

# **“Factors responsible for readmission of people with spinal cord injury”**

Sabrina Zaman Shova

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BHPI, CRP, Savar, Dhaka-1343



**Bangladesh Health Professions Institute (BHPI)**

Department of Physiotherapy

CRP, Savar, Dhaka-1343

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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled  
**“Factors responsible for readmission of people with spinal cord injury”**

Submitted by Sabrina Zaman Shova for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B.Sc. in PT)

.....  
**Md. Shofiqul Islam**

Assistant Professor  
Department of Physiotherapy  
BHPI, CRP, Savar, Dhaka  
**Supervisor**

.....  
**Mohammad Anwar Hossain**

Associate Professor, BHPI &  
Head, Department of Physiotherapy,  
CRP, Savar, Dhaka

.....  
**Muhammad Millat Hossain**

Assistant Professor & course coordinator  
Department of Rehabilitation Science  
CRP, Savar, Dhaka

.....  
**Ehsanur Rahman**

Assistant Professor,  
Department of Physiotherapy  
BHPI, CRP, Savar, Dhaka.

.....  
**Prof. Md. Obaidul Haque**

Head of Physiotherapy Department  
Vice Principal  
BHPI, CRP, Savar, Dhaka

## **DECLARATION**

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

**Signature:**

**Date:**

**Sabrina Zaman Shova**

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## Acronyms

<b>ASIA</b>	:	American Spinal Cord Injury Association
<b>BHPI</b>	:	Bangladesh Health Professions Institute.
<b>BMRC</b>	:	Bangladesh Medical Research Council
<b>CRP</b>	:	Center for the Rehabilitation of the Paralysed
<b>SCI-SCS</b>	:	Spinal Cord Injury Secondary Condition Scale
<b>IRB</b>		Institutional Review Board
<b>RTA</b>		Road Traffic Accident
<b>SCI</b>	:	Spinal Cord Injury
<b>SPSS</b>	:	Statistical Package for the Social Science
<b>UK</b>	:	United Kingdom
<b>WHO</b>	:	World Health Organization

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## Abstract

**Purpose:** To identify the factors which are responsible for re-admission of the people with Spinal Cord Injury (SCI). **Objectives:** To find out the factors responsible for re-admission of the people with Spinal Cord Injury, to identify the socio-demographic information, to explore the injury related status, to evaluate functional status, to find out the association between socio-demographic and different factors related information. **Methodology:** The study was cohort model which was retrospective cohort study design. Total 55 samples were selected conveniently for this study from the CRP nursing station and ward. Data was collected by using mixed type of questionnaire. Descriptive statistic was used for data analysis which focused through table, pie chart and bar chart. **Results:** The leading cause of readmission was diseases of the genitourinary system, including urinary tract infections (UTIs) respiratory system problem and pressure sore. In secondary condition scale patients suffering from pressure sore 22(40%) mild or frequent, injury caused by loss of sensation 34(61.8%) mild or frequent, muscle spasm 22(40%) moderate or occasional, contracture 22(40%) mild or frequent, heterotopic ossification 52(94.5%) not a problem, diabetes mellitus 24(43.6%) not a problem, urinary tract infection 19(34.5%), postural hypotension 24(43.6%), respiratory problem 27(49.1%), chronic problem 38(69.1%), joint and muscle pain 35(63.3%) mild or frequent. The Chi-Square Test performed between socio-demographic information with Problems experience .The Chi square value was 9.76 and P value was 0.02. Significant association was observed between sex and sexual dysfunction ( $P < 0.02$ ). The Chi-Square Test performed between living area and muscle spasm .The Chi square value was 10.102 and P value was 0.018. **Conclusion:** Readmission is a major important issue in people with SCI. Readmission rates remain high after SCI with an increased incidence of issues related to genitourinary system, respiratory system, and skin. Several factors, including neurologic level and extent of SCI, decreased functional abilities at discharge from rehabilitation, and payer source, have been shown to influence readmission rates.

**1.1 Background**

Spinal cord injury (SCI) is a disastrous injury associated with significant functional loss commensurate with the severity of injury (Silver et al., 2012). Common cause include motor vehicle collisions, fall from height, acts of violence, and sports injuries SCI results in complete or incomplete loss of function below the level of the lesion and has a broad impact on medical, social, psychological, and economic conditions for those directly affected, their paid or unpaid caregivers, and the community (Jang et al., 2005)

Physical disability but also emotionally depress the patient. It causes important changes within an individual physical and psychological relationship with their environment The World Health Organization (WHO) states that, 10% of total populations are disabled in Bangladesh & most of those are physically disabled where 43% are physically disable (Whiteneck et al., 2009). According to disability in Bangladesh (2002) the total figure of disability is increasing with population growth and aging. SCI is a devastating condition often affecting young & healthy individuals around the world. SCI can happen to anyone at any age. However, men between the age of 19 and 26 are more likely to have a SCI due to an accident or some act of violence (Ackery et al., 2012). This debilitating condition not only creates enormous. Some of the changes involve the loss of motor function, inability to control bladder & bowel function and the vitiated sexual functioning. It also has an Impact on quality of life, life expectancy and economic burden (Ning et al., 2011).

Spinal cord injury (SCI) results not only in a devastating change to a person's physical functioning and independence, but predisposes the individual to various secondary medical complications throughout life, which may interfere with health and well-being, social activity, productive employment and quality of life. Early readmission rates have been shown to be high in persons with SCI, particularly during the first year after discharge, thereafter declining over the next 5–10 year before increasing again later in life (McColl et al., 2005).

Reasons frequently cited for readmission to hospital in people with SCI include urinary tract infection, pneumonia, gastrointestinal problems, pressure sores, pain and spasticity (Klotz et al., 2002). Some authors have also highlighted the high costs associated with rehospitalization after SCI, with costs averaging in excess of USD\$7500 per readmission over the first year after discharge and USD\$5000 annually thereafter with costs 6–8 times greater in persons with tetraplegia and ASIA impairment grades A-C (USD\$10,000-\$15,000) than in persons with either paraplegia and ASIA impairment grades A–C or all ASIA grade D lesions (USD\$1700–\$1850) (Whiteneck et al., 2009).

In addition, health care costs and utilization of services due to medical complications have been shown to increase with age and duration post injury (Menter et al., 2009). Researchers have developed models to predict risk of re-admission based on various factors such as level and severity of neurological impairment, time since injury, age, sex, race, marital status and employment, although with a significant amount of variance in regression models remaining unexplained (Meyers et al., 2011).

Most previous studies have been cross-sectional in design (Klotz et al., 2002) sometimes based on retrospective medical records or self-administered survey, relatively short follow-up periods or small non representative samples, and where longitudinal and of long duration still limited by missing data for patients not readmitted to hospitals within a particular system (Samsa et al., 2011).

It could be argued that cross sectional studies and even longitudinal studies with high attrition rates may be biased by high morbidity rates in those persons with SCI who are more poorly adjusted or more severely impaired with loss to follow-up of less severely impaired and more mobile individuals (Davidoff et al., 2010).

Readmission following spinal cord injury (SCI) has been studied in a number of countries including the United States, Canada, Turkey, Britain, the Netherlands, Italy and Australia. These studies have reported that approximately one-third of persons with a traumatic SCI will be re hospitalized each year.

These readmission are not only costly to the healthcare system but also to the individual with SCI in terms of increased difficulty in obtaining or sustaining employment or becoming involved in other gainful or leisure activities and a reduced quality of life.

## **1.2 Rationale**

Spinal cord injury has been described as —one of the greater calamities that can befall a human being. Because SCI tends to occur to people in their early adulthood, in the prime of their lives, when they are attending school or developing their careers or establishing a home and starting a family. From a life course perspective, SCI derails people with disabilities leaving them off-track and off-time in regard to socially expectable normative activities and social roles (Pickett et al., 2006).

The aim of this study was to determine the causes of readmission in patients with spinal cord injury (SCI) treated in center for the rehabilitation of paralyzed (CRP). Patients who were re hospitalized after an initial phase of rehabilitation between February (2017-2019) were enrolled into the study. SCI patients aged 1-60 years or over at the time of injury were included. This retrospective cohort study was designed using our medical records. We examined the demographic and injury characteristics of readmission patients with SCI.

So, researcher interest to work in this area and to aware the people and professionals about the factor for readmission for people with spinal cord injury with SCI people. It helps to discover the role and importance of physiotherapy in every sector of Bangladesh.

## **1.3 Research Question**

What are the factors that are responsible for readmission of the people with spinal cord injury?

## **1.3 Study Objectives**

### **1.3.1 General Objectives**

To identify the risk factor for readmission for the people with spinal cord injury?

### **1.3.2 Specific Objectives**

- To identify socio-demographic status.
- To explore the age associate with risk factor.
- To evaluate the risk factor for readmission.

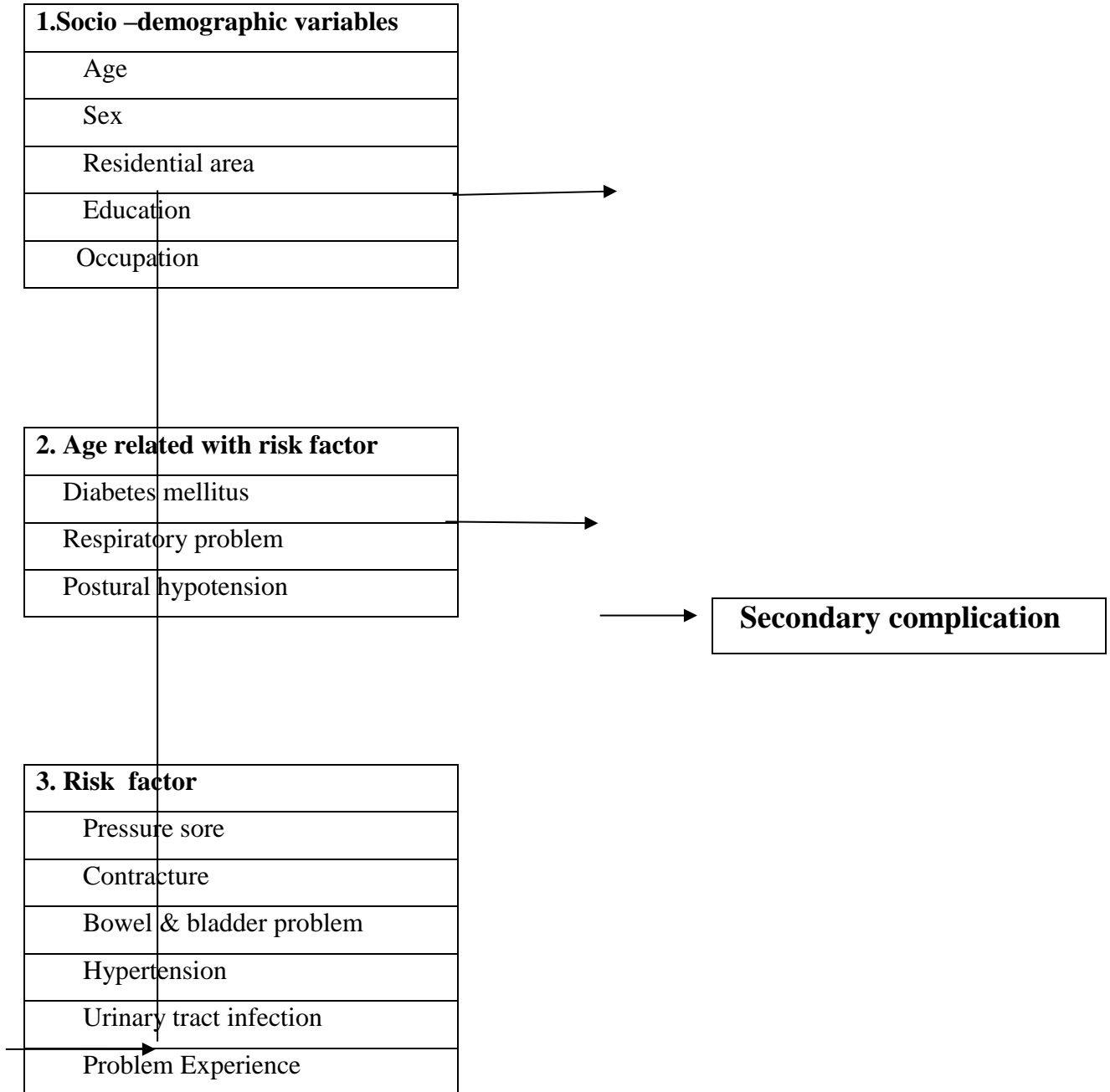


## 1.4 List of variables

### Conceptual framework

#### Independent variables

#### Dependent Variable



## **1.4 Operational definition**

### **Risk factor**

Risk factor is a health problem and its causes many secondary complication.

### **Spinal cord injury**

Any injury to the spinal cord that can cause paralysis of both upper and lower limb called Spinal Cord Injury. Spinal cord injury is an enormous devastating condition often affecting young and male healthy individuals and which result negatively at all the parameters of their life and lastly many secondary complications are developed.

### **Readmission**

Patient cannot maintain healthy life properly and for severe complication patient are readmit in hospital.

### **Activities of daily living**

Task that enable individual to meet the risk factor and how to overcome it in their life.

### **Spinal cord injury (SCI):**

According to (Kirshblum & Waring et al., 2014) spinal cord injury is an insult to the spinal cord resulting in a change, either temporary or permanent, in the cord's normal motor, sensory, or autonomic function. Patients with SCI usually have permanent and often devastating neurologic deficits and disability. The most important aspect of clinical care for the SCI patient is preventing complications related to disability.

**Spinal cord injury classification:**

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

B = Incomplete: Sensory, but not motor, function is preserved below the neurologic level and extends through sacral segments S4-S5

C = Incomplete: Motor function is preserved below the neurologic level, and most key muscles below the neurologic level have a muscle grade of less than 3

D = Incomplete: Motor function is preserved below the neurologic level, and most key muscles below the neurologic level have a muscle grade that is greater than or equal to 3

E = Normal: Sensory and motor functions are normal (Kirshblum & Waring et al., 2014).

People with spinal cord injury (SCI) face complex challenges in their care, recovery and life. Patients with traumatic SCI can develop secondary conditions involving the respiratory and genitourinary systems, as well as problems with pressure ulcers, bowel, cardiovascular, pain and musculoskeletal complications (Ackery et al., 2012). Secondary conditions impact function, quality of life, and community participation, are costly, and many are preventable (Ackery et al., 2012). Prioritization of healthcare resources, planning and improved management require accurate and timely data about the incidence and costs of conditions, although data about the direct costs of care for secondary conditions is limited (Fung et al., 2013). Most studies have been limited to people sustaining SCI prior to 2007 (Fung et al., 2013), limiting the generalizability to current clinical practice and costs (Verrier et al., 2010). Recent population-based studies have focused on the initial direct care costs of SCI using emergency department (ED) and inpatient (Khanna et al., 2014) data in the US. (Silver et al., 2012) reported a 20% increase in ED-related costs between 2007 and 2009 (Dhiman, et al., 2014), while Mahabeleshkavar and Karma reported the incidence and initial readmission costs for SCI admissions in 2009 (Khanna et al., 2014). Similarly, in another research it was reported that the acute care costs of spinal cord injury in the first 2-years after injury for a cohort of 481 individuals with SCI in Quebec, Canada (Radhakrisna et al., 2014). While these studies described the incidence of SCI and acute care costs across the total population of people with SCI, none described the incidence or nature of secondary conditions, or costs of readmissions to hospital. Other recent studies have reported the health care utilization, readmission rates and costs of readmission following SCI but have focused on patients managed in specialist SCI centers only (Hammond et al., 2013) described readmission to acute care from the rehabilitation centre only while (Mahmoudi et al., 2013) investigated the association between race/ethnicity and readmission to hospital post-injury (Mahmoudi et al., 2013), but neither study reported the reasons for readmission and associated costs. In contrast, (Skelton et al., 2014). reported the reasons for health care utilization after discharge from rehabilitation following SCI, but no costs were provided and these studies described the experiences of patients at a limited number of SCI centers (Skelton et al., 2014), which will under-estimate

the total costs and incidence of secondary conditions in the SCI population (Mahmoudi et al., 2013). Therefore, the aim of this population-based study was to describe the incidence, type and direct costs of secondary conditions requiring readmission to hospital, or ED visitation, within the first two years of traumatic SCI (Smout et al., 2013).

Secondary complications are the main reasons for readmission. They are similar across all studies and include respiratory, skin and urinary conditions and spinal surgery to repair or replace hardware (Dryden et al., 2004). Many of these complications are considered preventable. Studies have also examined factors associated with re hospitalization. However, it is difficult to compare factors across studies as there have been changes in SCI treatment practices over time and significant differences with respect to study population definitions, age distributions, variables measured and controlled for in the analyses, definitions of readmission, measures of readmission as well as loss to follow up. Yet, there are some interesting findings. (Davidoff et al., 2010) showed that a readmitted group was less educated and had a substantially longer initial rehabilitation LOS, which is similar to what we found for acute care (Cardenas et al., 2004) also examined the association between readmission and demographics, injury severity, payer sources, LOS, discharge functional status and discharge residence (Cardenas et al., 2004) There were no significant differences by age; and at year 1, the only two significant predictors of readmission were lower motor Functional Independence Measure at discharge from acute rehabilitation and payer (state or federal programs, OR 1.5 and health maintenance organizations, OR 1.4) compared to those with private insurance. In some studies, older age does not appear to be predictor (Lvie et al., 2006). In our study, age 70 years and older approached statistical significance. (Charlifue et al., 2009) found a significant effect of older age on readmission among 7981 people with traumatic SCI in the US National SCI Database. The number of readmission at year 5 was predicted by being older at injury, unmarried at time of injury, having an indwelling catheter, having a more severe SCI and having been hospitalized 5 years earlier. Other studies also found that having an indwelling catheter predicted readmission (Dorset et al., 2008) Injury to the spinal cord has a variety of causes. The primary causes of SCI include motor vehicle, falls, acts of violence, and sporting accidents such as diving, football, skiing, and rugby. In the South Africa context, records at a local rehabilitation

hospital indicated that 90% of SCI were as a result of traumatic injuries. Traumatic Motor vehicle accidents, violence and sports injuries emerged as the leading causes of traumatic SCI (Moore et al., 2011). Traumatic SCI as “a low incidence, high cost disability, requiring tremendous change in a person’s life style”. Spinal cord injuries can also be as a result of inflammatory or degenerative processes such as multiple sclerosis on in tuberculosis of the spinal cord and cancer of the spine, which can occur in all ages, most commonly from young adult age up. Such alternative causes of spinal cord injuries are classified as non-traumatic since they are acquired or developmental (Judd et al., 2007). It is important to note that the causes of traumatic SCI vary geographically (Nash et al., 2007). For instance violence is more prevalent in urban areas than in rural areas, and firearms are more frequently used in urban areas in committing crime (Judd et al., 2007). Research indicates that most new injuries globally occur to young people less than 30 years of age, with approximately 80% being men (Judd et al., 2007).

Although no specific data is available, the incidence of SCI in South Africa is rapidly escalating, particularly in young, male adults. Approximately 70% of SCI are the result of trauma while the remainders are attributed to non-traumatic causes (Nash et al., 2007). The fact that patients are often young and male, any change to their physical functioning, sexuality and independence can be detrimental, particularly at a time when they should be in their prime and may have the added responsibility of supporting a wife and young family. According to the majority of spinal injured patients have led very active lives prior to their injury and the physical limitations experienced often trigger feelings of frustration, worthlessness and helplessness (Judd et al., 2007).

There are varying types of spinal cord injuries, but nearly all are severe. Destruction of a small portion of the cord produces profound motor and sensory changes below the level of the lesion. Spinal cord injuries are named according to the level of neurological injury and classified as either complete or incomplete (Devivo et al., 2012). A spinal lesion is regarded as complete when there is no sensory or motor function preserved in the sacral segments S4-S5. Transverse ischaemic necrosis occurs in this type of lesion. The patient lacks sensory function, position sense and voluntary activity below the lesion. These patients

have the worst prognosis for recovering neurological function. This is due to the fact that all neurological function is lost below the level of the lesion. Those injuries occurring at the cervical level of the vertebral column (neck) will result in quadriplegia (if complete). Injuries occurring in the thoracic, lumbar, or sacral region of the vertebral column (trunk or low back) will result in paraplegia (if complete) (Hicks et al., 2003) An incomplete SCI means that parts of the spinal cord at the level of the lesion are intact, some sensory, proprioceptive (position sense) or motor impulses can still travel up and down the cord. How much sensory/motor function is lost depends on the size and location of the spinal cord lesion. Injuries at the cervical level of the vertebral column (neck) are called quadriparesis (if incomplete). Those injuries occurring in the thoracic, lumbar or sacral regions (trunk or low back) are called paraparesis (if incomplete). A combination and variation of symptoms associated mostly with incomplete spinal injuries, due to damage to different areas of the spinal cord, are grouped as the clinical syndrome of the SCIs. The three most prevalent syndromes are central cord, anterior cord, and Brown-Sequard (Norton et al., 2010).

Patients who suffer from a traumatic or non-traumatic spinal cord lesion (SCL) risk specific clinical problems leading to readmission after the first rehabilitation period. Data from the largest providers of care for patients with SCL in the United States suggest that the risk of readmission is maximal in the first 2 years after injury, decreasing drastically within the first 5 years and gradually thereafter. (Devivo et al., 2012) An assessment of the readmission pattern of SCL patients is extremely useful for planning bed allocation in the management of patients with stabilized SCL who seek medical help. Both the reason for readmission and the burden of care, calculated considering the duration and rate of readmission, have changed during the last two decades. Readmissions are not only needed for simple management of complications, but, with increasing frequency, patients are readmitted to implement the newer therapeutic options that advances in medical rehabilitation have made available for the management of chronic SCL.(Soni et al., 2005). In Italy, the uneven geographical distribution of centres for SCL, and the lack of regular, standardized recordkeeping of SCL data, make it difficult to obtain the records of complications and even of readmission of SCL patients. The annual report of activity from

the main centre suggests that readmission for complications is frequently required by SCL subjects. The study was designed to carry out a multi-centre data collection of first admissions and readmissions of patients with SCL, to gain information about the organization of care of individuals with SCL in Italy. (Paglbod et al., 2003) The present paper evaluates readmissions. The aims were (Samsa et al., 2011) to define the burden of care, quantified as bed occupancy, of stabilized patients compared with acute patients in a specialized setting; (Samsa et al., 2011) to characterize the demand for care, defined by the causes of readmission; and (Devivo et al., 2012) to explore the variables conditioning the length of stay (LoS).

The type of disability associated with SCI varies greatly, depending on the type and severity of the injury, the level of the cord at which injury occurs, and the nerve fibre pathways that are damaged. The more specific effects of spinal cord injury are determined by the type of nerve that has been damaged. Damage to motor nerves results in paralysis, or loss of control of movement. Damage to somatosensory nerves results in loss of sensation and perception; one can no longer feel touch, pain, temperature, or be able to tell without looking where in space the nerve-damaged body part is positioned (Agarwal et al., 2008). This highlights the profound effect spinal cord injuries may have. Paralysis of voluntary musculature can lead to reduced mobility as well as impairment of vocational, and self-care abilities. A host of debilitating and potentially life-threatening physical complication may result. There are primary and secondary physical effects of SCI. Primary damage is defined as the immediate effects of an injury to the spinal cord. Primary areas of functioning affected by the occurrence of a SCI may include, but not limited to, loss of sensation, impaired mobility, bladder and bowel control, pain or sensitivity to stimuli, muscle spasms, and sexual function. Pain is the most sequel following a spinal injury. Sixty percent of patients with posttraumatic para-tetraplegia suffer from severe pain (Carlson et al., 2012) SCI persons are also prone to develop secondary effects. Secondary effects happen as a result of the primary effects in that they develop due to problems arising from primary one. Paralysis or anesthesia, the primary result of SCI, whether partial or complete may lead to the development of further complication in other areas of the body (Donovan et al., 2001). These may occur during the acute and chronic phase. These secondary effects



may include medical problems such as bladder and lung infections and bedsores. Most problems include poorly localized abdominal pain, difficulty with bowel evacuation, hemorrhoids, and abdomen distension. These problems become more prevalent as time after injury increases (Beck et al., 2009).

The difficulty in adjusting to SCI is evidenced in alarming statistics generated by various studies (Hammell et al., 2007). Social and emotional adjustment to SCI can vary considerably from person to person. Some could make satisfactory adjustments, while others remain chronically distressed (Goia et al., 2007). As shown above, many studies have contributed in the understanding of individuals with SCI and the need for relevant research documenting their experiences as to design better prevention and intervention strategies. Although many of the studies are not specifically about SCI individuals in South Africa, there is no reason to believe that they apply less to individuals with SCI in South Africa than individuals elsewhere in the world, in spite of different cultures and socio-economic conditions. (Khan et al., 2010) Furthermore, whilst the research literature looking at the psychological effects of spinal cord injury continues to grow and develop, there is still a long way to go before we are able to describe the global psychosocial effects of this type of injury on the patient, their family and the staff who care for them in their rehabilitation period and in their life afterwards. SCI is an injury causing disability, a factor that has different implications for each individual. Some could make satisfactory adjustments, while others remain chronically distressed (Ning et al., 2011). However physical impairments are barely the tip of the iceberg! The individual with the disability, his/her support systems and lifestyle are affected by the disability. It is uncommon to admit to the fact that disability, whether one's own or that of another can evoke emotion and anxiety. This is often attributed to the fact that disability arouses a sense of vulnerability and dependency (Watermeyer et al., 2001). Individuals who sustain spinal cord injuries experience the trauma of one of the most devastating of all non-fatal injuries. The goals for these individuals are not of medical recovery, but of adaptation to the circumstances that have been drastically changed. The SCI affects the psychological well-being of the patients. This is because SCIs usually demand changes in almost every aspect of an individual's life. Personal relationships; the physical structure of the home, employment,

education; social and leisure pursuits; and financial position are all influence by the injury. (Hieltens et al., 2008).

Faced with changes in physique; physical functioning, functional capacities; accustomed activities, financial status, relationships; and plans for the future, these individuals' previous concepts of themselves have shifted. Personal identity is thus affected the above further emphasize that spinal cord injury is a devastating disability which has long term negative consequences to one's life. The injury occurs suddenly and often without warning, leaving the injured person and family with dramatically altered life situation (Elliott et al., 2006).

This loss is with regard to mobility, control, pleasure sensation, identity, independence, spontaneity and the threat of loss of life at the time of injury A study focusing on the experience of living with a spinal cord injury, found that participants, through individual in-depth interviews, reported an ongoing sense loss, characterized by largely diminishing sense of personal control (Kalpakian et al., 2009).

Pain continues to be a problem for individuals following SCI and an incidence of between 33% - 94 % has been reported in a number of studies. Ongoing pain has been shown to be associated with readmission. It has been found that a relationship between pain and depression develops over time but changes in pain are more likely to have an effect on readmission. In a study of 46 patients admitted with traumatic spinal cord injury to a rehabilitation hospital within 2 years of trauma, 46% experienced pain of a moderate to severe intensity and 70% of those with significant pain experienced symptoms of emotional distress. Those individuals who were experiencing pain, not surprisingly, reported a reduced quality of life compared to those without pain (Oyinbo et al., 2011). .

A possible explanation is that as progress in medical and rehabilitation treatment improves, and LOS decreases, patients with more complex needs are surviving, which could increase the need for readmission and thus explain why there has not been a decrease in the proportion of patients' readmission. Thus, the high rate of physician and specialist utilization and the main reasons for readmission being secondary complications indicate

that current care practices are not preventing or treating these complications adequately. This is of particular concern in rural areas where there is even less access to healthcare services. Alternately, patients are being followed closely in the community, and subtle/acute changes in health prompt appropriate acute care admission for management of secondary health complications. Future research needs to provide a greater understanding of factors at the individual, healthcare provider and health system level contributing to these readmission before effective preventive strategies could be implemented that will in the long term improve the quality and cost of care for persons with SCI (Ning et al., 2012 ).

This data suggests that pain is an important and significant factor in assessing the readmission of spinal cord injury and that it makes a major contribution to quality of life. The data also suggests that psychological interventions designed to control pain such as relaxation, distraction or goal setting and pacing techniques should be an important component of the rehabilitation process. Following spinal cord injury patients frequently take a variety of medications to help with problems such as pain or spasm. The effects of analgesics on mood and cognitive function have been well documented Spasm, however, is frequently treated with the drug baclofen, which is usually well tolerated but some adverse side effects such as sedation, confusion and fatigue, have been reported (Osterthon et al., 2014). Following spinal cord injury many patients develop pressure sores which interrupt their rehabilitation and can cause them additional problems. The development of pressure sores has been found not only to be related to physical factors but is also related to psychosocial factors as well, such as satisfaction with different areas of life and self-concept, It has been found that readmission variables predict not only the presence or absence of pressure sores but also the extent of them and their persistence (Anderson et al., 2007).The implications for the recognition of psychological problems is therefore important in this particular area. Pressure sores themselves may also have an adverse effect on psychosocial aspects of the individual. Studies have found that they form an important predictor of life satisfaction and general quality of life. Spinal cord injury by necessity frequently results in marked changes in body image for the individual. For many people this change in body image may cause significant psychological trauma and they may

require psychological intervention in order to help them reintegrate the loss of their former body image and its effects into their new state. Other elements of the spinal cord injury experience such as the use of a halo brace may also further distort and disrupt body image and self-concept, requiring significant psychological interventions in order to help the individual readjust. (Ginis et al., 2010) Recent research in the field of SCI had highlighted the presence of cognitive deficits in this particular group of individuals. Studies suggest that approximately 40% to 50% of patients have varying degrees and patterns of cognitive impairment. These deficits include difficulties with attention, concentration, memory, problem solving, abstract reasoning, new learning and higher level cognitive skills as well as changes in personality and emotional state.

The factors which contribute to these deficits are varied. Some patients may have sustained a traumatic brain injury at the time of their accident and these may be of varying severity. Others may have secondary 'trauma' as a result of factors such as cerebral edema, hypoxia and anoxia. Other patients may have a history of previous alcohol or substance abuse which in turn may have led to impairment in cognitive function. Recent studies have also reported cerebral effects in individuals subjected to whiplash injuries alone and clearly many SCI patients have sustained this type of injury during their accident (Rathore et al., 2007)

The aim of current rehabilitation trends/approaches focused on recovery from injury, restoration of independence by way of physiotherapy and exercise programs to maintain suppleness of limbs, preventing contractures and pressure sores, improving muscle strengths especially when there is recovery in motor function. Furthermore, teaching patients transfer to and from wheelchairs (Occupational therapy), psychotherapy and improving body image (psychological intervention), teaching family/caregiver to cope and restoring dignity which is the patient's constitutional right (Beck et al., 2009). The ultimate aim is to turn these patients humbly to care for themselves and to avoid morbidity. While this remains the main aim of rehabilitation, however the reality is most depressing, especially in the developing countries. The rehabilitation phase is hampered by the shortage of trained manpower to cope with the increased demand of rehabilitation (Beck et al., 2010). One of the most important changes in the care of SCI persons has been the shift

from hospital to home. Concomitant with this change has been a sizeable amount of time and money the family has to spend on their SCI person/family member. The financial constraints usually have bearing on the SCI and the family. In order to be able to alleviate some of the problems that the families may be faced with, the SCI patient must acquire as much independence as possible before leaving hospital (Ginis et al., 2012) Interestingly, the relative frequency of readmission for the different causes in the current study over a 10-year period after injury were generally quite similar to those reported by (Savic et al., 2005) in a population-based sample of people with chronic SCI for more than 20 years duration. The main differences were a reduction by approximately half in genito-urinary (24 versus 40%) and skin-related (9 versus 17%) readmissions, although similarly high and disproportionate bed occupancy rates for the latter were noted (approximately 30% of all bed days). In an earlier community sample, (Meyers et al., 2011) had identified a similar readmission rate for rehabilitation (e.g. for wheelchair assessments) to that found in the current study (16 versus 11%). Notably, (Whiteneck et al., 2009) described a number of conditions encountered most commonly in younger patients and early after injury, including seizures and central nervous system disorders, urinary retention and hydronephrosis, spasticity and contractures, superficial wounds, injuries and suicides, while some other illnesses were found to be more related to age than chronicity of SCI. A recent large multicenter survey of 1668 persons with tetraplegia revealed that urinary tract complications and pressure sores were reported more commonly in those with complete lesions, whereas contractures and pain were more frequent in persons with incomplete lesions (Ginis et al., 2010). Urinary tract infection was the single most common cause for readmission, with an increased readmission rate for persons with tetraplegia most likely related to type of bladder management, where persons managed with a permanent indwelling catheter have been reported to be approximately twice as likely to experience urinary complications compared to other methods (Whiteneck et al., 2009). Gastrointestinal problems are common after SCI, with incidence known to be related to completeness of lesion and duration since injury (Ginis et al., 2010). The present study also highlights the effect that older age has on bowel function, with almost 50% of readmissions for pseudo bowel obstruction occurring in the 60 years and older age group. Similarly,

pneumonia was shown to be associated with higher level (tetraplegia) and more complete lesions, as well as an increased incidence with age. Pressure sores are of major concern, not only because of demonstrated significant impact on activity, employment, interpersonal relationships and overall emotional well-being, (Ginis et al., 2010) but also because of the very disproportionate bed occupancy and resource utilization associated with them. Pressure sores are known to be a common problem in people with SCI, with later rates reported between 23 and 33% per year. Current results are consistent with data from the Model systems in the USA showing an early incidence of between 7.9 and 8.9% pressure ulcers at 1- and 2-year follow-up examination with an average of 1.6 ulcers per patient with ulcer/s.<sup>18</sup> Similarly, Krause<sup>16</sup> found 10% out of more than 1000 community subjects with SCI reported undergoing plastic surgery in previous 2-year period, with 7% of sample reporting needing to reduce their sitting time by 9 weeks or more. In that study, individuals with tetraplegia and complete lesions were more likely to suffer skin breakdown. In the present study, while this was found to be true for older persons, most readmissions for pressure sores, with high recurrence rates, occurred in a small group of young males with paraplegia. This particular problem warrants special attention to identify the personal characteristics of these recidivists and potential risk factors, as well as to better understand whether this form of behavior may represent parasuicide. Krause demonstrated a strong correlation between skin problems and poorer adjustment, however, could not attribute cause or effect and therefore recommended future studies should investigate the role of behavioral risk factors, both positive preventative behaviors, such as regular weight shift and skin checks and the presence of self-destructive behaviors, such as smoking, alcohol abuse and risk-taking. Heinemann and Hawkins showed a relationship between risk of substance abuse and developing pressure sores, even in those with a history of drinking problems who remained abstinent after injury, suggesting this may relate to poorer coping skills, diminished social support and being more vulnerable to depression, consequently failing to exercise due diligence in self-care and nutrition. Not surprisingly, use of illicit drugs or alcohol after injury and misuse of prescription medication has been shown to predict subsequent UTI and ulcers.( Fuhrer et al., 2017) reported different determinants governing the initial development of a pressure sore (eg extent of paralysis) and those

responsible for progression in ulcer severity (eg ethnicity). The latter may well relate to socioeconomic and educational disadvantage. Some authors have also suggested a link between unemployment and risk of re hospitalization for pressure sores have tried to develop a readmission risk profile for individuals with SCI based on level and severity of neurological impairment, with limited success. It appears that psychosocial factors are likely to play at least as great a role as impairment and functional capacity. Factors shown to be associated with increased likelihood of re hospitalization include lack of tertiary education, indwelling catheter, motor complete injuries, dependence in self-care, and dependence in ambulation. Samsa et al., 2012) showed both injury level and completeness affected the likelihood of re hospitalization. Similarly, the present study also demonstrated a strong effect of impairment on risk of re hospitalization, with significantly reduced time to readmission for more complete lesions (average of 2–3 years for ASIA A–C impairments versus 5 years for ASIA D) and increased likelihood of readmission for certain conditions with tetraplegia. (Samsa et al., 2012) have recommended that prevention efforts should target those persons with previous high utilization. (Davidoff et al., 2010) found patients with potentially preventable readmissions such as pressure sores, urinary tract infection, pulmonary infection and burns.

Spinal cord injury (SCI) results not only in a devastating change to a person's physical functioning and independence, but also predisposes the individual to various secondary medical complications throughout life. Early readmission rates have been shown to be high in persons with SCI, particularly during the first year after discharge (Middleton et al., 2004). Increased readmission rates were observed within 5 or 10 years after injury by some authors (Savic et al., 2005; Middleton et al., 2004). The factors most associated with unplanned readmission were indicated to be as follows: motor complete injuries (31.3%), unemployment (29.2%), continuous indwelling urethral catheter (41.7%), dependence in self-care (36.7%) and dependence in ambulation (30.6%) (Meyers et al., 2011). Readmission of patients with SCI results in high financial costs as well as increased workload in hospitals (Moore et al., 2011).

The numbers and causes of inpatient admittance in 2009 in Turkey, according to data from the Ministry of Health, were as follows: 54 836 people due to road accidents, 64 248 people due to falls and 4941 people due to gunshot injury. The exact number of patients with spinal cord injury is not known (Durmus, et al., 2012). Unfortunately, there was no specific SCI rehabilitation centre or SCI health policy at this time.

Davidoff et al., (2010) reported that readmissions were more common among patients who had longer initial rehabilitations, higher functional dependence and a lower level of education. Mean length of staying for initial rehabilitation was calculated to be  $78.7 \pm 4.1$  days and 47 patients were readmission in the first year for  $11.9 \pm 2.1$  days in their study. Mean initial length of staying for our patients was  $87 \pm 35$  days and mean LOS for re hospitalization was  $72 \pm 16.9$  days. The mean initial LOS was the same in several countries but unfortunately our readmission length of stay was higher than them (Pershouse et al., 2009). The major factors for this longer stay of SCI patients are poor rehabilitation conditions at home and time delay in post-initial-discharge. They were also enrolled into rehabilitation programmes, regardless of their reasons for readmission. This is the one of the major reasons for the longer stay for re hospitalized patients in our study. As domestic and social conditions are rather poor in this country, and most patients are unemployed following their injury, they feel safer and more at ease in hospital, where they can also perform their exercises. Therefore, length of stay is longer in this country when compared with western ones (Pershouse et al., 2009).

Pershouse et al., (2009) stated that the mean length of stay was 11 (1–20) days during readmission for secondary conditions in the first 2 years after initial rehabilitation for SCI patients. Patients admitted for removal of spinal instrumentation had the longest stay. Middleton et al., (2004) reported that pressure ulcers were the most frequent cause for a long length of stay. Patients readmitted as a result of pain or urological surgery constituted the group with the longest stay in our study. Patients' readmission because of urological complications had the shortest stay, with an average of 45 days. Mean length of stay for our urological surgery was 108 days. Age is an important predictor of readmission rates in



the general population, but studies failed to find an association between age and readmission (Ivie & DeVivo et al., 2012) showed the effects of age and neurogenic level on readmission. They reported that pseudo bowel obstruction was higher in older groups and pressure ulcers were noted in younger groups. The spinal surgery ratio was high in the group of under 25-year-olds, whereas pain was the most prevalent factor in the over 25 age group in our patient series ( $P=0.032$ ). Spinal surgery was also reported to be the most common cause for readmission in other studies (Davidoff et al., 2010).

Pressure sores, the third most prevalent reason for readmission is a common complication in patients with motor complete tetraplegia and paraplegia (Middleton et al., 2004). Patients admitted with pressure sores were stage 3 or 4 and required surgical treatment. Mean length of stay was 85 days for patients' readmission for pressure sores and spasticity in our study. (Maugham et al., 2004) showed that a relationship exists between pressure ulcers and readmissions, and individual programmes to treat pressure ulcers decrease readmissions.

Age is an important predictor of readmission rates in the general population, but studies failed to find an association between age and readmission (Ivie and DeVivo et al., 2012). Middleton et al., (2004) showed the effects of age and neurogenic level on readmission. They reported that pseudo bowel obstruction was higher in older groups and pressure ulcers were noted in younger groups. The spinal surgery ratio was high in the group of under 25-year-olds, whereas pain was the most prevalent factor in the over 25 age group in our patient series ( $P=0.032$ ). Spinal surgery was also reported to be the most common cause for readmission in other studies (Davidoff et al., 2010).

Patients admitted due to pain had the longest stay. Chronic pain is the most prevalent condition encountered in SCI patients, which poses major difficulties in its treatment (Ravenscroft et al., 2006) reported that 61% of their patients with SCI had only pain and pain/ dysesthesia. They demonstrated a significant correlation between pain and paraplegia/tetraplegia-related depressed mood and psychosomatic disturbances. Regular check-ups should be performed to offer treatment at an earlier stage before pain becomes chronic (Ravesloot et al., 2015) investigated the secondary conditions experienced by 81

SCI adults, and reported these to be mobility problems, pain, and decrease in condition, sleep disorders, sexual disorders, bladder and intestinal problems due to isolation, urinary tract infections, osteoporosis, pressure sores, autonomic dysreflexia, and heterotopic ossification. It can be seen that patients with SCI have a lot of complications to overcome. Spinal cord injury (SCI) results not only in a devastating change to a person's physical functioning and independence, but predisposes the individual to various secondary medical complications throughout life, which may interfere with health and well-being, social activity, productive employment and quality of life. Early readmission rates have been shown to be high in persons with SCI, particularly during the first year after discharge, thereafter declining over the next 5–10 years (Ivie et al., 2006) before increasing again later in life. (Reasons frequently cited for readmission to hospital in people with SCI including (Savic et al., 2005) urinary tract infection, pneumonia, gastrointestinal problems, pressure sores, pain and spasticity. (Davidoff et al., 2010) Some authors have also highlighted the high costs associated with readmission after SCI, with costs averaging in excess of USD\$7500 per readmission over the first year after discharge and USD\$5000 annually thereafter (Johnston et al., 2007) with costs 6–8 times greater in persons with tetraplegia and ASIA impairment grades A-C (USD\$10,000-\$15,000) than in persons with either paraplegia and ASIA impairment grades A–C or all ASIA grade D lesions (USD\$1700–\$1850).<sup>12</sup> In addition, health care costs and utilisation of services due to medical complications have been shown to increase with age and duration post injury (Menter et al., 2009)

## **CHAPTER –III:**

## **METHODOLOGY**

### **3.1 Study design**

This study were aimed to find out the related factors which are responsible for re-admission patients in CRP. To conduct this study I choose a cohort model which was retrospective cohort study design.

### **3.2 Study site**

This research were conducted at the Centre for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka. Researcher collect the data from those patients who are re- admitted in CRP at SCI unit and also collected the data from data source that was kept securing in nursing station. In the case when data were missing that time I did phone call follow-up. Researcher has chosen setting procedure because the participants were available in SCI unit. From the beginning of CRP, it serves disable patients specially SCI patients. In every year many patients received treatment from CRP.

### **3.3 Study population and sample population**

The patients with Spinal cord injury who were re-admitted in Centre for the Rehabilitation of the Paralyzed and those patients whose data were available in nursing station or by phone call follow up.

### **3.4 Sampling Technique**

Data were collected from nursing station from February (2017-2019).

### **3.5 Sample size**

I have found 55 samples in the data set of February (2017-2019) that was matched with my inclusion criteria.

### **3.6 Inclusion criteria**

- Persons with spinal cord injury
- All SCI re-admitted patients
- Both male and female patients
- Patients who were willing to participate

### **3.7 Exclusion criteria**

- Patients who were mentally unstable
- Those patients whose data were missing in nursing station
- Not willing to participate during phone call follow-up or face to face.
- Non-cooperative patients.

### **3.8 Data collection instrument and tools**

Demographic data is being collected by structured questionnaire and spinal cord injury secondary complication scale is being used as it was pre-tested preform, pretested and valid questionnaire. Questionnaire, pen, papers, pencil consent form, mobile were the tools of data collection.

### **3.9 Data collection procedure**

A structured questionnaire were used to collect data. In this study I took 55 samples where the questionnaire was pre-tested, preform and valid. Before collecting data I took consent from the participants. Researcher collect the data from those patients who are re- admitted in CRP at SCI unit and also collected the data from data source that was kept securing in nursing station. In the case when data were missing that time I did phone call follow-up. Researcher has chosen the setting procedure because the participants were available in SCI unit. If any participants were not willing to participate in the research project then I didn't collect data from them.

### **3.10 Data analysis plan**

The total subjects' names were coded to maintain confidentiality. Subjects were evaluating by spinal cord injury secondary complication scale. The demographic information's were analyzed through the SPSS 20.00 version software program. Data were analyzing mostly in terms of analytic and descriptive statistics and were present in the form of table, graphs and charts. Throughout the analysis of the data, the researcher had identified the socio-demographic status of the people which are re admitted.

### **3.11 Ethical considerations**

The researcher ensured that all participants were informed about their rights and reserves and about the aim and objectives of the study. Researcher also ensured that the organization (CRP) was not hampering by the study. All kinds of confidentiality highly maintained. The researcher explained to the participants about his or her role in this study. The participants were informing clearly that their information would keep confidential. The researcher

assured the participants that the study would not be harmful to them. It was explain that there might not a direct benefit from the study for the participants but in the future cases like them might get benefit from it. Information from this study will anonymously code to ensure confidentiality and will not personally identify in any publication containing the result of this study.

<b>CHAPTER –IV:</b>
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<b>RESULTS</b>
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Purpose of this study was to find out the factors which are responsible for readmission of people with Spinal Cord Injury. Data were numerically coded and analysis the data by using an SPSS 20.0 version software program and the result calculated as percentages and presented by using in table, pi-chart and bar-chart.

## 4.1 Socio demographic information

### 4.1.1 Age:

In this study finds out the 50 participants (1-18) were 7 (12.7%), (21-40) were 37 (67.3%) and (41-60) were 11 (20%) (**Table: 1**).

<b>Age</b>	<b>Number</b>	<b>Percent</b>
1-18	7	12.7%
21-40	37	67.3%
41-60	11	20%
<b>Total</b>	<b>55</b>	<b>100%</b>

**Table 1:** Age of the patients

### 4.1.2 Sex:

The study finds out the 50 participants 45(81.8%) were male and 10(18.2%) were female. Male participants were more than female (**Table-2**)

<b>Sex of the participants</b>	<b>Number</b>	<b>Percentage</b>
Male	45	81.8
	29	

Female	<b>10</b>	<b>18.2</b>
Total	<b>55</b>	<b>100.0</b>

**Table-2:** Sex of the patients.

#### **4.1.3 Marital Status of the patient:**

This figure shows the marital status of the participants. There 50 participants which are included in this study. Among them 35 (58%) participants were married, 24 (31%) participants were unmarried, widow were 04 (7%) and divorced were 02 (4%) were separate (**Figure-1**).



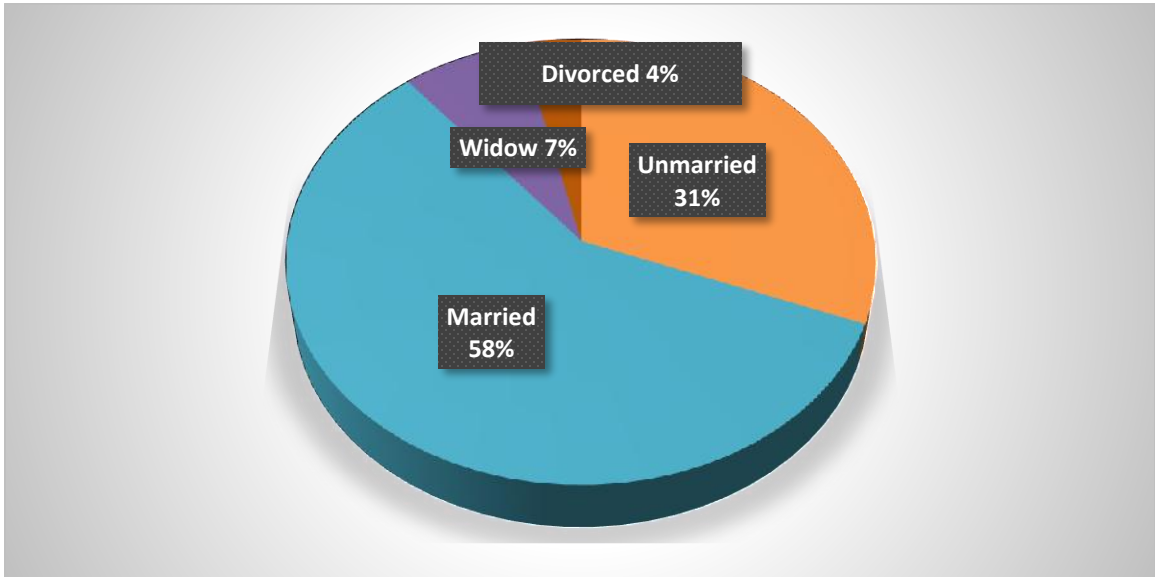


Figure-1: Marital status of the patients.

#### **4.1.4 Religion:**

The study finds out the 50 participants 65% were Muslim, 35% were Hindu.

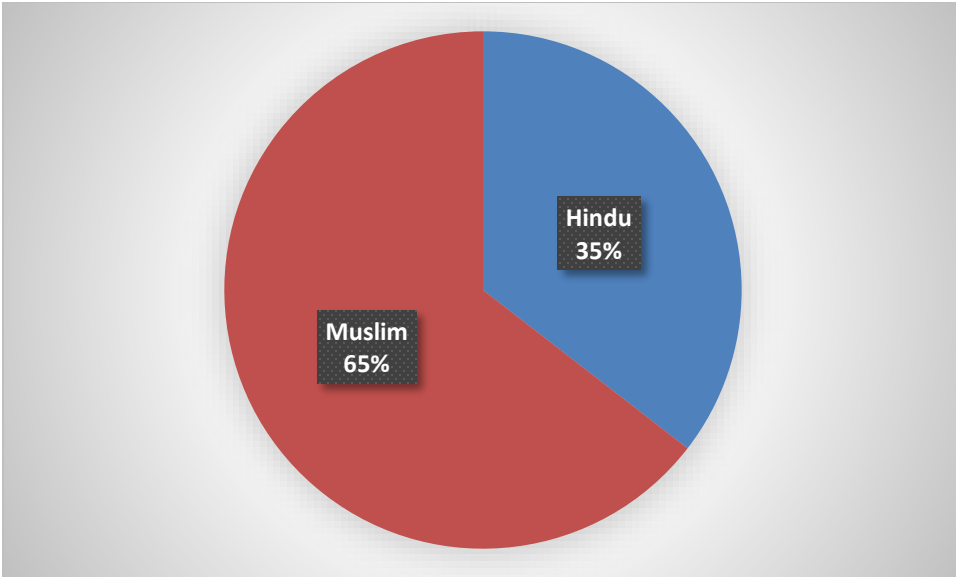


Figure-2: Religion of the patients.

#### 4.1.5 Education:

Among all 50 participants the number of uneducated participants were 7 (12.7%), primary were 28 (50.9%), Secondary school certificate were 13 (23.6%), H.S.C participants were 3 (5.5%), Honor's 4 (7.3%), (**Table-3**).

<b>Educational status</b>	<b>Number</b>	<b>Percentage</b>
Illiterate	7	12.7%
Primary	28	50.9%
Secondary	13	23.6%
Higher secondary	3	5.5%
Honours	4	7.3
Total	55	100

**Table-3:** Educational status of the participants

#### **4.1.6 Occupation:**

The occupation of the participants among 55 there business were 19(34.5%), shopkeeper were 10 (18.2%), Service holder were 1 (1.8%), teacher were 3 (5.5%) and others people occupation were 22 (40%), (**Table-4**).

<b>Occupation</b>	<b>Number</b>	<b>Percentage</b>
Service holder	1	1.8%
Business	19	34.5%
Teacher	3	5.5%
Shopkeeper	10	18.2%
Others	22	40%
Total	55	100%

**Table-4:** Occupation of the participants

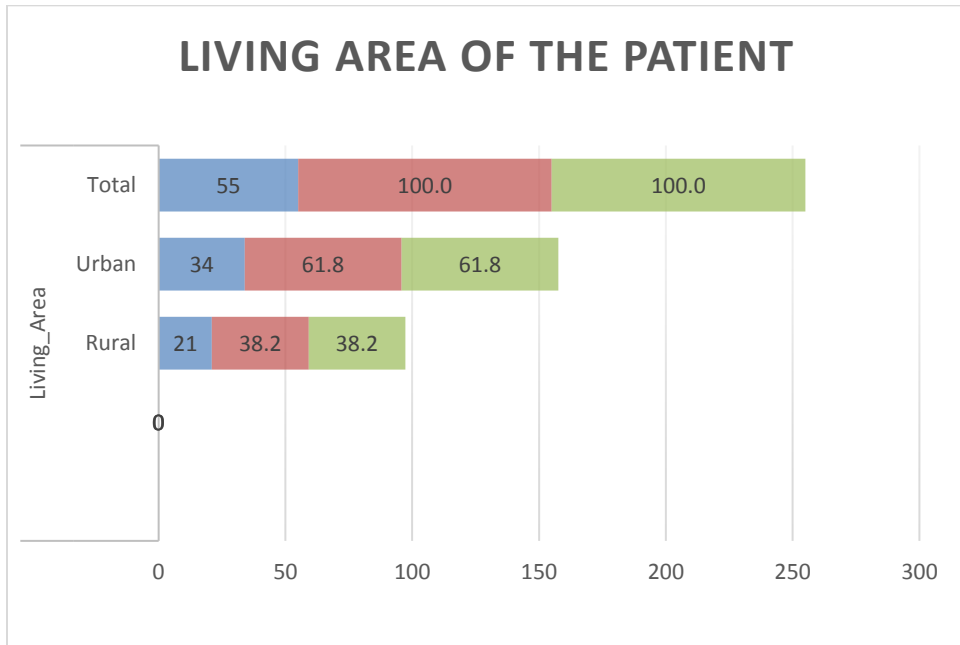
**4.1.7 Causes of injury:** Among 50 participants maximum cause of injury were road traffic accident 13 (23.6%) and then fall from height 25 (45.5%) others 17 (30.9%) were different cause of spinal cord injury. (**Table-5**)

<b>Causes of injury</b>	<b>Frequency</b>	<b>Percent</b>
Fall from height	25	45.5%
Road traffic accident	13	23.6%
Others	17	30.9%
<b>Total</b>	<b>55</b>	<b>100%</b>

**Table-5:** Causes of injury of the patients

#### **4.1.8 Living Area:**

In total 50 participants there were Urban 34 (61.8%) and Rural were 21 (38.2%). Urban were more than Rural. (Figure-3)



**Figure-3:** Living area of the patients.

#### **4.1.9 Types of the injury:**

There were total 50 participants among them paraplegia 50 (90.9%) and tetraplegia were 5 (9.1%). **(Table-6)**

<b>Types of injury</b>	<b>Frequency</b>	<b>Percent</b>
Traumatic tetraplegia	5	9.1%
Traumatic paraplegia	50	90.9%
Total	55	100%

**Table-6:** Types of the injury

**4.1.10 Neurological level:** There were total 50 participants among then maximum level of injury C<sub>4</sub>-C<sub>6</sub> (9.1%), then T<sub>3</sub>-T<sub>12</sub> (67.3%), then L<sub>1</sub>-L<sub>3</sub> (23.6%).(**Table-7**)

<b>Neurological level</b>	<b>Frequency</b>	<b>Percent</b>
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C <sub>4</sub> -C <sub>6</sub>	5	9.1%
T <sub>3</sub> -T <sub>12</sub>	37	67.3%
L <sub>1</sub> -L <sub>3</sub>	13	23.6%
Total	55	100

**Table-7: Neurological level**

**4.1.11 Skeletal level:** There were total 50 participants among then maximum level of injury C<sub>4</sub>-C<sub>7</sub> (9.1%), then T<sub>5</sub>-T<sub>12</sub> (63.6%), then S<sub>4</sub>-S<sub>5</sub> (1.8%). (**Table-8**)

Skeletal level	Frequency	Percent
C <sub>4</sub> -C <sub>7</sub>	5	9.1%
T <sub>5</sub> -T <sub>12</sub>	31	63.6%
L <sub>1</sub> -L <sub>3</sub>	14	23.6%
S <sub>4</sub> -S <sub>5</sub>	1	1.8%

**Table 8: Skeletal level**

#### **4.2 Spinal Cord Injury Secondary Condition Scale (SCI-SCS) Questionnaire:**



- **Pressure sore:** There were 50 participants among them 1 (1.8%) patients suffering from chronic problem, 21 (38.2%) patients suffering from moderate problem, 22 (40%) patients suffering from mild problem and 11(1.8%) patients not in a problem.
- **Injury caused by loss of sensation:** There were 50 participants among them (0%) patients suffering from chronic problem, 3(5.5%) patients suffering from moderate problem, 34(61.8%) patients suffering from mild problem and 18(32.7%) patients not in a problem.
- **Muscle spasm:** There were 50 participants among them 2(3.6%) patients suffering from chronic problem, 22(40%) patients suffering from moderate problem, 21(38.2%) patients suffering from mild problem and 10(18.2%) patients not in a problem.
- **Contracture:** There were 50 participants among them 1(1.8%) patients suffering from chronic problem, 20(36.4%) patients suffering from moderate problem, 22(40%) patients suffering from mild problem and 12(21.8%) patients not in a problem.
- **Heterotopic Ossification:** : There were 50 participants among them (0%) patients suffering from chronic problem, (0%) patients suffering from moderate problem, 3(5.5%) patients suffering from mild problem and 52(94.5%) patients not in a problem.
- **Diabetes Mellitus:** : There were 50 participants among them 3(5.5%) patients suffering from chronic problem, 13(23.6%) patients suffering from moderate problem, 15(27.3%) patients suffering from mild problem and 24(43.6%) patients not in a problem.
- **Bladder Dysfunction:** : There were 50 participants among them 1(1.8%) patients suffering from chronic problem, 16(29.1%) patients suffering from moderate problem, 32(58.2%) patients suffering from mild problem and 6(10.9%) patients were not in a problem.
- **Bowel Dysfunction:** There were 50 participants among them 1(1.8%) patients suffering from chronic problem, 18(32.7%) patients suffering from moderate

problem, 22(40%) patients suffering from mild problem and 14(25.5%) patients not in a problem.

- **Urinary Tract Dysfunction:** There were 50 participants among them 19(34.5%) patients suffering from chronic problem, 19(34.5%) patients suffering from moderate problem, 10(18.2%) patients suffering from mild problem and 7(12.2%) patients not in a problem.
- **Sexual Dysfunction:** There were 50 participants among them 13(23.6%) patients suffering from chronic problem, 10(18.2%) patients suffering from moderate problem, 13(23.6%) patients suffering from mild problem and 19(34.5%) patients not in a problem.
- **Autonomic dysreflexia:** There were 50 participants among them 1(1.8%) patients suffering from chronic problem, 5(9.1%) patients suffering from moderate problem, 33(60%) patients suffering from mild problem and 16(29.1%) patients not in a problem.
- **Postural Hypotension:** There were 50 participants among them 1(1.8%) patients suffering from chronic problem, 17(30.9%) patients suffering from moderate problem, 13(23.6%) patients suffering from mild problem and 24(43.6%) patients not in a problem.
- **Circulatory Problem:** There were 50 participants among them 4(7.3%) patients suffering from chronic problem, 16(29.1%) patients suffering from moderate problem, 25(45.5%) patients suffering from mild problem and 10(18.2%) patients not in a problem.
- **Respiratory Problem:** There were 50 participants among them 4(7.3%) patients suffering from chronic problem, 27(49.1%) patients suffering from moderate problem, 22(40%) patients suffering from mild problem and 2(3.6%) patients not in a problem.
- **Chronic Problem:** There were 50 participants among them (0%) patients suffering from chronic problem, 8(14.5%) patients suffering from moderate problem,

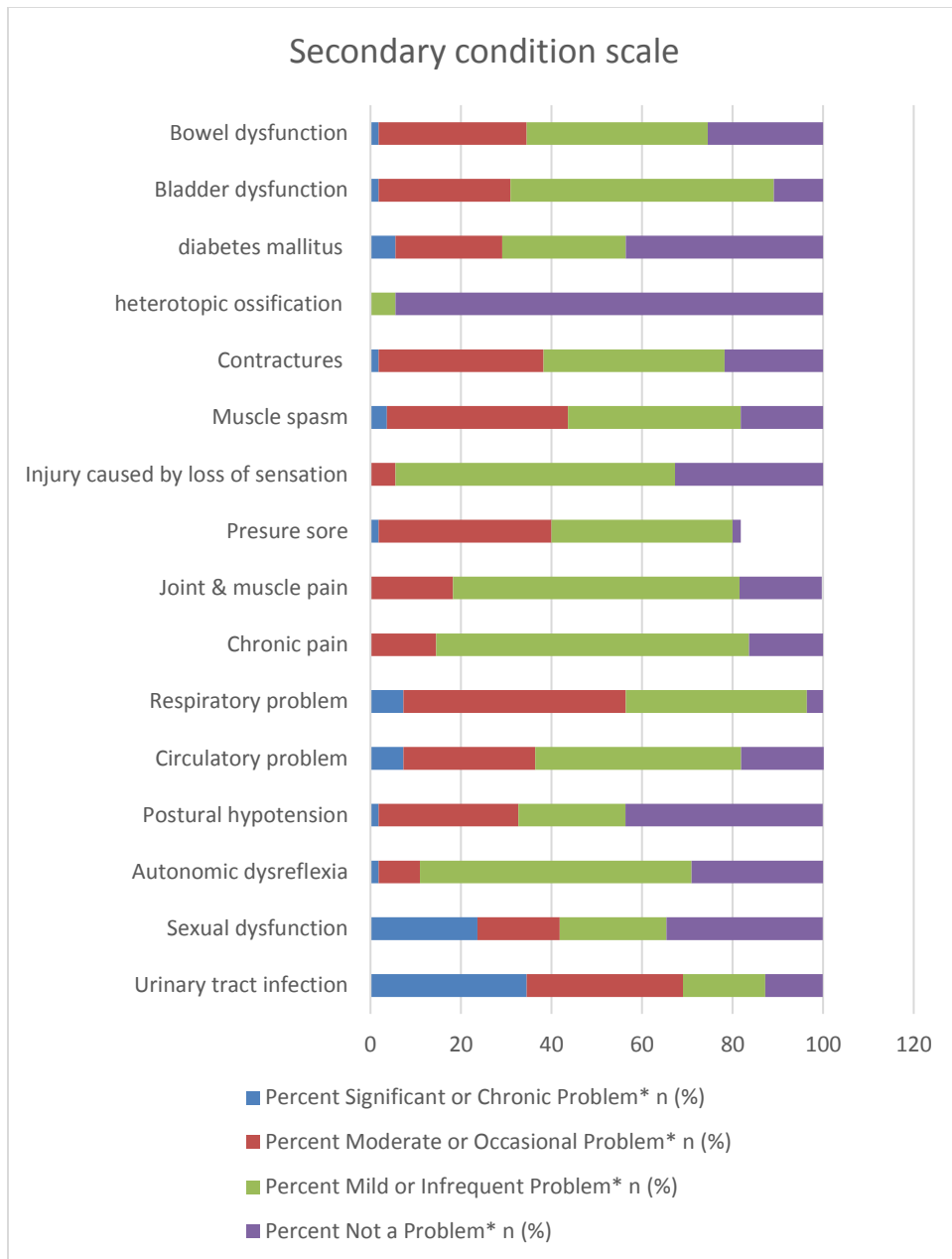
38(69.1%) patients suffering from mild problem and 9(16.4%) patients not in a problem.

- **Joint and muscle pain:** There were 50 participants among them (0%) patients suffering from chronic problem, 10(18.2%) patients suffering from moderate problem, 35(63.3%) patients suffering from mild problem and 10(18.2%) patients not in a problem.

<b>Secondary condition</b>	<b>Percent Significant or Chronic Problem* n (%)</b>	<b>Percent Moderate or Occasional Problem* n (%)</b>	<b>Percent Mild or Infrequent Problem* n (%)</b>	<b>Percent Not a Problem* n (%)</b>
<b>Pressure Sore</b>	1 (1.8%)	21 (38.2%)	22 (40%)	11(1.8%)

<b>Injury caused by loss of sensation</b>	--	3 (5.5%)	34 (61.8%)	18(32.7%)
<b>Muscle spasm</b>	2 (3.6%)	22 (40%)	21 (38.2%)	10(18.2%)
<b>Contractures</b>	1(1.8%)	20(36.4%)	22(40%)	12(21.8%)
<b>Heterotopic ossification</b>	--	--	3(5.5%)	52(94.5%)
<b>Diabetes Mellitus</b>	3(5.5%)	13(23.6%)	15(27.3%)	24(43.6%)
<b>Bladder dysfunction</b>	1(1.8%)	16(29.1%)	32(58.2%)	6(10.9%)
<b>Bowel dysfunction</b>	1(1.8%)	18(32.7%)	22(40%)	14(25.5%)
<b>Urinary tract infection</b>	19(34.5%)	19(34.5%)	10(18.2%)	7(12.7%)
<b>Sexual dysfunction</b>	13(23.6%)	10(18.2%)	13(23.6%)	19(34.5%)
<b>Autonomic dysreflexia</b>	1(1.8%)	5(9.1%)	33(60%)	16(29.1%)
<b>Postural hypotension</b>	1(1.8%)	17(30.9%)	13(23.6%)	24(43.6%)
<b>Circulatory problem</b>	4(7.3%)	16(29.1%)	25(45.5%)	10(18.2%)
<b>Respiratory problem</b>	4(7.3%)	27(49.1%)	22(40.0%)	2(3.6%)
<b>Chronic pain</b>	--	8(14.5%)	38(69.1%)	9(16.4%)
<b>Joint &amp; muscle pain</b>	--	10(18.2%)	35(63.3%)	10(18.2%)

**Table-9: Secondary condition scale findings of the patients.**



**Figure-5: Secondary condition scale**

#### 4.3.1 Association between Gender and Sexual dysfunction:

In Association between Gender and sexual dysfunction either by myself or by others, the way I want them done by Cross tabulation in there were found not experienced in the last 3 months (12 male and 7 female), mild problem (10 male and 3 female), moderate (10 male and 0 female) chronic problem (13 male and 0 female)

**Table-10: Association between Gender and Sexual dysfunction**

Gender	Sexual dysfunction				Total
	Not experienced in the last 3 months or is an insignificant problem.	Mild or infrequent problem	Moderate or occasional problem	Significant or chronic problem	
Male	12	10	10	13	45
Female	7	3	0	0	10
<b>Total</b>	<b>19</b>	<b>13</b>	<b>10</b>	<b>13</b>	<b>55</b>

The Chi-Square Test performed between socio-demographic information with Problems experience .The Chi square value was 9.76 and P value was 0.02. Significant association was observed between gender and sexual dysfunction (P<0.02).

Association between Gender and Sexual dysfunction :	Chi square	P value
	<b>9.76</b>	<b>0.02</b>

**4.3.2 Association between marital status and Diabetes mellitus:** In Association between marital status and diabetes mellitus either by myself or by others, the way I want them done by Cross tabulation in there were found not experienced in the last 3 months (4 married,20 unmarried,0 widow,0 divorce), mild problem (6married,8 unmarried,1 widow,0 divorce), moderate (6 married,3 unmarried,2 widow, and 2 divorce) chronic problem (1 married,1 unmarried,1 widow and 0 divorced).

**Table-11: Association between marital status and Diabetes mellitus**

Marital Status	Diabetes mellitus				Total
	Not experienced in the last 3 months or is an insignificant problem.	Mild or Infrequent problem	Moderate or Occasional problem	Significant or Chronic problem	
Married	4	6	6	1	17
Unmarried	20	8	3	1	32
Widow	0	1	2	1	4
Divorced	0	0	2	0	2
<b>Total</b>	<b>24</b>	<b>15</b>	<b>13</b>	<b>3</b>	<b>55</b>

The chi square test perform between association between marital status and my diabetes mellitus I want to Cross tabulation to there are significant association between marital status and diabetes mellitus .I want the chi square value were 20.894 and P Value were 0.013 significant. Chi square test were  $P < 0.013$  so the results were significant.

Association between Marital status and Diabetes Mellitus :	Chi square	P value
		20.894

**4.3.3 Association between living area and Muscle spasm:** In association between living area and muscle spasm either by myself or by others, the way I want them done by Cross tabulation in there were found not experienced in the last 3 months (0 rural, and 10 urban), mild problem (9 rural, and 12 urban), moderate (10 rural and 12 urban) chronic problem (2 rural and 0 urban)

**Table-12: Association between living area and Muscle spasm**

Living area	Muscle spasm(spasticity)				Total
	Not experienced in the last 3 months or is an insignificant problem.	Mild or infrequent problem	Moderate or Occasional problem	Significant or Chronic problem	
Rural	0	9	10	2	21
Urban	10	12	12	0	34
<b>Total</b>	<b>10</b>	<b>21</b>	<b>22</b>	<b>2</b>	<b>55</b>

The Chi-Square Test performed between living area and muscle spasm .The Chi square value was 10.102 and P value was 0.018. Significant association was observed between living area and muscle spasm (P<0.018).

Association between Living area & Muscle spasm :	Chi square	P value
	10.102	0.018



This study were aimed to find out the related factors which are responsible for re-admission patients in CRP. To conduct this study I choose a cohort model which was retrospective cohort study design.

Readmission of patients with SCL is a well-known problem that is widely debated in literature. Despite the efforts for complete and efficient rehabilitation, SCL subjects carry a high risk of complications throughout their lives (DeVivo et al., 2012).

In this study finds out the 50 participants the age (1-18) were 7 (12.7%), (21-40) were 37 (67.3%) and (41-60) were 11 (20%). The study finds out the 50 participants 45(81.8%) were male and 10(18.2%) were female. Male participants were more than female. There 50 participants which are included in this study. Among them 35 (58%) participants were married, 24(40%) participants were unmarried and 1(2%) were separate. Among all 50 participants the number of uneducated participants were 7 (12.7%), primary were 28 (50.9%), Secondary school certificate were 13 (23.6%), H.S.C participants were 3 (5.5%), Honor's 4 (7.3%0).

The occupation of the participants among 55 there business were 19(34.5%), shopkeeper were 10 (18.2%), Service holder were 1 (1.8%), teacher were 3 (5.5%) and others people occupation were 22 (40%). Among 50 participants maximum cause of injury were road traffic accident 13 (23.6%) and then fall from height 25 (45.5%) others 17 (30.9%) were different cause of spinal cord injury. There were total 50 participants among the maximum level of injury C<sub>4</sub>-C<sub>6</sub> (9.1%), then T<sub>3</sub>-T<sub>12</sub> (67.3%), then L<sub>1</sub>-L<sub>3</sub> (23.6%).

In secondary condition scale patients suffering from pressure sore 22(40%) mild or frequent, injury caused by loss of sensation 34(61.8%) mild or frequent, muscle spasm 22(40%) moderate or occasional, contracture 22(40%) mild or frequent, heterotopic ossification 52(94.5%) not a problem, diabetes mellitus 24(43.6%) not a problem, urinary tract infection 19(34.5%), postural hypotension 24(43.6%), respiratory problem 27(49.1%), chronic problem 38(69.1%), joint and muscle pain 35(63.3&)mild or frequent.

The Chi-Square Test performed between living area and muscle spasm .The Chi square value was 10.102 and P value was 0.018. Significant association was observed between sex and sexual dysfunction ( $P < 0.018$ ). The chi square test perform between association between marital status and my diabetes mellitus I want to Cross tabulation to there are significant association between marital status and diabetes mellitus .I want the chi square value were 20.894 and P Value were 0.013 significant. Chi square test were  $P < 0.013$  So the results were significant.

Long-term, secondary medical complications play an important role in the continuum of care for people with SCI. They are a frequent cause of morbidity and mortality and lead to increased rates of readmission, increased cost of care, loss of employability, and decreased quality of life (QOL).( Med et al., 2002) MSCIS programs have shown a decline in the annual readmission rate and in LOSs, citing advances in the prevention of secondary medical complications and improved treatment efficiency.( Charles et al., 2005 )Studies have shown that acute rehabilitation length of stays continue to decrease and patients are being discharged earlier. (Med et al., 2002) Although this has lead to short-term cost savings, there are concerns that long-term morbidity and need for increased readmission may place patients at higher risk and that this may represent a significant cost factor in long-term SCI management 35(63.3%).

Readmission for care of pressure ulcers was also common in our study, with 11% of patients readmitted for this condition, and total hospitalization costs of AUD\$1.8M. Others have highlighted the prevalence and cost of secondary conditions of the skin as a significant problem in people living with SCI ( Johnton et al., 2007)in their study of 115 patients in the US found that while urological conditions were more common than readmission for skin conditions, skin conditions were more expensive (Whiteneck et al., 2009). Similarly, we found that the average cost of readmissions involving pressure ulcers was \$AUD 31,180 compared to \$AUD 19,617 for readmissions involving UTI.

The first limitation of this study was small sample size. It was taken only 55 samples. A very few researches have been done on factors responsible for re-admission of people with SCI. So there was little evidence to support the result of this project study in the context of Bangladesh. Another major limitation was time. The time period was very limited to conduct the research project on this topic. As the study period was short so the adequate number of sample could not arrange for the study.

**6.1 Conclusion**

Readmission rates remain high after SCI with an increased incidence of issues related to genitourinary system, respiratory system, and skin. Several factors, including neurologic level and extent of SCI, decreased functional abilities at discharge from rehabilitation, and payer source, have been shown to influence readmission rates. The rising cost of SCI care, along with the associated personal, vocational, and family impact, make further understanding of these issues important. Medical management continues to be an integral part of the long-term follow-up and coordinated comprehensive services along the continuum of SCI care. It is hoped that an increased understanding of issues related to readmission and secondary SCI complications will assist in their prevention and management, decrease readmission rates and the enormous costs of medical care, and improve quality of life in people with SCI.

Overall, analysis of routine administrative data across a population can improve our understanding of SCI secondary conditions. In our population, hospitalization for complications within 2-years of traumatic SCI was common and costly. The findings have provided contemporary cost and incidence data about secondary conditions across the total population of SCI, identified areas of clinical concern, and highlighted the need for implementation of strategies to minimize these conditions. In particular, improved bladder and pressure area management could result in substantial cost and morbidity savings following SCI. Repeating this study would enable measurement of any reduction in incidence and costs resulting from changes in clinical practice.

## **6.2 Recommendation**

The purpose of the study was to find out the factors responsible for re-admission of people with SCI. Though the study had some limitations but investigator identified some further step that might be taken for the better accomplishment of further research. The main recommendations would be as follow.

The study was also limited in the ability to examine potential underlying causes for re-hospitalization. While rehospitalisation occurs because of diagnosis of problems, the actual cause may include inadequate training or poor compliance with use of preventative techniques. In addition, individual factors such as cognitive deficits, where people with SCI may have difficulty learning techniques, and/or depression, which has been found to reduce compliance with preventative techniques, were not evaluated.

The random sampling technique rather than the convenient would be chosen in further in order to enabling the power of generalization the results, the duration of the study was short.

Future wider time would be taken for conducting the study, investigator use only 50 participants as the sample of this study, in future the sample size would be more.

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## APPENDIX

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1. Permission Letter
2. Consent Form (Bangla)
3. Consent Form (English)
4. Questionnaire (Bangla)
5. Questionnaire (English)
6. IRB Permission Letter



Permission letter

January 2, 2019

To,  
Head of Medical Service Wings (MCSW)  
Centre for the Rehabilitation of the Paralysed (CRP),  
Chapain, Savar, Dhaka-1343.

Through: Rehabilitation Manager

**Subject:** Seeking permission for data collection of 4<sup>th</sup> year physiotherapy research project.

Dear Sir,

With due respect to state that, I am Sabrina Zaman Shova student of 4<sup>th</sup> Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). I have gotten my approval from ethical committee and my research project entitled "Factors responsible for re-admission of people with spinal cord injury". My entire research will be supervised by Md. Shofiqul Islam, Assistant Professor of Physiotherapy, BHPI, CRP, Savar, Dhaka-1343, Bangladesh. I have to conduct this research project as a partial fulfilment for the degree of B.Sc in physiotherapy. I want to collect the data for my research project from the patients of CRP. So I need permission for data collection from the Spinal Cord Injury unit of Physiotherapy department of CRP, Savar. I would like to assure that anything of my study will not be harmful for the participants.

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

Sincerely,

Sabrina Zaman Shova.

Sabrina Zaman Shova

4th professional B.Sc in Physiotherapy

Session: 2013-14

Bangladesh Health Professions Institute (BHPI)

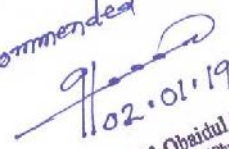
(An academic Institute of CRP)

CRP, Chapain, Savar, Dhaka-1343.

Forwarded for permission  
Shofiq  
02.01.2019

Forwarded of recm. to  
HMCSW  
Jan 2019

Recommended

  
02.01.19

Prof. Md. Obaidul Haque  
Head, Department of Physiotherapy  
BHPI, CRP, Savar, Dhaka-1343.

Forwarded  
to  
Recomm. by D/A  
S-10-1343

## সম্মতিপত্র

আসসালামুয়ালাইকুম / নমস্কার

আমি সাবরিনা জামান শোভা, বাংলাদেশ হেলথ প্রফেশনাল ইন্সটিটিউট এর বিএসসি ইন ফিজিওথেরাপি বিভাগের একজন ছাত্রী। আমি একটি গবেষণা করছি যার শিরোনাম হল, **যেসব কারণে মেরুদণ্ডে আঘাতপ্রাপ্ত রোগী পুনরায় ভর্তি হয়**” যেটা আমার কোর্সের অন্তর্ভুক্ত। এই জন্য আমি আপনার কাছে কিছু প্রশ্নের উত্তর জানতে চাচ্ছি, যেটাতে প্রায় ২০-২৫ মিনিট সময় লাগবে। আমি এই সময়ের মধ্যে আপনার আর্থ সামাজিক প্রেক্ষাপট, আপনার শারীরিক অবস্থা এবং কিছু ব্যক্তিগত প্রশ্ন করব। আমি আপনাকে নিশ্চিত করছি যে আপনি যেসব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে। এখানে অংশগ্রহণ আপনার নিজের ইচ্ছার উপর নির্ভর করে। আপনি চাইলে আমার গবেষণার পর্যবেক্ষক মোঃসফিকুল ইসলাম, সহকারী অধ্যাপক, বিএইচপিআই, সিআরপি, সাভার, ঢাকা এর সাথে যোগাযোগ করতে পারেন। উল্লেখ্য আপনি চাইলে যেকোন সময় অংশগ্রহণের তালিকা থেকে নিজের নাম বাদ দিয়ে চলে যেতে পারেন।

গবেষণাটি শুরু করার আগে আপনার কোন প্রশ্ন আছে?

আমি কি আপনার অনুমতি পেয়ে সাক্ষাতকারটি আরম্ভ করতে পারি?

হ্যা.....

না.....

গবেষকের স্বাক্ষরঃ

তারিখঃ

মোবাইলঃ ০১৯৮৭১৬৮২২৭

অংশগ্রহণকারীর স্বাক্ষরঃ

তারিখঃ

মোবাইলঃ

**Verbal Consent Statement**

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

Assalamualaikum/Namasker,

My name is Sabrina Zaman Shova, I am conducting this study as a part of my academic work of B.Sc. in Physiotherapy under Bangladesh Health Professions Institute (BHPI), which is affiliated to University of Dhaka. My study title is — “**Factors responsible for readmission of people with SCI**”. I would like to know about some personal and other related information regarding Spinal cord injury. You will need to answer some questions which are mentioned in this form. It will take approximately 20-25 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. All information provided by you will keep in a locker as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous and also all information will be destroyed after completion of the study.

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

If you have any query about the study or your right as a participant, you may contact with me and/or Md. Shofiqul Islam, Assistant Professor of Physiotherapy, Bangladesh Health Professions Institute (BHPI), Savar, Dhaka.

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

**Yes :**

**No :**

Signature of the Participant \_\_\_\_\_ Date:

Mobile No:

**Spinal Cord Injury Secondary Conditions Scale (SCI-SCS)**

Instructions to patient:

For the following 16 health problems, please rate how much each one affected your activities and independence in the last 3 months. If you have not experienced a secondary condition in the last 3 months or if it is an insignificant problem for you, please circle "0." Use the following scale to rate each of the secondary conditions.

SCI-SCS Rating System:

0 = NOT experienced in the last 3 months or is an insignificant problem.  
 1 = MILD or INFREQUENT problem.  
 2 = MODERATE or OCCASIONAL problem.  
 3 = SIGNIFICANT or CHRONIC problem.

Patient name: \_\_\_\_\_

Date: \_\_\_\_\_

<b>Health problem:</b>	<b>Description:</b>	<b>Rating:</b>
Pressure sore(s)	These develop as a skin rash or redness and progress to an infected sore. Also called skin ulcers, bedsores and decubitus ulcers.	0 1 2 3
Injury caused by loss of sensation	Injury may occur because of a lack of sensation, such as burns from carrying hot liquids in the lap or sitting too close to a heater or fire.	0 1 2 3
Muscle spasms (spasticity)	Spasticity refers to uncontrolled, jerky muscle movements, such as uncontrolled muscle twitch or spasm. Often spasticity increases with infection or some kind of restriction, like a tight shoe or belt.	0 1 2 3
Contractures	A contracture is a limitation in range of motion caused by a shortening of the soft tissue around a joint, such as an elbow or hip. This occurs when a joint cannot move frequently enough through its range of motion. Pain often accompanies this problem.	0 1 2 3
Heterotopic bone ossification	This is an overgrowth of bone, often occurring after a fracture. Early signs include a loss of range of motion, local swelling and warmth at the area to the touch. This condition must be diagnosed by a physician.	0 1 2 3

Diabetes mellitus	Diabetes is a problem resulting from irregularities in blood sugar levels. Symptoms include frequent urination and excessive thirst. This condition is diagnosed by a physician.	0 1 2 3
Bladder dysfunction	Incontinent, bladder or kidney stones, kidney problems, urine leakage and urine back up are all symptoms of bladder dysfunction. NOTE: there is a separate item for urinary tract infections.	0 1 2 3
Bowel dysfunction	Diarrhea, constipation, “accidents”, and associated problems are signs of bowel dysfunction	0 1 2 3
Urinary tract infections	This includes infections such as cystitis and pseudomonas. Symptoms include pain when urinating, a burning sensation throughout the body, blood in the urine and cloudy urine.	0 1 2 3
Sexual dysfunction	This includes dissatisfaction with sexual functioning. Causes for dissatisfaction can be decreased sensation, changes in body image, difficulty in movement, and problems with bowel or bladder, like infections.	0 1 2 3
Autonomic dysreflexia	Autonomic dysreflexia, sometimes called hyperreflexia, results from interference in the body’s temperature regulating systems. Symptoms of dysreflexia include sudden rises in blood pressure and sweating, skin blotches, goose bumps, pupil dilation and headache. It can also as the body’s response to pain where an individual doesn’t experience sensation.	0 1 2 3
Postural hypotension	This involves a strong sensation of lightheadedness following a change in position. It is caused by a sudden drop in blood pressure.	0 1 2 3
Circulatory problems	Circulatory problems involve the swelling of veins, feet or the occurrence of blood clots.	0 1 2 3
Respiratory problems	Symptoms of respiratory infections or problems include difficulty in breathing and increased secretions.	0 1 2 3
Chronic pain	This is usually experienced as chronic tingling, burning or dull aches. It may occur in an area that has little to no feeling.	0 1 2 3
Joint and muscle pain	This includes pain in specific muscle groups or joints. People who must overuse a particular muscle group, such as shoulder muscles, or who put too much strain on their joints are at risk of developing pain.	0 1 2 3

Total Score (/48): \_\_\_\_\_

ব্যক্তিগত তথ্যঃ		
রেজিঃ নং		
নামঃ		
বয়সঃ		
লিঙ্গঃ	১। পুরুষ	২। মহিলা
ঠিকানাঃ		
সম্মতিপত্র গ্রহণঃ	হ্যাঁ	না

আর্থ সামাজিক তথ্যঃ
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বৈবাহিক অবস্থা	১। বিবাহিত ২। অবিবাহিত ৩। বিধবা ৪। বিচ্ছিন্ন ৫। তালাকপ্রাপ্ত
ধর্ম	১। মুসলিম ২। হিন্দু ৩। বৌদ্ধ ৪। খ্রিস্টান ৫। অন্যান্য
শিক্ষাগত যোগ্যতা	১। অশিক্ষিত ২। প্রাথমিক শিক্ষা ৩। এসএসসি ৪। এইচএসসি ৫। স্নাতক/স্নাতকোত্তর
মাসিক আয়	..... টাকা
পেশা	১। চাকুরীজীবী ২। ব্যবসায়ী ৩। শিক্ষক ৪। গাড়ী চালক ৫। অন্যান্য .....
আধাতের পূর্বে পেশা	.....
বাসস্থান	১। শহর ২। গ্রাম



রোগের ধরণ	১। ট্রমাটিক ডেন্টোপ্লেজিক ২। ট্রমাটিক প্যারাপ্লেজিক		
রোগের কারণ	১। অনেক উচ্চতা থেকে পতন ২। সড়ক দুর্ঘটনা ৩। মারাত্মক ব্যাধি ৪। মারামারি/ ছিনতাই ৫। অন্যান্য. ....		
নিউরোলজিক্যাল লেভেল	1. C1 2. C2 3. C3 4. C4 5. C5 6. C6 7. C7 8. C8	1. T1 2. T2 3. T3 4. T4 5. T5 6. T6 7. T7 8. T8 9. T9 10. T10 11. T11 12. T12	1. L1 2. L2 3. L3 4. L4 5. L5 6. S1 7. S2 8. S3 9. S4-5
স্কেলেটাল লেভেল	1. C1 2. C2 3. C3 4. C4 5. C5 6. C6 7. C7	1. T1 2. T2 3. T3 4. T4 5. T5 6. T6 7. T7 8. T8 9. T9 10. T10 11. T11 12. T12	1. L1 2. L2 3. L3 4. L4 5. L5
ASIA	১। কমপ্লিট প্যারাপ্লেজিয়া ২। ইনকমপ্লিট প্যারাপ্লেজিয়া ৩। কমপ্লিট টেট্রাপ্লেজিয়া ৪। ইনকমপ্লিট টেট্রাপ্লেজিয়া		
জটিলতা সমূহ	১। চাপজনিত ঘা ২। শ্বাস-প্রশ্বাস জনিত সমস্যা ৩। পশাব-পায়খানায় সমস্যা ৪। যৌন সমস্যা ৫। অন্যান্য. ....		

এসসিআই – এসসিএসরেটিংপদ্ধতিঃ

- ০- গত ৩ মাসেতেমনকোনোসমস্যারঅভিজ্ঞতাহয়নাই
- ১- হালকাঅথবাঅনিয়মিতসমস্যা
- ২- মাঝারীঅথবাআকস্মিকসমস্যা
- ৩- লক্ষনযুক্তঅথবাদীর্ঘস্থায়ীসমস্যা

রোগীর নামঃ

স্বাস্থ্য সমস্যা	বিবরণ	রেটিং
চাপজনিত ঘা	এটা সাধারণত হয় ত্বকে লাল দাগ থেকে এবং ধীরে ধীরে জীবানুযুক্ত ঘা তে পরিণত হয়। এজন্য এটাকে ত্বকজনিত ঘা, বিছানাজনিত ঘা ও বলা হয়।	০
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অনুভূতিহানির কারণে আঘাত	এটা হয় অনুভূতিহীনতার কারণে যেমন আঙুলে পুড়ে যাওয়া যখন গরম পানি বহন করা হয় অথবা আঙুলের খব কাছাকাছি বসে থাকলে।	০
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মাংসপেশী শক্ত হয়ে যাওয়া (জড়তা)	এটা হতে পারে অনিয়ন্ত্রিত, মাংসপেশীর কাপনি থেকে।	০
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মাংসপেশী সংকোচন	এটাকে বলা হয় নড়াচড়া সীমাবদ্ধতা যখন অস্থিসন্ধি কোনো কারণে ছোট হয়ে যায় এটার সাথে ব্যথাও থাকতে পারে।	০
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অস্বাভাবিক হাড় বৃদ্ধি	এটা হল অস্বাভাবিক হাড় বৃদ্ধিজনিত সমস্যা মাঝেমাঝে হতে পারে হাড় ভেঙ্গে যাওয়া থেকে।	০
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বহুমূত্র রোগ	যখন শরীরে অনিয়ন্ত্রিত ভাবে রক্তে গ্লুকোজের পরিমাণ বেড়ে যায় যেমন অতিরিক্ত প্রস্রাব হতে পারে এবং খুব বেশি তৃষ্ণা পায়।	০
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		৩
প্রস্রাবজনিত সমস্যা	প্রস্রাব ধরে রাখতে পারে না, কিডনীতে পাথর, কিডনীজনিত সমস্যা, প্রস্রাব বের হয়ে যাওয়া এবং প্রস্রাব ফিরে যাওয়া এর সবই প্রস্রাবজনিত সমস্যার উপলক্ষনা	০
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পায়খানাজনিত সমস্যা	ডায়রিয়া, কোষ্টকাঠিন্য এই ধরনের সমস্যাগুলোই পায়খানাজনিত সমস্যার লক্ষনা	০
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মূত্রথলিতে জ্বালাপোড়া	এখানে প্রস্রাবের সাথে ব্যথা হতে পারে, পুরো শরীরে জ্বালাপোড়ার ন্যায় অনুভূতি হয়, প্রস্রাবের সাথে রক্ত আসে এগুলোই মূত্রথলিতে জ্বালাপোড়ার কারণ	০
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		৩
যৌনতার সমস্যা	যৌন কার্যাবলীর সময় অসন্তুষ্টি, শরীরে পরিবর্তন, নড়াচড়ায় সমস্যা, প্রস্রাব পায়খানায় সমস্যা এগুলোই যৌনতার সমস্যা।	০
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হঠাৎ উচ্চরক্তচাপ	যদি শরীরের তাপমাত্রা বেড়ে যায় তখন এ ধরনের সমস্যা হতে পারে যেমনঃ অতিরিক্ত ঘাম হবে, চোখের মনি ছোট বড় হবে, মাথা ব্যথা হবে।	০
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		৩
হঠাৎ নিম্ন রক্তচাপ	যদি হঠাৎ করে অবস্থান পরিবর্তনের সময় এই সমস্যা হতে পারে যার কারণে রক্তচাপ কমে যায়।	০
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		৩
রক্ত চলাচলজনিত সমস্যা	ধমনী ফুলে যাওয়া, পালে এবং আশে পাশে রক্ত জমাট বাধা এই সমস্যা হলো	০
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শ্বাস প্রশ্বাসজনিত সমস্যা	এই সমস্যায় প্রচণ্ড রকম শ্বাস কষ্ট দেখা দেয়।	০ ১ ২ ৩
তীব্র ব্যথা	এটা সাধারণত তীব্র ব্যথা, চিনচিন অনুভূতি হয়।	০ ১ ২ ৩
অস্থিসন্ধি এবং মাংসপেশীতে ব্যথা	নির্দিষ্ট অস্থিসন্ধি বা মাংসপেশীতে ব্যথা থাকে এবং তাদের হয় যারা নির্দিষ্ট মাংসপেশীকে অতিরিক্ত ব্যবহার করে যেমন কাধের মাংসপেশী।	০ ১ ২ ৩

