Faculty of Medicine

University of Dhaka

CHARACTERISTICS AND PSYCHOLOGICAL ISSUES AMONG THE SPINAL CORD INJURY PATIENTS DURING REHABILITATION

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Session: 2017-2018

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September, 2020

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

CHARACTERISTICS AND PSYCHOLOGICAL ISSUES AMONG THE SPINAL CORD INJURY PATIENTS DURING REHABILITATION

Submitted by **Jannat Laila sheba,** for the partial fulfilment of the requirement for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT).

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DECLARATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also decline 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).

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Acknowledgement

First of all, I would like to pay my gratitude to Almighty who has given me the ability to complete this research project in time with great success. I would like to pay my gratitude towards my parents who constantly encouraged me to carry out this project. My deepest great-fullness goes to my honorable supervisor & respected teacher **Professor Md. Obaidul Haque** Vice principal , Bangladesh Health Professions Institute (BHPI), CRP, Savar, Dhaka, for his keen supervision and tireless effort with excellent guidance and support without which I could not able to complete this project.

In addition, I am thankful to all of my honorable teachers specially **Professor MD Shafiqul Islam**, Associate Professor, BHPI, CRP, Savar, Dhaka ; **Dr. Mohammad Anwar Hossain**, Associate Professor, BHPI & Senior Consultant and Head of Department of Physiotherapy, CRP, Savar, Dhaka**; Asma Islam**, Assistant Professor, BHPI for their advice, support and guidelines and also given me the permission to collect the data from the Spinal Cord Injury Unit of Physiotherapy Department.

I wish to thanks to all respectable Physiotherapy staff working at CRP Spinal cord injury unit especially honorable teacher **Muzaffor Hossain**, Senior Physiotherapist & In-charge of SCI Unit, CRP, Savar, Dhaka for helping me in collection of my data.

I would also like to give thanks to BHPI librarian Mrs. Mohosina to her heartily help and library assistant Mr. Anis for their positive help, kind support to find out related books, journals and also access to internet during the project study. I thank all of my friends for their direct and indirect inspiration, suggestion as well as support.

Finally I would like to thanks all the participants who willingly participated as the study population during the conduction of my study and the entire individual who were directly or indirectly involved with this study.

Acronyms

ADL :	Activity of Daily Living
BHPI :	Bangladesh Health Profession's Institute
BMRC :	Bangladesh Medical Research Council
CRP :	Centre for the Rehabilitation of the Paralysed
IRB :	Institutional Review Board
MDD :	Major Depressive Disorder
PHQ-9 :	Patient Health Questionnaire-9
SCI :	Spinal Cord Injury
USA :	United State of America
WHO :	World Health Organization

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Abstract

Purpose*:** To assess mental health of people with spinal cord injury (SCI) in rehabilitation stage attending at CRP. ***Objective: The purpose of this study was to assess the degree of depression and learn more about the socio-demographic characteristics of individuals with spinal cord injuries. The goals also included determining whether there was any correlation between socio-demographic data (age, gender, kind of injury, cause of injury, severity of injury, and marital status) and mental health. ***Methodology:*** There was a cross-sectional study design. For this investigation, a total of 105 samples were conveniently chosen from the Spinal Cord Injury Unit at Savar Centre for the Rehabilitation of the Paralysed (CRP). A questionnaire was used to gather data, and the Patient Health Questionnaire (PHQ-9) was used to evaluate mental health. Using SPSS software 25.0, a quantitative descriptive analysis method was used to conduct the study. ***Results:*** Among 105 respondents, 89.5% % were male,10.5% were female, 45.7% were aged between 16–30 years and 40% were aged between 31-45 years, 66.7% were married & 33.3% unmarried, 15.2% were illiterate & 46.7% were S.S.C passed, 61.9% were paraplegic & 34.1% were tetraplegic, 77.1% had complete-A in American Spinal Injury Association scale, and 41.9% had SCI for Fall from height. Among the participants, 21% minimal depression, 34.3% mild depression, 38.1% moderate depression, 5.7% had moderately severe depression and 1% had severe depression. Statistically significant association was found in between mental health & some socio-demographic information such as Age, gender, types of injury, severity of injury, marital status. ***Conclusions:*** Many patients in Bangladesh remain untreated and receive inadequate diagnosis. To the best of our knowledge, very little study has been done expressly on the symptoms of depression and the variables that influence depression in people with spinal cord injuries over time. Social workers and health planners must have a deep awareness of the psychological challenges that individuals with spinal cord injuries encounter, in addition to the variations that arise from environmental, physical, and cultural factors, including the resources that are accessible in each community. To adequately visualize the burden, further large-scale research is needed.

Keywords: Patient Health Questionnaire 9(PHQ-9), SCI, Mental health.

CHAPTER – I INTRODUCTION

Background

In addition to harming or eliminating sensory and motor function, spinal cord injury (SCI), a severe impairment, can cause other organ dysfunctions (Huang et al. 2020). According to Geard et al. (2018), spinal cord injury (SCI) is the most complex type of severe injury. Patients with SCI frequently experience neurological abnormalities that are incapacitating and negatively impact their functional, physical, psychological, and economical well-being.Spinal cord injury can seriously impair one's ability to operate on the physical, psychological, and social levels (Gurcay et al. 2010; New et al. 2013; Smith et al. 2013). Everyone can sustain a spinal cord injury, which can cause a variety of challenges for the victim.

The average age of those affected by SCI ranges from 26.8 to 56.6 years, and the incidence rates in Asia from 12.06 to 61.6 per million (Ning et al. 2012). A nationwide review of hospital records in Pakistan between 1995 and 1999 revealed that 5.1 out of every million patients suffered head and spine injuries (Kumar et al. 2018).According to Razzak et al. (2011), spinal cord injury victims in developing countries such as Bangladesh have much lower life expectancies than those in wealthier nations. According to Islam et al. (2011), SCI continues to be one of the main causes of disability in Bangladesh and throughout Asia. Overall, out of those with SCI who were admitted, 43.6 percent passed away after five years, whereas 56.4 percent did not. A spinal cord injury (SCI) is a severe and persistent condition that typically causes paralysis, a number of secondary effects, functional restrictions, and ongoing suffering (Aaby et al. 2020). This kind of harm has been called one of the most serious wounds a person could receive, resulting in profound and irreversible changes in many areas of life (Phillips et al. 2016).

According to Craig et al. (2015), SCI patients have limited social participation, lower life satisfaction, and up to 30% of them have clinical levels of anxiety and sadness at some time after their injury (Guadagni et al. 2019). People with SCI frequently experience psychological distress, which has been observed to endure for up to ten years or more.

Accepting the injury has an impact on whether there are and how severe any negative psychological impacts are (Peter et al. 2014). In experimental studies, greater acceptance is associated with a better quality of life and lower levels of depression, anxiety, and post-traumatic stress disorder (PTSD) (Craig et al. 2017). The common secondary illnesses tha According to WHO, mental health illnesses impact about 10% of the world's population, and the prevalence is significantly higher among people with disabilities (Teesson et al. 2011). Because injury to the spinal cord leads in complete or partial loss of sensation and movement below the lesion level, SCI is a condition that frequently leaves patients with considerable physical handicap (WHO, 2013). Moreover, those with SCI are more likely to experience mental health issues (Williams & Murray, 2015). With incidence rates of about 22% and 27%, depression and anxiety disorders are widespread in people with spinal cord injuries. Given these findings, it's crucial to advance knowledge of the variables influencing mental health in the SCI community so that suitable interventions may be made.t reduce quality of life are chronic fatigue, chronic pain, and mental health problems including depression (De Almeida et al. 2013; Lim et al. 2017).

Because depression restricts physical, social, and personal activities, it is among the top 10 global causes of disability. It can affect anyone, at any age, and it is also the most prevalent psychological issue in people with spinal cord injuries (SCI). These people may suffer low mood, fatigue, difficulty concentrating, disturbed sleep, or changes in eating (Arango-Lasprilla et al. 2011; Shin et al. 2012; De Almeida et al. 2013). It starts at the time of the injury and lasts the entirety of the person's life with SCI, requiring new adjustments as the person advances and encounters new experiences that can vary from minor to significant depression (Shin et al. 2012).

Depending on the type of measurement utilized and the time period covered, studies' estimates of the prevalence of depression following SCI vary (Shin et al. 2012). Between 9.8% and 63.9 percent of community residents and inpatients had probable depression after SCI, which is a significant prevalence (Khazaeipour et al. 2015). According to Bombardier et al. (2012), up to 40% of people with SCI who live in the community are at risk, which makes thorough screening of SCI patients even more important. Additionally, 25% to 30% of adults with SCI who live in the community experience severe depressive symptoms. The Patient Health Questionnaire-9 (PHQ-9) is said to be a helpful diagnostic tool for depression. It possesses robust psychometric properties. Therefore, it can be considered positive.

Rationale

Spinal cord injury (SCI) is a debilitating disorder with a high mortality rate that affects all facets of life. This affects anywhere between 15 and 40 persons per million worldwide in a given year. Spinal cord injury is a serious disorder that can lead to social, mental, and physical issues (Smith et al. 2013). Mental health includes mood, emotion, suffering, and enjoyment of life. People with SCI typically experience higher levels of distress and lower levels of life satisfaction when compared to the general population.

In studies that included diagnostic interviews, the prevalence of serious depression ranged from 9.8% to 37.5%. 3 Depression screening studies of patients with SCI rehabilitation (20%–43%) and people living in the community (11%–60%) revealed comparable prevalence rates (Craig et al., 2009). Depression is linked to longer rehabilitation stays, fewer functional gains, decreased mobility and independence after discharge, and worse role performance. As a Southeast Asian developing nation with a high population density, Bangladesh has a sizable SCI population. Major or moderate depressive symptoms are poorly addressed and left untreated in this situation. Therefore, for better rehabilitation, it is crucial to comprehend the long-term physical & psychological effects of SCI.

The results of this study will give physiotherapists a better understanding of patients' post-SCI mental health. Many people with spinal cord injuries come to CRP for physiotherapy treatment, but due of their poor mental health, most patients' treatment goals are not reached. Through this study, patients will learn about their illness and some information on their mental health, which affects their quality of life. The purpose of this research is to ascertain, from the viewpoint of Bangladesh, how spinal cord injuries impact patients' mental health during their recuperation.This idea makes it easier to design a treatment plan that satisfies the patient's needs. Our ability to treat patients is improved.

Research Question

What is the characteristics and associated factors of psychological issues of spinal cord injury patients in rehabilitation stage attending at CRP?

Objectives

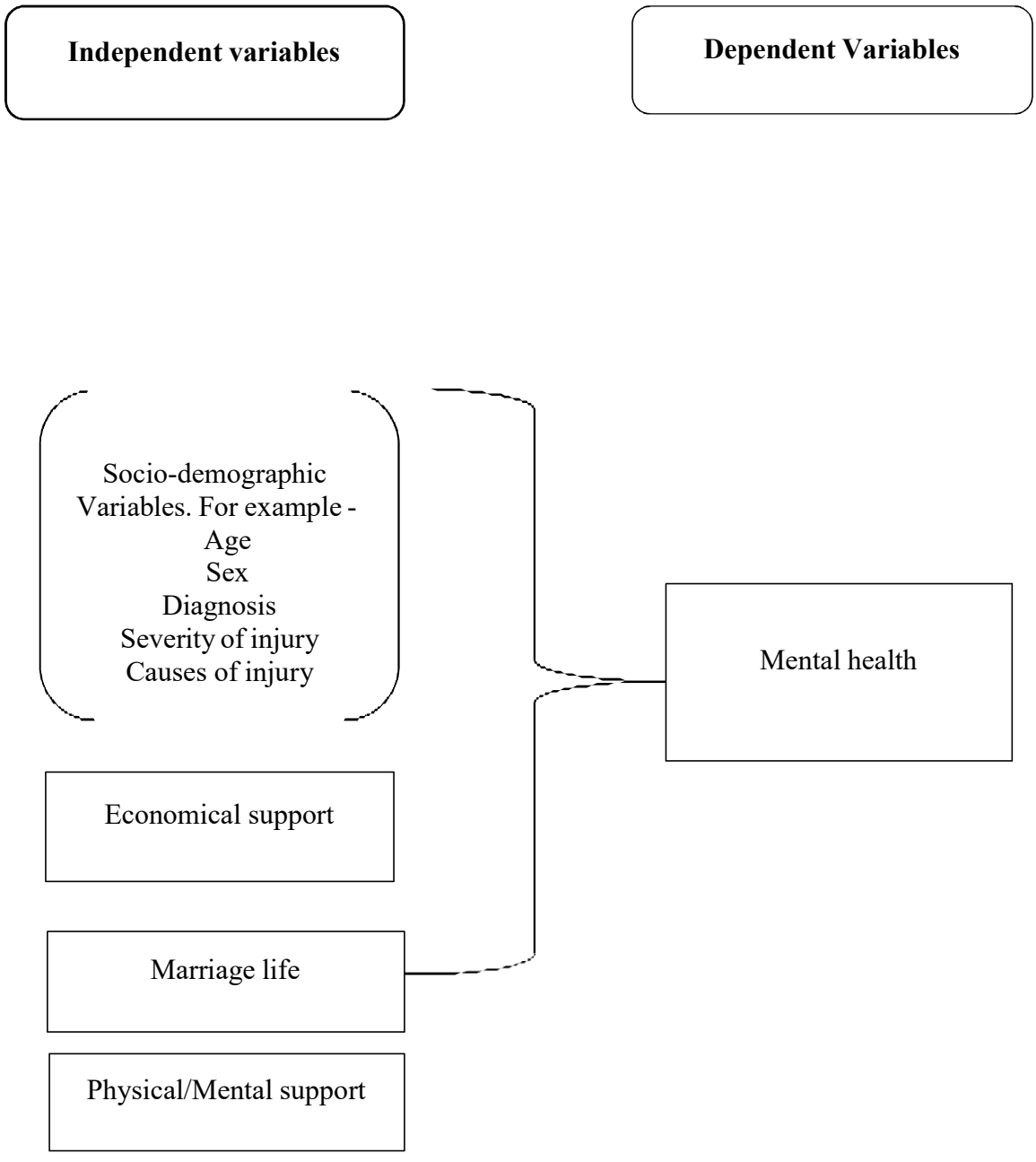
General Objective

To find out the psychological issues of Spinal Cord Injury patients in rehabilitation stage attending at CRP.

Specific Objectives

- To ascertain the socio-demographic data (age, gender, marital status, andoccupation).
- To identify the traits of psychological problems.
- To evaluate the patient's degree of depression following a spinal cord injury.
- To assess the degree of dementia, mood disorders, anxiety, and depression.

Conceptual Framework



Operational Definition

Spinal Cord Injury

Spinal cord injury is defined as the occurrence of an acute traumatic lesion of neural elements in the spinal canal resulting in temporary or permanent sensory and/or motor deficit.

Paraplegia

Impairment or loss of motor or sensory function / partial or complete paralysis of the lower half of the body with involvement of both legs that is usually due to damage to the spinal cord in the thoracic or lumber or sacral regions.

Tetraplegia

Tetraplegia is also known as Quadriplegia. It means paralysis of all four limbs, motor and/or sensory function in the cervical spinal segment is impaired or lost due to damage to that part of the spinal cord resulting in impaired or loss of function in the upper limbs, lower limbs, trunk and pelvic organs.

Psychological issues

Psychological issues includes our emotional, psychological ,Dementia and social well-being. It affects how we think, feel, and act. It also helps determine how we handle stress, relate to others, and make healthy choices. Mental health is important at every stage of life, from childhood and adolescence through adulthood.

CHAPTER – II LITERATURE REVIEW

Damage to the spinal cord that causes temporary or permanent alterations in function is known as a spinal cord injury (SCI). Traumatic and non-traumatic causes of SCI are distinguished (Noonan et al. 2013). A traumatic SCI occurs when the spinal cord is acutely damaged by an external physical impact (such as a car accident, fall, sports-related injury, or violence), whereas a non-traumatic SCI occurs when the primary injury is caused by an acute or chronic disease process (such as a tumor, infection, or degenerative disc disease). Damage to the spinal cord or the nerves at the end of the spinal canal is known as a spinal cord injury. This frequently leads to long-term strength changes.

The primary insult in traumatic SCI destroys cells and sets off a complicated secondary injury cascade that results in the death of neurons and glial cells, as well as ischemia and inflammation. Changes in the organization and structural architecture of the spinal cord, including the formation of a glial scar and cystic cavities, occur as a result of this cascade. Because of the glial scar and cystic cavities, as well as inadequate endogenous myelination and axonal regrowth, the spinal cord has a low intrinsic recovery capacity, resulting in lifelong neurological impairments following SCI (Ahuja et al. 2017).

Non-traumatic SCI is more common in older age groups, and as life expectancy rises, the incidence of non-traumatic SCI will rise and eventually overtake that of traumatic SCI (New et al., 2013). The etiology of non-traumatic SCI varies by area. The majority of etiologies identified in temperate zones also occur in the tropics; however, infectious and nutritional illnesses are more common in tropical climates (Roman, 2014). HIV infection has been demonstrated to have an impact on the etiology of non-traumatic SCI, with a preference for infectious causes (Modi et al. 2011).

Annually, 40 to 80 new cases of spinal cord injury (SCI) are predicted to occur globally (New et al. 2014). SCI affects 15 to 40 people per million people over the world, with an annual incidence rate of 10.4 to 83 cases per million (Moghimian et al. 2015) According to the National Spinal Cord Injury Association, up to 450,000 people in the United States are living with a spinal cord injury (SCI). Every year, an estimated 11,000 SCIs occur in the United States (American Association of Neurological Surgeons, 2017), and the incidence in Europe ranges from 10.4 per million per year to 29.7 per million per year (Moghimian et al. 2015). According to Lim et al. (2017), the highest prevalence of SCI is 906 per million in the United States; however, incidence rates of SCI in Asia range from 12.06 to 61.6 per million (Ning et al. 2012), but Moghimian et al. (2015) stated in his other literature that the incidence rate is 27.1 per million per year in Asia after 3 years. Accepting SCI in society can affect anyone, but males, particularly active younger men, are more likely to be victims (Craig, 2015). SCI is currently being prevent at the primary level all over the world. The International Spinal Cord Society (ISCoS) recently began a global mapping effort to create a structure for an ongoing data repository to inform stakeholders about prevention strategy development and coordination. The reported SCI incidence rate in the United States (39 per million) is comparable to that of Canada (35 per million), although it is significantly higher than that of Western Europe (16 per million) and Australia (14 per million) (15 per million). Aside from differences in methodology, population characteristics, and pre-hospital mortality rates, the increase in SCI incidence in North America appears to be connected with a greater percentage of violence-related SCIs (18%) compared to Western Europe (8%) and Australia (2%). SCI prevalence varies geographically within the United States (Cripps et al. 2011).

According to a study, the average life expectancy of patients with SCI in Bangladesh is 5.36 years. Overall, 56.4 percent of people admitted with SCI died within 5 years, whereas 43.6 percent lived for 5 years or more. According to a study conducted at CRP in Bangladesh, the most susceptible age groups were 20-40 years old, accounting for 55.6 percent of the population. The frequency of SCI was lower in those under the age of 20 and higher in those over the age of 50. In the 158 people, 86.1 percent had traumatic

injuries and 13.9 percent had non-traumatic injuries, resulting in 79.75 percent having paraplegia and just 20.25 percent having tetraplegia (Razzak et al. 2011).

Although the ratio of SCI varies significantly between industrialized and developing countries, people with SCI are predominantly male. The male-female ratio in affluent countries ranges between 2.5:1-4.3:1, while in poor countries it ranges from 2.34:1-9:1. In India, the male-female ratio of SCI is 4.2:1 with a frequent age group of 20-49. Despite the fact that the gender distribution of the Bangladeshi population is nearly equal, the malefemale ratio among people with SCI in Bangladesh is 4.5:1. According to many published papers in Bangladesh, the number of females with is increasing in Bangladesh today (Razzak et al. 2017).

In Bangladesh, 60 percent of traumatic spinal cord injury lesions are paraplegics and 40 percent are tetraplegics, while 84 percent of non-traumatic spinal cord injury cases are paraplegics and 16 percent are tetraplegics. SCI have a variety of non-traumatic and traumatic etiologies, with differing degrees of brain damage as a result. Falling from a height, whether from trees, building sites, electric poles, or roofs, was found to be the most common cause (40.30 percent) while falling while carrying a large burden on the head was shown to be the second most common cause (40.30 percent) in a Bangladeshi study (16.0 percent). Spinal TB was shown to be the most common cause of non-traumatic SCI, accounting for 7.0 percent of patients. Road traffic accidents, falling objects on the back, Guillain-Barre Syndrome, and Transverse Mellitus were among the other reasons (Razzak et al. 2011).

Spinal cord injuries carry a substantial risk of morbidity and mortality. When compared to the general population, the risk of death is highest in the first year after an accident. People who have had a spinal cord injury are 2 to 5 times more likely to die young than those who have not suffered a spinal cord injury. Various epidemiological studies have been conducted in various parts of the world regarding this life-threatening illness. SCI occurs in 9.2 to 56.1 per million people over the world (Mathur et al. 2015). Males are more likely to suffer than females in spinal cord injury around the world, but children are

Also affected (Nas et al. 2015). Females, on the other hand, are most at risk during adolescence, between the ages of 15 and 19, and later in life, when they are over 60 years old. Male-to-female ratios of at least 2:1, and occasionally much higher, have been reported in studies among adults (WHO, 2013).

People with SCI face a major health risk as a result of their lack of function and movement. Pressure ulcers, urinary tract infections, chronic pain, obesity, respiratory dysfunction, and cardiovascular diseases are examples of secondary health concerns linked to SCI. Furthermore, these secondary health issues can raise the likelihood of poor mental health, increased disability, and a shorter life expectancy (Williams et al., 2018). As a result, the abrupt and profound changes brought on by SCI pose considerable obstacles to an individual's well-being. The lack of function and movement that people with SCI experience puts their health at danger. Secondary health problems associated with SCI include pressure ulcers, urinary tract infections, chronic discomfort, obesity, respiratory dysfunction, and cardiovascular disease. Furthermore, these secondary health problems can increase the risk of poor mental health, increased disability, and a shorter lifespan (Williams et al., 2018). As a result, SCI's quick and substantial changes offer significant challenges to an individual's well-being. Damage to the spinal cord causes a total or partial loss of sensation and movement below the lesion level, making spinal cord injury (SCI) a common cause of serious physical impairment (WHO, 2013). Individuals with SCI have also been shown to have a higher risk of mental health concerns. Depression and anxiety disorders, in particular, are frequent after SCI, with prevalence rates of around 22% and 27%, respectively (Williams & Murray, 2015). Given these data, it's critical to gain a better understanding of the factors that influence mental health in the SCI community so that tailored interventions and health policies may be developed.

Depression has a variety of effects on people with SCI. It has an impact on one's attitude, ambition, outlook, problem-solving abilities, and energy levels. It is detrimental to one's well-being, health, and quality of life. Depressed people with SCI have a harder time looking after themselves and managing their medical conditions. They may have

Difficulties drinking enough water, caring for their skin, taking prescriptions, and eating appropriately, for example (Stanley, 2012).

Feeling sad, blue, unhappy, wretched, or down in the dumps is a common symptom of depression; most of us have experienced it at some point in our lives. True clinical depression is a mood illness characterized by feelings of sorrow, loss of interest, decreased energy, disturbed sleep, disturbed appetite, poor concentration, anger, or frustration that lasts for weeks or more (Sharma et al., 2012).

Depression has been classified as a mood state, a set of symptoms that usually occur together, and a recognized psychiatric disease in SCI research (Kalpakjian et al. 2009). Most of us have felt this way for brief periods of time at some point in our lives. True clinical depression is a mood illness characterized by feelings of sadness, loss, anger, or frustration that interfere with daily life for several weeks or more (Zieve & Merrill, 2011).

People who are physically ill should experience anxiety or depression as a result of their illness. These emotional responses are frequently fleeting. Some patients' emotional reactions are severe, and psychiatric diseases may appear to be triggered by physical illness. The most frequent psychiatric condition is major depression. Certain circumstances increase the likelihood of a significant psychological condition arising among the physically unwell. There are three types of psychological effects of physical sickness. First, physical disease or drugs used to treat it might cause psychological problems. Second, psychiatric diseases can develop as a psychological reaction to physical sickness or therapy. Third, physical disease may elicit psychological protection mechanisms and specific types of conduct. Patients who have a history of past psychological disorders, lifelong physical disabilities, or an inability to cope with hardship are especially vulnerable. If a physical sickness has a significant influence on a patient's life, it is more likely to have a psychological consequence. A patient's spinal cord injury, for example (Williams & Murry, 2015).

As potential predictors of mental health (Alegria et al. 2018), socioeconomic conditions and social ties have been identified. Individuals in low socioeconomic status have a higher risk of mental health issues than those in higher socioeconomic status, according to evidence from general population samples. In the SCI community, there are significant socioeconomic disparities in mental health. Individuals with inadequate social interactions are more likely to develop mental health problems than those with good structural and functional social relationships, according to research from both general and SCI populations (Zürcher et al. 2019).

Spinal cord injuries (SCI) frequently have psychological implications, particularly anxiety and sadness, which can obstruct rehabilitation opportunities, as well as adjustment to their handicap and, as a result, the potential of returning to former social and work activities

(Scivoletto et al. 1997). “Depression is a widespread mental condition marked by sorrow, loss of interest in activities, and diminished energy,” according to the World Health Organization. The severity of the disorder, the symptoms, and the length of the disorder distinguish depression from normal mood swings" (WHO, 2013). For a little period of time, most of us have felt this way. True clinical depression is a mood illness characterized by feelings of sadness, loss, anger, or frustration that last for weeks or longer (Khan et al., 2006). Depression has been described as "dwelling in a black hole" or having a sense of approaching doom by some people. Some depressed people, on the other hand, don't feel sad at all; instead, they feel lifeless, empty, and indifferent. Men, in particular, may feel angry, aggressive, and restless (Smith et al. 2013).

Although depression manifests itself differently in each individual, there are certain similar indications and symptoms. It's vital to remember that these symptoms are common throughout life's low points. The more symptoms it has, however, the stronger they are and the longer they have endured (Arango-Lasprilla et al. 2011). Loss of appetite, which is frequently associated with weight gain or loss, difficulty concentrating, and exhaustion Agitation, restlessness, and irritability are common symptoms of depression, as are dramatic changes in energy levels, feelings of hopelessness and

helplessness, feelings of worthlessness, self-hate, and guilt, withdrawal or isolation, loss of interest or pleasure in previously enjoyed activities, thoughts of death or suicide, and difficulty sleeping or excessive sleeping (Anneken et al. 2010).

Factors, such as alcohol or drug abuse, certain medical conditions, such as underactive thyroid, cancer, or long-term pain, certain medications, such as steroids, sleeping problems, stressful life events, such as death or illness of a close relative, divorce, childhood abuse or neglect, job loss, and social isolation, may all play a role in depression (Zieve and Merril, 2011). Anxiety and sadness can have a major impact on one's ability to operate. Severe depression episodes can lead to health issues such as weight loss, social issues such as job loss, and financial difficulties. For people who have lost function (such as SCI patients), depressive episodes might be considerably more harmful (Osterthun et al. 2014). SCI sufferers frequently display anxiety and depression, depending on the level of their loss. Depressive symptoms are more common in women with SCI (Kent and Dorstyn, 2014). Female patients were 3.8 times more likely than male patients to suffer from depression (Oh et al. 2006). There are three main groups of drugs used to treat depression such as tricyclic antidepressants, mono-amine-oxidase inhibitors and lithium salts and other treatments are group psychotherapy, relaxation therapy, behavior change, social skills training, occupational, art, music therapy, Psychodrama and training in sports or various leisure activities (Anadon et al. 2016).

Stanford et al. (2007) found that at least 1 in 5 participants had a high risk of acquiring a psychological illness, and more than 1 in 10 had a risk of developing co-occurring psychological disorders six months following discharge. Major depressive disorders and drug use disorders were the most prevalent psychological illnesses discovered. Given the high rates of suicide in this group, it was alarming that a substantial number of people with depression were also classified as being at risk of self-harm.

According to Fann et al. (2011), mild depression was shown to be prevalent in a varied sample of people with SCI. The rate of depression was comparable to earlier reports of probable major depression in non-selected community samples of people with SCI, and it

was more than three times higher than the 1-year prevalence of MDD in the general population (6.7 %). Even among individuals who were not depressed at the time, 24% said they had been diagnosed with depression or had had therapy for it. Our finding that 15% of individuals indicated current suicidal thoughts, compared to just 9% of primary medical care patients, is another evidence of the seriousness of depression in this cohort. In comparison to individuals who were not depressed, a higher percentage of depressive patients said they had a history of generalized anxiety disorder, panic disorder, or posttraumatic stress disorder. The presence of comorbid anxiety and sadness is predicted to be high.

Depression is one of the most-well researched psychological issues linked to SCI. Despite this, we still have a lot to learn about SCI-related melancholy and how to deal with it. Major depression was found to be present in 9.8% to 37.5 percent of people in studies that used diagnostic interviews. Depression screening studies of persons undergoing SCI rehabilitation (20%–43%) and community-dwelling adults (11%)–60%) revealed similar prevalence rates. In the United States, MDD was found to be present in 6.7 percent of the population after one year (Mondin et al. 2013). Depression was linked to longer rehab stays, less functional gains, and worse functional independence and mobility upon release. Furthermore, depression was linked to a higher risk of pressure ulcers, a worse selfappraised health, more days in bed, more usage of professional personal care, and poorer role performance. After a spinal cord injury, the presence of probable severe depression predicted all-cause death (Hagen et al. 2012).Arafat et al. (2018) informed in their study that 64% of the patients had moderate and above severity depression and patients of complete A was found to have more depression than other classes whereas Shin et al. (2012) found that depression was greater in Complete A and B were 8.02%. The study revealed severity of depression was found to be greater in tetraplegia than paraplegia as Khazaeipour et al. (2015) found that high prevalence of depression in patients with tetraplegia 62.2%. Among the respondents 30% had moderately severe depression, 28% had moderate depression, whereas Wiseman et al. (2015) found to have mild-moderate depression in 21%, severe-extremely severedepression 16%.

CHAPTER – III METHODOLOGY

Study Design

Cross-sectional investigations were conducted during a brief period of time or at a single point in time. The researcher chose to conduct a cross-sectional study for the investigation. In this study, the mental health condition of patients with spinal cord injuries was investigated using a cross-sectional study methodology. This study's design was suitable for determining its goals. The information was gathered all at once or in a brief period of time. A cross-sectional design gives an overview of the study's variables at a certain moment in time.

Study Site

Data was collected from patients with spinal cord injury attending at Centre for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka in SCI Unit; the only specialized & largest hospital in Bangladesh .

Study population and sample population

A population is the total group or set of events or totality of the observation on which a research is carried out. In this study the people who had SCI and people who were receiving treatment and rehabilitation was selected to carry out the study. About 105 sample were selected for this study.

Sampling Technique

Sample were selected through convenience sampling method for conducting this study. A convenience sample is a group of individuals who (conveniently) were available for study.

Sample Size

When the sample frame is finite,

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

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

$$= \frac{(1.96)2\times0.5\times0.5}{(0.05)2}$$

= 384

Here,

Z (confidence interval) = 1.96

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

q = (1-p)

= (1-0.5)

= 0.5

The actual sample size was, n= 384.

As it is an academic thesis, self-funding and data was collected from a single specialized hospital by considering the feasibility and time limitation 105 sample were selected conveniently.

Inclusion Criteria

- Patients who were in rehabilitation stage.
- Patients who were receiving treatment at CRP.
- Information was taken only form the clients.
- Both male and female patients with SCI.
- Patients who willingly participate in the study.

Exclusion Criteria

- People who had SCI with psychological disorders.
- SCI patients with severe head injury.
- SCI with speech problem & medically unstable patient.
- Patient with cognitive problem.
- Patient suffering from serious pathological disease e.g. tumors, tuberculosis, TM etc.

Data Collection Tool

"Patient Health Questionnaire (PHQ-9)" was selected to collect data. Mental health measurement tool is an established tool at SCI-related research; assessing mental health

By using the PHQ-9, which consist of 10-items. The PHQ-9 questionnaire was developed in the context of overall level of depression and overall rate of charactaristics and psychological issues. Some other necessary materials like pen, pencil, and white paper, clip board & note book are also needed.

Data Collection

The researcher used the "PHQ-9" instructions to collect data from participants for this investigation. The authors gave permission to use these data collection techniques for this investigation. Individuals with the capacity to read independently completed the questionnaire. The participants were informed of the study's goals and purpose prior to data collection. The permission form and information page were read by the participants or careers, if they could. The information sheet and consent form were explained to those who couldn't read by the researcher. Every participant had the chance to express interest in participating in the study by signing the consent form voluntarily and asking any questions they might have about the investigation. Pen, pencil, and paper along with a structured questionnaire were used by the researcher to gather data.

Data Analysis

The researcher was analyzed data to find out mental health, the level of depression. The data was collected and analyzed by using statistical package for social sciences (SPSS) 25.0 version. Researcher analyzed the data by descriptive statistics using Frequency, Percentage (%), Pie diagram, Bar diagram, 95% CI test and IQR test was done and also shown the association by non-parametric test which was Chi-Square test.

95% Confidence Interval

A 95% confidence interval (CI) of the mean is a range with an upper and lower number calculated from sample. Because the true population mean is unknown, this range describes possible values that the mean could be. If multiple samples were drawn from the same population and a 95% CI calculated for each sample, we would expect the population mean to be found within 95% of these CIs. CIs are sensitive to variability in the population

(spread of values) and sample size. When used to compare the means of two or more treatment groups, a CI shows the magnitude of a difference between groups. This is helpful in understanding both the statistical significance and the clinical significance of a treatment. In this article we describe the basic principles of CIs and their interpretation.

Interquartile range

The interquartile range is a measure of where the "middle fifty" is in a data set. Where a range is a measure of where the beginning and end are in a set, an interquartile range is a measure of where the bulk of the values lie.

The interquartile range formula is the first quartile subtracted from the third quartile:

$$IQR = Q3 - Q1$$

Chi square ($\chi 2$) Test

Chi square ($\chi 2$) Test is the most popular discrete data hypothesis testing method. It is a non-parametric test of statistical significance for bivariate tabular analysis with a contingency table. In this study Chi square ($\chi 2$) test was done to measure the associations between two variables. It was used to test the statistical significance of results reported in bivariate tables.

Assumption

Different and Independent variable

Variables were quantitative

Normal Distribution of the variable Formula:

the test statistics follow-

$\chi 2 = \sum_{i=1}^{k}(0 - E)^2 /$

Here, $\chi 2$ = Chi square

value $\sum$ = The sum

of

O = Observed count

E = Expected count

Chi square is the sum of the squared differences between observed (O) and the expected (E) data divided by expected (E) data in all possible categories.

Level of significance

The researcher has used 5% level of significant to test the hypothesis. If the p value for the calculated $\chi 2$ is $p<0.05$ conclude that there is significant association between the two variables.

Ethical Consideration

The investigator upheld certain ethical considerations: The researcher has adhered to both the WHO and the Bangladesh Medical Research Council (BMRC) guidelines. An initial clearance from the course coordinator and the research project supervisor was granted to the faculty members who reviewed and approved the research proposal before it was submitted to the BHPI physiotherapy department. The dissertation proposal, together with the methodology, was submitted to the Bangladesh Health Professions Institute's (BHPI) Institutional Review Board (IRB) for an oral presentation defence in front of the IRB. The Institutional Review Board then authorised the required data, allowing the research to proceed. Following approval from the academic institution to conduct this investigation, the researcher had been. The researcher had been taken permission for data collection from the SCI unit of Savar, CRP. The participants would be informed before to invite participation in the study. Each participant's approval is obtained through a signed consent form for the study. The investigator made certain that everyone of the twenty-five

subjects was aware of their rights and reserves as well as the purpose and goals of the investigation. Additionally, the researcher made sure the study wouldn't negatively impact the organisation (CRP). Extreme secrecy is guaranteed in all forms. The researcher took care to protect all confidential information. After learning the clinical and academic guidelines for doing research regarding what should and shouldn't be done, the researcher was qualified to begin the study. Participants' rights were reserved, and the researcher was responsible to them for responding to any inquiries they may have had about the study.

Informed Consent

Informed consent relates to a state of affairs in which all potential participants receive and understand all the information they need to decide whether they want to participate.

This includes information about the study's benefits, risks, funding, and institutional approval.

In this study a written consent was given to all participants before the completion of the questionnaire. The investigator explains to the participants about their role in this study. He also explained what type of questions they would be asked and also informed that they are free to ignore questions as their wish. He also assured that he didn't foresee any risks or discomfort from their participation.

Written consent (appendix) was given to all participants prior to completion of the questionnaire. The researcher explained to the participants about his or her role in this study and aim & objectives of this study. The researcher read the informed consent to the participants. Those who were literate was encouraged to sign the form. The researcher received a written consent from every participants including signature. Those who were illiterate, verbally consent was taken from them. Patients who were not that much cooperative, the career were explained the entire process. So that they can understand about the consent from and their participation was on voluntary basic. The aims and objectives of this study must be informed to the subjects verbally. So, gave the consent from to the subject and the subjects had the rights to withdraw themselves from the research at any time. The participants were meant to be reassured that neither their name

nor address will be utilised. The subjects' material may be presented in any typical presentation, seminar, or essay, but their identities will remain hidden. The researcher assured the participants that the outcome would not be detrimental to them. To maintain participant confidentiality, no information has been disclosed without the research supervisor's approval. The researcher is always accessible to address any more inquiries about the study.

CHAPTER-IV RESULTS

A Cross-sectional study was conducted to achieve the research objectives. About 105 samples were selected for this study. The main objective was to find out the assessment of mental health of people with SCI in rehabilitation stage attending at CRP.

Socio-demographic Information

Gender of the participants

Among 105 participants, most of them were male 89.5% (n=94) and Female were 10.48% (n=11)

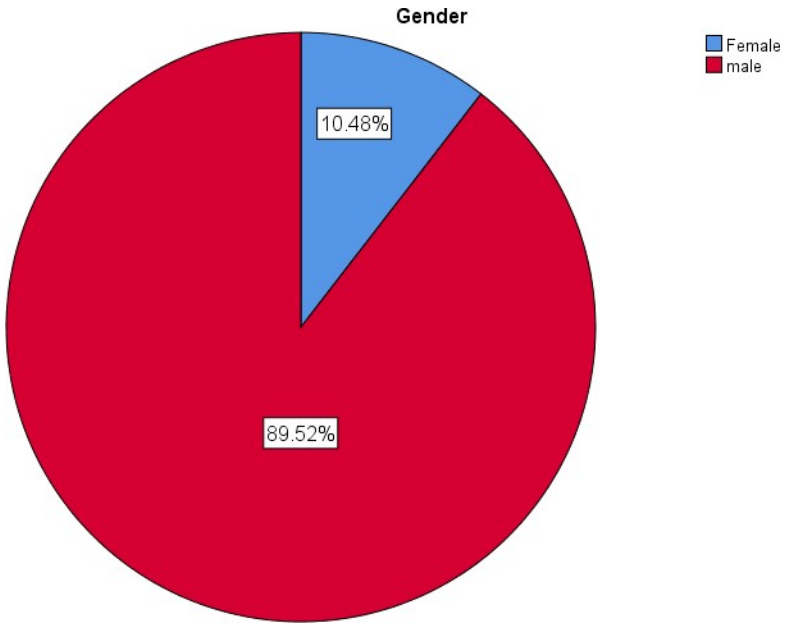


Figure 1: Gender of the participants

Age group of the participants

In this research, the mean of the age was 34, median was 32 and mode was 16. There were several age groups among 105 participants. The participants with 16-30 years were 45.7% (n=48), 31-45 years were 40% (n=42), 46-60 years were 10.5% (n=11), 61-75

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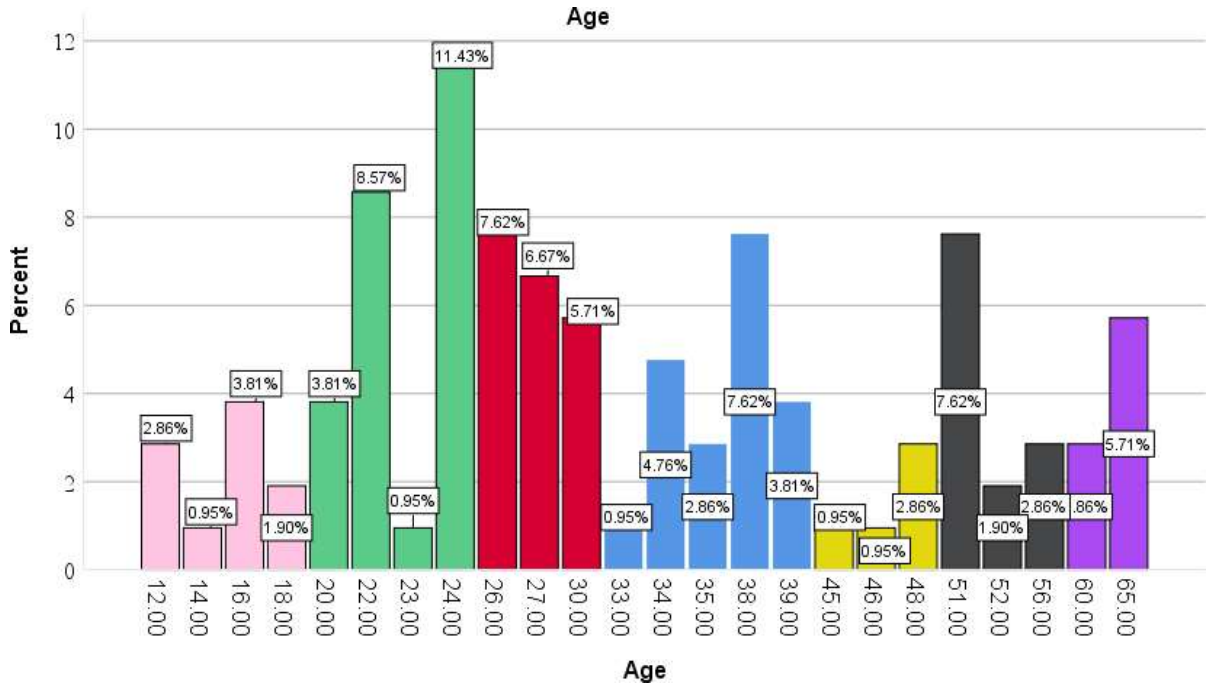


Figure 2: Age group of the participants

Types of injury of the participants

Out of 105 participants, there were little difference between the number of paraplegia and Tetraplegia; paraplegia were 61.9% (n=65) and tetraplegia were 38.1% (n=40).

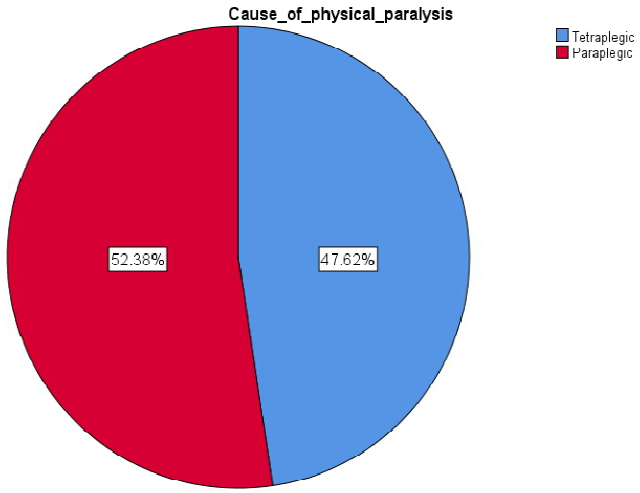


Figure 3: Types of injury of the participants

4.1 Marital status of the participants

Among 105 participants, most of them were married 60.95% (n=70)and unmarriedwere 39.05% (n=35).

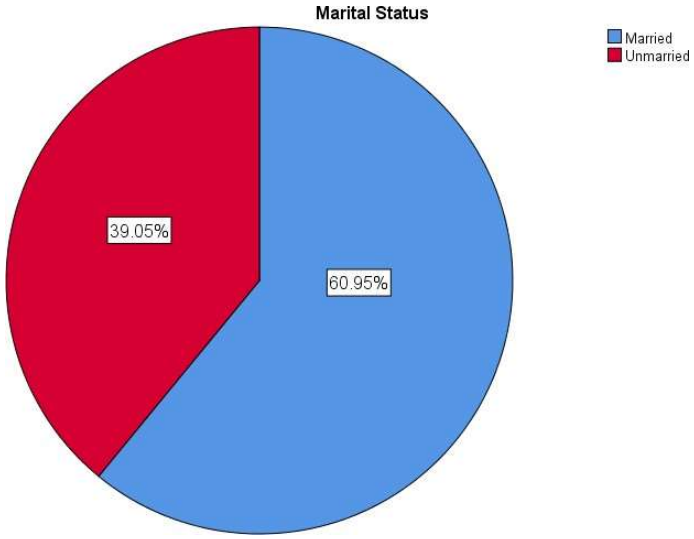


Figure 4: Marital status of participants

4. 5 Education level

Out of 105 participants, Illiterate were 51.43% (n=16), educated were 48.57% .

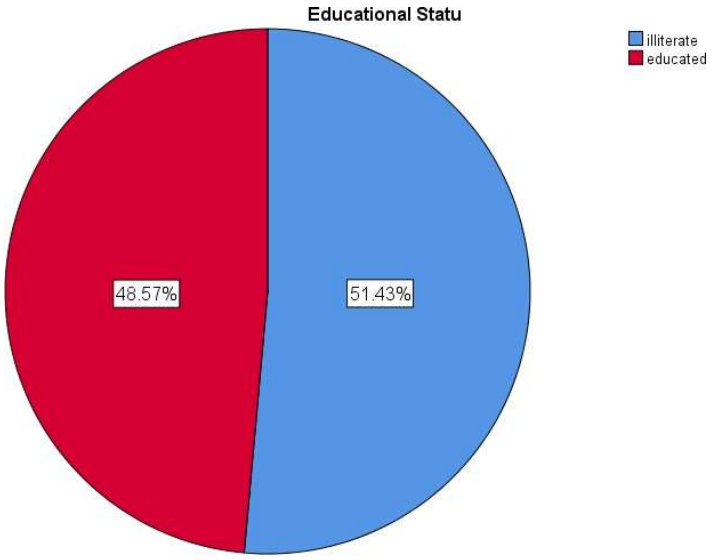
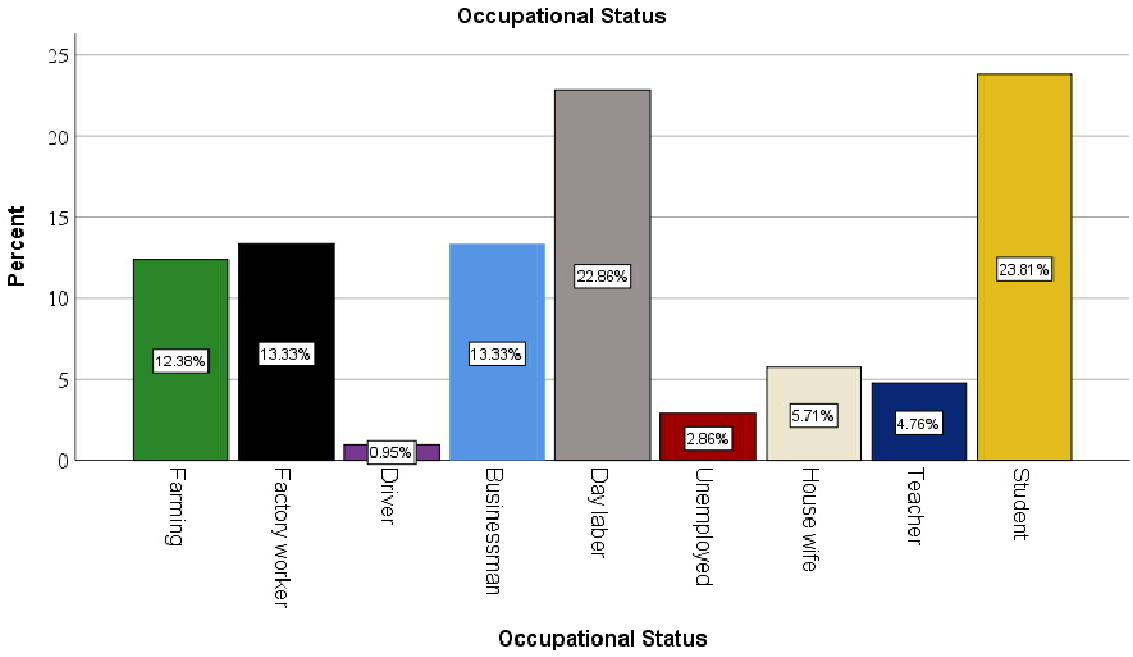


Figure 5: Education level of the participants

Occupation of the participants

There were participants of different occupation. Student were 23.81%(n=19), farmer were 12.38% (n=18), worker were 13.33% (n=9), driver were 0.95% (n=10), Businessman were13.33% (n=19), day laborer were 22.86% (n=7), teacher were4.76% (n=8), housewife were 5.71% (n=8), unemployed were 2.86% (n=2).



Residential area of the participants

Among the 105 participants, participants live on rural area 90.48% (n=78), participantslive on urban area 9.52% (n=27).

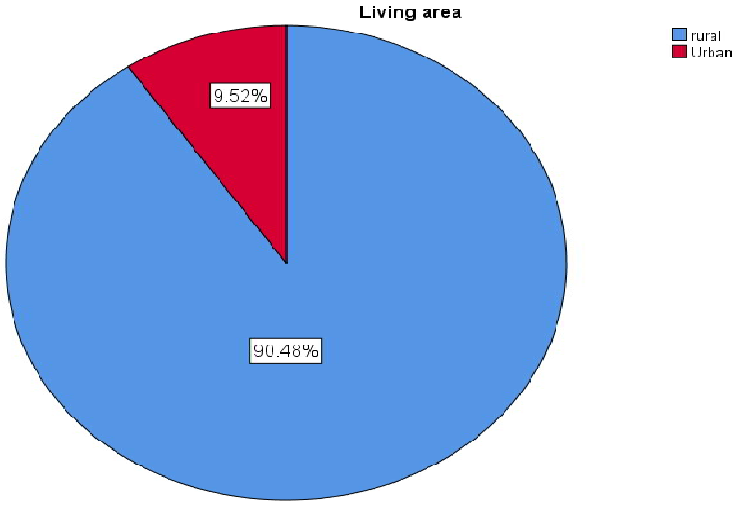


Figure 7: Residential area of the participant.

Causes of injury

Among the105 participants, maximum participants had faced spinal cord injury due to fall from height. The percentage of spinal cord injury due to fall from height were 12.38% (n=16), RTA were 35.24% (n=40), Fall during carrying heavy weight 40.95% (n=44), Heavy weight fall on back 4.76% (n=2), Sports injury were 4.76% (n=2), others were 1.90% (n=2)

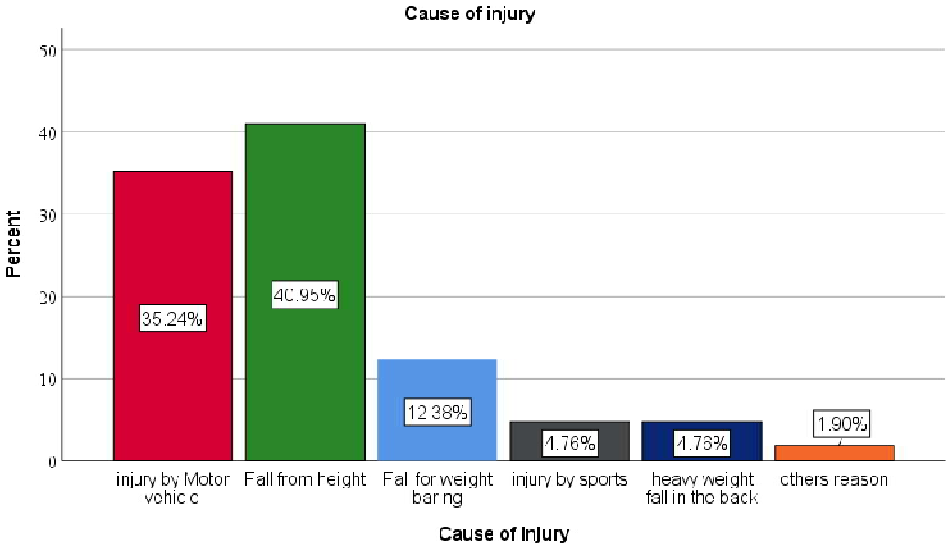


Figure 8: Causes of injury

Severity of injury of the participants

There were 105 patients who participate in this study. Most of them were complete A according to ASIA impairment scale. The percentage of complete A were 49.52% (n=44), incomplete B were 32.36% (n=38), incomplete C were 12.38% (n=13), incomplete D were 5.71 % (n=6).

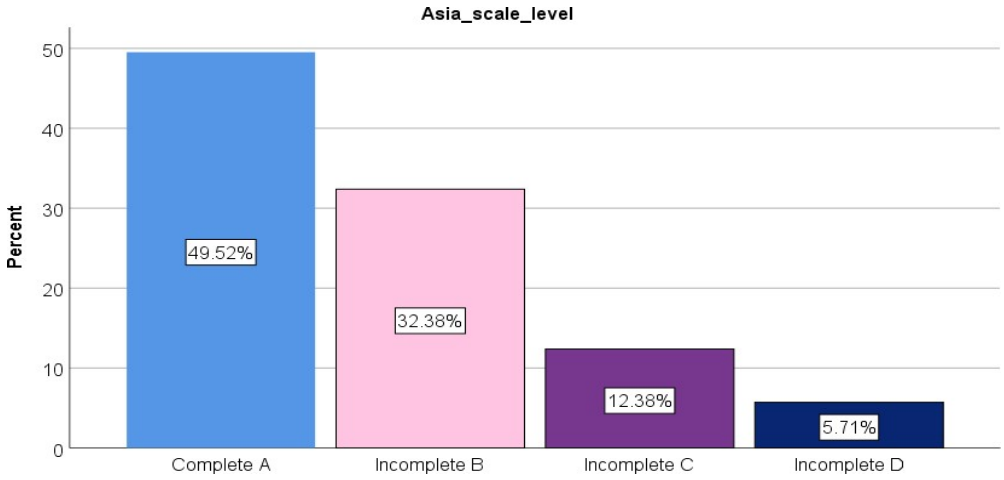


Figure 9: Severity of injury of the participants

2. The traits of psychological problems

Table -2: PHQ-9 1st part (N=105)

Variables	Not at all N (%)	Several days N(%)	More than half of the days N (%)	Nearly every day N (%)
1. I had little interest or pleasure in doing things	11.4%	26.7%	13.3%	48.6%
2. I was feeling down, depressed or hopeless	7.6%	28.6%	44.8%	19.0%
3. I had trouble falling or staying asleep or sleeping too much	14.3%	17.1%	43.8%	24.8%
4. I was feeling tired or having little energy	0.0%	34.3%	51.4%	14.3%
5. I had poor appetite or overeating	3.8%	26.7%	41.0%	28.6%
6. I was feeling bad about myself- or that I am a failure or I had let myself or my family down	8.6%	11.4%	60.0%	20.0%
7. I had trouble concentrating on things, such as reading the newspaper or watching television	6.7%	30.5%	22.9%	40.0%
8. I was moving or speaking so slowly that other people have noticed. Or the opposite –being so figety or restless that I have been moving around a lot more than usual	12.4%	19.0%	54.3%	14.3%
9. I had thoughts that I would be better off dead, or of hurting myself	0.0%	27.6%	24.8%	47.6%

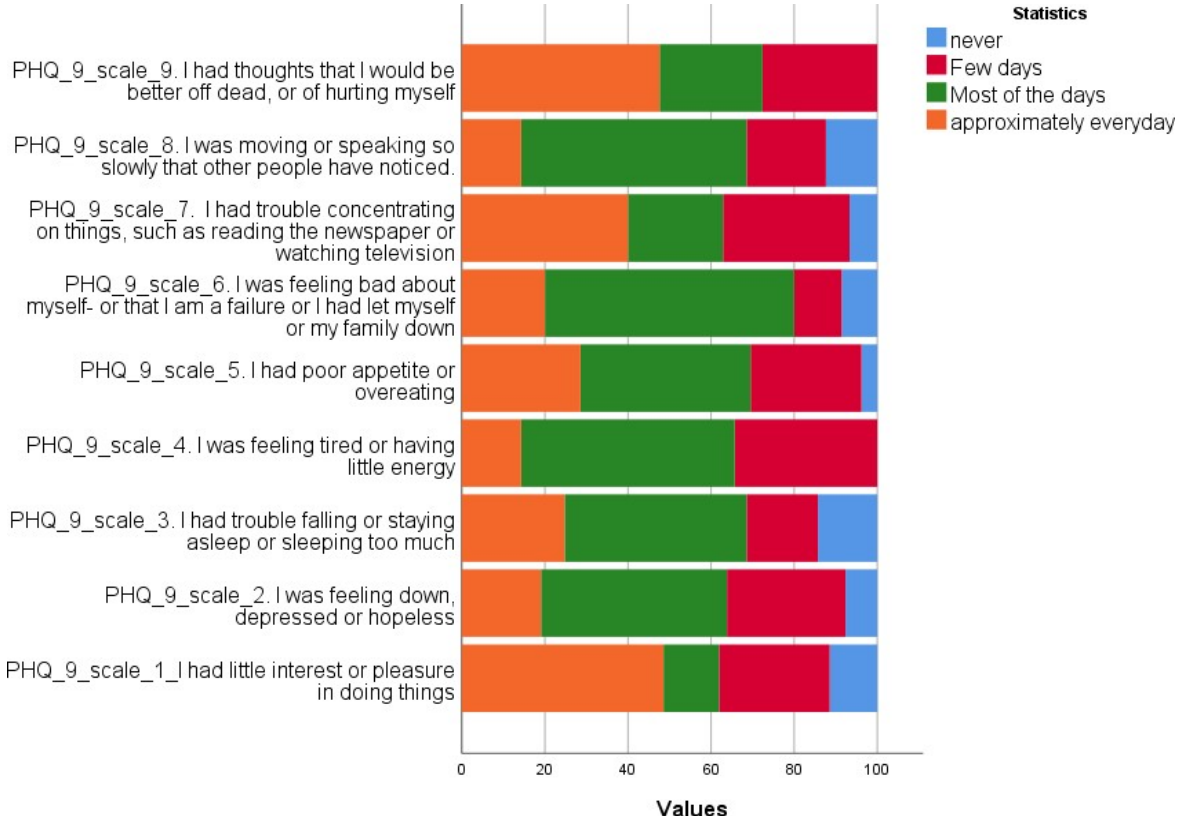


Figure 14 Result of PHQ-9 first part question of all participants (n=105). The x-axis shows the percentage of responses and the y axis shows each of the items on the first part of the Patient Health Questionnaire Scale.In this study among 105 participants, 13.3% (n=16) of participants felt little interest or pleasure in doing things more than half of the days, 26.7% (n=29) had little interest in work for several days & 11.4% (n=12) participants did not face such difficulties. 48.4% (n=50) of participants felt down or depressed almost several days, 28.6% (n=30) felt depressed more than half of the days, 7.6% were depressed nearly every-day and 19% (n=20) were not depressed. Among 105 participants, 43.8% (n=50) had trouble falling asleep or sleeping too much for several days, 17.1% (n=18) had sleeping problem for more than half of the days, 24.8% (n=25) had nearly every-day and 14.3% (n=15) had no such complains. 34.3% (n=35) was feeling tired or having little energy for several days, 51.5% (n=52) felt tired for more than half of the day, 14.3% (n=15) for almost every-day and 0.0% (n=0) had no complain of weakness. Poor appetite/overeating habit for several days had 28.6% (n=29) participants, more than half of the days had 41.0% (n=41) participants, nearly every-day had 28.6% (n=29) participant and 3.8% (n=38) had normal appetite. Among 105 participants,11.4%

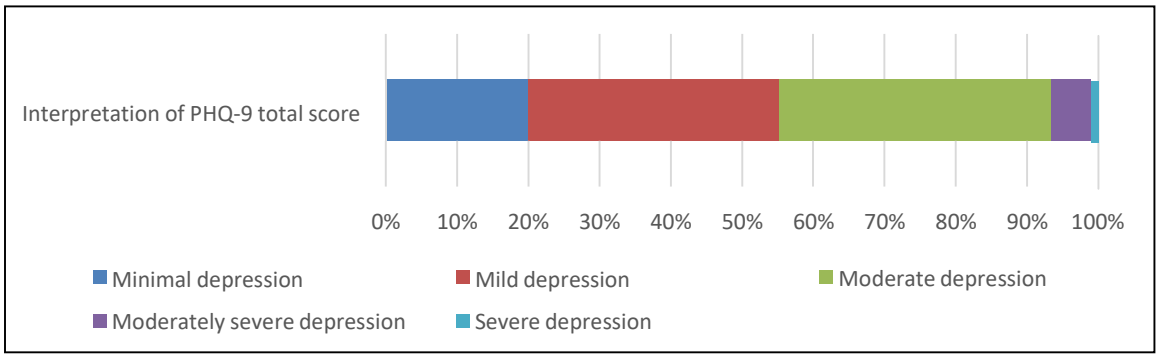
(n=12) of participants felt bad for themselves or their family several days, 60% (n=60) for more than half of the days, 20% (n=20) for almost every-day and 4.8% (n=5) had no such thought. Among participants, 30.5% (n=31) had trouble concentrating for several days, 22.9% (n=23) for more than half of the days, 40% (n=40) for nearly every-day and 6.7% (n=7) had no problem in concentrating things. 22.9% (n=24) of participants used to move noticeable slowly several days and 1% (n=1) more than half of the days and76.2% (n=80) had no such problems. Among them, 55.2% (n=58) had thought it would be better off dead/hurt themselves about several days, 22.9% (n=24) more than half of the days and 1% (n=1) nearly every-day and 21% (n=22) had no such thought.

3. Patient's degree of depression following a spinal cord injury

Table-4: Interpretation of PHQ-9

Variable	Minimal Depression N (%)	Mild depression N (%)	Moderate depression N (%)	Moderately severe depression N (%)	Severe depression N (%)
Interpretation of PHQ -9 total score	23 (22.0)	35 (33.2)	41 (39.1)	04 (3.7)	02 (02.0)

Figure 16 Result of PHQ-9 total score interpretation of all participants (n=105). The x-axisshows the depression percentage of participants.



PHQ-9 Scale has been used to find out the level of depression. The possible range of scores in scale is 1-27, with the higher scores indicating the presence of major depressive disorder. In this study, the score 1-4 indicates Minimal depression, the score 5-9 indicates Mild depression, the score 10-14 indicates Moderate depression, the score 15- 19 indicates Moderately severe depression and the score 20-27 indicates Severe depression. This study shows that among the 105 participants, most of the participants 22% (n=23) had Minimal depression, 33.2% (n=35) had Mild depression 39.1% (n=41) had Moderate depression, 3.7% (n=4) Moderately severe depression and 2% (n=2) had Severe depression.

4. Degree of dementia, mood disorders, anxiety, and depression.

Table- 5: Interpretation of 95% CI & IQR

Variables	95% CI		IQR
	Higher	Lower	
Age	38.1	31.41	16
Monthly income(BDT)	20997.51	12412.02	10000
Little interest or pleasure	1.05	0.78	
Feeling down/depressed	1.49	1.06	
Trouble sleeping	1.46	0.95	
Feeling tired	1.95	1.69	
Poor appetite/overeating	0.77	0.49	
Feeling bad about yourself	1.53	1.29	
Trouble concentrating	1.65	1.40	
Moving/speaking noticeable slow	0.34	0.16	
Thoughts of being dead/hurting yourself	1.17	0.90	
Difficulty to take care of things/get along with people	0.98	0.79	
PHQ-9 Interpretation	10.57	9.05	

The study shows in 95% CI test age has upper value 38.1, lower value 31.41 and IQR was

16. Monthly income's upper value was 20997.51, lower value was 12412.02 and IQR was 10000. PHQ-9 scale which has 10 items, Item 1-"Little interest or pleasure" has upper value was 1.05, lower value was 0.78. Item 2- "Feeling down/depressed" has upper value 1.49, lower value 1.06. Item 3- "Trouble sleeping" has upper value 1.46, lower value 0.95.Item 4- "Feeling tired" has upper value 1.95, lower value 1.69. Item 5- "Poor appetite/overeating" has upper value 0.77, lower value 0.49. Item 6- "Feeling bad about yourself" has upper value 1.53, lower value 1.09. Item 7- "Trouble concentrating" has upper value 1.65, lower value 1.40. Item 8- "Moving/speaking noticeable slow" has 0.34, lower value 0.16. Item 9- "Thoughts of being dead/hurting yourself" has upper value 1.17, lower value 0.90. Item 10- "Difficulty to take care of things/get along with people" has upper value 0.98, lower value 0.79. Interpretation PHQ-9 has upper value 10.57, lower value9.05.

CHAPTER – V DISCUSSION

A spinal cord injury (SCI) significantly changes a person's life. According to Migliorini et al. (2008), SCI is associated with more psychological problems, which are linked to worse outcomes such higher pain, health problems, and drug dependence. One of the most well-known mental illnesses linked to SCI is depression. According to Williams and Murray (2015), depression is thought to be a side effect of SCI that impedes physical recovery and hastens health-related issues. The PHQ-9 scale was utilised in this study to gauge participants' mental health. The characteristics and psychological problems of people with spinal cord injuries who are undergoing rehabilitation were investigated using a cross-sectional study. Since this was a cross-sectional study, we view this research as a preliminary investigation that can provide insightful data that may help to explain a number of crucial topics regarding. Among the 105 participants, male participants 89.52% (n=94) were higher than the female participants 10.48% (n=11). Most of the injured participantsof this study were male following injury. According to Razzak, (2013) found that, among 56 participants 84% were male and 16.0% were female. Arafat et al. (2018) found that among 150 participants 90% were male and 10% were female following SCI. So, it seems that male participants are more permeable than female participants in spinal cord injury.In this study majority of the participants were from (16-30 years) age group which was 45.7% (n=48) and 40% (n=42) were aged from 31-45 years. Similarly Bombardier et al. (2008) in their study found 29.7% was from (25-35 years) age group. Both results claim that active younger (age around 20-40) are more vulnerable with the incidence of spinal cord injury.There were total 105 participants in this study, among them Tetraplegia were 61.9% (n=65) and paraplegia were 38.1% (n=40). Hammond et al. (2014) noted the same type of result that in their study among 364 participants tetraplegia were 53.3% (n=194) and paraplegia were 46.7% (n=170). There is little difference between the type of injury (paraplegia and tetraplegia), but anyone with spinal cord injury would be paraplegia or tetraplegia. Arafat et al. (2018) revealed in their study that severity of depression was

found to be greater in tetraplegia than paraplegia as Khazaeipour et al. (2015) found that high prevalence of depression in patients with tetraplegia 62.2%.Among 105 participants, most of them were complete-A 77.1% (n=81) according to ASIA Scale; incomplete-B were 12. 4% (n=13), incomplete-C were 5.7 % (n=6) and incomplete D were 3.4% (n=4). Siddall et al. (2017) mentioned similar type of result in their study that 58.49% (n=31) participants had complete spinal cord injury and 41.50% (n=22) patients had incomplete spinal cord injury. The study was carried out on 105 participants with Spinal Cord Injury. Among them, participants with RTA were 38.1% (n=40), Fall during carrying heavy weight were 7.6% (n=8), Heavy weight fall on back were 1.9% (n=2), Sports injury were 1.9% (n=2), others were 6.7% (n=7) and In North America, the main cause of Traumatic spinal cord injury was motor vehicle accidents rather than fall from height (Mothe & Tator, 2013). But in the current study, the most common cause of injury was fall from height followed by road traffic accidents. This could be due to the fact that a greater percentage of people live in the villages in Bangladesh, similar to neighboring countries like India (Singh et al., 2003).Among 105 participants, most of them were married 66.7% (n=70) and unmarried were 33.3% (n=35). Arafat et al. (2018) informed in his study that 64% were married and 32.67 % were unmarried. In this study, participants live on rural area were 25.7% andparticipants live on urban area 74.3%.

In this study, among the participants illiterate were 15.2% (n=16), participants from class 1 to SSC were 46.7% (n=49), participants from HSC were 20% (n=21), participants who graduate were 17.1% (n=18) & Post graduate were 1% (n=1). In another study, illiterate were 19.4%, primary were 32.3%, SSC were 25.8% and HSC were 22.6% (Imran et al., 2018).

Among the 105 participants, most of the participants (38.1%) had moderate depression, 34.3% had mild depression, 21% had minimal depression, 5.7% moderately severe depression and 1% had severe depression in rehabilitation stage. Arafat et al. (2018) informed their study that among 150 participants, 30% had moderately severe depression, 28% had moderate depression, 25.33% had mild depression, 10.66% had minimal depression, and 6% had severe depression. In Australia, nearly half of the population with

spinal cord injury suffered from mental health problems of depression around 37% according to Fann et al., (2011). Another study noted that the prevalence of probable minimal depression was 50%, mild depression was 27%, moderate depression was 14%, moderately severe was 6% and severe depression was 3% (Migliorini et al., 2008). Wiseman et al. (2015) found to have mild-moderate depression in 21%, severe-extremely severe depression 16% among spinal cord injured patients.Spinal cord injury (SCI) is a long-term disabling and catastrophic disorder. Depression is the most prevalent comorbidity among the many psychiatric issues connected with SCI. Bangladesh is a highly populated developing nation with a high prevalence of SCI. Previous research has shown, depression symptoms whether minor or severe, are badly

addressed and neglected. However, understanding the long-term physical and psychological effects of SCI is essential for a successful recovery.

This study found an association in between age and depression ($P<0.000$) which was strongly significant. Arango-Lasprilla et al. (2013) found association between age and depression at their study. Shin et al. (2012) stated that high levels of depression might be a result of the adjustment process. Patients with SCI who survived the longest had a higher rate of depression, which might be due to aging as a secondary disease. Likewise, Bombardier et al. (2008) study found that, a significant association with depression and age of SCI peoples.

In this study there was found a significant association in between gender & depression ($p<0.000$). Arango-Lasprilla et al. (2013) in their study provided an understanding relationship between gender and depression. There were also an association in between severity of injury and depression which was strongly significant ($p<0.02$). Shin et al. (2012) found that participants with complete SCI were more depressed, had less life satisfaction and more stress levels than incomplete participants. Kochhar et al. (2007) informed that the severity of injury was found to be aligned with many other studies.

Additionally, this study discovered a strong correlation ($P<0.02$) between the types of injuries and depression. Saadat et al. (2010) found that paraplegics and tetraplegics with mild depression were less active than those without the condition, suggesting a

connection between depression and the kind of impairment. According to Arafat et al. (2018), of the participants, 77 had paraplegia, and of these, the majority (n = 30) had mild depression, whereas among the 73 tetraplegics, 30 patients had fairly severe depression. The degree of damage was correlated with the severity of depression. Additionally, this study discovered a strong correlation ($P<0.00$) between depression and married status. In this investigation, there was no statistically significant correlation or relationship established between the aetiology of injury and depression levels. In a similar vein, Arango-Lasprilla et al. (2013) discovered in their investigation that there was no meaningful correlation between the reason for the injury and depression.

Limitations

The following are some of the restrictions and hurdles this research endeavour faced, which affected the accuracy of the study:

Because the study's sample size was so small and the samples were limited to the CRP in Savar, the results cannot be generalised to the entire Bangladeshi population with spinal cord injuries. The project's findings were not well supported by data in the Bangladeshi setting. A convenience sample that was not representative of the entire population was used in the study. The study project was finished by an undergraduate student—it was her first. As a result, the researcher lacked familiarity with processes and methods related to the practical aspects of research. Given that this was the investigator's initial survey, it could be plausible.

CHAPTER-VI CONCLUSION & RECOMMENDATION

Conclusion

Spinal cord injuries (SCIs) are sudden, unforeseen events that can affect a person's physical and mental health over time. They can be acute or chronic. It is one of the main causes of disability in Bangladesh and throughout Asia. Spinal cord injuries, whether traumatic or non-traumatic, affect thousands of people annually. While spinal cord injuries can affect anyone at any age or period, they are more common in young, athletic men than in women.

Patients with spinal cord injuries are confronted with the reality of impairment. They suffer from anxiety and sadness, and therefore a loss of confidence, affecting their quality of life. Anxiety and depression are two of the most common fatal mental disorders, hence they should be given higher importance. Though paraplegic and incomplete spinal cord damage patients improved the most, improvements were seen in individuals of all levels of impairment. The importance of early discovery and careful management of this illness cannot be overestimated.According to the study a significant portion of SCI patients were found to be depressed. Surprisingly, in a nation like Bangladesh, large numbers of patients are underdiagnosed, undertreated, and even untreated. To our knowledge, there is only a small amount of research specifically addressing depression signs and factors that affect depression in persons with SCI over time. Health planners and social services, need a thorough understanding of the psychological issues that people with SCI face, as well as the differences that develop as a result of cultural, physical, and environmental conditions including the resources available in each community. More extensive research is required in order to properly visualise the burden.To find out what obstacles might be causing SCI patients to treat depression at low rates, more research is required. Research from a variety of medical settings shows that professional development and feedback alone cannot significantly enhance the treatment of depression; the greatest benefits come from programmes that incorporate comprehensive patient education, active follow-up, and greater accessibility to evidence-based treatments. It is essential to develop and evaluate comparable solutions in order to improve depression care for individuals with SCI.

Recommendation

The study's objective was to evaluate the psychosocial problems that individuals with spinal cord injuries face. Despite certain limitations, the study's investigators suggested a few further steps that may be taken to improve the success of future research.To further enable the power of generalisation of the results, the random sampling technique would be utilised instead of the convenience sampling technique. A large body of research has been done on spinal cord injuries, but not much has been done on the psychological aspects of these patients, such as depression, anxiety, mood disorders, and dementia. Since the inquiry was completed in a brief amount of time, more time should be set up for it in the future. 105 participants made up the study's sample, although that number will go up in the future.The investigator in this study only included participants from the one hospital in Savar that was chosen as a sample. Therefore, in order to ensure that this study may be generalised, the investigators highly advised including SCI patients from all across Bangladesh in future research.

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Appendix

VERBAL CONSENT STATEMENT

(Please read out to the participants)

Assalamualaikum/Namasker, My name is Jannat Laila Sheba, I am conducting this study for a B.Sc in Physiotherapy project study dissertation titled "**Characteries and psycological issues among the spinal cord injury patients during rehabilitation"** under Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related information regarding Spinal Cord Injury (SCI). You will perform some tasks which are mention in this form. This will take approximately 20-30 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. The researcher is not directly related with this area (spinal cord injury), so your participation in the research will have no impact on your present or future treatment in this area (spinal cord injury unit). All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous and also all information will be destroyed after completion of the study. Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during interview.

If you have any query about the study or your right as a participant, you may contact with me, researcher and/or my supervisor **Professor Md. Obaidul Haque**, Vice principal BHPI, CRP, Savar, Dhaka.

Do you have any questions before I start?
So, may I have your consent to proceed with the interview or work?

Yes ☐

No ☐

Signature of the Participant _____

Signature of the Interviewer _____

English questionnaire

	Interview Schedule Part- I: Patient's Identification (to be provided by patient or attendant)	
1.1	Identification number: (PDMS)	Date of Interview:
1.2	Address:	Contact no:

	Part- II: Patient's Socio-demographic Information(To be collected from Record/Patient/Care giver)	
2.1	Age (In year):.....Yrs	
2.2	Sex	1. Female 2. Male
2.3	Marital status:	1. Married 2. Unmarried
2.4	Educational level?	
2.5	Occupation?	
2.6	What is the average monthly income of your household?	_____(*Taka*)
2.7	Residential Area	1. Rural 2. Urban
2.8	How your marriage life going on?	
2.9	How is your relation with your family members now?	

2.10	For doing daily activity how much you get support (Physical or mental) from your spouse/ family members?	
2.11	Do you get any economical support from your family members?	

	Part-III: Physiotherapy related Information (To be collected from Record/ Care provider/Clinicalexamination)	
3.1	Date of injury:	
3.2	Causes of injury:	
3.3	Skeletal level :	
3.4	Neurological level :	
3.5	ASIA classification scale :	1. Complete A 2. Incomplete B 3. Incomplete C 4. Incomplete D 5. Normal E
3.6	Types of paralysis:	1. Tetraplegic 2. Peraplegic

Part- IV: PHQ-9 Scale

Public Health Questionnaire (PHQ-9)

ID:……

Date:…….

Over the last 2 weeks, how often have you been bothered by any of the following problems? (Use " ✓ " to indicate your answer).

	Not at all	**Several days**	**More than half the days**	**Nearly everyday**
1. I had little interest or pleasure in doing things	0	1	2	3
2. I was feeling down, depressed or hopeless	0	1	2	3
3. I had trouble falling or staying asleep or sleeping too much	0	1	2	3
4. I was feeling tired or having little energy	0	1	2	3
5. I had poor appetite or overeating	0	1	2	3
6. I was feeling bad about myself- or that I am a failure or I had let myself or my family down	0	1	2	3

7. I had trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. I was moving or speaking so slowly that other people have noticed. Or the opposite – being so figety or restless that I have been moving around a lot more than usual	0	1	2	3
9. I had thoughts that I would be better off dead, or of hurting myself	0	1	2	3

	+		+	

Total=

10. If you checked off any problems, how difficult have these problems made this for you to do your work, take care of things at home or gate along with other people?	Not difficult at all ……. Somewhat difficult ……. Very difficult ……. Extremly difficult …….

Interpretation of total score:

Total Score	Depression Severity
1-4	Minimal depression
5-9	Mild depression
10-14	Moderate depression
15-19	Moderately severe depression
20-27	Severe depression

অনুমতি পত্র

(অংশগ্রহণকারীকে পড়ার জন্য অনুরোধ করা হলো)

আসসালামু আলাইকুম

আমি জান্নাত লায়লা সেবা, ঢাকা বিশ্ববিদ্যালয় এর চিকিৎসা অনুষদের অন্তর্ভুক্ত বাংলাদেশ হেলথ প্রফেশন্স ইন্সটিটিউট এর বিএসসি ইন ফিজিওথেরাপি কোর্সের ২০১৭-২০১৮ সেশনের শিক্ষার্থী। বিএসসি ইন ফিজিওথেরাপি ডিগ্রী অর্জনের জন্য আমাকে একটি গবেষণা সম্পূর্ণ করতে হবে। আমার গবেষণার শিরোনাম হল " **পূর্ণবাসন প্রক্রিয়ায় মেরুরুজ্জুতে আঘাতপ্রাপ্ত রোগীদের বৈশিষ্টতা এবং মনোস্তাতিক সমস্যা"**। এই গবেষণা সম্পূর্ণ করার জন্য আমি আপনাকে আপনার মানসিক অবস্থা সম্পর্কিত কিছু প্রশ্ন করব । আপনাকে আশ্বস্ত করছি, আমার ও আমার প্রশ্নের দ্বারা আপনার কোনরুপ ক্ষতি হবে না। আপনার দেওয়া তথ্য গোপন রাখা হবে এবং শুধুমাত্র গবেষণার উদ্দেশ্য ব্যবহার করা হবে। যে কোন সময় গবেষণায় আপনার আংশগ্রহণ বন্ধ করার অধিকার রয়েছে। পাশাপাশি আপনি যদি কোন প্রশ্নের উত্তর দিতে অশ্বস্তি বোধ করেন তবে আপনি সেই প্রশ্নটি এরিয়ে যেতে পারেন। প্রশ্নাবলী পূরণ করতে ২০ মিনিট থেকে ৩০ মিনিট সময় লাগবে। অনুগ্রহ করে আমাকে প্রশ্নগুলির সঠিক উত্তর দিন এবং আপনার স্বাস্থ্যের মূল্যায়ন করতে ডেটা সংগ্রহকারীকে যথাসাধ্য সহযোগিতা করুন। আপনার কোন প্রশ্ন থাকলে আমার সুপারভাইজারের সাথে যোগাযোগ করতে পারেন। মোঃ ওবায়দুল হক, প্রফেসর এবং ভাইস প্রিন্সিপাল বিএইচপিআই, সিআরপি, সাভার, ঢাকা। আপনি যদি অনুগ্রহপূর্বক আপনার সম্মতি দেন, তবে আমরা শুরু করতে পারি।

হ্যাঁ না

ধন্যবাদ আপনার অংশগ্রহণের পাশপাশি প্রশ্নগুলোর যথাযথ উত্তর দিয়ে সহযোগিতা করার জন্য।

অংশগ্রহণকারীর স্বাক্ষর ..... তারিখ .....
তথ্য সংগ্রহকারীর স্বাক্ষর ..... তারিখ .....
গবেষকের স্বাক্ষর ..... তারিখ .....

প্রশ্নাবলী (বাংলা)

	স্বাক্ষাৎকারের সময়সূচী **পর্ব-১ঃ রোগীর সনাক্তকরণ/পরিচয়** (রোগী অথবা রোগীর সহকারী তথ্য প্রদান করবেন)	
১.১	সনাক্তকরণ নাম্বারঃ	স্বাক্ষাতের তারিখঃ
১.২	ঠিকানাঃ	যোগাযোগ নম্বরঃ
১.৩	অনুমতি নেওয়া হয়েছেঃ	হ্যাঁ না

	পর্ব-২ঃ রোগীর আর্থসামাজিক তথ্যাবলি (রোগী অথবা রোগীর সহকারী তথ্য প্রদান করবেন)	
২.১	আপনার বয়স ..... বছর	
২.২	লিঙ্গ	১. মহিলা ২. পুরুষ
২.৩	বৈবাহিক অবস্থা	১. বিবাহিত ২. অবিবাহিত
২.৪	শিক্ষাগত যোগ্যতাঃ	১. নিরক্ষর ২. অক্ষরজ্ঞান সম্পন্ন ৩. সুশিক্ষিত
২.৫	পেশাঃ	১. রিক্সাচালক ২. কৃষিকাজ ৩. ফ্যাক্টরি/পোশাক শ্রমিক ৪. গাড়ি চালক ৫. ব্যবসায়ী ৬. দিন মজুর ৭. বেকার ৮. গৃহিণী ৯. শিক্ষক ১০. ছাত্র/ছাত্রী
২.৬	পারিবারিক মাসিক আয়	১. ..... টাকা
২.৭	আবাসিক এলাকা	১. গ্রাম ২. শহর

২.৮	আপনার বিবাহিত জীবন কেমন যাচ্ছে	
২.৯	পরিবারের সদস্যদের সাথে আপনার এখন সম্পর্ক কেমন	
২.১০	দৈনন্দিন কাজ করার জন্য আপনি আপনার সঙ্গী/পরিবার থেকে কতটুকু (শারিরিক অথবা মানসিক) সহযোগিতা পান?	
২.১১	আপনি কি আপনার পরিবারের সদস্যদের থেকে কোন ধরনের আর্থিক সহযোগিতা পান?	
২.১২	আপনি এতই খুশি ছিলেন বা এতই রাগ ছিলেন যে অন্যরা ভেবেছিলো এটা আপনার স্বাভাবিক রুপ নয় নাকি কোন বিপদে পওে এত রাগ উঠেছিল?	১. হ্যাঁ ২. না
২.১৩	আপনি স্বাভাবিক সময়ের তুলনায় কম ঘুমিয়েছিলেন কিন্তু এতে কি আপনি ঘুমের অভাব, অতৃপ্তি অনুভব করেছিলেন?	১. হ্যাঁ ২. না
২.১৪	আপনি কেমন কথা বলতেন, স্বাভাবিকের চেয়ে বেশি কথা বলেছিলেন?	১. হ্যাঁ ২. না

	পর্ব-৩ঃ ফিজিওথেরাপি সম্পর্কিত তথ্যাবলি (রোগী দলিল/ রোগীর সহকারী/ পরিক্ষার মাধ্যমে নিতে হবে)	
৩.১	আঘাতের তারিখঃ	
৩.২	আঘাতের কারণঃ	১. মোটর যানের আঘাতে ২. উপর থেকে পড়ে ৩. ভারী কিছু বহন করর সময় পড়ে গিয়ে ৪. খেলাধূলার কারণে ৫. পিঠে ভারী কিছু পড়ে ৬. অন্য কারণে
৩.৩	স্কেলেটাল লেভেলঃ	
৩.৪	নিউরোলজিকাল লেভেলঃ	
৩.৫	এশিয়া স্কেল লেভেলঃ	১. কমপ্লিট এ ২. ইনকমপ্লিট বি ৩. ইনকমপ্লিট সি ৪. ইনকমপ্লিট ডি ৫. নরমাল ই
৩.৬	শারিরিক অসারতার কারণ	১. টেট্রাপ্লেজিক ২. পেরাপ্লেজিক

পর্ব-৪ঃ পি এইচ কিউ ৯ স্কেল

রোগীর স্বাস্থ্য সম্পর্কিত প্রশ্নাবলী (পিএইচকিউ ৯)

রোগীর আইডিঃ ..... তারিখঃ .....

গত দুই সপ্তাহের মধ্যে নিচের উল্লিখিত সমস্যার জন্য আপনি কতবার বিরক্ত হয়েছেন?

(√ চিহ্ন ব্যবহার করে আপনার উত্তর দিন)

	একবারই না	কিছু দিন	অর্ধেকের বেশি দিন	প্রায় প্রতিদিন
১. আমি কাজ করতে খুব কমই আগ্রহ বা আনন্দ পেয়েছি।	০	১	২	৩
২. আমি ভেঙ্গে পড়েছি, বিষাদগ্রস্ত এবং আশাহত হয়েছি।	০	১	২	৩
৩. আমার ঘুমাতে সমস্যা হয়েছে অথবা আনেক বেশি ঘুম হয়েছে।	০	১	২	৩
৪. আমি ক্লান্ত বোধ করেছি অথবা একদম শক্তি পাইনি।	০	১	২	৩
৫. আমার কম ক্ষুদা লেগেছে অথবা আনেক বেশি খেয়েছি।	০	১	২	৩
৬. আমি নিজেকে নিয়ে দুঃচিন্তায় আছি, অথবা আমি ব্যর্থ অথবা আমি নিজেকে না হয় আমার পরিবারকে নিচু করে ফেলেছি।	০	১	২	৩
৭. কোন কিছুতে মনোযোগ ধরে রাখতে সমস্যা হয় যেমনঃ খবরের কাগজ পড়তে অথবা টেলিভিশন দেখতে।	০	১	২	৩
৮. আমি এত আস্তে চলাচল করি অথবা কথা বলি যে অন্যরা খেয়ালই করে না অথবা এর উল্টোটা-স্বাভাবিকের চেয়ে বিরামহীন ভাবে অনেক বেশি নড়াচড়া করি।	০	১	২	৩
৯. আমার মনে হয় মরেগেলেই ভাল হয় অথবা নিজেই নিজেকে আঘাত করি	০	১	২	৩

সর্বমোট =

১০. যদি আমার কোন ধরনের সমস্যা মনে হয় তাহলে এগুলো প্রতিদিনের কাজ, বাড়িতে নিজের যত্ন নেয়া এবং মানুষের সাথে মেশার ক্ষেত্রে কতটা কঠিন করে তুলে?	একদম কঠিন না ..... কিছুটা কঠিন ..... অনেক কঠিন ..... খুব বেশি কঠিন .....

সর্বমোট নাম্বারের ব্যাখ্যাঃ

সর্বমোট নাম্বারের	**হতাশার পরিমাণ**
১ - ৪	খুবই অল্প হতাশা
৫ - ৯	অল্প হতাশা
১০ - ১৪	মাঝারি হতাশা
১৫ - ১৯	মাঝারির চেয়ে বেশি হতাশা
২০ - ২৭	খুব বেশি হতাশা

Date: March 25.2023

To

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343

Through: Head, Department of Physiotherapy, BHPI

Subject: Prayer for seeking permission to collect data for conducting a research project.

Sir,

With due respect and humble submission to state that I am Jannat Iaila Sheba, student of 4th year B.Sc. in Physiotherapy at Bangladesh Health Professions institute (BHPI). The Ethical committee has approved my research project entitled: **"Characteristics and Psychological Issues among the spinal cord injury patients During Rehabilitation"** under the supervision of Professor Md. Obaidul Haque, Vice principal, Bangladesh Health Professions Institute (BHPI), CRP, Savar, Dhaka-1343. Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. I want to collect data for my research project from department of Physiotherapy. So, I need your kind permission for data collection at spinal cord injury unit of CRP at Savar, Dhaka. I would like to assure that nothing of the study would be harmful for the participants.

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

Sincerely

Jannat Iaila Sheba

Jannat Iaila Sheba
4th Year
B.Sc. in Physiotherapy
Class Roll: 27
Session: 2017-18
Bangladesh Health Professions Institute (BHPI)
(An academic institution of CRP)
Chapain, CRP, Savar, Dhaka, 1343.

Been Shafiq 25.03.23

Allow to Data Collection from SCI unit. Hossain 22.5.23

Muzaffor Hossain
Consultant - Physiotherapy & In-charge
Spinal Cord Injury (SCI) Unit
Physiotherapy Department
CRP, Chapain, Savar, Dhaka-1343

Recommended

25.03.2023

Prof. Md. Obaidul Haque
Vice-Principal
BHPI, CRP, Savar, Dhaka.

Approved

Dr. Mohammad Akhter Hossain, PhD
Senior Consultant & Head
Physiotherapy Department
Associate Professor, BHPI
CRP, Savar, Dhaka-1343

BANGLADESH HEALTH PROFESSIONS INSTITUTE

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

Ref: CRP/BHPI/IRB/03/2023/708 Date: 13/03/2023

To
Jannat laila sheba
B.Sc. in Physiotherapy,
Session: 2017-2018, DU Reg. No: 8648
BHPI, CRP, Savar, Dhaka- 1343, Bangladesh

Subject: Approval of the dissertation proposal **"Characteristics and Psychological Issues among the Spinal Cord Injury Patients during Rehabilitation"**- by ethics committee.

Dear
Jannat laila sheba,
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 Md. Obaidul Haque, Vice-principle, BHPI, as dissertation 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 explore the characteristics and psychological issue among the SCI patients during Rehabilitation. Should there any interpretation, typo, spelling, grammatical mistakes in the title, it is the responsibilities of the investigator. Since the study involves questionnaire that takes maximum 20-25 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 January 9, 2023 at BHPI, 34th 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
Associate Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB) BHPI,
CRP, Savar, Dhaka-1343, Bangladesh

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ। ফোন: +৮৮ ০২ ২২৪৪৪৫৪৬৪-৫, +৮৮ ০২ ২২৪৪৪১৪০৪, মোবাইল: +৮৮ ০১৭৩০ ০৫৯৬৪৭
CRP-Chapain, Savar, Dhaka-1343, Bangladesh. Tel: +88 02 224445464-5, +88 02 224441404, Mobile: +88 01730059647
E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd

Date: 12th February 2023
The Chairman
Institutional Review Board (IRB)
Bangladesh Health Professions Institute (BHPI),
CRP, Savar, Dhaka-1343.Bangladesh

Subject: Application for review and ethical approval.

Dear sir,

With due respect, Jannat Laila Sheba, student of B.Sc. in physiotherapy program at Bangladesh Health Professions Institute (BHPI) the academic institute of Centre for the Rehabilitation of the Paralysed (CRP) under the Faculty of Medicine,University of Dhaka.As per the course curriculum, I have to conduct a dissertation entitled **"Characteristics and Psychological Issues among the spinal cord injury Patients During Rehabilitation"** under the supervision of Professor Md Obaidul Haque,Vice principal, BHPI.

The purpose of the study is to explore the characteristics and psychological issues among the SCI patients during Rehabilitation. The study involves face-to-face interview by using semi-structured questionnaire. I would like to assure that anything my study will not be harmful for the participants.

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

Sincerely,
Jannat laila sheba

Jannat Laila Sheba
4th Year B.Sc. in Physiotherapy
Session: 2017-2018 Student ID: 112170390
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Recommendation from the Dissertation supervisor

12.02.23
Prof. Md. Obaidul Haque
Vice principal
BHPI.

Dissertation presentation date: 9th January 2023

Shofiq 18.02.2023

Head, Department of Physiotherapy, BHPI

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