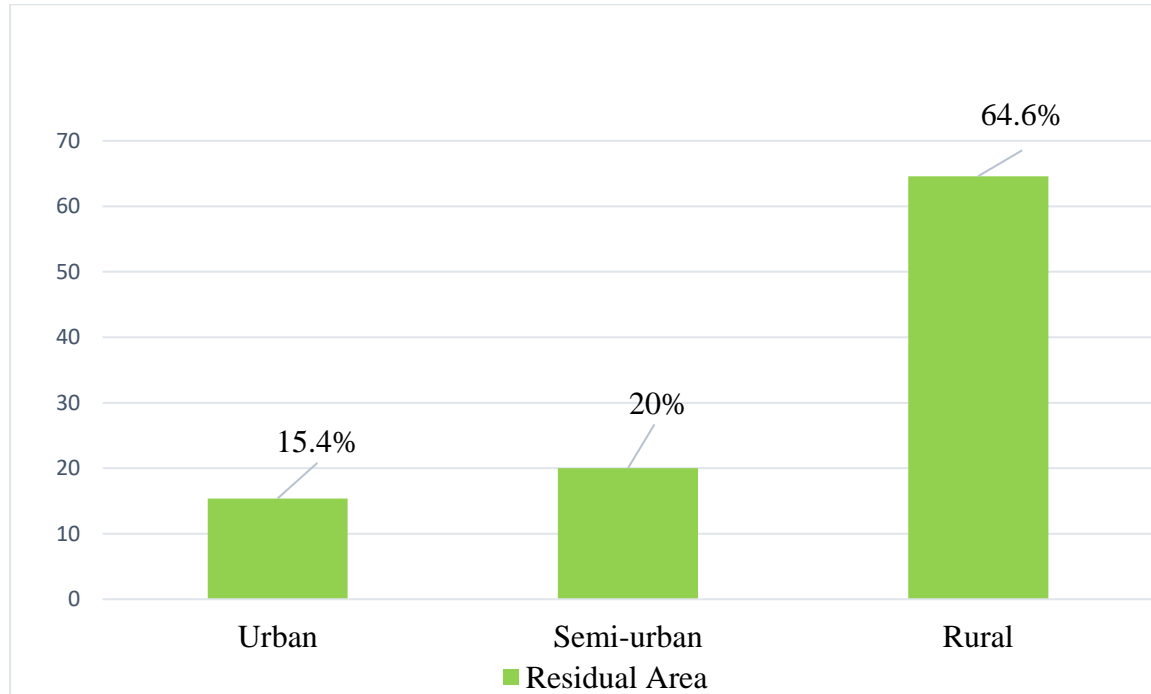
Figure 6: Residual area of the participant

4.1.7 Family monthly income

Among 65 participants, the mean of their family monthly income is 16223.08 with a standard deviation of ±10518.596 (Table-1).

Monthly income	Value
Mean	16223.08
Median	15000
Mode	15000

4.1.8 Admission from date of injury

Among 65 participants 52.3%(n=34) were admitted less than 12 weeks from date of injury, 18.5%(n=12) were admitted between 13-24 weeks, 7.7%(n=5) were admitted between 25-36 weeks, 6.2%(n=4) were admitted between 37-48 weeks and 15.4% (10) were admitted more than 48 weeks from the date of injury (Table-2).

4.1.9 Previous treatment

Among 65 participants 93.8%(n=61) whose are done operation after their injury and 6.2%(n=4) are taking conservative treatment before admitted at CRP (Figure-7).
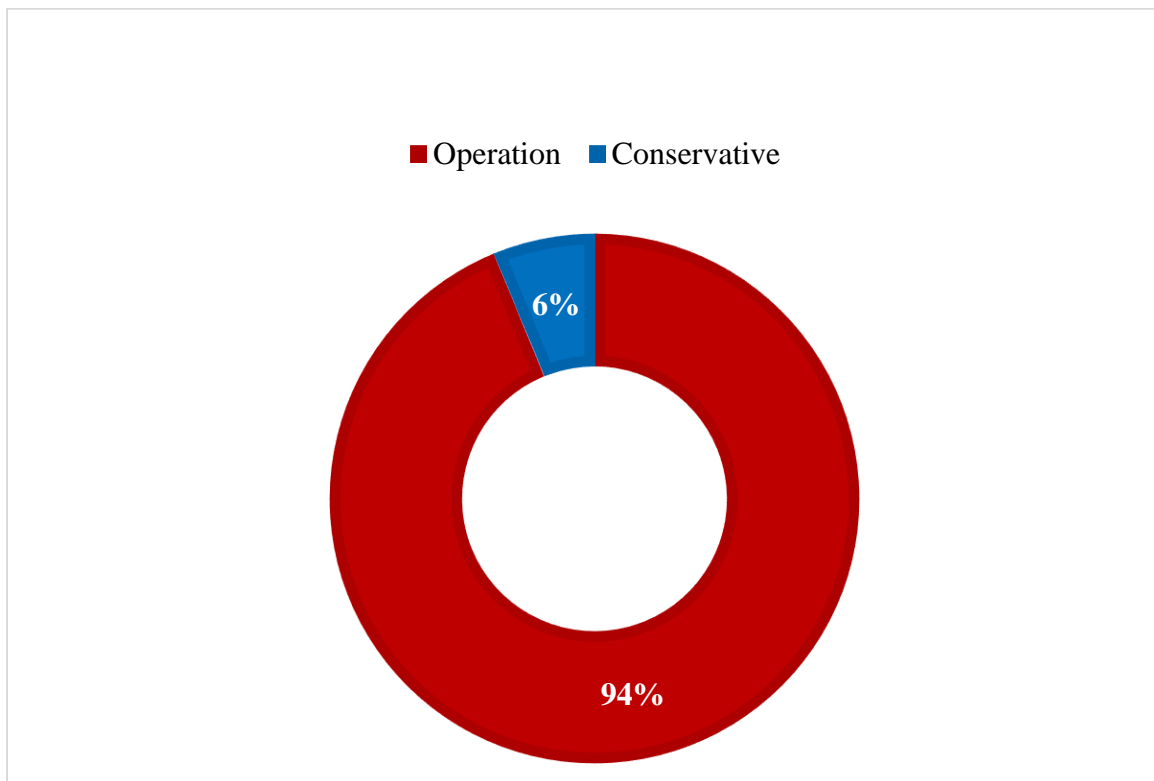
Figure 7: Previous treatment of the participant

4.1.10 Causes of injury

Among 65 participants, 96.9% (n=63) participants most of them had experienced spinal cord injury due to Traumatic causes 3.1% (n=2) participants got SCI due to Nontraumatic (Figure-8).

	Traumatic	Non-traumatic
■ Causes of injury	96.90%	3.10%
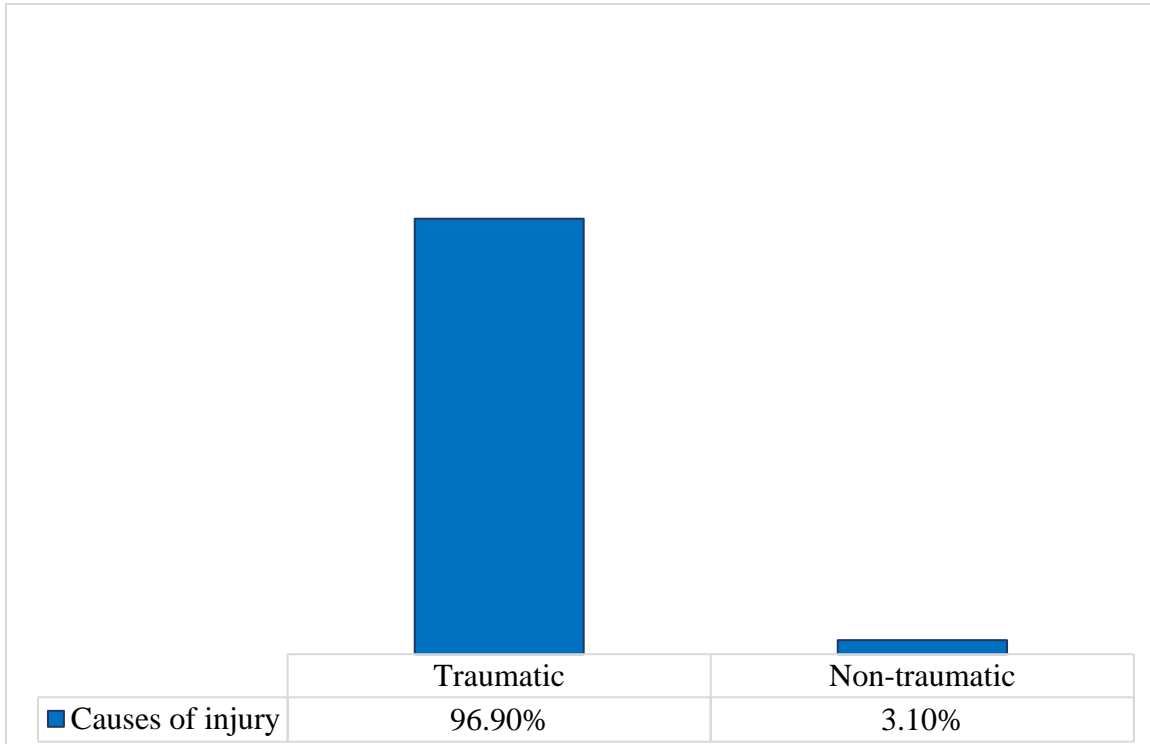
Figure 8: Cause of injury

4.1.11 Severity of injury of the participants

65 patients participate in this study. Most of them were complete A according to the ASIA impairment scale. The percentage of complete A was 72.3 % (n=47). incomplete B diagnosis were 20%(n=13) and incomplete C were 7.7% (n=5) (Figure-9).
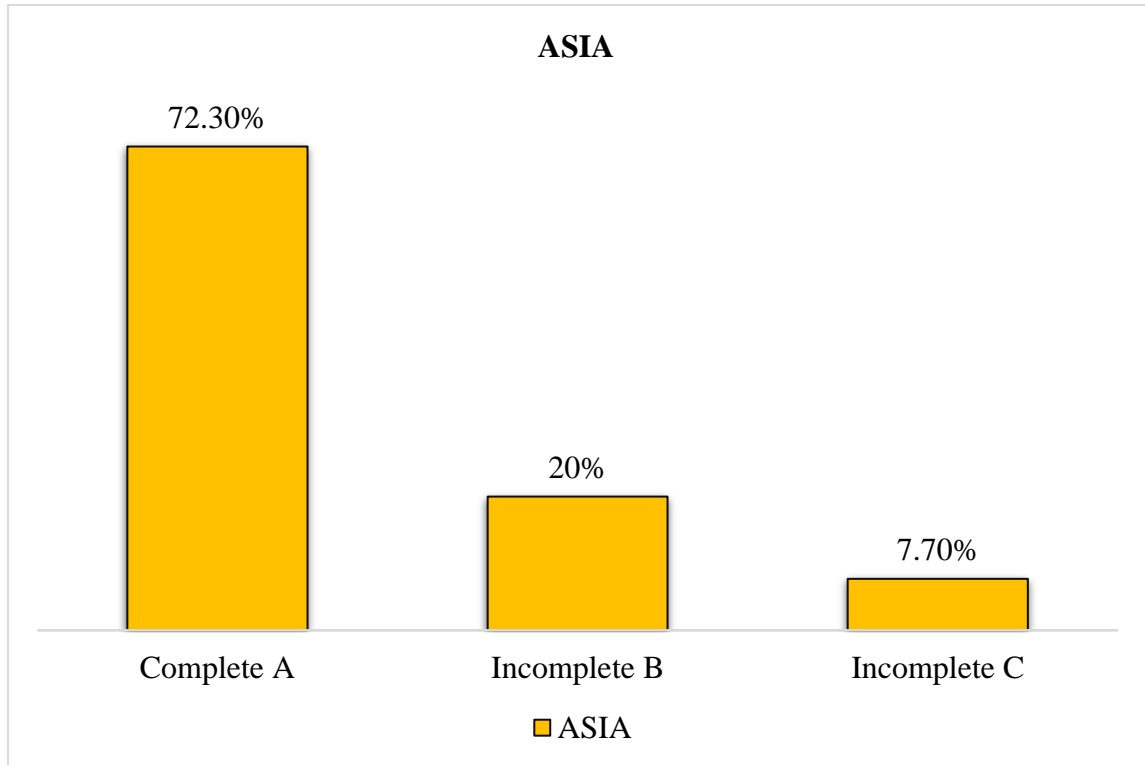
Figure 9: Severity of injury of the participants

4.1.12 Types of injury of the participants

Out of 65 participants, there were approximately have a far difference between the number of paraplegia and tetraplegia; paraplegia was 78.5% (n=51) and tetraplegia was 21.5% (n=14) (Figure-10).
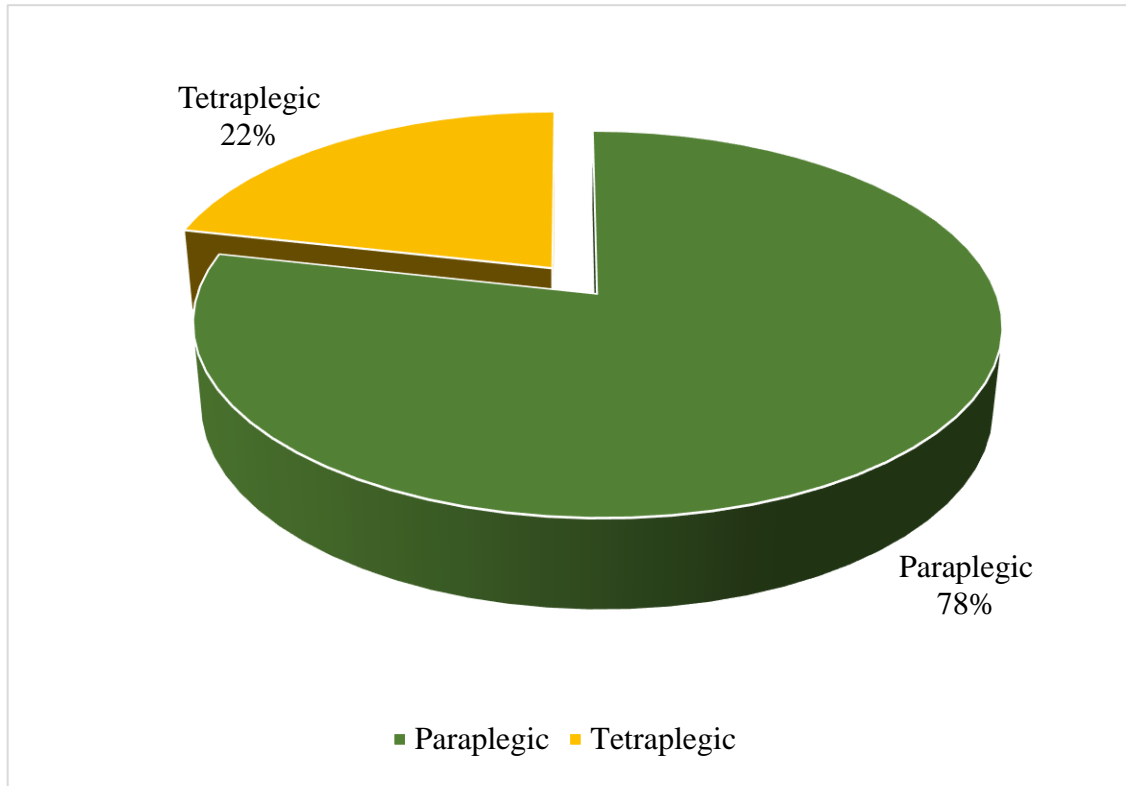
Figure 10: Types of injury

4.1.14 Comorbidities

The chart shows that the number of 83.1% (n=54) are not involve with any comorbidities which is more than other and second most common are the patient with asthma which is 6.2%(n=4),3.1%(n=2) are involve with blood pressure,1.5%(n=1) are involve with TB,3.1%(n=2) are involve with diabetes,1.5%(n=1) are involve with blood pressure and asthma and 1.5%(n=1) are involve with asthma and diabetes (Figure-11).
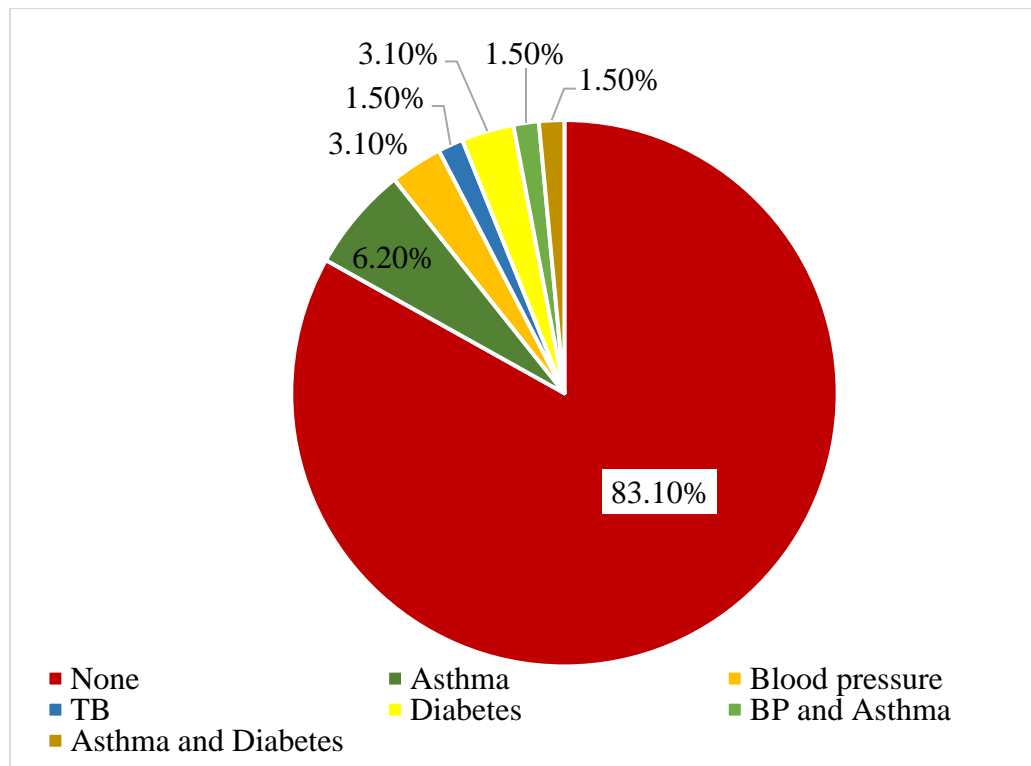
Figure 11: Comorbidities

4.1.13 The score of SCIM scale

In my study shows that among the 65 patients who participate in this study, the mean of selfcare of SCIM is 10.83 with a standard deviation ±5.586 scores. Each participant had Respiration and Sphincter Management of SCIM is 19.05 with a standard deviation ±7.700 scores. And lastly the mean value of Mobility (room and toilet) of SCIM scale is 8.95 with a standard deviation ± 5.949 scores (Table-2).

Table.2 Distribution of the participants according to Socio- Demographic & Injury related characteristics:

Variable	Description of data
Age-Overall (8-66) years	(M± S.D) 31.92±12.730
Age in category	
<10 years	1(1.5%)
11-20 years	11(16.9%)
21-30 years	21(32.3%)
31-40 years	19(29.2%)
41-50 years	7(10.8%)
51-60 years	5(7.7%)
>60 years	1(1.5%)
Gender	
Male	56(86.2%)
Female	9(13.8%)
Marital status	
Married	41(63.1%)
Unmarried	24(36.9%)
Educational status	
Illiterate	9(13.8%)
Primary	26(40%)
JSC	12(18.5%)
SSC	9(13.8%)
HSC	6(9.2%)
Graduation	3(4.6%)
Occupational status	
Service holder	2(3.1%)
Businessman	7(10.8%)
Housewife	3(4.6%)
Day labor	9(13.8%)

Students	14(21.5%)
Others	30(46.2%)
Residual Area	
Urban	10(15.4%)
Semi-urban	13(20%)
Village	42(64.6%)
Total Family Members	5.40±1.902
Total Earning Members	
Own-self	1.43±0.499
Other-member	
Monthly Family Income	16223.08±10518.596
Days-week	24.91±34.036
Days-week-category	
<12	34(52.3%)
13-24	12(18.5%)
25-36	5(7.7%)
37-48	4(6.2%)
>48	10(15.4%)
Previous treatment	
Operation	61(93.8%)
Conservative	4(6.2%)
Cause Of Injury	
Traumatic	63(96.9%)
Non-traumatic	2(3.1%)
ASIA Impairment scale Diagnosis	
Complete A	47(72.3%)
Incomplete B	13(20%)
Incomplete C	5(7.7%)

Type Of Paralysis	
Paraplegic	51(78.5%)
Tetraplegic	14(21.5%)
Comorbidities	
None	54(83.1%)
Asthma	4(6.2%)
Blood pressure	2(3.1%)
TB	1(1.5%)
Diabetes	2(3.1%)
BP and Asthma	1(1.5%)
Asthma and Diabetes	1(1.5%)
The score of SCIM scale	38.52±16.709
The score of SCIM scale with interpretation	
Self-care	10.83±5.586
Respiratory	19.05±7.700
Mobility	8.95±5.949

4.2 Association between selfcare of SCIM scale with Socio- demographic information:

The study had an association occurred between socio-demographic profile and SCIM scale score which was mentioned in the 3rd objective of the study. In this study, the SCIM-III scale was used. Here, the dependent variable was selfcare of SCIM scale had highly significant (.002) with the admission date after injury (Table-3).

Selfcare was not found any association with age category in which the observed chi-square value was 87.801 and P-Value was 0.713 so there was no association between age and selfcare of SCIM scale and also Selfcare was not found any association with gender here chi-square value was 13.520 and P-Value was 0.634 so there was no association between gender and selfcare of SCIM scale again marital status was also not found any association with selfcare of SCIM scale here the observed chi-square value was 13.904 and P-Value was 0.606 so there was no association between marital status and selfcare of SCIM scale. Educational status was not found any association with selfcare of SCIM scale the observed chi-square value was 79.447 and P-Value was 0.496 so there was no association between education and selfcare of SCIM scale. And occupation was not found any association with selfcare of SCIM scale here the observed chi-square value was 91.222 and P-Value was 0.184 so there was no association between occupation and selfcare of SCIM scale. Again residual area was not found any association with selfcare of SCIM scale the observed chi-square value was 28.497 and P-Value was 0.645 so there was no association between residual area and selfcare of SCIM scale. Family monthly income was not found any association with selfcare of SCIM scale the observed chi-square value was 304.294and P-Value was 0.244 so there was no association between family monthly income and selfcare of SCIM scale. Previous treatment was not found any association with selfcare of SCIM scale here chi-square value was 15.527 and P-Value was 0.486 so there was no association between previous treatment and selfcare of SCIM scale. Causes of injury also not found any association with selfcare of SCIM scale the chi-square value was 6.104 and P-Value was 0.987 so there was no association between causes of injury and selfcare of SCIM scale. Types of paralysis was not found any association with selfcare of SCIM scale the chi-square value was 17.242 and P-Value was 0.370 so there was no association between types

of paralysis and selfcare of SCIM scale and Comorbidities was not found any association with selfcare of SCIM scale the chi-square value was 17.242 and P-Value was 0.370 so there was no association between comorbidities and selfcare of SCIM scale (Table-3).

Table.3 Correlations between selfcare of SCIM scale and demographic related information (chi-square test).

Dependent Variable: Selfcare		
Independent variable	**Test value**	**P value**
Age in category <10, 11-20, 21-30, 31-40,41-50, 51-60, >60	87.801	0.713
Gender Male, Female	13.520	0.634
Marital status Married, Unmarried	13.904	0.606
Educational status Illiterate, Primary, JSC, SSC, HSC, Graduation	79.447	0.496
Occupational status Service holder, Businessman, Housewife, Day labor, Students, Others	91.222	0.184
Residual Area Urban, Semi-urban, Village	28.497	0.645
Total Earning Members Own-self, other-member	20.788	0.187
Monthly Family Income	304.294	0.244

Days-week-category <12, 13-24, 25-36, 37-48, >48	102.068	**0.002
Previous treatment Operation, Conservative	15.527	0.486
Cause Of Injury Traumatic, Non-traumatic	6.104	0.987
ASIA Impairment scale Diagnosis Complete A, Incomplete B, Incomplete C	31.021	0.516
Type Of Paralysis Paraplegic, Tetraplegic	17.242	0.370
Comorbidities None, Asthma, TB, Hepatitis, Diabetes, BP and Asthma, Asthma and Diabetes	67.135	0.989

Alpha value (p value) = [*= <0.05, **=<0.01, *= <0.001]**

4.3 Association between Respiration and Sphincter Management of SCIM scale with Socio- demographic information:

Here, the dependent variable was respiration and sphincter management of SCIM scale score had significant (.014) with monthly family income (Table.4).

Respiration and sphincter management of SCIM scale was highly significant with cause of injury (p=.002), significant with comorbidities (P=.013) and comparatively significant with ASIA (p=0.058) (Table.4).

Respiration and sphincter management of SCIM scale was found no association with age category in which the observed chi-square value was 141.356 and P-Value was 0.547 so there was no association between age and respiration and sphincter management of SCIM scale. And Gender was not found any association with respiration and sphincter management of SCIM scale in which the observed chi-square value was 15.161 and P-Value was 0.916 so there was no association between gender and respiration and sphincter management of SCIM scale, Marital status was not found any association with respiration and sphincter management of SCIM scale in which the observed chi-square value was 34.597 and P-Value was 0.075 so there was no association between marital status and respiration and sphincter management of SCIM scale, Educational status was not found any association with respiration and sphincter management of SCIM scale here the observed chi-square value was 144.818 and P-Value was 0.061 so there was no association between education and respiration and sphincter management of SCIM scale, Occupation was not found any association with respiration and sphincter management of SCIM scale here the observed chi-square value was 122.454 and P-Value was 0.421 so there was no association between occupation and respiration and sphincter management of SCIM scale, Residual area was not found any association with respiration and sphincter management of SCIM scale here the chi-square value was 47.358 and P-Value was 0.499 so there was no association between residual area and respiration and sphincter management of SCIM scale, Previous treatment was not found any association with respiration and sphincter management of SCIM scale here the chi-square value was 20.557 and P-Value was 0.665 so there was no association between previous treatment and respiration and sphincter management of SCIM scale. Types of paralysis was not found any association with

respiration and sphincter management of SCIM scale here the chi-square value was 23.677 and P-Value was 0.480 so there was no association between types of paralysis and respiration and sphincter management of SCIM scale (Table.4).

Table.4 Correlations between Respiration and Sphincter Management of SCIM scale and demographic related information (chi-square test).

Dependent Variable: Respiration and Sphincter Management		
Independent variable	**Test value**	**P value**
Age in category <10, 11-20, 21-30, 31-40,41-50, 51-60, >60	141.356	0.547
Gender Male, Female	15.161	0.916
Marital status Married, Unmarried	34.597	0.075
Educational status Illiterate, Primary, JSC, SSC, HSC, Graduation	144.818	0.061
Occupational status Service holder, Businessman, Housewife, Day labor, Students, Others	122.454	0.421
Residual Area	47.358	0.499

Urban, Semi-urban, Village		
Total Earning Members Own-self, other-member	22.665	0.540
Monthly Family Income	499.525	*0.014
Days-week-category <12, 13-24, 25-36, 37-48, >48	118.119	0.062
Previous treatment Operation, Conservative	20.557	0.665
Cause Of Injury Traumatic, Non-traumatic	48.234	**0.002
ASIA Impairment scale Diagnosis Complete A, Incomplete B, Incomplete C	64.249	*0.058
Type Of Paralysis Paraplegic, Tetraplegic	23.677	0.480
Comorbidities None, Asthma, TB, Hepatitis, Diabetes, BP and Asthma, Asthma and Diabetes	184.147	*0.013

Alpha value (p value) = [*= <0.05, **=<0.01, *= <0.001]**

4.4 Association between Mobility (room and toilet) of SCIM scale with Socio-demographic information:

Here, the dependent variable was Mobility (room and toilet) of SCIM scale score had significant (.012) with cause of injury. (Table.5) Mobility (room and toilet) of SCIM scale was comparatively significant with comorbidities (p=0.056) (Table.5).

Mobility (room and toilet) of SCIM scale was found no association with age category in which the observed chi-square value was 106.410 and P-Value was 0.681 so there was no association between age and mobility (room and toilet) of SCIM scale, Gender was found no association with mobility (room and toilet) of SCIM scale in which the observed chi-square value was 21.618 and P-Value was 0.304 so there was no association between gender and mobility (room and toilet) of SCIM scale. And marital status was found no association with mobility (room and toilet) of SCIM scale in which the observed chi-square value was 27.727 and P-Value was 0.089 so there was no association between marital status and mobility (room and toilet) of SCIM scale. And educational status was found no association with mobility (room and toilet) of SCIM scale in which the observed chi-square value was 108.234 and P-Value was 0.167 so there was no association between educational status and mobility (room and toilet) of SCIM scale. Also occupation was found no association with mobility (room and toilet) of SCIM scale in which the observed chi-square value was 106.445 and P-Value was 0.198 so there was no association between occupational status and mobility (room and toilet) of SCIM scale. Residual income was found no association with mobility (room and toilet) of SCIM scale in which the observed chi-square value was 41.130 and P-Value was 0.335 so there was no association between residual area and mobility (room and toilet) of SCIM scale. Monthly family income was found no association with mobility (room and toilet) of SCIM scale in which the observed chi-square value was 296.385 and P-Value was 0.213 so there was no association between monthly family income and mobility (room and toilet) of SCIM scale. Previous treatment was found no association with mobility (room and toilet) of SCIM scale in which the observed chi-square value was 13.218 and P-Value was 0.827 so there was no association between previous treatment and mobility (room and toilet) of SCIM scale. Types of paralysis was found no association with mobility (room and toilet) of SCIM scale in which

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the observed chi-square value was 14.759 and P-Value was 0.738 so there was no association between types of paralysis and mobility (room and toilet) of SCIM scale (Table.5).

Table.5 Correlations between Mobility (room and toilet) of SCIM scale and demographic related variables (chi-square test).

Dependent Variable: Mobility (room and toilet)		
Independent variable	**Test value**	**P value**
Age in category <10, 11-20, 21-30, 31-40,41-50, 51-60, >60	106.410	0.681
Gender Male, Female	21.618	0.304
Marital status Married, Unmarried	27.727	0.089
Educational status Illiterate, Primary, JSC, SSC, HSC, Graduation	108.234	0.167
Occupational status Service holder, Businessman, Housewife, Day labor, Students, Others	106.445	0.198
Residual Area Urban, Semi-urban, Village	41.130	0.335

Total Earning Members Own-self, other-member	23.577	0.213
Monthly Family Income	296.385	0.964
Days-week-category <12, 13-24, 25-36, 37-48, >48	84.582	0.234
Previous treatment Operation, Conservative	13.218	0.827
Cause of Injury Traumatic, Non-traumatic	35.660	*0.012
ASIA Impairment scale Diagnosis Complete A, Incomplete B, Incomplete C	41.773	0.310
Type Of Paralysis Paraplegic, Tetraplegic	14.759	0.738
Comorbidities None, Asthma, TB, Hepatitis, Diabetes, BP and Asthma, Asthma and Diabetes	138.922	*0.056

Alpha value (p value) = [*= <0.05, **=<0.01, *= <0.001**

| CHAPTER-V | DISCUSSION |

The purpose of this study was to know the impact of physiotherapy intervention to increase SCIM score on patients with spinal cord injury who were admitted and receiving treatment at the Center for the Rehabilitation of the Paralysed (CRP). In spite of the sample size was limited, this study gives us the information regarding individuals in our country who have spinal cord injuries. The spinal cord independence measure (SCIM) scale and a demo-graphical questionnaire were utilized in this study to see if there was any correlation between the SCIM scale score and socio-demographic data. In this study, socio-demographic data had an essential role in the connection with SCIM. There was an association between SCIM score and socio-demographic parameters. Even though the sample size was small. Total 65 patients were taken in this study period. Measurement the impact of physiotherapy intervention on increasing SCIM score in patients with spinal cord injury. It is an essential part of any goal-oriented, multidisciplinary rehabilitation program and it demands the use of appropriate assessment methods.

According to the findings of a researcher named Chen et al., (2013) the most common age of injury was between the ages of 16 and 30 years (38.5%), followed by ages 31 to 45 and 46 to 60 years (21.0% and 21.5%) respectively. The etiology profile varied substantially by age. Both results claim that active younger (age around 20-40) are more vulnerable to the incidence of injury.

In my study population consisted of 56 males (86.2%) and 9 (13.8%) females. Their age ranged from <10 to >60 years with a mean age of the patients were 31.92 years with standard deviation (±12.730). The majority of the patients were aged between 21-30 years. Most of the patients were young age. Both results claim that active younger age around (20-40) are more vulnerable to the incidence of injury.

Males scored significantly higher than females. The majority of the patients lived in rural areas, which was also observed in India (Singh et al., 2014). Rural residents are typically impoverished and labor in hazardous jobs that may result in SCI. For traumatic spinal cord damage, Farmer scored higher. The most frequent employment where spinal cord damage

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was reported was daily work. More over 80% of the population lives in villages, while agriculture employs 65% of all laborers. Rural residents are typically poor, and they engage in dangerous work that can result in SCI. The risk of traumatic spinal cord injury was greater in Farmer. The second most prevalent occupation with spinal cord damage was daily work. More than 80% of the population lives in villages, while agriculture employs 65% of the total labor force (National Spinal Cord Injury Statistical Center, 2015). Most of the respondents who are suffering from spinal cord injury were from rural Areas 64.6% (n=42), 20%(n=13) were from semi-urban & only 15.4% (n=10) were from urban area. This study identified a correlation between the residential area with spinal cord injury.

According to Witiw & Fehlings, (2015) the majority of participants were married 63.1% and had an education level of primary school certificate or higher. Also, the majority of participants were male. This study shows that the participants who passed with SSC had a rate of 13.8% (n = 9). JSC level participants had a literacy rate of 18.5% (n = 12), those who had completed their higher secondary education had a literacy rate of 9.2% (n = 6), those who had finished their graduation level education had a literacy rate of 4.6% (n = 3), and the illiteracy rate was 13.8% (n = 9).

According to the findings of Chowdhury et al. 2015'S research, as a result of disabilities such as spinal cord injury, family members have reported feeling worried and powerless. As family members attempted to modify their family structure now that the patient was gone, connections within the family were strained, and it was clear that they were suffering from emotional anguish and negative feelings. In this study, among 65 participants 27.7%(n=18) majority have 5 family members ,24.6%(n=16) have 4 family members, 21.5(n=14) have 6 family members and others have 2 to 13 family members. among 65 participants 56.9%(n=37) patients were active working person and they support their family with their income but after injuries they have been feeling worried and hopeless and 43.1%(n=28) patients were depending on others and the family income of the participants mean were 16223.08 with a standard deviation of (±10518.596).

In this study, the majority of participants 52.3%(n=34) were get admitted within a month after their injury and there have a highly significant (p=0.002) result with the admission date after injury. This study showed that there had a correlation between increasing SCIM score with admission after injury. Chowdhury et al., (2015) mentioned that those patients are getting admitted immediately after injury they have a significant improve or have a positive response to the treatment for their recovery.

In this study 63 patients had traumatic 96.9% spinal cord injury and Others had non-traumatic 3.1% causes. According to National SCI statistical center males account for 82% of all spinal cord injuries, while females account for 18%. Traumatic SCI occurs more frequently in people under the age of 40, while non-traumatic SCI occurs more frequently in people over the age of 40. Patients with SCI who are older have a higher risk of death. In North America, the main cause of Traumatic spinal cord injury was motor vehicle accidents rather than fall from height (Mothe et al., 2013). Spinal Cord Injury, which may occur suddenly but its effect can be devastating. Rahimi et al., (2013) stated that in the perspective of Bangladesh, people live their lives under conditions that make them vulnerable to SCI. SCI affects persons for the long term, as well as it also impacts on physiotherapy intervention to increase spinal cord independence measure on SCI patients.

This study included 65 participants, with tetraplegia (involving four limbs) accounting for 21.5% (n=14) and paraplegia (involving two limbs) accounting for 78.5% (n=51). According to Hammond et al., (2014) reported that in their study of 364 participants, tetraplegia was 53.3 percent (n=194) and paraplegia was 46.7% (n=170). Because there is no discernible distinction between the two types of injuries (paraplegia and tetraplegia), everybody who has a spinal cord injury will be paraplegic or tetraplegic.

Among 65 patients participate in this study. Most of them were complete A according to the ASIA impairment scale. The percentage of complete A was 72.3 % (n=47). incomplete B diagnosis were 20%(n=13) and incomplete C were 7.7% (n=5). Siddall et al., (2017) found a similar type of result in their study that 58.49% (n=31) participants had complete

spinal cord injury and 41.50% (n=22) patients had incomplete spinal cord injury. In this, my study identified a correlation with ASIA impaired scale and their recovery.

There were many kinds of typical physiotherapy intervention are given such as some type of gait training, any form of exercise, passive interventions such as stretch or passive movements and hand therapy. Trials examining cranial or epidural stimulation or acupuncture were not included. After physiotherapy intervention giving to the patients for one month and more we found that the Score of the SCIM scale are slightly improve from the earlier. In this study, SCIM scale shows that majority of the participants 21.53%(n=14) among 65, remain their score is between 41-50, 18.46%(n=12) patients scoring 21-30, 18.46%(n=12) patients scoring 31-40, 15.38%(n=10) patients scoring 11-20, 9.23%(n=6) patients scoring 61-70 and only 2 patients score the highest point with SCIM that is >70.

6. Limitation of the study

Every study has its own set of limitations. A small sample size may be a limitation in this study. Because the research was conducted in a specific area of the Centre for the Rehabilitation of the Paralysed (CRP) in the Spinal Cord Injury (SCI) unit, it is possible that the results do not represent the entire population of people living with SCI in Bangladesh. Another significant limitation was time and resources, both of which had a significant impact on the study and on the ability to generalize the findings to a larger population. Due to the short study period, an adequate number of samples could not be gathered for the study. So, in order to ensure the generalizability of this study, the researcher strongly advised including SCI patients from the community or from throughout Bangladesh in future research.

| CHAPTER-VII: | CONCLUSION AND RECOMMENDATION |

7. Conclusion and Recommendation

7.1 Conclusion

A spinal cord injury (SCI) is a sudden, unexpected event that can happen suddenly or over time and has a long-term impact on physical function. In Asia as well as Bangladesh, it is a leading cause of disability. Many people are affected each year by spinal cord injuries caused by traumatic or non-traumatic causes. Spinal cord injury can strike anyone, at any age, at any time, but active younger males are more likely than females to sustain a spinal cord injury. Specialized care is required from the time of injury onwards in order to maximize health as well as psychosocial and functional adaptation. Patients with SCI lose some of their functional abilities. However, it is critical to make every effort to restore their functional ability. It's critical to assess a spinal cord injured person's function and independence after a rehabilitation program, which can be done with spinal cord independence measure (SCIM) scale. Patients with spinal cord injuries must begin rehabilitation as soon as possible. Patients with SCI lose some of their functional abilities. The goal of rehabilitation is to teach SCI patients how to live an independent and fulfilling life in their own community. Fortunately, most patients are able to return home after rehabilitation, and a large percentage of them achieve functional independence. The outcome of this study is that functional activity related therapy plays a significant role among the SCI patients for achieving independency and increase the SCIM score. Patients with spinal cord injuries must begin rehabilitation as soon as possible. Physiotherapists can also help people with excess secretion in the chest keep their airways free. The findings of this study added to our understanding of how physiotherapy can improve functional outcome or SCIM score of a group of patients with spinal cord injury. To assess the rehabilitation program for these patients, more research is required.

7.2 Recommendation

It is recommended that, if at all possible, someone overcome the current limitation to allow for more research. If it is possible, more research into this area should be done. Despite the fact that the study has some limitations, it has identified some additional steps that could be taken to improve future research. It is recommended that a larger sample be chosen at random for the cross-sectional study in order to ensure the research's generalizability. The sample should be representative from the whole population. Researchers in this study attempted to determine the impact of physiotherapy rehabilitation on increasing spinal cord independence scores, but no comparison to standard functional expectation guidelines was made. As a result, the researcher strongly advises that future research should be compared to standard functional expectation guidelines. Due to time limitation only 65 samples were taken the researcher recommends for further study including a large number of samples for getting better result. The results will be more significant if the researcher conducts a long-term study. Finally, the entire research team recommended that the further study should be conducted across the entire country of Bangladesh in order to generalize the findings.

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CONSENT STATEMENT

(**Please read out to the participant**)

Assalamu Alaaikum, my name is **Md. Jahidul Islam**; I am conducting a research project (dissertation) study which included in Bachelor of Science in Physiotherapy (B.Sc. in PT) course curriculum of Bangladesh health professions institute (BHPI). The title of the study is "**Impact of Physiotherapy Intervention to Increase Spinal Cord Independence Measure on SCI Patients**". I would like to know about some personal and other related question about impact of physiotherapy intervention on functional activities. This will take approximately 20 to 30 minutes. I would like to inform you that this is purely academic study and will not be used for any other purpose. The researcher is not directly related with this Spinal Cord Injury (SCI) area, so your participation in the research will have no impact on your present or future treatment. All information provided by you will be treated as confidential and in the event of any report or publication. It will be insured that the sources of information remain anonymous. Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any consequence. You also have a right not to answer a particular question that you do not like or do not want to answer during interview. If you have any query about the study or your right as a participant you may contact with me and / or contact with my supervisor Md. Shofiqul Islam, Associate Professor and Head, Department of Physiotherapy. BHPI, CRP, Savar.Dhaka-1343.

Do you have any question before you start?

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

YES ☐

NO ☐

Signature and date of Participant's …………………………………..

Signature and date of Career's ……………………………………….

Signature and date of the interviewer's …………………………………

সম্মতিপত্র

(অংশগ্রহনকারীকে পড়ে শোনাতে হবে)

আস্‌সালামু-আলাইকুম,

আমার নাম মো: জাহিদুল ইসলাম, আমি এই গবেষণা প্রকল্পটি বাংলাদেশ হেলথ প্রফেশন ইনস্টিটিউট (বি এইচ পি আই) এ পরিচালনা করছি যা আমার ৪র্থ বর্ষ বি. এসসি ইন ফিজিওথেরাপী কোর্সের অধিভুক্ত। আমার গবেষণার শিরোনাম" স্পাইনাল কর্ড ইনজ্বুরিতে আক্রান্তদের মাঝে স্পাইনাল কর্ড ইন্ডিপেন্ডেস মেজার স্কেলের মান বৃদ্ধিতে ফিজিওথেরাপি চিকিৎসার প্রভাব'' স্পাইনাল কর্ড ইনজ্বুরির পর আপনার সমস্যা এবং নিজস্ব যত্ন, শ্বসন ও স্ফিংটার পরিচালনা এবং গতিশীলতা (রুম,টয়লেট) সম্পর্কে আমি আপনার কিছু ব্যক্তিগত এবং মেরুরজ্জ ক্ষতিগ্রস্থতা সম্পর্কে আনুষাঙ্গিক প্রশ্ন করতে চাচ্ছি। এতে আনুমানিক ২০-৩০ মিনিট সময় নিবো।

আমি আপনাকে অবগত করছি যে,এটা আমার অধ্যয়নের অংশ এবং যা অন্যকোন উদ্দেশ্যে ব্যবহার হবে না।গবেষক সরাসরি এই স্নায়ুজ্ঞান অধ্যায়নের সাথে অন্তর্ভুক্ত নয়।তাই এই গবেষনায় 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 অংশগ্রহন স্বেচ্ছাপ্রণোদীত এবং আপনি যে কোন সময় এই অধ্যয়ন থেকে কোন নেতিবাচক ফলাফল ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন। এছাড়াও কোন নির্দিষ্ট প্রশ্ন অপছন্দ হলে উত্তর না দেয়ার এবং সাক্ষাৎকারের সময় কোন উত্তর না দিতে চাওয়ার অধিকারও আপনার আছে।

এই অধ্যয়নে অংশগ্রহণকারী হিসেবে যদি আপনার কোন প্রশ্ন থাকে তাহলে আপনি আমাকে 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। অংশগ্রহনকারীর স্বাক্ষর   ....।

২।সাক্ষাৎগ্রহনকারীর স্বাক্ষর ....।

৩। গবেষক এর সাক্ষর   ....।

Questionnaire

Part I: Patient's Identification

(to be provided by patient or attendant)

Identification No:	Date of interview:	
Address	Contact no:	
Consent Taken:	Yes	NO

Part II: Patient's Socio-demographic Information

(To be collected from Record/Patient/Caregiver)

QN	Questions and Filters	Responses	Code
2.1	Age (in year)	……………years	
2.2	Sex	1=Male 2=Female	
2.3	Marital Status	1=Married 2=Unmarried 3=Divorced 4=Separated 5=Widow 6=others	
2.4	Educational status	1=Illiterate 2=Primary 3=Junior school certificate(JSC) 4=Secodary school certificate(SSC) 5=Higher secondaryCertificate (HSC)	

		6=Bachelor	
		7=Masters	
		8=Other (specify)	
2.5	Occupation		
2.6	Family Members		
2.7	Earning Member	1=Himself 2=Others (Specific)	
2.8	Financial Condition	1= Independent 2= Dependent	
2.9	Residential Area	1=Rural 2=Semirural 3=Urban In which Devision and Distric	

Part III: Physiotherapy related Information

(To be collected from Record/ Care provider/clinical examination)

3.1	Date of injury		
3.2	Date of admission		
3.3	Previous management	1= Surgical management 2= Conservative management	
If answer is traumatic, please answer 3.3a otherwise go to 3.4			
3.3a	Type of surgery		
3.4	Type of Injury	1=Traumatic 2=Non- traumatic	

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If answer is traumatic, please answer 3.2 otherwise go to 3.3			
3.4a	Causes of injury (Traumatic)	1=Motor vehicle injury 2=Fall from height 3=Fall while carrying heavy load 4=Sport- related 5=Others (Please Specify)	
3.4b	Causes of injury (Non-traumatic)	1=Potts's diseases 2=Spinal tumor 3=Transverse myelitis 4=Renal Tubular Acidosis (RTA) 5=Intervertebral disc prolapsed 6=Other(specify) 7=Undiagnosed	
3.5	On admission ASIA		
3.6	Skeletal Level of injury	1=Cervical…… 2=Thoracic……. 3=Lumber………... 4=Sacral………….	
3.7	Initial Neurological level	C……T……. L……S……	
3.8	Motor score during admission	1=Upper extremity 2=Lower extremity	
3.9	Confirmed type of Paralysis	1=Paraplegia 2=Tetraplegia	

Part-IV: Anthropometric and Clinical Parameter

(To be collected from Record/ Care provider/clinical examination

	Coding categories	**code**
4.1	Heart Rate	
	Respiratory Rate	
	Pulse Rate	
	Blood Pressure	
4.2	Co-morbidities	Yes/No
	1. Blood pressure	
	2. Bronchial Asthma	
	3. TB	
	4. Bronchitis	
	5. Hepatitis B	
	6. Diabetes Mellitus	
	7. Heart Diseases	

Part V: - Spinal Cord Independent Measure III Spinal Cord Independent Measure (SCIM)-III

Self- Care

1. Feeding (cutting, opening containers, pouring, bringing food to mouth, holding cup with fluid)

0. Needs pare anal, gastrostomy, or fully assisted oral feeding

1. Needs partial assistance for eating and /or drinking, or for wearing adaptive devices

2. Eats independently; needs adaptive or assistance only for cutting food and/or pouring and/or opening containers

3. Eats and drinks independently; does not require assistance or adaptive devices

2. Bathing (soaping, washing, drying body and head, manipulating water tap).A-upper body; B-lower body

A. 0. Requires total assistance

1. Require partial assistance

2. Washes independently with adaptive devices or in a specific setting (e.g., bars, chair)

3. Washes independently; does not require adaptive devices or specific setting (not customary for healthy people)

B. 0. Requires total assistance

1. Require partial assistance

2. Washes independently with adaptive devices or in a specific setting (adss)

3. Washes independently; does not require adaptive devices (adss) or specific setting

3.Dressing (clothes, shoes, and permanent orthoses: dressing, wearing, and undressing). A-upper body; B-lower body

A. 0.requires total assistance

   1.Requires partial with clothes without buttons, zippers or laces (cwobzl)

   2.Independent with cwobzl; requires adaptive devices and/ or specific settings (adss)

   3.Independent with cwobzl; does not require adss; needs assistance or adss only for bzl

Dresses (any cloth) independently; does not require adaptive devices or specific setting

B.0.Requires total assistance

  1. Requires partial assistance with clothes without buttons, zipps or laces

  2. (cwobzl)

  3. Independent with cowbzl; requires adaptive devices and/or specific settings (adss)

  4. Independent with cwobzl without adss; needs assistance or adss only for bzl

  5. Dresses (any cloth) independently; does not require adaptive devices or specific setting..

4. Grooming (washing hands and face, brushing teeth, combing hair, shaving, applying makeup)

  0. Requires total assistance

  1. Requires partial assistance

  2. Grooms independently with adaptive devices

  3. Grooms independently without adaptive devices

SUB-TOTAL (0-20)

Respiration and Sphincter Management

5.Respiration

☐☐☐☐☐

0. Requires tracheal tube (TT) and permanent or intermittent assisted
   ventilation (IA V)

2. Breathes independently with TT; requires oxygen, much assistance in
   coughing or TT management

4. Breathes independently with TT; requites little assistance in coughing or TT
   management

6. Breathes independently without TT; requires oxygen, much assistance incoughing ,
   a mask (e.g., peep) or IA V (bipap)

8. Breathes independently without TT; requires little assistance or stimulation
   for coughing

10. Breathes independently without assistance or device

6. Sphincter Management- Bladder

☐☐☐☐☐

0. Indwelling catheter

3. Residual urine volume (RUV)>100cc; no regular catheterization or assisted
   intermittent catheterization

6. RUV<100cc or intermittent self- catheterization; needs assistance for applying
   drainage instrument

9. Intermittent self-catheterization; uses external drainage instrument; does not need assistance
   for applying

11. Intermittent self-catheterization; continent between catheterizations; does not
    use external instrument

13. RUV< 100cc; needs only external urine drainage; no assistance is required for
    drainage

15. RUV<100cc; continent; does not use external drainage instrument

7. Sphincter Management – Bowel

0. Irregular timing or very low frequency (less than once in 3 days) of bowel movements

5. Regular timing, but requires assistance (e.g, for applying suppository); rare accidents (less than twice a month)

8. Regular bowel movements, without assistance; rare accidents (less than twice a month)

10. Regular bowel movements, without assistance; no accidents

8. Use of Toilet (perineal hygiene, adjustment of clothes before / after, use of napkins or diapers).

0. Requires total assistance

1. Requires partial assistance; does not clean self

2. requires partial assistance; cleans self independently

4. Uses toilet independently in all tasks but needs adaptive devices or special setting (e.g., bars)

5. Uses toilet independently; does not require adaptive devices or special setting

SUB-TOTAL (0-40)

Mobility (room and toilets)

9.Mobility in Bed and Action to Prevent Pressure Sores

a. Needs assistance in all activities: turning upper body in bed, turning lower body in bed, sitting up in bed, doing push-ups in wheelchair, with or without adaptive devices, but not electric aids

2. Performs one of the activities without assistance

4. Performs two or three of the activities without assistance

6. Performs all the bed mobility and pressure release activities independently

10.Transfers: bed- wheelchair (locking wheelchair, lifting footrests, removing and adjusting arm rests, transferring, lifting feet).

    a. Requires total assistance

    b. needs partial assistance and /or supervision, and/or adaptive devices (e.g., grab-bars)

    c. Independent (or does not require wheelchair)

11. Transfers: wheelchair-toilet-tub (if uses toilet wheelchair: transfers to and from; if uses regular Wheelchair: locking wheelchair, lifting footrests, removing and adjusting armrests, transferring, lifting feet)

    a. Requires total assistance

    b. Needs partial assistance and /or supervision, and/or adaptive devices (e.g., grab-bars)

    c. Independent (or does not require wheelchair)

Mobility (indoors and outdoors, on even surface)

12. Mobility Indoors

    a. Requires total assistance

    b. Needs electric wheelchair or partial assistance to operate manual wheelchair

    c. Moves independently in manual wheelchair

    d. Requires supervision while walking (with or without devices)

    e. Walks with a walking frame or crutches (swing)

    f. Walks with crutches or two canes (reciprocal walking)

    g. Walks with one cane

    h. Needs leg orthosis only

    i. Walks without walking aids

13. Mobility for Moderate Distances (10 – 100 meters)

a. Requires total assistance

b. Needs electric wheelchair or partial assistance to operate manual wheelchair

c. Moves independently in manual wheelchair

d. Requires supervision while walking (with or without devices)

e. Walks with a walking frame or crutches (swing)

f. Walks with crutches or two canes (reciprocal walking)

g. Walks with one cane

h. Needs leg orthosis only

i. Walks without walking aids

14. Mobility Outdoors (more than 100 meters)

a. Requires total assistance

   a. Needs electric wheelchair or partial assistance to operate manual wheelchair

   b. Moves independently in manual wheelchair

   c. Requires supervision while walking (with or without devices)

   d. Walks with a walking frame or crutches (swing)

   e. Walks with crutches or two canes (reciprocal waking)

   f. Walks with one cane

   g. Needs leg orthosis only

   h. Walks without walking aids

15. Stair Management

a. Unable to ascend or descend stairs

b. Ascends and descends at least 3 steps with support or supervision of another person

c. Ascends and descends at least 3 steps with support of handrail and/ or crutch or

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cane

d. Ascends and descends at least 3 steps without any support or supervision

16. Transfers: wheelchair-car (approaching car locking wheelchair, removing arm -and footrests, transferring to and from car bringing wheelchair into and out of car)

    a. Requires total assistance

    b. Needs partial assistance and/or supervision and/or adaptive devices

    c. Transfers independent; does not require adaptive devices (or does not require wheelchair)

17. Transfers: ground-wheelchair

    a. Requires assistance

    b. Transfer independent with or without adaptive devices (or does not require wheelchair

SUB- TOTAL (0-40)

TOTAL SCIM SCORE (0- 100

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পার্ট ১: ব্যাক্তিগত তথ্য

আইডি নংঃ		তারিখঃ	
ঠিকানাঃ		ফোন নংঃ	
সম্মতিঃ		হ্যাঁ	না

পার্ট ২: অর্থ সামাজিক প্রেক্ষাপটের তথ্য

ক্রমিক নং	প্রশ্নাবলি	উত্তর	কোড
২.১	বয়স	.....................বছর	
২.২	লিঙ্গ	১= পুরুষ ২= মহিলা	
২.৩	বৈবাহিক অবস্থা	১= বিবাহিত ২= অবিবাহিত ৩= ডিভোর্সড ৪= আলাদা ৫= বিধবা ৬= অন্যান্য	
২.৪	শিক্ষাগত যোগ্যতা	১= অশিক্ষিত ২= প্রাইমারি ৩= জুনিয়র স্কুল সার্টিফিকেট ৪= সেকেন্ডারি (এস এস সি ৫= ইন্টারমিডিয়েট ৬= গ্রাজুয়েট ৭= পোস্ট গ্রাজুয়েট ৮= অন্যান্য	
২.৫	পেশা	১= সরকারি চাকুরিজীবি ২= ব্যবসায়ী ৩= গৃহিণী ৪= দিনমজুর ৫= শিক্ষার্থী	

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		৬= অন্যান্য	
২.৬	আবাসন	১= শহর ২= আধা-শহর ৩= গ্রাম কোন বিভাগ বা জেলা	
২.৭	পরিবারের সদস্য সংখ্যা	.... জন	
২.৮	উপার্জনকারী সদস্য সংখ্যা	১= নিজেই ২= অন্য সদস্য	
২.৯	পরিবারের মাসিক আয়	.... টাকা	

পার্ট ৩: স্বাস্থ্য বিষয়ক তথ্য

ক্রমিক নং	প্রশ্নাবলি	উত্তর	কোড
৩.১	ইনজুরির তারিখ		
৩.২	ভর্তির তারিখ		
৩.৩	পূর্ববর্তী চিকিৎসা	১= অপারেশন ২= কনজারভেটিভ চিকিৎসা	
৩.৪	অপারেশনের ধরণ		
৩.৫	ইনজুরির ধরণ	১= ট্রমাটিক ২= নন- ট্রমাটিক	
৩.৫ ক	ইনজুরির কারণ { ট্রমাটিক }	১= মোটর সাইকেল ইনজুরি ২= উপর থেকে পরা ৩= বোঝাসহ পরে যাওয়া ৪= খেলাধূলা সংক্রান্ত ৫= অন্যান্য	
৩.৫ খ	ইনজুরির কারণ { নন- ট্রমাটিক }	১= পটস ডিজিস ২= স্পাইনাল টিউমার ৩= ট্রান্সভার্স মায়েলাইটিস ৪= ডিস্ক প্রোলাপস	

		৫ = অন্যান্য ৬ = আন-ডায়াগনসড	
৩.৬	ভর্তির সময় (ASIA)		
৩.৭	স্কেলেটাল লেভেল	১= সারভাইকল ২= থোরাসিক ৩= লাম্বার ৪= স্যাক্রাল	
৩.৮	নিউরোলজিকাল লেভেল	১= কমপ্লিট A ২= ইন- কমপ্লিট B ৩= ইন- কমপ্লিট C ৪= ইন- কমপ্লিট D	
৩.৯	প্যারালাইসিসের ধরণ	১= প্যারাপ্লেজিক ২= টেট্রাপ্লেজিক	
৩.১০	নির্ণিত রোগ		
৩.১১	অন্যান্য		

পার্ট ৪: ক্লিনিকাল প্যারামিটার

ক্রমিক নং	প্রশ্নাবলি	কোড
৪.১	হার্ট রেট	
	রেসপিরেটরি রেট	
	পালস রেট	
	ব্লাড প্রেসার	

	কো-মরবিটিস	হ্যা	না
৪.২	১. ব্লাড প্রেসার	☐	☐
	২. এজমা	☐	☐
	৩. টিবি	☐	☐
	৪. হেপাটাইটিস	☐	☐
	৫. ব্রঙ্কাইটিস	☐	☐
	৬. ডায়াবেটিস	☐	☐
	৭. হার্ট ডিসিজ	☐	☐

পার্ট ৫: স্পাইনাল কর্ড ইন্ডিপেন্ডেন্ট মেজারমেন্ট স্কেল - III

নিজস্ব যত্ন	স্কোর	
১. খাওয়ানো (কাটা, কন্টেইনার খোলা, ঢালা, খাবার মুখে নেওয়া, তরল ভর্তি কাপ ধরে রাখতে পারা) ০. প্যারেন্টেরাল, গ্যাস্ট্রোটমি অথবা সম্পূর্ণ মুখে খাওয়াতে সহযোগীতার প্রয়োজন। ১. খাওয়া, পান করা অথবা অ্যাডাপ্টিভ ডিভাইস পরিধানে আংশিক সাহায্যের প্রয়োজন। ২. স্বাধীনভাবে খেতে পারা; শুধুমাত্র খাবার কাটা , ঢালা অথবা কন্টেইনার খোলায় অ্যাডাপ্টিভ ডিভাইস প্রয়োজন ৩. স্বাধীনভাবে খেতে এবং পান করতে পারা; কোনো ধরণের সগযোগীতা বা অ্যাডাপ্টিভ ডিভাইসের প্রয়োজন হয় না।		
২. গোসল করা (সাবান মাখানো, ধোয়া, মাথা ও শরীর শুকানো, কল ব্যবহার করা) . **ক-উর্ধাংশ;খ-নিম্নাংশ** **ক.** ০. সম্পূর্ণ সাহায্যের প্রয়োজন। ১. আংশিক সাহায্যের প্রয়োজন। ২. অ্যাডাপ্টিভ ডিভাইস বা নির্দিষ্ট সেটিংস এর সাথে		

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স্বাধীনভাবে ধৌত করতে পারা। ৩. স্বাধীনভাবে ধৌত করতে পারা; কোনো ধরণের অ্যাডাপ্টিভ ডিভাইস বা নির্দিষ্ট সেটিংস এর প্রয়োজন নেই।		
খ.০. সম্পূর্ণ সাহায্যের প্রয়োজন। ১. আংশিক সাহায্যের প্রয়োজন। ২. অ্যাডাপ্টিভ ডিভাইস বা নির্দিষ্ট সেটিংস এর সাথে স্বাধীনভাবে ধৌত করতে পারা। ৩. স্বাধীনভাবে ধৌত করতে পারা; কোনো ধরণের অ্যাডাপ্টিভ ডিভাইস বা নির্দিষ্ট সেটিংস এর প্রয়োজন নেই।		
৩. পরিধান করা (জামা, জুতো, স্থায়ী অর্থোসিস: পরিধান করা এবং (খোলা). **ক-উর্ধ্বাংশ;খ-নিম্নাংশ** **ক.**০. সম্পূর্ণ সাহায্যের প্রয়োজন। ১. বোতাম, চেইন অথবা ফিতাবিহীন জামার ক্ষেত্রেআংশিক সাহায্যের প্রয়োজন। ২. Cwobzlএর ক্ষেত্রে adds এর সাহায্যে স্বাধীনভাবে করতে পারা। ৩. adds এর সাহায্য ব্যতীত cwobzl স্বাধীনভাবে করতে পারা; শুধুমাত্র bzl এর ক্ষেত্রে adds এর প্রয়োজন। ৪. যে কোনো ধরণের কাপড় স্বাধীনভাবে পরতে পারা; কোনো ধরণের adds এর প্রয়োজন নেই।		
খ. ০. সম্পূর্ণ সাহায্যের প্রয়োজন। ১. cwobzl ক্ষেত্রেআংশিক সাহায্যের প্রয়োজন। ২. Cwobzlএর ক্ষেত্রে adds এর সাহায্যে স্বাধীনভাবে করতে পারা। ৩. adds এর সাহায্য ব্যতীত cwobzl স্বাধীনভাবে করতে পারা; শুধুমাত্র bzl এর ক্ষেত্রে adds এর প্রয়োজন। ৪. যে কোনো ধরণের কাপড় স্বাধীনভাবে পরতে পারা; কোনো ধরণের adds এর প্রয়োজন নেই।		

৪. পরিষ্কার-পরিচ্ছন্নতা (হাত-মুখ ধোয়া, দাত মাঁজা, চুল আঁচড়ানো, শেভিং, সাজসজ্জা করা) ০. সম্পূর্ণ সাহায্যের প্রয়োজন। ১. আংশিক সাহায্যের প্রয়োজন। ২. অ্যাডাপ্টিভ ডিভাইসের সাহায্যে স্বাধীনভাবে পরিচ্ছন্ন থাকা। ৩. অ্যাডাপ্টিভ ডিভাইসের সাহায্য ব্যতীত স্বাধীনভাবে পরিচ্ছন্ন থাকা।		
SUBTOTAL (0-20)		
শ্বসন এবং স্ফিংটার পরিচালনা	স্কোর	
৫. শ্বসন ০. ট্রাকিয়াল টিউব (TT) এবং পারমানেন্ট অথবা ইন্টারমিনেন্ট অ্যাসিস্টেড ভেন্টিলেশন (IAV) প্রয়োজন। ২. TT-এর সাহায্যে স্বাধীনভাবে শ্বাস নিতে পারা; এক্ষেত্রে অক্সিজেন প্রয়োজন, কাশি অথবা TT ম্যানেজমেন্ট এর ক্ষেত্রে সর্বোচ্চ সহায়তা প্রয়োজন। ৪. TT এর সাহায্যে স্বাধীনভাবে শ্বাস নিতে পারা, কাশি কিংবা TT ম্যানেজমেন্ট এর ক্ষেত্রে সামান্য সহায়তা প্রয়োজন। ৬. TT ব্যতীত স্বাধীনভাবে শ্বাস নিতে পারা; অক্সিজেন প্রয়োজন এবং কাশির ক্ষেত্রে সর্বোচ্চ সহায়তা প্রয়োজন; মাস্ক এবং IAV প্রয়োজন। ৮. TT ব্যতীত স্বাধীনভাবে শ্বাস নিতে পারা; কাশির জন্য সামান্য সহায়তা প্রয়োজন। ১০. কোনোরকম সহায়তা বা ডিভাইস ব্যতীত স্বাধীনভাবে শ্বাস নিতে পারা		

৬. স্ফিংটার পরিচালনাঃব্লাডার ০. স্থায়ী ক্যাথেটার। ৩. অবশিষ্ট মূত্রের পরিমাণ(RUV)>100cc. রেগুলার অথবা অ্যাসিস্টেড ইন্টারমিনেন্ট ক্যাথেটারের প্রয়োজন নেই। ৬. RUV<100cc অথবা ইন্টারমিনেন্ট সেলফ ক্যাথেটারাইজেশন; নিষ্কাশন যন্ত্র প্রয়োগের জন্য সাহায্যের প্রয়োজন। ৯. ইন্টারমিনেন্ট সেলফ ক্যাথেটারাইজেশন; বাইরের নিষ্কাশন যন্ত্র ব্যবহার করা হয় এবং প্রয়োগের জন্য কোনো প্রকার সাহায্যের প্রয়োজন হয় না। ১১. ইন্টারমিনেন্ট সেলফ ক্যাথেটারাইজেশন; কোনো ধরণের বাইরের ড্রেনেজ ব্যবস্থাপনা নেই। ১৩. RUV<100cc; শুধুমাত্র বাইরের ড্রেনেজ ব্যবস্থা প্রয়োজন; কোনো প্রকার সাহায্যের প্রয়োজন নেই। ১৫. RUV<100cc; কন্টিনেন্ট; বাইরের ড্রেনেজ ব্যবস্থা প্রয়োজন নেই।		
৭. স্ফিংটার পরিচালনাঃ পায়খানা ০. অনিয়মিত বা খুব কম পায়খানা হওয়া (৩ দিনে একবারেরও কম) ৫. নিয়মিত কিন্তু সাহায্যের প্রয়োজন (উদাহরণস্বরুপ, সাপোজিটরি প্রয়োগের মাধ্যমে); ব্যতিক্রমী দূর্ঘটনা (মাসে দুইবারেরও কম)। ৮. সাহায্যব্যতীত নিয়মিত হয়; ব্যতিক্রমী দূর্ঘটনা (মাসে দুইবারেরও কম)। ১০. কোনো সাহায্য ছাড়াই নিয়মিত মলত্যাগ হয়; কোনো দূর্ঘটনা নেই।		

৮. টয়লেটের ব্যবহার (পেরিনিয়াল অঞ্চলের স্বাস্থ্যরক্ষা। মলত্যাগের আগে/পরে কাপড়ের সমন্বয়, ন্যাপকিন কিংবা ডায়পার ব্যবহার করা) ০. সম্পূর্ণ সাহায্যের প্রয়োজন। ১. আংশিক সাহায্যের প্রয়োজন; নিজে পরিষ্কার করতে সক্ষম নয়। ২. আংশিক সাহায্যের প্রয়োজন; নিজে পরিষ্কার করতে সক্ষম। ৪. adds এর সাহায্যে টয়লেটের যাবতীয় কাজ নিজে নিজেই সম্পন্ন করতে পারা। ৫. adds এর সাহায্য ব্যতীত নিজে নিজেই স্বাধীনভাবে টয়লেট ব্যবহার করতে পারা।		
SUBTOTAL (0-40)		
গতিশীলতা (রুম এবং টয়লেট)	স্কোর	
৯. বিছানায় নড়াচড়া এবং চাপজনিত ঘা প্রতিরোধে করণীয় ০. সকল কাজেই সাহায্যের প্রয়োজন; বিছানায় শরীরের উপরের এবং নিচের অংশ ঘুরানো, বিছানায় বসা, হুইলচেয়ারে পুশ আপ ইত্যাদিতে অ্যাডাপ্টিভ ডিভাইসের সাহায্য অথবা সাহায্য ছাড়া, কিন্তু কোনো ইলেক্ট্রিক যন্ত্রের নয়। ২. উপরের যেকোনো একটি কার্যক্রম সাহায্য ছাড়া করতে পারা। ৪. সাহায্যব্যতীত দুইটি অথবা তিনটি কাজ সম্পন্ন করতে পারা। ৬. বিছানায় সকল প্রকার নড়াচড়া ও চাপমুক্ত করার কাজ স্বাধীনভাবে করতে পারা।		
১০. স্থানান্তরঃ বিছানা-হুইলচেয়ার (হুইলচেয়ার লক করা, ফুটরেস্ট তোলা, হাতল সরানো বা অ্যাডজাস্ট করা, স্থানান্তরণ, পা তোলা) ০.সম্পূর্ণ সাহায্যের প্রয়োজন।		

১. আংশিক সহায়তা এবং/অথবা সুপারভিশন এবং/অথবা অ্যাডাপ্টিভ ডিভাইসের প্রয়োজন।		
২. নিজেই করতে পারা (অথবা হুইলচেয়ারেরই প্রয়োজন নেই)।		
১১. স্থানান্তরঃ হুইলচেয়ার-টয়লেট ০. সম্পূর্ণ সাহায্যের প্রয়োজন। ১. আংশিক সহায়তা এবং/অথবা সুপারভিশন এবং/অথবা অ্যাডাপ্টিভ ডিভাইসের প্রয়োজন। ২. নিজেই করতে পারা (অথবা হুইলচেয়ারেরই প্রয়োজন নেই)।		
চলাচল (ঘরের ভেতরে বা বাইরে এমনকি সমতলে) **১২. ভেতরে চলাচল** ০. সম্পূর্ণ সহায়তা প্রয়োজন। ১. ম্যানুয়েল হুইলচেয়ার চালানোর জন্য ইলেক্ট্রিক অথবা আংশিক সহায়তা প্রয়োজন। ২. ম্যানুয়েল হুইলচেয়ারে স্বাধীনভাবে চলাচলে সক্ষম। ৩. হাঁটার সময় সুপারভিশন প্রয়োজন (ডিভাইস সহ/ব্যতীত)। ৪. ওয়াকিং ফ্রেম বা ক্রাচের সাহায্যে হাঁটা (সুইং)। ৫. ক্রাচ অথবা দুই কেইনের সাহায্যে হাঁটা। ৬. একটি কেইনের সাহায্যে হাঁটা। ৭. শুধুমাত্র পায়ের অর্থোসিস প্রয়োজন। ৮. ওয়াকিং এইড ব্যতীত হাঁটা।		
১৩. মোটামুটি দূরত্বে চলাচল (১০-১০০মিটার) ০. সম্পূর্ণ সহায়তা প্রয়োজন। ১. ম্যানুয়েল হুইলচেয়ার চালানোর জন্য ইলেক্ট্রিক অথবা আংশিক সহায়তা প্রয়োজন।		

২. ম্যানুয়েল হুইলচেয়ারে স্বাধীনভাবে চলাচলে সক্ষম।		
৩. হাঁটার সময় সুপারভিশন প্রয়োজন (ডিভাইস সহ/ব্যতীত)।		
৪. ওয়াকিং ফ্রেম বা ক্রাচের সাহায্যে হাঁটা (সুইং)।		
৫. ক্রাচ অথবা দুই কেইনের সাহায্যে হাঁটা।		
৬. একটি কেইনের সাহায্যে হাঁটা।		
৭. শুধুমাত্র পায়ের অর্থোসিস প্রয়োজন।		
৮. ওয়াকিং এইড ব্যতীত হাঁটা।		
১৪. বাইরে চলাচল (১০০মিটারেরবেশিদূরত্ব) ০. সম্পূর্ণ সহায়তা প্রয়োজন।		
১. ম্যানুয়েল হুইলচেয়ার চালানোর জন্য ইলেক্ট্রিক অথবা আংশিক সহায়তা প্রয়োজন।		
২. ম্যানুয়েল হুইলচেয়ারে স্বাধীনভাবে চলাচলে সক্ষম।		
৩. হাঁটার সময় সুপারভিশন প্রয়োজন (ডিভাইস সহ/ব্যতীত)।		
৪. ওয়াকিং ফ্রেম বা ক্রাচের সাহায্যে হাঁটা (সুইং)।		
৫. ক্রাচ অথবা দুই কেইনের সাহায্যে হাঁটা।		
৬. একটি কেইনের সাহায্যে হাঁটা।		
৭. শুধুমাত্র পায়ের অর্থোসিস প্রয়োজন।		
৮. ওয়াকিং এইড ব্যতীত হাঁটা।		
১৫. সিঁড়ি ব্যবস্থাপনা ০. সিঁড়ি বেয়ে উপরে উঠতে বা নিচে নামতে না পারা।		
১. অন্যব্যক্তির সাপোর্ট বা সুপারভিশনের সাহায্যে কমপক্ষে ৩টি ধাপ উঠতে বা নামতে পারা।		
২. হ্যান্ডরেইল এবং/অথবা ক্রাচ অথবা কেইনের সাপোর্টে কমপক্ষে ৩ ধাপ উঠতে বা নামতে পারা।		

৩. কোনো সাপোর্ট বা সুপারভিশন ছাড়াই কমপক্ষে ৩ ধাপ উঠতে বা নামতে পারা।		
১৬. স্থানান্তর (হুইলচেয়ার-গাড়ি) ০. সম্পূর্ণ সহায়তা প্রয়োজন। ১. আংশিক সহায়তা এবং/অথবা সুপারভিশন এবং/অথবা অ্যাডাপ্টিভ ডিভাইসের প্রয়োজন। ২. নিজে স্বাধীনভাবে স্থানান্তর করতে পারা; কোনো ধরণের অ্যাডাপ্টিভ ডিভাইসের প্রয়োজন নেই।		
১৭. স্থানান্তর (গ্রাউন্ড-হুইলচেয়ার) ০. সাহায্যকারী প্রয়োজন। ১. নিজে স্বাধীনভাবে স্থানান্তর করতে পারা; অ্যাডাপ্টিভ ডিভাইসের সাহায্য অথবা সাহায্য ছাড়া **(**অথবা হুইলচেয়ারের প্রয়োজন নেই**)**।		
SUBTOTAL (0-40)		
Total SCIM Score (0-100)		

Ref:
CRP/BHPI/IRB/03/2022/585

Date:
06/03/2022

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

Subject: Approval of the research project proposal "**Impact of Physiotherapy Intervention on Functional Activities of SCI patients**" by ethics committee.

Dear Md. Jahidul Islam,
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:

Sl. 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 gain in-depth insight and understandings from people with spinal cord injury in order to understand their own experiences and perspectives on impact of physiotherapy intervention on functional activities with spinal cord injury patients. Since the study involves questionnaire that takes maximum 20- 30 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 October 12 , 2021 at BHPI (30th IRB 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,

llelletharraien

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
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<u>**Permission letter**</u>

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. Jahidul Islam, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project entitled on **"Impact of Physiotherapy Intervention on Functional Activities of SCI Patients"** 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,

Jahidul Islam

Md. Jahidul Islam

4th professional B.Sc. in Physiotherapy

Roll: 19, Session: 2016-17, ID No: 112160341

Bangladesh Health Professions Institute (BHPI)

(An academic Institute of CRP)

CRP, Chapain, Savar, Dhaka-1343.

Forwarded & Recommended

Shofiq

13.03.22

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

Approved

13/03/22

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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. Jahidul Islam, 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 Paralysed (CRP) under the Faculty of Medicine, University of Dhaka. As per the course curriculum, I have to conduct a research project entitled "**Impact of Physiotherapy Intervention on Functional Activities of SCI patients**" 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 impact of physiotherapy intervention on functional activities with spinal cord injury patients. The study involves face-to-face interview by using questionnaire to explore the perception of people with spinal cord injury who are admitted at CRP hospitals in Savar that may take 20 to 30 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. 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,

Jahidul Islam

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

Recommendation from the Supervisor

Shofi

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

Thesis presentation date: 12ᵗʰ October 2021

Shofi

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

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