



University of Dhaka

**SECONDARY COMPLICATION OF SPINAL CORD INJURY
PATIENT AT COMMUNITY AFTER COMPLETING THEIR
REHABILITATION FROM CRP**

ALPHA AHMED

Bachelor of Science in Physiotherapy (B.Sc. PT)

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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

**SECONDARY COMPLICATION OF SPINAL CORD INJURY
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REHABILITATION FROM CRP**

Submitted by **ALPHA AHMED** for the partial fulfilment of the requirement for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT).

.....

Mohammad Anwar Hossain

Associate Professor, Physiotherapy, BHPI &

Head of the Department of Physiotherapy

BHPI, CRP, Savar, Dhaka

Supervisor

.....

Prof. Md. Obaidul Haque

Vice Principal

BHPI, CRP, Savar, Dhaka

.....

Ehsanur Rahman

Associate Professor & MPT Coordinator

Department of Physiotherapy

BHPI, CRP, Savar, Dhaka

.....

Md. Shofiqul Islam

Associate Professor & Head,

Department of Physiotherapy,

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 declare that same any publication, presentation or dissemination of information of the study. I would bind to take consent from the department of Physiotherapy of Bangladesh Health Profession Institute (BHPI).

Signature:

Date:

ALPHA AHMED

Bachelor of Science in Physiotherapy (B.Sc. PT)

DU Roll no: 826

DU Reg.no:3641

Session: 2015-2016

BHPI, CRP, Savar, Dhaka-1343

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Acronyms

BMRC : : Bangladesh Medical Research Council

BHPI: Bangladesh Health Professions Institute.

CRP : Center for the Rehabilitation of the Paralysed

SCI-SCS: Spinal Cord Injury Secondary Condition Scale

IRB: Institutional Review Board

RTA: Road Traffic Accident

SCI : Spinal Cord Injury

SPSS : Statistical Package for the Social Science

UK : United Kingdom

WHO : World Health Organization

UTI: Urinary tract infection

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Abstract

Purpose: To identify the secondary complication of spinal cord injury patient after returning community. **Objectives:** To find out the factors responsible for secondary complication of the people with Spinal Cord Injury, to identify the socio-demographic information, to explore the injury related status, to find out the association between socio-demographic and different factors related information. **Methodology:** The study was observational cross sectional study design. Total 60 samples were selected conveniently for this study from community area. 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 secondary complication was diseases of the genitourinary system, including urinary tract infections (UTIs) respiratory system problem and pressure sore. The fisher exact Test performed between socio demographic information with Problems experience . The fisher exact value was 11.156 and P value was .047. In this way researcher found significance between level of injury and pressure sore. The fisher exact value was 11.333 and P value was .043. P value (<.043) indicates the significance between living area and pressure sore. The fisher exact value was 25.193 and P value was .021. It indicates significance between traumatic injury and muscle spasm. The fisher exact value was 7.503 and P value was .030. P value (<.030) indicates the significance between cause of injury and diabetes mellitus. The fisher exact value was 17.753 and P value was .018. In this way researcher found the significance between paralysis type and bladder dysfunction. The fisher exact value was 8.343 and P value was .05 .P value (<.05) indicates the significance between circulatory problem and level of injury. The fisher exact value was 7.121 and P value was .038. In this way researcher found the significance between respiratory problem and gender.

1.1 background

Spinal cord injury (SCI) was one of the most debilitating illnesses known to mankind. The most common causes of SCI in the world today are car accidents, gunshot wounds, knife wounds, falls, and sports injuries (Yuen, Folpe and Lehman, 2022). The situation in developing countries, such as road safety, has deteriorated day by day, and the number of road traffic accidents (RTA) has risen in recent years. RTA was the leading cause of spinal cord injury in developed countries, followed by falls and sports injuries. Because of the injury, a person's independence and physical function are harmed, and various issues arise as a result of the injury (Islam and Dinar, 2021). Complications from spinal cord injury (SCI) were common, and the loss of motor, sensory, and autonomic function had a significant impact on a person's health, quality of life, and social involvement. Neurogenic bladder and bowel dysfunction, urinary tract infections, fall, pressure ulcers, pain, spasticity, pulmonary and cardiovascular complications, and psychotic disorders were the common complications after SCI (Ahuja et al., 2017).

In one study, researchers found that the incidence of SCI in underdeveloped nations was around 25.5 per million per year, based on 64 articles from 28 countries. Males (82.8%) were more likely than females to sustain SCI (Smith, Finn and Fitzpatrick, 2017). The formation of pressure ulcers was the most usually reported problem. In the United States, around 24% of spinal cord injuries have happened as a result of a motor vehicle collision, which, along with tremendous technological advancement, creates a significant risk factor for SCI. In one year, the global incidence rate varies between 10.4 and 83 cases per million. In Europe, the incidence rate ranges from 10.4 to 29.7 per million per year, while Asia recorded 27.1 per million per year (Harvey, 2017). According to recently published data, the annual incidence in Tehran, Iran is 10.5 per million. In Northern America, incidence rates ranged from 27.1 per million to 83 per million per year. Cervical spine injuries, which produce neurological abnormalities in more than 40% of cases, have a substantial public health impact due to the unwelcome events that occur on a personal and family level, the high cost of patient treatment, lost productivity, and reduced quality of life (World Health Organization., 2011). The number of spinal cord injuries is increasing every day, despite the fact that the true frequency of spinal cord injuries in most developing nations remains unknown. Every year,

an estimated 20000 new patients with spinal cord injuries are admitted in India, the majority of whom are from rural areas and are illiterate. In the United States, the yearly incidence rate of SCI was 11000-14000 per year, with an annual cost of patient care of \$4 billion for 200000 alive patients (Uddin et al.,2022).

Many patients reside in remote communities in rural Nepal and India, where existence farming is the primary source of income, and where the harsh terrain, poor road access, and distance housing are frequently hurdles to using mobility devices, according to one study. About 48.3% of SCI patients had issues with their housing's default structure, requiring a ramp, lift, or elevator to exchange stairs, or renovations to offer ample space to go around in a wheelchair. These issues prohibited free mobility within the home and a safe exit from the home, substantially diminishing autonomy and independence (Yang, Yeh and Pan, 2021). In Nepal, the incidence and prevalence rate of SCI were unknown. Complications have a significant influence on SCI patients. A greater rate of problems was linked to lower levels of health-related factors such physical ability, activities, and functional outcome. Complications can obstruct the start of active rehabilitation, create unacceptable setbacks during therapy, and frequently result in re-hospitalization. Complications were a leading cause of death after SCI (Sezer, 2015).

In a study found that 93.4 percent of spinal cord injury patients' rehabilitation was not started early enough, resulting in a significantly poor functional outcome (Nas, 2015). Because of the increased risk of complications as a result of a lack of or inadequate knowledge, hospitalization is prolonged, the expense of hospitalization rises, and functional outcomes are significantly impacted. In this study, 10.4 percent of patients were admitted after the third day after injury. According to evidence, the time between injury and right diagnosis is more than three weeks. The lack of awareness among 52.5 percent of patients and others with a lower socioeconomic status, as well as the distance to the final hospital (16.4 percent), act as risk factors for problems. Patients with spinal cord injury (SCI) have a wide spectrum of medical, social, psychological, and economic problems (Lude et al., 2014). This is often due to the fact that the injury occurs in young people. Reduced motor performance and physical activity while in the same environment can lead to a less active lifestyle, increased risk of injury, and secondary health concerns after returning to their community, all of which can have a detrimental impact on people with SCI a high rate of problems is linked to lower levels of health-related factors like physical ability, activities, and functional outcome (Booth, Roberts and Laye, 2012). This fact has gotten little attention in the literature until recently. Only a few

studies have looked at how SCI patients' physical performance, complications, and falls changed after they were discharged or returned to their communities (Abu Mostafa, Plastow and Savin-Baden, 2019). As a result, the goal of this research is to learn more about the medical issues that people with SCI have after returning to their communities. The outcomes of this study could lead to crucial therapy modifications that improve patients' ability to be self-sufficient. We are all aware that prevention is always preferable to cure. When a spinal cord injury patient develops a complication, the patient is confronted with a slew of issues that attempt to deteriorate the patient's state. Early detection reduces the risk of decline, raises public awareness, and aids in the prevention of all types of consequences associated with spinal cord injuries (Hagen, 2015).

1.2 Rationale

A spinal cord injury (SCI) impairs a person's life and needs a considerable coping process. All effort is concentrated on stabilizing the patient shortly after the accident, and the individual is confronted with physical, social, environmental, and psychological challenges. Patients with a spinal cord injury (SCI) lose their ability to control body functions, rendering them motionless. Due to adverse circumstances such as a lack of home adaptations and assistive devices, functional levels may decline after discharge, increasing the risk of falls and medical repercussions. As a result, outpatient and community rehabilitation may be important in resolving the problems.

Complications are the most common cause of morbidity and mortality in SCI patients. 44.4 percent of patients die from respiratory failure, 26.4 percent from septicemia, and 11.8 percent from DVT. 44 patients had at least one problem, 11 of them were re-admitted and tallied 1-5 times over the course of 6 months. Tetraplegics had greater complications than paraplegics, and men had four times the number of complications as women . Urinary tract infections and pressure sores were the most common secondary problems, with 47 percent and 36 percent of the population reporting them, respectively. Complications struck 49 percent and 36 percent of the population respectively within the year following discharge (Hagen, 2015).

The evidence of SCI is developing in Bangladesh, thanks to the growing population and people engaging in numerous risky activities. After a spinal cord injury, there is no method to regenerate CNS neuron in humans, and if the lesion is stable, the neurologic deficit does not change. In patients with spinal cord injury, motor functional control and self-care skills are impaired. As a result, the patient is more prone to experience complications following SCI. This study will look into the number of people who have problems after finishing treatment and returning to their communities. This study will look for people who have undergone a spinal cord injury and are experiencing various subsequent complications. This information can help the patient and others determine the likelihood of complications following a SCI. The importance of patient education and awareness initiatives in averting difficulties is highlighted in this study. Finally, it will help to reduce the morbidity and mortality rates linked with SCI complications.

1.3 Research question

What were the secondary complications among the spinal cord injured patients after returning the community?

1.4 Aim of the study

The aim of the study was to find out the secondary complications among the spinal cord injured patients after returning the community.

1.5 Objectives

1.5.1 General objective

To identify the secondary complications among the spinal cord injured patients after returning to the community.

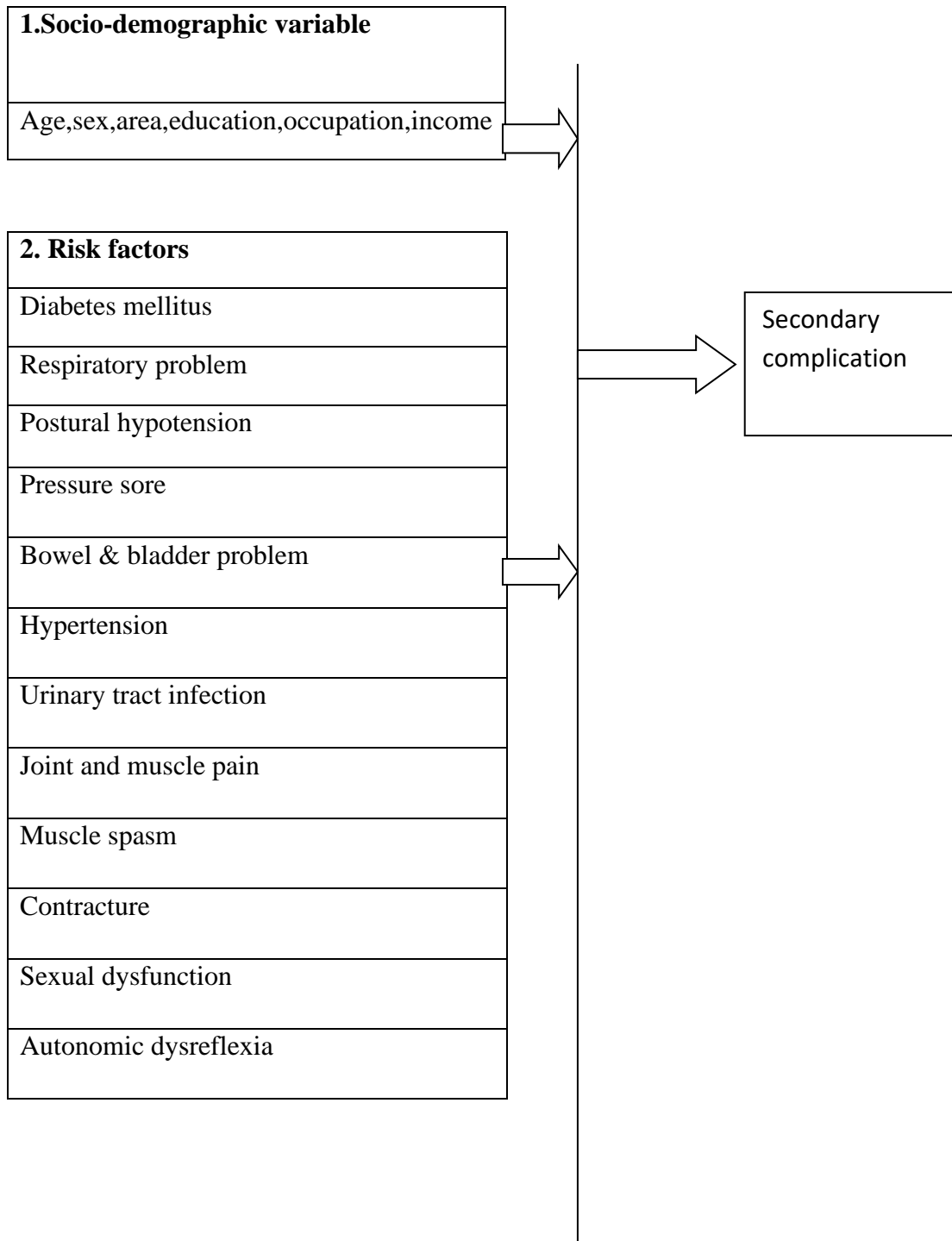
1.5.2 Specific objectives-

- To find out socio demographic information of spinal cord injured patients;
- To find out the association between level of injury and pressure sore
- To find out the association between living area and pressure sore
- To find out the association between traumatic injury and muscle spasm.
- To find out the association between level of injury and diabetes mellitus.
- To find out the association between paralysis type and bladder dysfunction.

1.6 Conceptual framework:

Independent variable

Dependent variable



1.7 Operational definition

Risk factor

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

Spinal cord injury

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 (Devesa, 2017). 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.

Paraplegia

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 (Zebracki, Melicosta, Unser and Vogel, 2020). Through paraplegia, arm functioning is spared but the trunk, legs and pelvic organs may be involved depending on the level of injury. The term is used in referring to cauda equine and conusmedullaris injuries, but not to lumbosacral plexus lesions or injury to peripheral nerves outside the neural canal.

Tetraplegia (preferred to “quadriplegia”)

This term refers to impairment or loss of motor and/or sensory function in the cervical segments of the spinal cord due to damage of neural elements within the spinal canal. Tetraplegia results in impairment of function or paralysis of the arms, usually in the trunk, legs and pelvic organs, with including the four extremities. It does not include brachial plexus lesions or injury to peripheral nerves outside the neural canal (Kirshblum, Schmidt Read and Rupp, 2021).

Traumatic spinal cord injury

A direct or indirect trauma to spinal cord following complete or incomplete cut off of the spinal cord. Complete cut injuries defect in total loss of motor and sensory function, incomplete injuries result in the loss of some motor and sensory function.

Stages of pressure sore: 4 stages are most commonly use.

- Stage-I: Affects skin, results in redness and coloration of the area.
- Stage-II: Skin is broken both epidermis and dermis.
- Stage-III: Damage skin and involve fat and muscle tissue.
- Stage-IV: Extends up to bone and joint structures

Long-term problems from spinal cord injury (SCI) have a severe impact on patients' lifestyles on multiple levels, including social and familial relationships, education, work, and financial position. SCI is most common in young adults while they are in their primary school years and have a productive life and social role (Khazaeipour et al., 2014). In Bangladesh and India, this is common. These injuries were usually sustained by day laborers who were constantly carrying 60-100 kg loads on their heads. We need to stop this undesirable employment, such as significant weight bearing on the head, by raising awareness among workers and employers, as well as properly enforcing current rules. Motor vehicle accidents, on the other hand, were the major cause of death in developed countries such as the United States (Shrivastava and Shrivastava, 2019).

Several elements such as personality and social, cultural, and economic circumstances influence rehabilitation in people with SCI. Bladder and bowel difficulties, pressure ulcers, self-care, sexuality, and neuropathic pain are all common health issues for those with spinal cord injuries (Hicken, Putzke and Richards, 2001). Physical or psychological health issues that are influenced directly or indirectly by the existence of a handicap or underlying physical injury are classified as secondary health conditions (SHCs). SHCs, in addition to the basic motor and sensory impairments caused by the SCI, impede an active lifestyle and quality of life (Battalio, Jensen and Molton, 2019). They are a leading cause of death and readmission to hospitals. Just 16.4% of the study population survived for ten years, which is significantly lower than the data for other industrialized countries, where a 10-year survival rate of about 80% was reported. Different causes of damage, inadequate acute management, lack of good social reintegration, less attention or care by family and community, and failure to treat the co-morbidity of persons with SCI may all contribute to this inconsistency. According to the research, more than 80% of people with SCI died at home (Wideqvist et al., 2021). This result contradicted findings from prior research on death location. Effort was placed into the treatment of problems and the promotion of physical fitness during spinal cord injury rehabilitation. As a result, the length of rehabilitation is determined not only by the severity of the injury, but also by the rate of complications and the rehabilitation goals.

Complications were the most common causes of unsuccessful recovery, and while fitness increases during therapy, it is still minimal. There were complicated relationships between

fitness, the occurrence of problems, and the length of therapy that needed to be uncovered, and this will provide tools to improve individual outcomes and rehabilitation programs (Booth, Roberts and Laye, 2012). According to a recent study, problems were common both during and after inpatient rehabilitation. Tetraplegics have more complications than paraplegics. Urinary tract infection and bowel and bladder incontinence were more common in paraplegic patients than in tetraplegic patients. The majority of patients with spinal cord damage (74.7%) were dedicated to pain, spasticity, and contracture (Tauqir et al., 2007).

Traumatic SCI (TSCI) is defined as an acute, traumatic lesion of the spinal cord that causes motor and/or sensory deficits or paralysis in variable degrees. Although cauda equine injuries were included in the criteria, isolated damage to other nerve roots were not (Attabib et al., 2021). Traumatic SCI is most common in young adults, with more than half of all cases occurring between the ages of 16 and 30. Approximately 80% of instances involve men. A considerable number of people were admitted for SCI rehabilitative treatment. Non-traumatic SCI was caused by spinal stenosis, primary and metastatic tumors, ischemia, infection, and congenital disorders (Razzak, Roy and Khan, 2017). The annual incidence of non-traumatic SCI could be as high as 8 per 100000. The majority of people were found to be paraplegic rather than tetraplegic (79.75 percent vs 20.25 percent), which differed from previous investigations (Chamberlain et al., 2015). Tetraplegics made up 52 percent of the population in France, while paraplegics made up 48 percent. This disparity in findings could be due to the higher mortality of people with cervical cord damage as a result of various causes of harm in different countries, such as improper evaporation from injury sites, hasty transportation to the doctor's facility, insufficient intensive administration, and the lack of pre-facility doctor's mind (Zimmer, Nantwi and Goshgarian, 2007).

In Nepal, there were no reports of non-traumatic SCI; however, one Indian hospital reported that 13% of 207 SCI patients hospitalized in 2003–2004 were non-traumatic. SCI patients' results following release from rehabilitation at (Green Pastures Hospital and Rehabilitation Centre) GPHRC have been a source of concern, with roughly one-third of patients requiring readmission for treatment due to secondary problems (Scovil, Ranabhat, Craighead and Wee, 2011). Individuals with spinal cord lesions are vulnerable to many medical problems, which increase the length and cost of hospitalization and result in lost therapy time, delays in rehabilitation, and increased impairment. Non traumatic spinal cord injuries account for 30–50% of all spinal cord injuries and are a major cause of medical issues during recovery (Nas, 2015). The most common complications observed in patients with NTSCl during

rehabilitation or after returning to the community were pain (both naturopathic and musculoskeletal), contracture, pressure ulcers, spasticity, urinary tract infection (UTI), depression, autonomic dysreflexia, and deep vein thrombosis (Rapidi, 2014).

However, official evaluation has been limited due to the difficulties in completing follow-up in rural Nepal. Without good community reintegration, patients are more prone to develop or experience secondary health consequences such as pressure ulcers, urinary tract infections (UTI), heterotrophic ossification, DVT, respiratory complications, and so on, which can lead to re-hospitalization or even death (Buys et al., 2022). According to the GPHRC, pressure ulcers account for one-fourth of the expense of caring for persons with SCI in the West, and 7–8% of those who die from associated complications have SCI (Chan et al., 2012). Recurrent medical issues and falls, may have a significant impact on the individuals' functional abilities, especially following release from chronic SCI. In addition, the linked constrictions that the participants face following discharge may have an impact on their functional abilities. The majority of the 16 patients were from rural areas in Thailand's northeast and had financial difficulties. These were rarely tight spaces that had been specially modified for people with disabilities. They were also unable to obtain mobility assistance and housing modifications due to financial constraints. It was reasonable to assume that the loss of motor capacity, while appealing under the same ecological conditions, would lead to a hypoactive lifestyle, increasing the risk of potential medical disorders and affecting the ability to independently perform daily workouts (Amatachaya et al., 2010). During the course of six months, the majority of the patients had to deal with medical issues one to five times. Neuropathic pain, urinary tract infections, and pressure ulcers were the most commonly reported problems, with the latter two being the primary causes of re-hospitalization. According to Joseph et al. (2016), roughly 50.3 percent (n=71) of patients suffered one or more secondary complications. PUs were the most common (n=42; 29.8%), followed by pulmonary problems (23.4 percent; 33%) and UTIs (17 percent; 24) (Boulton, 2016).

Falls are the leading cause of spinal cord injury in developing countries like Bangladesh, Turkey, India, and Nigeria, as well as developed ones like Canada and the United Kingdom. In Nigeria, 48 percent of cases are caused by falls, while 36 percent are caused by street automobile accidents. In Romania, 59% of people say they've fallen and 13% say they've been in a street automobile accident (Chen, Tang, Allen and DeVivo, 2015). In Bangladesh, 72 percent of instances are traumatic, with 43 percent occurring as a result of falling from a height, 20 percent due to carrying a heavy burden on the head, and 18 percent due to a street

activity accident (Hossain et al., 2020). According to an Indian study, 90.62 percent of patients experience at least one inconvenience, with half of them suffering from urinary tract disease (Derakhshan, Pourzare and Roshani, 2018). Another study focuses on the prevalence of embarrassments, with 70 percent of patients suffering from neurogenic bladder brokenness, 60 percent reporting spasticity, 45 percent with agony, 25 percent weight ulcer, 20 percent heterotopic hardening, and 10 percent urinary tract contamination.

Spasticity 52.8 percent, UTI 22.6 percent, Pressure ulcer 7.5 percent, Pain 45.2 percent, Depression 16.9 percent, Dependent edema 30.1 percent, and No complication 15.0 percent were the most prevalent medical consequences during rehabilitation in Bangladesh (Naser, 2022).

Several clusters of concerns among community-dwelling people with SCI, including (a) mental issues like loneliness, despair, and stress, (b) reliance and control issues, (c) physical issues like pain and others, and (d) natural issues like openness. Clearly, SCI can cause mental challenges for people affected.

The majority of individuals who had a spinal cord injury felt or complained of pain. Pain is the leading cause of re-hospitalization in people with spinal cord injuries. Psychosocial characteristics such as depression, rage, and negative cognition were linked to pain. Chronic pain has an impact on the quality of life and physical function of people with SCI (Modirian et al., 2010). According to a New Delhi research, nearly 45 percent of patients are in agony. At each examination, the majority of patients experienced neurogenic and musculoskeletal pain, as well as spasticity. Pain was reported to be dominating at 1-year after injury rates ranging from 63 to 91 percent following a SCI. Up to 71 percent of participants who reported discomfort in the first year said it interfered with everyday activities (Hassanijirdehi et al., 2015). Musculoskeletal pain and neuropathic pain are two types of pain experienced by spinal cord injury sufferers. Musculoskeletal pain is characterized by aching and throbbing, while neuropathic pain is characterized by acute, shooting, and burning sensations. According to a pain research, musculoskeletal pain accounted for 25% of all pain, referred pain for 15%, and central cord pain for 5%. Discomfort was experienced by 64-80 percent of patients, with 38 percent of them describing the pain as severe. Shoulders (75 percent), wrists (53 percent), hands (43 percent), and elbows (35 percent) may be involved when the patient experiences pain in the upper extremities (Treede et al., 2015). A study from the Netherlands discovered that the severity of pain was linked to the development of spasticity. The most common

secondary health problems were neuropathic pain (83.7–92.1%) and urinary tract infections (56.5–58.9%). Musculoskeletal pain was present in 40% of individuals 6 months after SCI (compared to 62.3 percent at our first follow-up year) and 59 percent of participants 5 years after SCI in a study with a comparable follow-up length (compared with 87.1 percent in our study) (Adriaansen et al., 2013). They also discovered that at 5 years 18 after SCI, 25% of people reported severe musculoskeletal pain, while 34.7 percent reported moderate discomfort. The rise in musculoskeletal pain over the 5-year follow-up period was linked, which can be explained by the physiological age-related decrease in the musculoskeletal system and the chronic misuse of the upper extremities as a result of their wheelchair-dependent lifestyle. Between 1 and 2 years following discharge, there was a considerable reduction in the occurrence of troublesome spasticity and neuropathic pain. Pain was linked to psychosocial characteristics such as despair, rage, and negative thinking. Chronic pain has an impact on the quality of life and physical function of SCI patients (Siddall, McClelland, Rutkowski and Cousins, 2013).

The rate of falls in his study was higher than other studies, and the researchers investigated falls in independent ambulatory participants with SCI and discovered that 75% of the patients experienced at least one fall per year. In his research, he discovered that 24 patients (55 percent) fell within 6 months. In upright exercise, ambulatory people fell while performing (17 in 23 subjects: 74 percent, range 1–24 times) while wheelchair-bound patients fell from their wheelchair (7 in 21 subjects: 33 percent, range 1–8 times) (Phonthee, Saengsuwan, Siritaratiwat and Amatachaya, 2013). This suggested a significant chance of falling, particularly in patients who were more mobile. Higher functional capacity may motivate patients to do daily tasks more regularly. However, loss of motor control and unsuitable environmental conditions may enhance the patients' risk of damage. Substantial variations in the reduction of self-care, transfer, and mobility scores among chronic motor incomplete people with SCI. Patients reported a high rate of medical problems (91%) and falls during the follow-up period (55 percent). More than half of the subjects fell at least once during the 6-month follow-up (range 1–24 times per person). Persons with partial SCI were more likely to fall while standing, mostly walking and doing tasks (Nas, 2015). According to the National Spinal Cord Injury Database (NSCID), the percentage of falls was 31% between 2010 and 2013, but only 17% in the 1970s, indicating that the percentage of SCI cases caused by falls is increasing. Fall-induced SCI was particularly common in the elderly, with falls accounting for almost 75 percent of SCI cases among patients aged 76 and more

"Autonomic Dysreflexia (AD) was defined as a sudden reaction of the autonomic nervous system triggered by a stimulus below the level of the lesion (e.g. bladder distension, UTI) that resulted in an increase in blood pressure and symptoms such as: below the level of the lesion: Piloerection, pallor, cool extremities, abundant sweating; above the level of the lesion: severe headaches, nasal congestion". Patients with T6 and higher injury levels are more likely to develop autonomic dysreflexia. "AD is a symptom complex caused by a noxious or strong stimulus that causes an unopposed sympathetic nervous system discharge below the level of damage." This sympathetic discharge cannot be controlled by higher brain centers, resulting in hypertension." Many persons with SCI have a baseline systolic blood pressure of 90 to 110 mmHg, and an increase of 20 to 40 mmHg could indicate Alzheimer's disease. It is anticipated that 92 percent of those who acquire AD will have their first episode within the first year after their injury. Bladder dysfunction, such as an over-distended bladder, detrusor sphincter dissynergia, and kidney and bladder stones, were the most common causes of AD, with ingrown toenails, menstrual cramps, infections, bowel impaction, pressure ulcers, or undetected musculoskeletal conditions being some of the other causes (Al Taweel and Seyam, 2015).

"A symptomatic subject was operationalized as a subject who was treated with antibiotics and had fever, malaise, incontinence, increased spasms of the legs, abdomen, or bladder, gritty particles or mucus in the urine or murky urine, foul-smelling urine." Infections of the lungs were only included if they were treated with antibiotics. People with subacute SCI have a greater risk of UTI after discharge due to a lack of systematic training and sufficient feedback in bladder care. According to a study conducted in India, 90.62 percent of patients experience at least one problem, with UTI being the most common .Another study indicated that 56.5 percent, 58.3 percent, and 58.9 percent of those who were in the community or at home after 20 taking therapy had UTI at 1, 2, and 5 years after SCI, respectively. The most common secondary consequence was urinary tract infections, which were reported by 47% of the population (Amaral et al., 2019).

Symptomatic UTIs and pneumonia affected an equal number of SCI patients in Divanoglou's research. Respiratory difficulties included shortness of breath, fever, and yellow or greenish sputum. Long-term respiratory problems are a leading cause of morbidity and mortality in people with spinal cord injuries. Pneumonia was identified several times as the primary cause of death in chronic SCI patients. Pulmonary or respiratory issues can be caused by respiratory muscle paralysis, restricted breathing, or an ineffective cough (Burns, 2007).

Patients with ASIA grade A, B, or C tetraplegia had a higher risk of respiratory-related re-hospitalization, and these groups were most prominent during the first year following injury and subsequently dropped in later years. Previously, it was known that as the severity of spinal cord injury grew, so did the effect on lung volumes. About 72.3 percent of patients, the bulk of whom were tetraplegics, died of respiratory problems, whereas 44.4 percent of spinal cord injury patients in Nigeria died of respiratory failure. According to another study, tetraplegic and high paraplegic patients are more vulnerable to respiratory complications because they are unable to cough effectively and expectorate secretions due to a previous history of heavy smoking, intrinsic lung disease, or general anesthesia, and nearly 20% of them are at risk for respiratory complications after some time has passed (Kang et al., 2017). In both complete and incomplete motor tests, people with subacute SCI scored higher in self-care, transfer, and mobility, but lower in breathing and sphincter management after discharge.

Pressure ulcers are a life-threatening complication of spinal cord injury (SCI) that can "interfere with physical, psychological, and social welfare, as well as affect overall quality of life." The high morbidity and mortality associated with spinal cord injury (SCI) persist despite significant advances in spine surgery and rehabilitation medicine. Even with SCI, ulcers (PUs) were a common complication. Pressure ulcers were the second most common medical problem, with rates ranging from 12 to 36 percent on the first annual follow-up year after injury, and the most common medical consequence, with a rising rate in subsequent follow-ups (Chishtie, Chishtie, Yoshida and Balogh, 2018).

PUs affected "practically 100%" of SCI patients in developing countries like "low-income" and "middle-income" countries. People with SCI are particularly sensitive to the development of PU due to their sensory loss, motor dysfunction, and skin abnormalities. PUs were not unique to SCI patients, but they were a prevalent side effect of patients who were immobilized or hospitalized in a variety of treatment settings. 26 percent of wheelchair users and 2% of ambulatory patients had a pressure ulcer. In the prior three months, more than 75% of wheelchair-dependent people stated pressure ulcers were a "moderate to severe concern." For the establishment of PU, some exogenous and adjustable risk factors were involved. These modifiable risk factors were especially prevalent in developing nations. Poverty, a lack of education, a poor household income, a lack of physical activity, and malnutrition were all significant risk factors in developing countries, making PUs more difficult to prevent and treat. Pressure sores are a common secondary result reported by 36 percent of the population. Secondary complications, such as skin infections, were the second most common cause of re-

hospitalization at most time intervals (years 1, 10, 15, 20), and the most common cause at year 5 (Rahman, Halder, Rahman and Parvez, 2021). Pressure ulcers can be caused by a variety of factors, including moisture, sheering forces, poor nutrition, cigarette smoking, and persistent pressure on the skin. Pressure ulcers can cause discomfort (incomplete lesions), as well as increased spasticity, and wound infections, which can all lead to increased medical morbidity and hospitalization. Pressure ulcers in the sacrum and ischial areas are more common in people with SCI. The prevalence of PUs was higher in poor nations than in wealthy countries. The prevalence of PU was 11.5 percent one year after injury in the United States and 21 percent 15 years afterwards. The prevalence of PU was found to be 26.7–46.2 percent in his study, with a mean of 35.2 percent. 22 In a population of purely paraplegics in Brazil, the prevalence of paraplegia was less than 30%. (26.7 percent) (Bhattacharya and Mishra, 2015).

Upper motor neuron damage patients may develop spasticity after a period of spinal shock. Spasticity may or may not be harmful to the sufferer. Spasticity can be beneficial when a patient uses extensor muscle tone to perform upright pivot transitions (Elbasiouny, Moroz, Bakr and Mushahwar, 2009).

Without an appropriate adjustment for dietary intake following injury, energy consumption easily exceeds daily energy requirements, predisposing affected individuals to weight gain. According to a recent survey of 348 persons with chronic SCI, almost 40% of them were overweight or obese. (Crane, Little and Burns, 2011)

The purpose of current rehabilitation trends/approaches is to restore independence through physiotherapy and exercise programs to maintain limb suppleness, reduce contractures and pressure sores, and enhance muscle strength, particularly when motor function is recovering. Occupational therapy, counseling, and modifying body image (psychological intervention), as well as educating family/caregivers on how to cope and restoring dignity, are all options. To avoid morbidity, the ultimate goal is to make these patients self-sufficient (Pollock et al., 2014). While this is still the primary goal of rehabilitation, the reality is grim, especially in developing countries. The rehabilitation phase is hampered by a shortage of qualified workers to handle the increasing demand for rehabilitation services. One of the most notable advancements in SCI care has been the transition of 19 from hospital to home. The family has spent a substantial amount of time and money on their SCI person/family member as a result of this metamorphosis. Financial constraints influence the SCI and the family in general

(Juguera Rodriguez et al., 2018). The SCI patient must obtain as much independence as possible before leaving the hospital in order to lessen some of the issues that the family may be facing. Surprisingly, the relative incidence of readmission for the various causes in the current study over a 10-year period after injury was typically similar to those reported in a population-based sample of people with chronic SCI who had been in the hospital for more than 20 years. Despite comparably high and disproportionate bed occupancy rates for the latter, genito-urinary (24 versus 40 percent) and skin-related (9 versus 17 percent) readmissions were reduced by about half (nearly 30 percent of all bed occupancy). Had discovered a readmission rate for rehabilitation (e.g., wheelchair assessments) in a previous community sample that was identical to that seen in the current study (16 versus 11 percent) (Karam et al., 2012). Seizures and CNS disorders, urinary retention and hydronephrosis, spasticity and contractures, superficial wounds, injuries, and suicides were among the most common conditions described in younger patients and early after injury, while other illnesses were found to be more related to age than chronicity of SCI. According to a recent large multicenter assessment of 1668 patients with tetraplegia, urinary tract difficulties and pressure sores were more common in those with complete lesions, but contractures and pain were more common in those with incomplete lesions (Klotz et al., 2022). Following a spinal cord injury, gastrointestinal problems are common. Urinary tract infection was the most common reason for readmission, with an increased readmission rate for people with tetraplegia most likely due to the type of bladder management used, with people who used a permanent indwelling catheter being twice as likely to have urinary complications as people who used other methods. Gastrointestinal problems are common after SCI, and their severity is connected to the size of the lesion and the time since the damage. The new study also highlights the influence of advanced age on bowel function, with persons aged 60 and higher accounting for nearly half of all readmissions for pseudo intestinal blockage. Similarly, pneumonia 20 has been connected to more severe (tetraplegia) and complete lesions, as well as an increase in incidence as people get older (Antonucci et al., 2008). Pressure sores have been proven to have a major impact on activity, employment, interpersonal relationships, and overall emotional well-being, as well as a disproportionately high bed occupancy and resource utilization. Pressure sores are a well-known problem among SCI patients, with annual rates ranging from 23 to 33 percent. The current findings are consistent with data from the Model systems in the United States, which show a 7.9% to 8.9% early incidence of pressure ulcers at 1- and 2-year follow-up exams, with an average of 1.6 ulcers per patient with ulcer/s. 18 Similarly, Krause¹⁶ discovered that 10% of over 1000 community

respondents with SCI had had plastic surgery in the previous two years, and that 7% of the sample needed to reduce their sitting time by 9 weeks or more (Mortada, Malatani, Awan and Aljaaly, 2020). In that study, people with tetraplegia and complete lesions were more likely to have skin breakdown. While this was found to be true in the current study for older people, the bulk of pressure sore readmissions, with high recurrence rates, occurred in a small group of young paraplegic boys. Further research is needed to learn more about the personal characteristics of these recidivists, as well as potential risk factors, and to determine whether this type of behavior constitutes parasuicide discovered a substantial correlation between skin issues and poor adjustment, but she was unable to specify a cause or effect. She proposed that future studies look into behavioral risk factors, such as the existence of self-destructive behaviors like smoking, alcohol misuse, and risk-taking, as well as good preventative behaviors like regular weight reduction and skin checks. Even in those who had a history of drinking problems but remained abstinent after injury, Heinemann and Hawkins discovered a link between the risk of substance abuse and the development of pressure sores, implying that this could be due to poorer coping skills, a lack of social support, and a higher risk of depression, leading to a lack of self-care and nutrition²¹ determinants governing ulcer severity progression (eg ethnicity) (Mahmoodpoor et al., 2018). UTI and ulcers have been connected to post-injury use of illicit drugs or alcohol, as well as prescription medication misuse. Different determinants controlling the onset of a pressure sore (for example, the level of paralysis) and those 21 determinants guiding ulcer severity progression (eg ethnicity). The latter could be linked to socioeconomic and educational disadvantage. Some authors have also discovered a correlation between unemployment and the likelihood of re hospitalization for pressure sores, and have sought (though unsuccessfully) to develop a readmission risk profile for patients with SCI based on the extent and severity of neurological impairment. Psychosocial factors appear to have at least as much of an impact as impairment and functional capacity. Lack of tertiary education, indwelling catheter, motor complete injuries, self-care dependency, and ambulation dependency have all been linked to an increased risk of re hospitalization. The severity and extent of the injury had an impact on the risk of re hospitalization. Similarly, the current study found a strong effect of impairment on the risk of readmission, with a significantly shorter time to readmission for more complete lesions (average of 2–3 years for ASIA A–C impairments versus 5 years for ASIA D) and a higher likelihood of readmission for certain conditions involving tetraplegia. Prevention efforts should target those with a history of high usage (Hiremath, Kupfer and Ruediger, 2021).

3.1 Study design

This study aimed to find out secondary complication of spinal cord injury patient after returning to their community. As a result, the study was conducted using an observational research model in the form of a cross sectional study design. The data was collected using observational research approach with a high number of participants. The most popular type of observational study was the cross sectional study, which was used to observe a part of the people in a community.

3.2 Study area

Data were collected from the persons with spinal cord injury at Manikganj sadar, Shibalaya, Satura upozila of Manikganj and Dhamrai & Savar upozila who return to their community after taking treatment or after discharge from hospital. Data was collected for 60 days after permission from IRB. Researcher collected data during this period.

3.3 Study population

The study populations were all the Spinal cord injury patients, who are in the community after having treatment or discharge. The sample was taken by convenience sampling.

3.4 Sample size

The equation of sample size calculation were given below

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

$$n = \frac{Z^2 pq}{d^2}$$

$$= \frac{(1.96)^2 \times 0.15 \times 0.85}{(0.05)^2}$$

$$= 195$$

Here,

Z (confidence interval) = 1.96

P (prevalence) = .15 (Singh, Prakash, Bhatti and Mahen, 2019)

$$\begin{aligned}\text{And, } q &= (1-p) \\ &= (1-0.15) \\ &= 0.85\end{aligned}$$

The actual sample size was, $n = 195$.

Actual sample size for the study was 195. But due to limitation of different conditions at least 60 samples was taken to make the study. As it was an educational research and the study was cross-sectional survey the number of the study sample was 60.

3.5 Inclusion criteria

- Persons with spinal cord injury in community. It is an important criteria to conduct the study with appropriate identification of population.
- Both male and female patients. It will help to identify ration of male and female to the study. It will also indicate who more vulnerable for the risk factor are.
- Patients who were willing to participate. Unwilling and unconscious patient will make a negative impact to the study.
- Spinal cord injury patients with secondary complications (Equebal, Anwer and Kumar, 2013).

3.6 Exclusion criteria

- Patients who were mentally unstable. This patient can't provide correct information
- Undiagnosed patient. If it is not diagnosed correctly then the correct information will not be available.
- Unconscious patient. If patient is unconscious cant give information
- Not willing to participate (Amer, 2013).

3.7 Sampling technique

Semi structured questioner was applied for this study. It includes socio demographic information of patient like name, gender, types of paralysis, and causes of injury. The spinal cord injury secondary conditions scale (SCI-SCS) scale used in this study to identify secondary complication of the patient. The data used to test the SCI-SCS were drawn from a larger study to evaluate the effectiveness of a holistic health promotion program after SCI. Items were selected by these criteria of a) nature, b)that they are measurable by patient history and physical examination, c) those that can be prevented or managed by medical

intervention. According to these the number of secondary complication are pressure ulcer, pain, autonomic dysreflexia, bowel and bladder dysfunction, sexual dysfunction and more.

3.8 Data collection method and tools

The investigators created a semi structured form of questionnaire paper and conducted interviews to obtain data. The demographic information (age, sex, educational status, jobs, and residential area) on the questionnaire, as well as secondary complication-related information. Pen and pencils, paper, approved forms and consent forms, as well as a bag to store these items, were utilized to gather data.

3.9 Data analysis

Data was entered into an excel spreadsheet and the Statistical Package for Social Science (SPSS) software version 22. SPSS software was also used to examine the data. Age, gender, educational status, occupation, home location, and other socio-demographic characteristics were assessed and discussed using a semi structured Bengali questionnaire. After returning to the community, this questionnaire was also discussed in terms of injury-related information and secondary complications. The results were discovered using SPSS software version 22 and processed in Excel. There were 34 questions in this questionnaire. Descriptive statistics were used to examine the data, and the results were given as percentages, tables .Fisher’s exact test were performed to conduct the study. This test is a statistical test of independence for categorical variables. Researcher use Fishers exact test to determine if there is dependence between two variables. To perform Fishers exact researcher calculates p-value directly, according to the hypergeometric distribution. Fisher’s Exact Test is used to determine whether or not there is a significant association between two categorical variables. (Bonokwane and Ololade, 2022)

Suppose we have the following 2×2 table:

Table 1: Fisher’s exact test calculation

	Group 1	Group 2	Row Total
Category 1	a	b	a+b
Category 2	c	d	c+d
Column Total	a+c	b+d	a+b+c+d = n

The one-tailed p value for Fisher’s Exact Test is calculated as:

$$p = \frac{(a+b)!(c+d)!(a+c)!(b+d)!}{(a!b!c!d!n!)} \text{ (Woolson and Clarke, 2011)}$$

Example of fisher’s exact test

Fisher’s Exact Test: Example

Suppose researcher want to know whether or not gender is associated with respiratory problem. researcher take a simple random sample of 22 voters and survey them on their condition. The following table shows the results of the survey:

Table 2: Fisher's Exact Test: Example

	Male	Female	Total
Mild respiratory problem	11	1	12
Moderate respiratory problem	9	1	20
Total	20	2	22

$$p = \frac{(11+1)!(9+1)!(11+9)!(1+1)!}{(11!1!9!1!22!)}$$

=.038

Table 3: Association between socio demographic variables and secondary health complications

Assosiation between variable	Fisher exact value	P value
Pressure sore and level of injury	11.156	.047*
Pressure sore and living area	11.333	.043*
Muscle spasm and traumatic injury	25.193	.021*
Diabetes mellitus and cause of injury	7.503	.030*
Bladder dysfunction and types of paralysis	17.753	.018**
Sexual dysfunction and age	14.472	.018**
Sexual dysfunction and gender	9.987	.001***
Circulatory problem and level of injury	8.343	.05*
Respiratory problem and gender	7.121	.038*

*p<.05 level of significance; **p<.01 level of significance; ***p<.001 level of significance

3.10 Ethical Consideration

The proposal was presented to the Institutional Review Board (IRB) and the Bangladesh Health Profession Institute (BHPI), and the board approved it. The study was carried out in accordance with the World Health Organization (WHO) and Bangladesh Medical Research Council (BMRC) guidelines. Before collecting data, participants gave their written or verbal consent. The samples who were interested in the study had submitted consent forms during the study, and the purpose of the research and the consent form were verbally described to them. They were told that their participation in the study was completely voluntary and that they could withdraw or stop at any time. They were also assured that their personal information would be kept private. The participant should be assured that his or her name and address will not be used. The participants were also told that the study's findings would not affect them.

Table 4.1:Socio demographic information

Variables		n	%
Age	18-30 years	23	38
	31-43 years	24	40
	More than 43 years	13	22
Gender	Male	48	80
	Female	12	20
Living area	Urban	10	17
	Semi rural	35	58
	Rural	15	25
Educational Status	Informal education	10	17
	Primary education	20	33
	Secondary education	11	18
	Higher education	11	18
	Graduate and above	8	14
Marital status	Married	38	64
	Unmarried	20	33
	Divorced	2	3
Cause of injury	Fall from height	23	38
	Shallow water diving	1	2
	RTA	19	32
	Carrying heavy load	3	5
	Violence	2	3
	Others	12	20
Level of injury	Cervical	8	13
	Thoracic	18	30
	Lumber	34	57

In this study find out 60 participants (18-30) were 23, (31-43) were 24, (>43) were 13. Among them 48 male and 12 female. Among 60 participants 35(58%) participants lives in semi-rural area. 15 (25%) participants lives in rural area. 10 (17%) participants lives in urban area. Among 60 participants 10 people were informal education. 20 participants got primary education. 11 participants got secondary education. 11 participants got higher education and 8 participants got graduate and above. 38 (64%) participants of them were married. 20 (33%) participants were unmarried and 2 (3%) participants were divorced or separated. Among the participants 23 participants got injured by fall from height. 1 participants got injured by shallow water diving. 19 participants got injured by road traffic accident. 3 participants got injured by carrying heavy loads. 2 participants got injured by violence. 12 participants got injured by non-traumatic cause and other from this cause. 13% participants were lumber injury. 30% participants were cervical injury. 57% participants were thoracic injury.

4.2: Secondary complication related information

4.2.1: Association between level of injury and pressure sore

From table 3 in association between level of injury and pressure sore, researcher wanted them done by cross tabulation and fisher exact test where researcher have found 9 (50%) participant of cervical injury did not experienced pressure sore where 9 (50%) of cervical injury patient got mild problem with pressure sore. 18(52.9%) participants thoracic injury patient did not experienced pressure sore where 8 (23.5%) participant experienced mild pressure sore and 8(23.5%) participant of thoracic injury experienced moderate pressure sore. Among them 4 (50%) participants of lumber injury did not experienced pressure sore 2(25%) participant of lumber injury experienced mild pressure sore. 1 (12.5%) participants of lumber injury experienced moderate pressure sore and 1 (12.5%) participants of lumber injury experienced chronic problem of pressure sore. The fisher exact value was 11.156 and P value was .047. P value (<.047) indicates the result was significant.

4.2.2: Association in between living area and pressure sore

From table 3 in association between living area and pressure sore, researcher want them done by cross tabulation and fisher exact test where researcher have found 3 (30%) participant of urban area did not experienced pressure sore where 4 (40%) of urban area patient got mild problem with pressure sore. 2(20%) of participant got moderate pressure sore living in urban area. 1(10%) participants got significant pressure sore living in urban area.

17(48.6%) participants semi rural area patient din not experienced pressure sore where 14 (40%) participant experienced mild pressure sore and 4(11.4%) participant of semi rural area experienced moderate pressure sore.

Among them 11 (73.3%) participants of rural area did not experienced pressure sore 1(6.7%) participant of rural area experienced mild pressure sore. 3 (20%) participants of rural area experienced moderate pressure sore.

The fisher exact value was 11.333 and P value was .043. P value ($<.043$) indicates the result was significant

4.2.3: Association between traumatic injury and muscle spasm

From table 3 in association between traumatic injury and muscle spasm, researcher wanted them done by cross tabulation and fisher exact test where researcher have found 8 (34.8%) participant of fall from height did not experienced muscle spasm where 5 (40%) of fall from height patient got mild problem with muscle spasm. 10(43.5%) of participant got moderate muscle spasm who fall from height.

1 participants of shallow water diving got no muscle spam.

4(21.1%) participants RTA patient din not experienced muscle spasm where 12 (63.2%) participant experienced mild muscle spasm and 3 (15.8%) participant of RTA experienced moderate muscle spasm.

Among them 1 (33.3%) participants of carrying heavy loads did not experienced muscle spasm 2(66.7%) participant of carrying heavy loads moderate muscle spasm.

1 (50%) participants of violence experienced moderate muscle spasm and 1 (50%) participants of violence experienced chronic muscle spasm

The fisher exact value was 25.193 and P value was .021. P value ($<.021$) indicates the result was significant.

4.2.4: Assosiation between cause of injury and diabetes mellitus

From table 3 in association between cause of injury and diabetes mellitus, researcher wanted them done by cross tabulation and fisher exact test where researcher have found 38 (77.6%) participant of traumatic injury did not experienced diabetes mellitus where 9 (18.4%) of traumatic injury patient got mild problem with diabetes mellitus. 1(2%) of participant got moderate diabetes mellitus. 1(2%) of participant got chronic diabetes mellitus who got traumatic injury.

6(54.5%) participants of non traumatic injury patient din not experienced diabetes mellitus where 2 (18.2%) participant experienced mild diabetes mellitus and 3 (27.3%) participant of non traumatic injury patient experienced moderate diabetes mellitus.

The fisher exact value was 7.503 and P value was .030. P value ($<.030$) indicates the result was significant.

4.2.5: Association between paralysis type and bladder dysfunction

From table 3 in association between paralysis type and bladder dysfunction, the way researcher wanted them done by cross tabulation and fisher exact test where researcher have found 1 (11.1%) participant of complete tetraplegia did not experienced bladder dysfunction where 3 (33.3%) of complete tetraplegia patient got mild problem of bladder dysfunction. 3(33.3%) of participant got moderate bladder dysfunction who are complete tetraplegia.

2(25%) participants of incomplete tetraplegia patient did not experienced bladder dysfunction where 1 (12.5%) participant experienced mild bladder dysfunction and 5 (62.5%) participant of incomplete tetraplegia experienced moderate bladder dysfunction.

Among them 2 (9.5%) participants of complete paraplegia did not experienced bladder dysfunction. 3(14.3%) participant of complete paraplegia mild bladder dysfunction. 8 (38.1%) participants of complete paraplegia experienced moderate bladder dysfunction. 8(38.1%) participant of complete paraplegia experienced chronic bladder dysfunction.

Among them 5 (22.7%) participants of incomplete paraplegia did not experienced bladder dysfunction. 10(45.5%) participant of incomplete paraplegia mild bladder dysfunction. 7 (31.8%) participants of incomplete paraplegia experienced moderate bladder dysfunction.

The fisher exact value was 17.753 and P value was .018. P value ($<.018$) indicates the result was significant.

4.2.6: Association between age and sexual dysfunction

From table 3 in association between age and sexual dysfunction, the way researcher wanted them done by cross tabulation and fisher exact test where researcher have found 9 (39.1%) participant of age between 18-30 did not experienced sexual dysfunction where 3 (13%) of age between 18-30 patient got mild problem of sexual dysfunction. 7(30.4%) of participant got moderate sexual dysfunction and 4 (17.4%) who are chronic sexual dysfunction of age between 18-30.

9(37.5%) participants of age between 31-43 patient experienced mild sexual dysfunction where 11 (45.8%) participant experienced moderate sexual dysfunction and 4 (16.7%) participant of age between 31-43 experienced chronic sexual dysfunction.

Among them 3 (23.1%) participants of age more than 43 years did not experienced sexual dysfunction. 2(15.4%) participant of age more than 43 year mild sexual dysfunction. 6 (46.2%) participants of age more than 43 year experienced moderate sexual dysfunction. 2(15.4%) participant of age more than 43 year experienced chronic sexual dysfunction.

The fisher exact value was 14.472 and P value was .018. P value ($<.018$) indicates the result was significant

4.2.7 Association between gender and sexual dysfunction

From table 3 in association between gender and sexual dysfunction, the way researcher wanted them done by cross tabulation and fisher exact test where researcher have found 6 (12.5%) participant of male did not experienced sexual dysfunction where 11 (22.9%) of male patient got mild problem of sexual dysfunction. 23(47.9%) of participant got moderate sexual dysfunction and 8 (16.7%) who experienced chronic sexual dysfunction of male.

Among them 6 (50%) participants of female did not experienced sexual dysfunction. 3(25%) participant female mild sexual dysfunction. 1 (8.3%) participants of female experienced moderate sexual dysfunction. 2(16.7%) participant of female experienced chronic sexual dysfunction.

The fisher exact value was 9.987 and P value was .009. P value ($<.009$) indicates the result was significant

4.2.8: Assosiation between circulatory problem and level of injury

From table 3 in association between circulatory problem and level of injury, the way researcher wanted them done by cross tabulation and fisher exact test where researcher have found 12 (66.7%) participant of cervical injury patient did not experienced circulatory problem where 2 (11.1%) of cervical injury patient got mild circulatory problem. 4 (22.2%) of participant got moderate circulatory problem who got cervical injury

Among them 28 (82.4%) participants of thoracic injury patient did not experienced circulatory problem. 4(11.8%) participant of thoracic injury patient got mild circulatory problem. 2 (5.9%) participants of thoracic injury patient experienced moderate circulatory problem.

Among them 3 (37.5%) participants of lumber injury patient did not experienced circulatory problem. 2 (25%) participant of lumber injury patient got mild circulatory problem. 3 (37.5%) participants of lumber injury patient experienced moderate circulatory problem

The fisher exact value was 8.343 and P value was .05 .P value (<.05) indicates the result was significant

4.2.9 : Association between gender and respiratory problem

From table 3 in association between respiratory problem and gender, the way researcher wanted them done by cross tabulation and fisher exact test where researcher have found 28 (58.3%) participant of male patient did not experienced respiratory problem where 11 (22.9%) of male patient got mild reparatory problem. 9 (18.8%) of participant got moderate problem of male patient.

Among them 10 (83.3%) participants of female patient did not experienced respiratory problem. 1(8.3%) participant of female patient got moderate respiratory problem. 1 (8.3%) participants of female patient experienced chronic respiratory problem.

The fisher exact value was 7.121 and P value was .038. P value ($<.038$) indicates the result was significant

The aim of the study was to find the socio-demographic information's, injury related information and complications among the spinal cord injured patient after returning the community. In this study 60 patients with SCI, who were in community most of them were 31-43 years range that was almost 40% (n=24), 18-30 years were 38% (n=23), Above 43 years were 22% (n=13). So it was found that biggest sample contains in age range 31-43 years and lowest sample range was more than 43 years. Among the study of Bangladeshi most common age group between 25-29 years in spinal cord injured patients (Rahman et al., 2017)

From this study were found that females were 20% (n=12), whereas males were 80% (n=48). So this result shows that males were more vulnerable than females. In one study reported data of 44 patients. There were 35 males and 9 females whose average age was 45.23 ± 13.78 years (Srisim, Saengsuwan and Amatachaya, 2014)

In these study patients who lived in semirural were more affected than the people who lived in urban. Among these approximately 58% (n=3) were in semirural and 25% (n=10) were in urban area and 25% (n=15) participant lived in rural area.

Among 60 (100%) participants in the study about 17% (n=10) informal education, 33% (n=20) took primary education, 18% (n=11) took secondary education, 18% (n=11) were higher education and 13% (n=8) took . So the result shows that most participants are in primary education. A study of India showed that almost 60-70% was illiterate (Chalmers, 2015). A Brazilian study showed that of the 60 patients, 38 (63.3%) had complete or incomplete primary education, 19 (31.7%) had complete or incomplete secondary education and 3 (5%) had college education (Pereira and Sanchez, 2018)

Among the 60 participants there were 64% (n=38) participants were married and 33% (n=20) were unmarried and 3% (n=2) were divorced or separated.

Among the participants almost 13% were lumber injury and 30% were cervical injury and 57% were thorasic injury participants. In one study shows that SCI typically affects the cervical level of the spinal cord (50%) with the single most common level affected being C5. Other injuries include the thoracic level (35%) and lumbar region (11%) (Ahuja et al., 2017).

With recent advancements in medical procedures and patient care, SCI patients often survive these traumatic injuries and live for decades after the initial injury.

In this study, most of the injuries were 38% (n=23) fall from height. 2% (n=1) were shallow water diving, 32% (n=19) were road traffic accident, 5% (n=3) were carrying heavy loads, 3% (n=2) were violence and 20% (n=12) were other or non traumatic cause. In the developed country, road traffic accident is the leading cause of SCI followed by fall and then sports injury (Rahman et al., 2017).

According to this study the incidence of pressure sore, pain, spasticity, joint stiffness, muscle atrophy, contracture, urological problems, fall were increased after returning the community.

In one study most often the complications were reported like as pain, spasticity and pressure ulcers, as well as complications associated with bladder, bowel and sexual dysfunction (Hagen, 2015)

One study report of the 51 participants, 58.8% reported bladder incontinence, 54.0% bowel incontinence, 60.8% sexual dysfunction and 29.4% had all three. The regression models demonstrated that age at injury, bowel incontinence, sexual dysfunction, presence of pain, motor score at follow-up and the number of SHC were significant predictors of health status (Park et al., 2016).

In this study cervical , thoracic and lumbar injury patient reported 50% insignificant problem of pressure sore, 24% reported mild problem of pressure sore , 25% reported moderate problem and 1% reported chronic problem of pressure sore as secondary complication.

In this study 28% patient with fall from height got mild problem with muscle spasm and 44% got moderate problem with muscle spasm. Another traumatic injury of road traffic accident patient got 63% of mild problem with muscle spasm and 16% of moderate problem with muscle spasm.

In this study researcher found that traumatic spinal cord injury patient are more vulnerable to diabetes mellitus than non traumatic injury patient.

In this study researcher found that complete paraplegic patient found significant problem with bladder dysfunction then other types of paralysis. 38% of complete paraplegic patient got

moderate problem with bladder dysfunction and 38% got significant problem of bladder dysfunction also.

In this study researcher found that age between 31-43 got moderate sexual dysfunction of 46% than other age group. This study also report that male patient got more sexual dysfunction than female.

In Bangladesh there are no well proper documents about spinal cord injury and also lack of specialized care of SCI patients. Bangladesh is a developing country. Most of them live with low economic level and poor educational level. In this country there is also lack of awareness about injury especially caused by SCI. But spinal cord injury causes a bad impact on quality of life results in long term disability, mortality & morbidity and burden for the community.

In this study In this study 60 patients with SCI, who were in community most of them were 31-43 years range that was almost 40% (n=24), 18-30 years were 38% (n=23), Above 43 years were 22% (n=13). From this study were found that females were 20% (n=12), whereas males were 80% (n=48). So this result shows that males were more vulnerable than females. Among these approximately 58% (n=3) were in semirural and 25% (n=10) were in urban area and 25% (n=15) participant lived in rural area. Among the participants almost 13% were lumber injury and 30% were cervical injury and 57% were thorasic injury participants And the study also found that the complications which commonly develop within the SCI patients are pressure sore, pain, spasticity, UTI, muscle atrophy, psychological problem etc. So the result shows that most participants are in secondary level. So it is necessary to raise awareness and take steps to reduce the risk of complications. Spinal cord injury is a catastrophic, devastating and life changing event. Most of the patients with SCI do not come under specialized care and follow up care, as a result they become more prone to develop complications and these complications are major factor of mortality & morbidity.

So only awareness and proper care can help to survive after SCI returning the community. Awareness should be early hospitalization, early initiation of the complications and prevention of complications. Comparative study to find out the complications among before admission, during admission and after admission at specialized rehabilitation center will be better one. But 61 during further research it is recommended to take more samples with adequate time to solve the recent problems areas for better result and perspectives. Needs to arrange awareness program among the community based populations about specialized care, proper hygiene and prevention of complications

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Appendix

Part: - 1 Socio-demographic information

1.1	Patients name	
1.2	Mob. no	
1.3	Age	Years:
1.4	Sex	1. Male 2. Female
1.5	Address	

1.6	Past Occupation	<ol style="list-style-type: none"> 1. Service holder 2. Retired 3. Housewife 4. Businessman 5. Students 6. Others(Specify)
1.7	Present Occupation	<ol style="list-style-type: none"> 1. Employment 2. Unemployment 3. Business
1.8	Monthly income	
1.9	Educational status	<ol style="list-style-type: none"> 1. Informal education 2. Primary 3. Secondary 4. Higher 5. Graduate and above
1.10	Residential area	<ol style="list-style-type: none"> 1. Urban 2. Semi-rural 3. Rural
1.11	Marital status	<ol style="list-style-type: none"> 1. Married 2. Un-married 3. Divorced/Seperated.

Part: -2 Injury related Information

2.1	Date of admission	
2.3	Causes of injury	1. Traumatic 2. Non traumatic
2.4	If injury is traumatic	1. Fall from height 2. Shallow water diving 3. RTA 4. Carrying heavy load 5. Bull attack 6. Violence 7. Others
2.5	Level of injury	1. Cervical 2. Thoracic 3. Lumber
2.6	Types of paralysis	1. Complete Tetraplegia 2. Incomplete Tetraplegia 3. Complete Paraplegia 4. Incomplete Paraplegia
2.6	Date of discharge	

Part: 3 The SCI condition related questionnaire

For the following 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.

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.

SI	Health Problem	Description	Rating			
			0	1	2	3
3.1	Pressure sore	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
3.2	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
3.3	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
3.4	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
3.5	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
3.6	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

3.7	Bowel dysfunction	Diarrhea, constipation, “accidents”, and associated problems are signs of bowel dysfunction	0	1	2	3
3.8	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
3.9	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
3.1 0	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 p	0	1	2	3
3.1 1	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
3.1 2	Circulatory problems	Circulatory problems involve the swelling of veins, feet or the occurrence of blood clots	0	1	2	3
3.1 3	Respiratory problems	Symptoms of respiratory infections or problems include difficulty in breathing and increased secretions.	0	1	2	3
3.1 4	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
3.1 5	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

“কমিউনিটিতে মেরুরুজ্জতে আঘাত প্রাপ্ত রোগীদের পরবর্তী সমস্যা / জটিলতা”

বাংলা প্রশ্নাবলী

পাট ঃ ১ আর্থ সামাজিক তথ্যবলি

ক্রমিক নং	প্রশ্ন	উত্তর
১.১	রোগীর নাম	
১.২	মোবাইল নং	
১.৩	বয়স	
১.৪	লিঙ্গ	
১.৫	ঠিকানা	
১.৬	পূর্ববর্তী পেশা	১। চাকুরীজীবী ২। অবসরপ্রাপ্ত ৩। গৃহিণী ৪। ব্যবসায়ী ৫। ছাত্রছাত্রী ৬। অন্যান্য
১.৭	পরবর্তী পেশা	১। চাকরি ২। বেকার ৩। ব্যবসায়ী
১.৮	মাসিক উপার্জনটাকা
১.৯	শিক্ষা	১। অশিক্ষিত ২। প্রাথমিক শিক্ষা ৩। মাধ্যমিক শিক্ষা ৪। উচ্চ মাধ্যমিক শিক্ষা ৫। স্নাতক
১.১০	বসবাসের এলাকা	১। শহর ২। মফঃস্বল ৩। গ্রাম
১.১১	বৈবাহিক অবস্থা	১। বিবাহিত ২। অবিবাহিত ৩। তলাক প্রাপ্ত

পার্ট ঃ ২ -পক্ষাঘাত সম্পর্কিত তথ্য

২.১	হাসপাতালে ভর্তির তারিখ	
২.২	অসুস্থতার কারন	১/ আঘাতমূলক ২/ অআঘাতমূলক
২.৩	যদি আঘাতজনিত অসুস্থতা হয়	১/ উচ্চ স্থান থেকে পড়ে যাওয়া ২/ অগভীর পানিতে ঝাপ দেয়া ৩/ সড়কে দুর্ঘটনা ৪/ অতিরিক্ত ভারী জিনিস বহন ৫/ ষাঁড়ের আক্রমণ ৬/ সহিংসতা ৭/ অন্যান্য
২.৪	আঘাতের স্থান	১/ সার্ভাইকাল ২/ থোরাসিক ৩/ লাম্বার
২.৫	পক্ষাঘাতের প্রকার	১/ সম্পূর্ণ টেট্রাপ্লেজিয়া ২/ অসম্পূর্ণ টেট্রাপ্লেজিয়া ৩/ সম্পূর্ণ পেরাপ্লেজিয়া ৪/ অসম্পূর্ণ পেরাপ্লেজিয়া
২.৬	হাসপাতাল ত্যাগের তারিখ	

পার্ট ৩ঃ এসসিআই-এসসিএস রেটং পদ্ধতিঃ

০=গত তিন মাসে কোনো সমস্যার সম্মুখীন হয়নি

১=অল্প অথবা অনিয়মিত সমস্যা

২=মার্মারি অথবা আকস্মিক সমস্যা

৩=লক্ষনযুক্ত অথবা দীর্ঘস্থায়ী সমস্যা

নাম্বার	স্বাস্থ্য সমস্যা	বিবরণ	রেটিং			
৩.১	চাপজনিত ঘা	এটা সাধারণত হয় ত্বকে লাল দাগ থেকে এবং ধীরে ধীরে জীবানুযুক্ত ঘা তে পরিনত হয়।এজন্য এটাকে ত্বকজনিত ঘা বলা হয়।	০	১	২	৩
৩.২	অনুভূতিহানির কারণে আঘাত	সংবেদনের অভাবের কারণে আঘাত হতে পারে, যেমন কোলে গরম তরল বহন বা খুব বসে থেকে পোড়া একটি হিটার বা আগুনের কাছাকাছি।	০	১	২	৩
৩.৩	মাংসপেশী শক্ত হয়ে যাওয়া (জড়তা)	এটা হতে পারে অনিয়ন্ত্রিত মাংসপেশির কাপনি থেকে	০	১	২	৩
৩.৪	মাংসপেশী সংকোচন	এটাকে বলা হয় নড়াচড়া সীমাবদ্ধতা যখন অস্থিসন্ধি ছোট হয়ে যায়।এটার সাথে ব্যাথাও থাকতে পারে।	০	১	২	৩
৩.৫	বহুমূত্র রোগ	যখন শরীরে অনিয়ন্ত্রিতভাবে গ্লুকোজ এর পরিমাণ বেড়ে যায়।অতিরিক্ত প্রস্রাব হয় এবং খুব বেশি তৃষ্ণা পায়।	০	১	২	৩
৩.৬	প্রস্রাবজনিত সমস্যা	প্রস্রাব ধরে রাখতে পারে না, কীডনিতে পাথর, কিডনীজনিত সমস্যা, প্রস্রাব বের হয়ে যাওয়া এবং প্রস্রাব ফিরে যাওয়া এর সবই প্রস্রাবজনিত সমস্যার উপলক্ষণ	০	১	২	৩
৩.৭	পায়খানাজনিত সমস্যা	ডায়রিয়া, কোষ্টকাঠিন্য এই ধরনের সমস্যাগুলোই পায়খানাজনিত সমস্যার লক্ষণ	০	১	২	৩
৩.৮	মূত্রথলিতে জ্বালাপোড়া	এখানে প্রস্রাবের সাথে ব্যাথা হতে পারে, পুরো শরীরে জ্বালাপোড়ার ন্যায় অনুভূতি হয়, প্রস্রাবের সাথে রক্ত আসে এগুলোই মূত্রথলিতে	০	১	২	৩
৩.৯	যৌনতার সমস্যা	যৌন কার্যাবলীর সময় অসন্তুষ্টি শরীরে পরিবর্তন, নরাচড়ায় সমস্যা, প্রস্রাব পায়খানায় সমস্যা এগুলোই যৌনতার সমস্যা।	০	১	২	৩

৩.১০	হঠাত উচ্চরক্তচাপ	যদি শরীরের তাপমাত্রা বেড়ে যায় তখন এ ধরনের সমস্যা হতে পারে যেমনঃ অতিরিক্ত ঘাম হবে, চোখের মনি ছোটবড় হবে, মাথা ব্যাথা হবে।	০	১	২	৩
৩.১১	হঠাত নিম্নরক্তচাপ	যদি হঠাত করে অবপস্থান পরিবর্তনের সময় এ সমস্যা হতে পারে যার কারনে রক্তচাপ কমে যায়।	০	১	২	৩
৩.১২	রক্তচলাচলজনিত সমস্যা	ধমনী ফুলে যাওয়া,পায়ে ও আশে পাশের রক্ত জমাট বাধে এই সমস্যা হলে	০	১	২	৩
৩.১৩	শ্বাসপ্রশ্বাসজনিত সমস্যা	প্রচলিত রকমের শ্বাসকষ্ট দেখা দেয়	০	১	২	৩
৩.১৪	অস্থিসন্ধি এবং মাংসপেশীতে ব্যাথা	নির্দিষ্ট অস্থি ও মাংসপেশীতে ব্যাথা হয় এবং তাদের হয় যারা নির্দিষ্ট মাংসপেশীকে অতিরিক্ত ব্যবহার করে। যেমন কাধের মাংসপেশি	০	১	২	৩



বাংলাদেশ হেলথ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)

(The Academic Institute of CRP)

Ref:

CRP/BHPI/IRB/03/2022/579

Date:

02/03/2022

Alpha Ahmed
4th year B.Sc. in Physiotherapy
Session: 2015-2016, Student ID: 112150308
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal “Secondary complication of spinal cord injury patient at community after completing rehabilitation from CRP” by ethics committee.

Dear Alpha Ahmed,
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 Mohammad Anwar Hossain as thesis supervisor. The Following documents have been reviewed and approved:

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

The purpose of the study is to find out the secondary complication of spinal cord injury patient at community after completing rehabilitation from CRP. Since the study involves questionnaire that takes maximum 15-20 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 12th October, 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,

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

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404

E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd, www.crp-bangladesh.org

The Chairman

Institution Review Board (IRB)

Bangladesh Health Professions Institute (BHPI)

CRP, Savar, Dhaka-1343, Bangladesh.

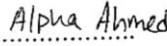
Subject: Application for review and ethical approval.

Dear Sir,

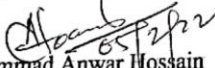
With due respect, I am Mahmudul Hasan student of 4th professional B. Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI), academic institute of Center for the Rehabilitation of the Paralyzed (CRP) under the faculty of medicine of university of Dhaka. As per the course curriculum, I have to conduct a thesis entitled, "**Secondary complication of spinal cord injury patient at community after completing rehabilitation from CRP**" under the supervision of Mohammad Anwar Hossain, Associate professor (BHPI), Senior Consultant and Head of the department of Physiotherapy, CRP, Savar, Dhaka-1343. The purpose of the study is to find out the chance of developing secondary complication of sci patient. I would like to assure that anything of my study will not be harmful for the participants. Informed consent will be received from all participants, 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


Alpha Ahmed
4th professional B.Sc. in Physiotherapy
Roll: 45, Session: 2015-16,
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Recommendation from the thesis supervisor:


Mohammad Anwar Hossain

Associate Professor (BHPI)

Senior Consultant and Head of the department of Physiotherapy, CRP, Savar, Dhaka-1343

Thesis presentation date: 17th October 2021


Head of Department

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