

**ANXIETY AND DEPRESSION OF SPINAL CORD INJURY  
PATIENTS DURING STAYING AT CRP**

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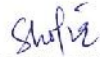
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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

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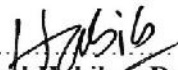
Submitted by **Md. Saruar Hossain Bhuiyan** for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT)



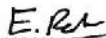
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## DECLARATION

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 for any publication, presentation or dissemination of information of the study. I would bound to take written consent from the department of physiotherapy of Bangladesh Health Professions Institute (BHPI).

Signature: *Md. Sarwar Hossain Bhuiyan* Date: *05/11/2018*

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# CONTENTS

	<b>Page No.</b>
Acknowledgement	i
Acronyms	ii
List of table	iii
List of figure	iv
Abstract	v-vi
<b>CHAPTER-I: INTRODUCTION</b>	
1.1 Back ground	1 - 3
1.2 Rationale	4
1.3 Research question	5
1.4 Objectives	
1.4.1 General objectives	6
1.4.2 Specific objectives	6
1.5 Conceptual framework	7
1.6 Operational definition	8 - 9
<b>CHAPTER-II: LITERATURE REVIEW</b>	10 - 20
<b>CHAPTER – III: METHODOLOGY</b>	
3.1 Study design	21
3.2 Study site	21
3.3 Study population and sample population	21
3.4 Sampling technique	21
3.5 Sample size	22

3.6 Inclusion criteria	22
3.7 Exclusion criteria	23
3.8 Data collection instrument and tools	23
3.9 Data collection procedure	23
3.10 Data analysis	24-25
3.11 Ethical considerations	25
3.12 Informed Consent	26
3.13 Rigor of the study	26
<b>CHAPTER- IV: RESULT</b>	27 - 40
<b>CHAPTER- V: DISCUSSION</b>	41 – 43
5.1 Discussion	41 - 42
5.2 Limitation	43
<b>CHAPTER –VI: CONCLUSION &amp; RECOMMENDATION</b>	44 - 45
<b>REFERENCES</b>	46-53

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## Acronyms

BHPI	Bangladesh Health Professions Institute
BMRC	Bangladesh Medical Research Council
CBR	Community Based Rehabilitation
CRP	Centre for the Rehabilitation of the Paralysed
D-Lit	Depression Literacy
ICF	International Classification of Functioning, Disability and Health
IRB	Institutional Review Board
PHQ	Patient Health Questionnaire
QOL	Quality Of Life
SCI	Spinal Cord Injury
SPSS	Statistical Package for Social Sciences
USA	Unite States of America
WHO	World Health Organization

## List of Tables

<b>Table No.</b>	<b>Topics</b>	<b>Page No.</b>
<b>Tabale-1</b>	Monthly family income of the participants	31
<b>Tabale-2</b>	Association between age and the depressed man may think himself guilty without blaming	34
<b>Tabale-3</b>	Association between sex and depression does not interfere with your memory and attention	35
<b>Tabale-4</b>	Association between Marital status and anxiety	36
<b>Tabale-5</b>	Association between skeletal level and anxiety	37
<b>Tabale-6</b>	Association between complications and depression	37
<b>Tabale-7</b>	Association between Income and depression	38
<b>Tabale-8</b>	Association between Income and anxiety	39
<b>Tabale-9</b>	Association of Causes of injury and Severity of D-Lit	40



## List of Figures

<b>Figure No.</b>	<b>Topics</b>	<b>Page No.</b>
<b>Figure-1:</b>	Age of the participants	26
<b>Figure-2:</b>	Sex of the participants	27
<b>Figure-3:</b>	Educational status of the participants	28
<b>Figure-4:</b>	Type of paralysis the participants	29
<b>Figure-5:</b>	Residential area of the Participant	30
<b>Figure-6:</b>	Marital status of the Participant	31

## Abstract

**Introduction:** Spinal cord injury is one of the most debilitating and devastating injuries in the world. This debilitating condition not only creates enormous physical disability but also emotionally depress the patient. Anxiety and depression found two or three times more often among people who are paralyzed than the nondisabled. Anxiety and depression are more common in the spinal cord injury (SCI) population-about 1 in 5 people. **Aim:** To identify the level of the anxiety and depression among SCI patients during rehabilitation. **Objectives:** To determine the socio-demographic information of the SCI patients and to find out the association between anxiety and depression level with age group of the participants. **Methodology:** This study was done by using cross sectional method. The study population was all spinal cord injury patients who rehabilitated at CRP. 40 Sample were conveniently selected for the study. Data were collected by using PHQ questionnaire and D-lit questionnaire. These two standard structured questionnaires were used to assess the anxiety and depression of these participants. Researcher maintained the all-ethical issues. Data were numerically captured in SPSS 20 version. Furthermore, Microsoft excel was used for the analysis of data and for the presentation of the data as well. **Result:** This study found that, among the 40 participants 80% (n=32) were male and 20% (n=8) were female, most of the participants 53% (n=21) were 2<sup>nd</sup> decade and 4<sup>th</sup> decade. Among 40 participants Tetraplegia were 40% (n=16) and paraplegia were 60% (n=24). A significant association had found in anxiety and depression SCI patient during rehabilitation. Statistically significant association also found in between anxiety and depression & some socio-demographic information such as Age, sex, residential area, income, types of injury. **Conclusion:** There are clear associations between social, educational and economic disadvantage, anxiety and depression in this population. Strategies that address the social determinants of anxiety and depression, such as education, social exclusion, financial protection and affordable housing for all are indicated.

**Key words:** Spinal Cord Injury, Anxiety, Depression.

### 1.1 Background

The World Health Organization (WHO) states that, 10% of total populations are disabled in Bangladesh & most of those are physically disabled. According to disability in Bangladesh (2002) the total figure of disability is increasing with population growth and aging. SCI is a devastating condition often affecting young & healthy individuals around the world. SCI can happen to anyone at any age. However, men between the age of 19 and 26 are more likely to have a SCI due to an accident or some act of violence (Ackery et al., 2005). This debilitating condition not only creates enormous physical disability but also emotionally depress the patient. It causes important changes within an individual physical and psychological relationship with their environment. Some of the changes involve the loss of motor function, inability to control bladder & bowel function and the vitiated sexual functioning. It also has an Impact on quality of life, life expectancy and economic burden (Wu et al., 2012).

A person with SCI is considered to be the most physically inactive segment of society who faces many challenges and barriers to physical activity participation (Martin., 2013). Disability due to SCI changes a patient's circumstances and is also responsible for great dissatisfaction which has a negative impact on life (Wollaars et al., 2007). Spinal cord injury always results in a significant emotional response from the survivor. While emotions vary considerably and no one emotion is expecting, the impact of SCI on psychological status has been variously debated (Kennedy et al., 2013). Anxiety and depression is one of the most very much concentrated mental conditions related with SCI. According to effect, SCI is differentiating in two types' paraplegic and tetraplegic. Literature shown that two thirds of SCI patients are paraplegic and one-third is tetraplegic whereas in older studies, the proportion of paraplegics used to be up to 90%, (Wyndaele & Wyndaele., 2006). A common illness can affect anyone. About 1 in 20 Americans (over 11 million people) get depressed every year. Depression found two or three times more often among people who are paralyze like people with SCI than the nondisabled (Dijkers., 1997). Depression is more common in the spinal cord injury (SCI) population-

about 1 in 5 people (Hartoonian et al., 2014). Estimated rates of depression among people with SCI range from 11% to 37% described by Anderson, et al. (2009). Anxiety and depression varies from person to person, but there are some common signs and symptoms. It's important to remember that these symptoms can be part of life's normal laws. But the more symptoms it has, the stronger they are, and the longer lasted (Beck, et al., 2009). Common symptom of anxiety and depression includes agitation, restlessness, and irritability, dramatic change in appetite, often with weight gain or loss, very difficult to concentrate, fatigue and lack of energy feelings of hopelessness and helplessness, feelings of worthlessness, self hate, and guilt, becoming withdrawn or isolated, loss of interest or pleasure in activities that were once enjoyed, thoughts of death or suicide, trouble sleeping or excessive sleeping (Wilder., et al., 2006). A significant number of studies have shown the relation between demographic characteristics, injury-level characteristics, health, function, depression, and QOL. A number of demographic characteristics have been identified as potential predictive factors for depression after SCI, including age between 25 and 49 years, lower education and income, being female, being divorced, being unemployed, and race/ethnicity (ethnic minorities).

Spinal cord injury (SCI) is a devastating condition that may occur acutely (traumatic accidents such as traffic crashes, falls, sports injuries, or workplace accidents) or chronically illness such as spinal tumors or transverse myelitis (Williams et al., 2015). Globally, the highest prevalence of SCI is 906 per million in the US. The injury usually results in symptoms of pain, disability, loss of function, and neurologic dysfunction (Furlan et al., 2011), such as paralysis of voluntary muscles and loss of sensation below the level of the lesion, which is related to reduce mobility and functional independence (Ahoniemi et al., 2008). Additionally, people with SCI can be prone to complications such as pneumonia, septicemia, urinary tract infections, cardiac diseases and chronic pain, which may increase the clinical severity of their medical conditions. This might lower their quality of life in comparison with the general population (Middleton et al., 2007). However, the timing of the assessment of psychological conditions after SCI could be viewed as a dynamic and individualized process (Bonanno et al., 2012). SCI patients might experience chronic and lasting anxiety or depression in response to their injuries, and further understanding about the psychological disorders following SCI in the long

term is necessary. A systematic review and revealed that SCI patients in the rehabilitation phase still have a risk of depression and that almost 30% of those may develop a risk of depression. The possible factors that influenced depression development included demographic characteristics, injury causes, and rehabilitation discharge factors. Furthermore, the longitudinal results provided an indicator of subtle changes in anxiety and depression over time. Anxiety and depression are common mental disorders and increasingly so in the Asia Pacific areas or Western countries (Baxter et al., 2013). The genetic and environmental factors may also affect the development of anxiety and depression disorders (Nugent et al., 2011). In addition to their overlapping symptomatology and clinical presentation, they are highly comorbid with each other. Furthermore, anxiety and depression are found in patients with chronic medical illnesses. The combination of anxiety and depression may increase comorbidities, disabilities, the impact on quality of life, and healthcare utilization (Johansson et al., 2013).

## **1.2 Rationale**

Anxiety and Depression is a serious medical disorder that affects your thoughts, feelings, physical health and behaviors. Depression and anxiety disorders symptoms are commonly reported after spinal cord injury (Sakakibara et al., 2009). It has been reported as the most common form of psychological distress after spinal cord injury (SCI) and appear to occur more frequently in persons with SCI compared with the non-disabled population (Saunders et al., 2011). In addition to the numerous treatments for depression, exercise has become an appealing new alternative to alter ones mood. Many recent studies have been published supporting the belief that exercise has been proven effective in improving depression and in some cases has been able to prevent it all together, Studies have shown that exercise and physical activity provide health and wellness benefits for paraplegics and tetraplegics including: improved psychological functioning, decreased pain, weight management, and prevention of many secondary conditions (Stillson & Virginia., 2007).

This study will help the researcher to find out the level of anxiety and depression among the participants and also will help to find out the factors responsible for anxiety and depression of the spinal cord injury patients. It will also help in drawing attention regarding anxiety and depression and to improve their physical as well as psychological rehabilitation. It is also help to raise awareness among the population and will help full to get information about spinal cord injury. In addition, indicate that the spinal cord injury patient who needs a specialized and comprehensive rehabilitation services to continue their activities of daily living in the community.

To minimize the impact of anxiety and depression, it must be correctly identified and successfully treated. By this study Physiotherapist and other professionals will aware about the anxiety and depression and can understand which factors are responsible for anxiety and depression after spinal cord injury.

### **1.3 Research question**

What are the factors responsible for anxiety and depression in SCI patients during staying at CRP?

## **1.4 Objectives**

### **1.4.1 General objective**

To figure out the level of anxiety and depression among SCI patients during staying at CRP.

### **1.4.2 Specific objectives**

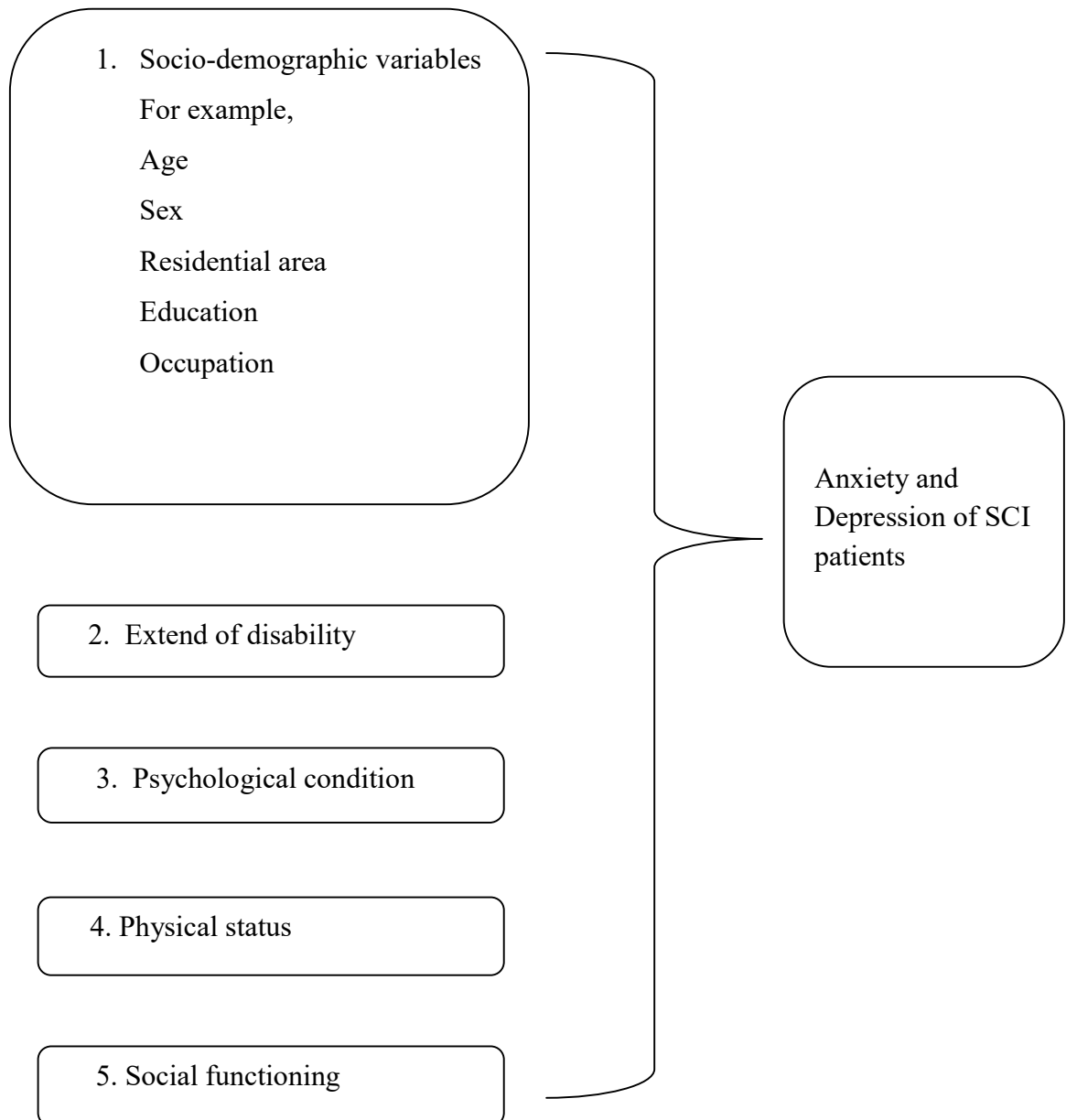
- To determine the socio-demographic information of the SCI patients.
- To find out the level of anxiety and depression in SCI patients during rehabilitation.
- To find out the association between anxiety and depression level with age group of the participants.
- To find out the association between anxiety and depression level with type of paralysis of the participants.
- To find out the association between anxiety and depression level with marital status of the participants.
- To find out the association between anxiety and depression level with literacy of the participants.
- To find out association between anxiety and depression level with income of the participants.



## 1.5 Conceptual framework

### Independent variables

### Dependent variables



## **1.6 Operational definition**

### **Spinal cord injury**

Spinal cord injury (SCI) is defined as damage to the neural elements in the spinal canal (spinal cord and cauda equina) which can be traumatic or non-traumatic that results in temporary or permanent loss of motor and/or sensory function.

### **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 lumbar 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.

### **Anxiety**

Anxiety is your body's natural response to stress. It's a feeling of fear or apprehension about what's to come.

### **Depression**

Depression is a low state of mood and unwillingness to activity that can affect a person's thoughts, behavior, feelings and sense of well being.

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

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

Spinal cord injury classification:

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

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

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

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

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

Anxiety scale: D-lit questionnaire

Depression scale: PHQ-9 Bangla Questionnaire which is developed by Arafat, S.M.Y et al, 2017

## 2.1 Literature Review

Spinal cord injury (SCI) is an event which can be traumatic or non-traumatic that results in disturbances to normal sensory, motor or autonomic function and ultimately impacts a patient's physical, psychological and social well-being (Singh et al., 2014). This is a major public health problem in Bangladesh (Hoque et al., 2012). SCI is a complex disability and poses challenges to rehabilitation health professionals. It affects not only the person's ability to walk but also virtually every bodily system with profound psychological and social implications SCI and its effects are often either underestimated or exaggerated (Judd, 2007).

Prior highlighting the impact of living with spinal cord injury and its effect on the persons with SCI, it is important to have a concept of the spinal cord itself. Therefore this section will give a brief description of the spinal cord itself and the criterion for describing spinal cord injury. The spinal cord and its terminal nerves Cauda Equina are contained within the bony vertebral column. This consists of Cervical (neck comprising of spinal nerves called C1-8), T-thoracic (chest comprising of spinal nerves called T1-12), L-lumbar (low back comprising of spinal nerves called L1-5), Sacral (pelvis comprising of spinal nerves called S1-5) and 1 C-coccygeal (tail) areas (Ditor et al., 2008). The above mentioned spinal nerves provide common pathways for controlled movement, sensory input, and reflex responses. Specifically, C4 is concerned with the diaphragm; C5 with the deltoids and biceps; C6 with wrist extensors; C7 with triceps; and C8-T1 with the hand. T2-7 is concerned with the chest muscles, while T9-12 with abdominal muscles. L1-5 concerns the leg muscles. S2-5 is significant with bowel, bladder and sexual functioning (Bombarider et al., 2012).

The spinal cord is the main connection between the brain and the rest of the body. All sensory and motor messages are mediated through the cord. It has a crucial function of conducting impulses for bodily movement. For movement to occur, the appropriate motor neurons must be active and fire nerve impulses to the muscle. An injury to the spinal cord

can be described by its anatomical level but also the extent of the neurological loss below the lesion (termed „complete“ or incomplete“). In a complete lesion, there is no sensory or motor function and in incomplete, there is some (Ditor et. al, 2008).

Damage to the spinal cord may be traumatic or non-traumatic; Traumatic SCI can result from many different causes – including falls, road traffic injuries, occupational and sports injuries and violence; On the other hand, non-traumatic SCI, usually involves an underlying pathology – such as infectious disease, tumour, musculoskeletal disease such as osteoarthritis and congenital problems such as spina-bifida which is a neural tube defect that arises during development of the embryo (International perspective on spinal cord injury; WHO, 2013; Guest et al., 2014). It is important to note that the causes of traumatic SCI vary geographically. For instance violence is more prevalent in urban areas than in rural areas, and firearms are more frequently used in urban areas in committing crime. Research indicates that most new injuries globally occur to young people less than 30 years of age, with approximately 80% being men (Judd, 2007).

The symptoms of spinal cord lesion depend on the extent of the injury or non-traumatic cause but they can include loss of sensory or motor control of the lower limbs, trunk and the upper limbs, as well as loss of autonomic (involuntary) regulation of the body; This can affect breathing, heart rate, blood pressure, temperature control, bowel and bladder control and sexual function; Cervical SCI commonly causes sensory and motor loss (paralysis) in the arms, body and legs which is referred to as tetraplegia (the alternative term quadriplegia is now less used); Thoracic SCI commonly causes sensory and/or motor loss in the trunk and legs, this condition is called paraplegia; Lumbar SCI typically causes sensory and motor loss in the hips and legs; According to the International Standards for Neurological Classification of SCI with the American Spinal Injury Association (ASIA) Impairment Scale (AIS), SCI is considered complete if there is no sensory and motor function at S4–S5; While some sensory and or motor function is preserved below the level of injury in incomplete SCI including the lowest sacral segments S4-S5, it is no less serious and can still result in severe impairments (International perspective on spinal cord injury; WHO, 2013; Craig et al., 2009; Lim et al., 2017; De Almeida et al., 2013).

The type of disability associated with SCI varies greatly, depending on the type and severity of the injury, the level of the cord at which injury occurs, and the nerve fibre pathways that are damaged. The more specific effects of spinal cord injury are determined by the type of nerve that has been damaged. Damage to motor nerves results in paralysis, or loss of control of movement. Damage to somatosensory nerves results in loss of sensation and perception; one can no longer feel touch, pain, temperature, or be able to tell without looking where in space the nerve-damaged body part is positioned (Agarwal et al., 2008). The detection of psychological problems in individuals following SCI is vital as research suggests that those individuals who experience high levels of anxiety and depression benefit significantly from therapies such as cognitive behaviour therapy (Foreman, 2007).

Factors investigated have included demographic characteristic (e.g. age, gender, marital status), injury-related variables (e.g. level, lesion, age of onset, time since onset, sexuality), personal values and attitudes (e.g. health care orientation, acceptance of disability), vocational and avocational activities (e.g. employment, leisure activity, social roles), intra-personal strengths (e.g. locus of control, coping strategies), and environment resources (e.g. family relationships, social support) (Kent and Dorstyn., 2014). These studies highlight a number of factors, from the above, which influence a person's ability to adjust. These include emotional maturity, degree of family or social support, education level, intellectual development, job, security, financial status, access to the environment, perceived locus of control, level of self-esteem and participation in social and leisure activities (Mota-pereira et al., 2011).

Research further indicates that persons with SCI face many psychosocial and vocational adjustment problems including depression and anxiety, alcohol and drug abuse, unemployment, and lack of social support (Anderson et al., 2009). These problems have each been found in various research studies as relating to a poorer quality of life. Research has shown that patients with spinal cord injury tend to have reduced self-esteem which can, in turn, lead to lower self-worth and less motivation (Ginis et. al., 2010).

Persistent low self-esteem is detrimental and has the potential to lead to long term depression and even suicide. Indeed, suicide has been cited as increasing rate of mortality in spinal injured patients under the age of 55 years (Capaul et al., 2008).

Social and emotional adjustment to SCI can vary considerably from person to person. Some could make satisfactory adjustments, while others remain chronically distressed (Gioia et al., 2008). As shown above, many studies have contributed in the understanding of individuals with SCI and the need for relevant research documenting their experiences as to design better prevention and intervention strategies. Although many of the studies are not specifically about SCI individuals in South Africa, there is no reason to believe that they apply less to individuals with SIC in South Africa than individuals elsewhere in the world, in spite of different cultures and socio-economic conditions. (Khan et al., 2010) Furthermore, whilst the research literature looking at the psychological effects of spinal cord injury continues to grow and develop, there is still a long way to go before we are able to describe the global psychosocial effects of this type of injury on the patient, their family and the staff who care for them in their rehabilitation period and in their life afterwards. SCI is an injury causing disability, a factor that has different implications for each individual. Some could make satisfactory adjustments, while others remain chronically distressed (Ning et al., 2012).

Individuals who sustain spinal cord injuries experience the trauma of one of the most devastating of all non-fatal injuries. The goals for these individuals are not of medical recovery, but of adaptation to the circumstances that have been drastically changed. The SCI affects the psychological well-being of the patients. This is because SCIs usually demand changes in almost every aspect of an individual's life. Personal relationships; the physical structure of the home, employment, education; social and leisure pursuits; and financial position are all influence by the injury (Hjeltnes et al., 2008).

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

warning, leaving the injured person and family with dramatically altered life situation (Elliott et al, 2006).

The literature contains much theoretical discussion about the various ways in which individuals react to the stress of SCI. The progression of reaction of the spinal cord injured person has been discussed by many using similar terminologies and frequently noting the resemblance to the process reported in patients approaching death. However it should be noted that there is nothing predictable about the psychological sequelae of SCI (Forchhimer and Tate., 2008). The response is individual and is mediated by both pre-morbid individual characteristics and external factors further emphasize that people living with SCI resent theories (adjustment theories) as a form of victimization by professionals “who write articles about the reactions to spinal cord injury which are based more on theory than fact”. While this section takes into consideration the existing theoretical literature, however it seeks to highlight various psychological effect of SCI without a sequence to them. Further it acknowledges that within the following list of common psychological effect of SCI, individuals respond differently (Groff et al., 2009).

Therefore it must be remembered that the population of people with spinal cord injury is heterogeneous in terms of age, level of injury, social class and education and the immediate reactions may be as varied as the pre-injury interactional styles. According to the various literature reviewed there is a mentioning of one or more of the following common emotional reactions which however are not the focus of this section. Spinal cord injury may produce a variety of emotional reactions, including but not limited to sadness & crying, despair & guilt, fear of losing control, disbelief & panic, helplessness & inadequacy, resentment & bargaining, loss of interests, fatigue & lethargy, loneliness & isolation (discussed below), and withdrawal. Acquired paralysis can generate feelings of loss (Muraki et al., 2007).

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



This loss of personal control manifested itself in incontinence, emotion and loss of movement. Furthermore the study found that helplessness (discussed below) and embarrassment were common responses. While a loss of independence was associated with inability to control bodily functions, but also with a loss of spontaneity. Furthermore, in relation to physical health and bodily functions, men who have sustained an injury to the spinal cord may experience inability to achieve an erection and reduced fertility, inability to feel when the bowel is full and to empty it voluntarily, inability to sense pressure, heat or cold in parts of the body below the level of the injury (Martin et al., 2013).

All these happenings further impacts on the psychological well-being of the individual. Spinal cord injury imposes multiple stresses not just for the patient but also for their family. The impact is far reaching and family relationships and roles may be radically changed. Chronic health problems, feelings of frustration, isolation, guilt and even resentment have been reported in family members of individuals with spinal cord injury (Frankel et al., 2008). It has been reported that it is not only the perception of physical disability and distress in the patient that creates emotional difficulties for their families but it is wider ranging factors such as severe financial hardship or the prospect of financial difficulties which are likely to occur as employment is adversely affected. The above difficulties may lead to role redefinition, and also to lifestyle changes. In example if a father suffered from SCI he will still maintain the role of father and husband, yet the typical roles that he usually fulfilled needs to change such as taking out the garbage or mowing the lawn, and being a provider for the family (Haskell et al., 2007).

Helplessness has been described by authors such as a psychological state that frequently results when events are uncontrollable further describes that an event is uncontrollable when one cannot do anything about it, when nothing one does matters sees helplessness as more severe than depression since it totally immobilizes the sufferer. Physical disease can elicit feelings of helplessness because often a person finds his own responses ineffective and is thrown upon the care of others. In the light of SCI diagnosed person, feelings of helplessness result from loss of control in areas that were previously well mastered. Loss of control is experienced in specific areas, such as, loss of independence,

loss of ambitions, physical attractiveness, sexual relationships, status and respect in the community (Phalkey et al., 2011). SCI persons can as a result of the extreme feelings of helplessness feel that no matter what she or he can do, his or her situation can never be better. At this stage, a SCI diagnosed person may be more likely to try ineffective strategies such as abuse of substances as a way of avoiding feelings of helplessness. Many individuals with severe disability do not consider they will ever adjust, as adjustment implies acceptance, a situation they feel they will never achieve. Rather they tend to use the word “tolerate” getting on with their lives despite their disability. It contends that psychological adjustment, rather than intellectual capacity or completeness of injury, is the critical factor in determining the rehabilitation process. There are other several possible emotional and psychological reactions and processes that the person with SCI may experience. These may include, but not limited to, pain, medication, isolation, boredom etc., and are discussed next (Rauch et al., 2014).

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

The process through which persons, who are seen as relatively different from the norm, are peripheralised a situation in which groups of people are excluded from useful participation in society”. According to stigma and societal attitudes towards people with disability (discrimination in terms of employment, promotion, and dating) and loss experienced in a more social context can result in the individual’s inability to maintain their place in the social and economic hierarchy. The financial consequences impacting on the individual, family, and society, there are alterations that may occur in individual’s

interaction activities and in their relationships with significant others. Such changes may be attributed to societal devaluation of disabled persons, the daily struggle to accomplish activities of daily living, stress of significant others relationships/role interactions and the loss of satisfaction from vocational and leisure activities which can no longer be accomplished. While the situation in the South African context has clearly evolved with regard to stigmatization and discrimination of individuals with disability (including SCI persons), from casual observation, it seems evident that there are still societal attitudes towards people with disability (Rabadi et al., 2013).

A South African study probing into the subjective experience of SCI persons living in the rural areas, found that the experiences of being undermined, thus preventing them from their societal roles, evoked feelings of helplessness and frustration, and did not promote the participants' view of themselves positively. The participants of the study experienced being seen and treated as objects. This had major impact on the psychological well-being from how participants view themselves (Hartoonian et al., 2014).

Furthermore, in a case study by a participant (who sustained a spinal cord injury through a rugby sport) reveals that after the accident "most people he knew soon stopped to visiting" him at the spinal cord injury rehabilitation centre. Furthermore, the participant shares that since the injury he has no friends, no one to socialize or speak with. This experience is what terms deprivation of opportunity (Kong et al., 2013).

There is frequent mention of individuals suffering from "depression" in rehabilitation units. This may have been used loosely to describe people "having a bad day" or to describe Major Depression. Major depression is not a normal and necessary or essential part of the process of adjustment to SCI, but indicates that the person is distressed and not coping. The presence of depression is not related to level or degree of injury, contrary to popular opinion. The grieving reaction may appear similar to depression, but unlike depression will dissipate over time as the individual learns to live with his or her disability. Mourning or grieving may also present with physical complaints, preoccupation with a former self- image, feelings of guilt, feelings of anger and irritability, and behavioral changes. The important distinction between mourning and

depression is that people who are experiencing a grief reaction will be focused on the lost body part and the accompanying secondary emotional reactions. For example, the individual with SCI would bemoan the altered quality of life without independence and limbs. In reactive depression, the focus is self-critical, with feelings of worthlessness, hopelessness, helplessness and withdrawal from others (Hanson et al., 2007).

Historically SCI condition was viewed linearly. For instance, it describes SCI as a “severe traumatic disability that occurs suddenly, affecting both sensory and motor function”. This echoes the traditional medical model which focuses purely on physical (sensory and motor) function. For years literature neglected to include aspects of the individual’s functioning other than sensory and motor functions. The impairment caused by SCI produces a unique experience in disablement for each individual. To understand this experience, one needs to consider the emotional and social factors that compliment motor and sensory aspects. This allows health professionals to deal with person in totality, constantly bearing in mind that different components are affected in varying degrees (Anneken et al., 2010).

Over the years the definition of SCI has evolved thus prompting for new rehabilitation trends that view SCI persons holistically. For this reason, the aim of current rehabilitation trends/approaches focused on recovery from injury, restoration of independence by way of physiotherapy and exercise programs to maintain suppleness of limbs, preventing contractures and pressure sores, improving muscle strengths especially when there is recovery in motor function. Furthermore, teaching patients transfer to and from wheelchairs (Occupational therapy), psychotherapy and improving body image (psychological intervention), teaching family/caregiver to cope and restoring dignity which is the patient’s constitutional right (Beck et al., 2009).

The ultimate aim is to turn these patients homeable to care for themselves and to avoid morbidity. While this remains the main aim of rehabilitation, however the reality is most depressing, especially in the developing countries. The rehabilitation phase is hampered by the shortage of trained manpower to cope with the increased demand of rehabilitation (DOH, 2010). One of the most important changes in the care of SCI persons has been the shift from hospital to home. Concomitant with this change has been a sizeable amount of

time and money the family has to spend on their SCI person/family member. The financial constraints usually have bearing on the SCI and the family. In order to be able to alleviate some of the problems that the families may be faced with, the SCI patient must acquire as much independence as possible before leaving hospital (Ginis et al., 2010).

Furthermore, after discharge access to health care service depends on the patients' proximity to a hospital with such services, or their ability to meet transport and treatment costs. In most rural areas of the referral hospitals in South Africa, there are no rehabilitation centres working with SCI persons. Nevertheless, the above view has led to the understanding that SCI disability in itself is influenced not only by impairment but also by contextual factors thus involving not only the person with the disability but also the context in which he/she find themselves. Apart from physical barriers in the environment such as architectural obstacles, the attitude of others and that of SCI persons has contribution to the rehabilitation process and outcome (Krishblum et al., 2014)

While there are theories on adjustment after a SCI, however the impact of SCI could never be generalized, but remain unique for each individual case. It is this belief that motivates the relevancy of such a study. This highlights a crucial need in understanding the known and unknown psychological challenges that may hinder progress of rehabilitation after sustaining a SCI (Ahoneimi et al., 2008).

Associate certain individual characteristics with successful adaptation Favorable predictors include young age, female, internal locus of control, developed social skills, employment, access to transportation, financial security, assertive, and problem-solving ability. Specifically, access to sufficient resources encourages the development of appropriate coping efforts, resulting in greater psychological well-being. Presumably, individuals with higher levels of resources will progress through adjustment cycles faster with better outcomes and fewer recurrent problems (Martin et al., 2013). This chapter discussed the literature reviewed undertaken for the study. The literature reviewed was divided into two main components, namely the spinal cord and spinal cord injury, and psychological impact of SCI. The first component sought to provide the background

information about spinal cord and what happens when it has been injured (Lysack et al., 2007).

The second component provided an account of the psychological impact of SCI and lastly highlighted that psychological adjustment is critical in determining the rehabilitation process. Due to its unexpectedness and severity, rehabilitation is intense and aimed at reintegrating the individual who sustained a SCI to community and be an optimal functioning individual. High levels of psychological well-being are associated with adequate social support, perceived high levels of control, high income and more education (Mothe et al., 2013).

### **3.1 Study design**

This study aimed to find out the related factors affecting the development of anxiety and depression during stay at CRP. For this aim a cross-sectional research model is used. Cross-sectional studies measure simultaneously the exposure and health outcome in a given population and in a given geographical area at a certain time. A cross-sectional study is an observational study. Cross-sectional is also called prevalence study. The temporal relationship between exposure and disease cannot be determined.

### **3.2 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.

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

The patients of Spinal cord injury who admitted in Centre for the Rehabilitation of the Paralyzed. A population is the total group or set of event or totality of the observation on which a research carried out.

### **3.4 Sampling technique**

Convenience sampling technique was use for this study. A convenience sample is simply one in which the researcher uses any subjects that are available to participate in the research study. A convenience sample is a group of individuals who (conveniently) are available for study. It was extremely difficult to select either a random or a systematic nonrandom sample (Jack, 2006). Participants who start their rehabilitation stage at that time were select for the study. Because of all patients did not start rehabilitation at the same time. Therefore, convenience sampling technique is appropriate for this study.

### 3.5 Sample size

Sampling procedure for cross sectional study done by following equation-

$$n = \frac{Z^2 pq}{d^2}$$
$$= (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2$$
$$= 384$$

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 40 sample were selected conveniently.

### 3.6 Inclusion criteria

Age 18 years or more

Patient is in Rehabilitation stage

Voluntary participation

Both male and female patient



### **3.7 Exclusion criteria**

Patient is known with others mental or physical illness.

Patients take medication for mental disorder

SCI with speech problem

SCI patients with head injury

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

Data were collected by using a standard questionnaire included PHQ and D-lit questionnaire. In that time some other necessary materials were needed like pen, pencil, and white paper, clip board & note book. Data were analyzed with the software named Statistical Packages for the Social Science (SPSS) version 20.0 Data were presented by using table.

### **3.9 Data collection procedure**

A structured questionnaire was to collect data. The researcher followed the time schedule of the setting for collecting data. Researcher has chosen two setting for collecting data. This data collection tools were permitted from the authors to use this study. Participants who had the reading ability they administered the questionnaire own-self. Before collecting data the study aims and purpose explained to the participants. The participants or caregivers read (if they can) the information sheet and consent form. Who were unable to read researcher was explained the information sheet and the consent form. All the participants had the opportunities to ask any study related questions and they could show interest to participate in the study they could sign in the consent form willingly. The researcher was collected data by structured questionnaire, pen, pencil and paper. The researcher used anxiety and depression measurement scale. This scale was developing according to cultural context of the Bangladesh.

### **3.10 Data analysis**

The data that was collected is descriptive data. The graph technique was used for analyzing data, calculated as percentages and presented this using bar and pie charts by SPSS (Statistical Package of Social Science) software version 20.0. SPSS is a comprehensive and flexible statistical analysis and data management solution. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics and conduct complex statistical analyses.

#### **Chi square ( $\chi^2$ ) Test**

Chi square  $\chi^2$  test was a nonparametric test of statistical significance for bivariate tabular analysis with a contingency table. Chi square helps us analyze data that come in the form of counts. This test can be applied to nominal or categorical data. The most common application for chi square was to determine whether or not a significant difference exists between the observed counts of cases falling into each category and the expected counts based on the null hypothesis. It was often used to compare two proportions.

#### **Assumptions for Chi Square test**

- The data must be in the form of frequencies counted in each of a set of categories.
- The total numbers observed must exceed 20.
- The expected frequency in any one fraction must not normally be less than 5.
- All the observations must be independent of each other. In other words, one observation must not have an influence upon another observation.

### Calculation of ( $\chi^2$ ) Statistic

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

In contingency table problems, writer creates an index that computes for each outcome cell,

$$\frac{(\text{Observed count} - \text{Expected count})^2}{\text{Expected count}}$$

If O stands for observed count and E for expected count, the mathematical notation the formula looks like this:

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

### 3.11 Ethical considerations

The research proposal was submitted to the Institutional Review Board (IRB) of Bangladesh Health Profession Institute (BHPI) and after defense the research proposal approval was taken from the IRB. A written/ verbal consent was taken from participate before collecting of data. The necessary information has been approved by the ethical committee of CRP and was permitted to do this research. Also the necessary permission was taken from the in-charge of the rehabilitation division of CRP. The participants were explained about the purpose and goal of the study before collecting data from the participants. The World Health Organization (WHO) and Bangladesh Medical Research council (BMRC) guideline was always followed to conduct the study. During the course of the study, the samples who were interested in the study had given consent forms and propose of the research and the consent forms were explained to them verbally. The study did not interfere with their jobs. They were informing that their participation was fully voluntary and they had the right to withdraw or discontinue from the research at any time. They were also informed that confidentiality was maintained regarding their information. It should be assumed the participant that his or her name or address would not be used.

The participants will also be informed or given notice that the research result would not be harmful for them.

### **3.12 Informed Consent**

Written consent was given to all participants prior to completion of the questionnaire. The investigator explains to the participants about his or her role in this study. The investigator received a written consent form every participants including signature. So the participant assured that they could understand about the consent form and their participation was on voluntary basis. The participants were informed clearly that their information would be kept confidential. The investigator assured the participants that the study would not be harmful to them. It was explained that there might not a direct benefit from the study for the participants but in the future cases like them might get benefit from it. The participants had the rights to withdraw consent and discontinue participation at any time without prejudice to present or future care at the community. Information from this study was anonymously coded to ensure confidentiality and was not personally identified in any publication containing the result of this study.

### **3.13 Rigor of the study**

The rigorous manner was maintained to conduct the study. The study was conducted in a clean and systemic way. During the data collection it was ensured that participants were not influenced by experience. The answers were accepted whether they were in negative or positive impression. No leading questions were asked. The participant information was coded accurately checked by the supervisor to eliminate any possible errors. The entire information was handled with confidentiality. In the result section, outcome was not influenced by showing any personal interpretation. Every section of the study was checked & rechecked by research supervisor.

In this study there were 40 participants. The analysis was done by the SPSS 20 version.

#### 4.1 Socio-demographic Information

##### 4.1.1 Age of the participants

Among the 40 participants (20%) 8 participants were between 1-20 years, (53%) 21 were between 21-40 years, (20%) 8 were between years 41-60 years and (7%) 3 were 61-80 years. Among the 40 participants who were included in this study and their mean age were 34.65 with standard deviation 0.834 (Figure-1).

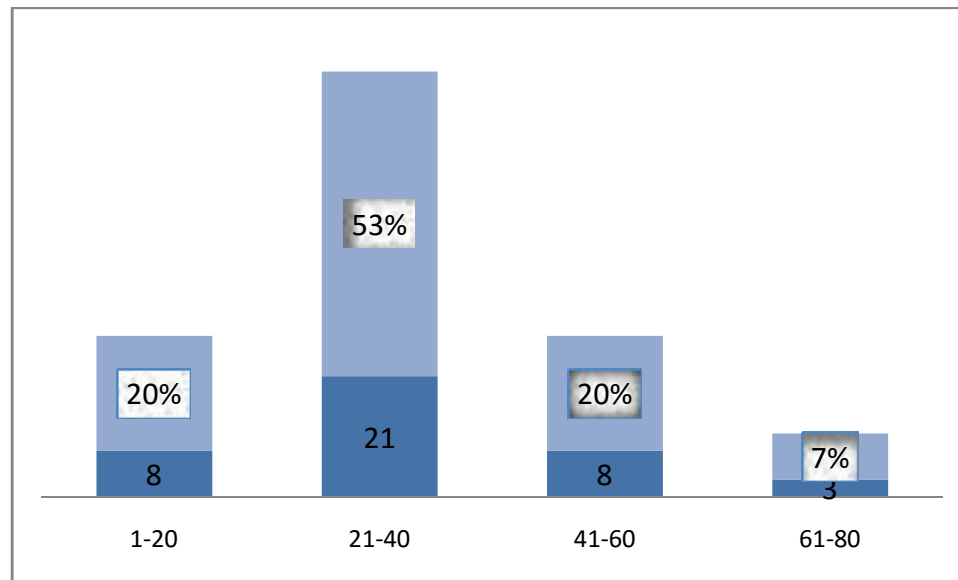


Figure-1: Age of the participants

#### 4.1.2 Male Female ratio

The study finds out the 40 participants 32 (80%) were male and 8 (20) were female (Figure -2).

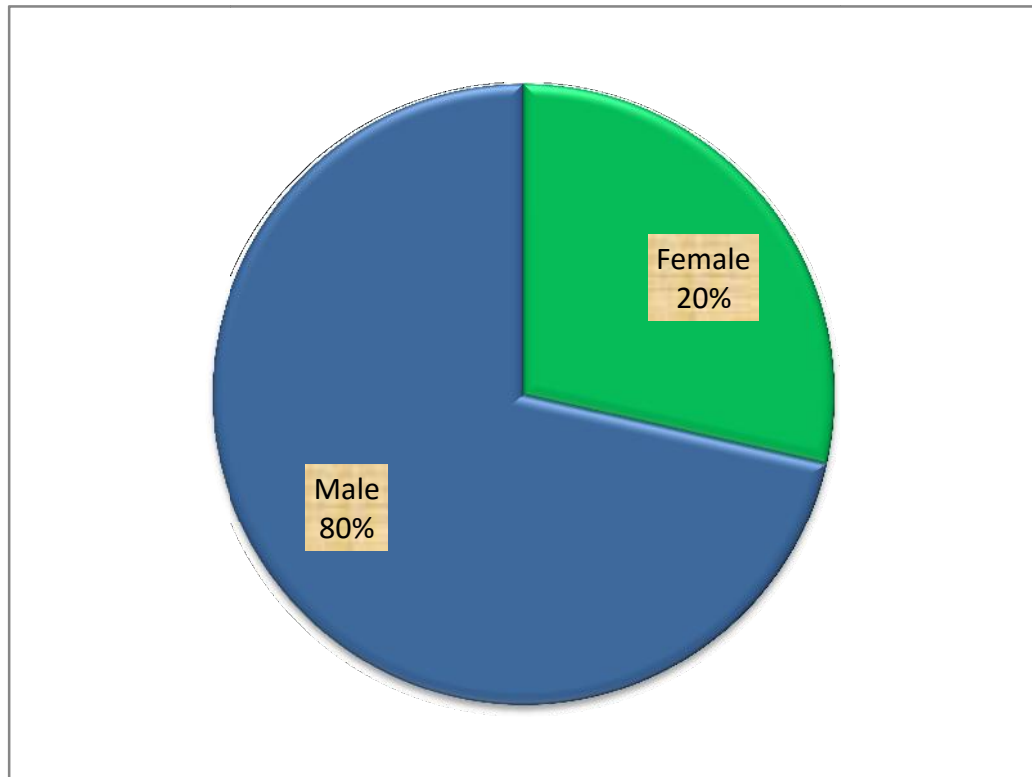


Figure -2: Sex of the participants.

### 4.1.3 Educational Status of the participants

The study observed the 40 participants, among them (50%) participants had primary education, (10%) participants completed Secondary School Certificate education, (15%) participants completed their higher secondary certificate education, (15%) participants completed Bachelor and masters program, (10%) participants had no education what so ever (Figure-3).

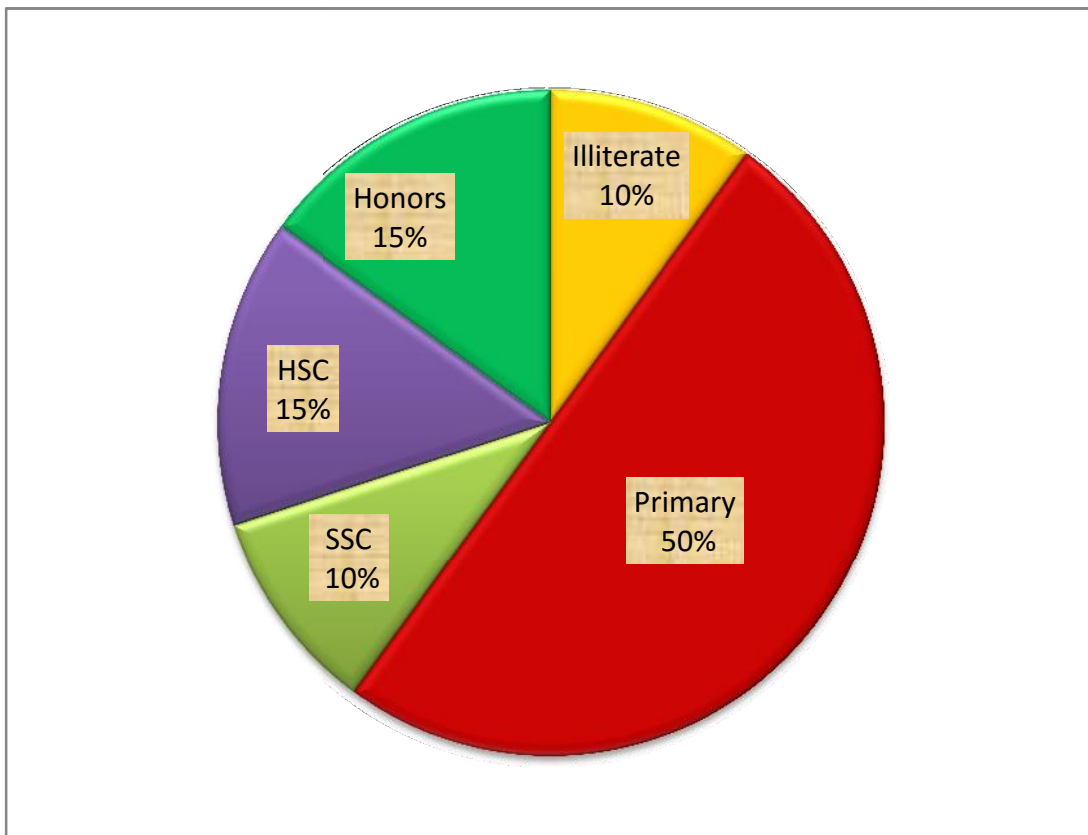


Figure -3: Educational status of the participants

#### 4.1.4 Type of paralysis the participants

The study identifies the 40 participants there is 16 (40%) participants who are diagnosed as tetraplegic patient and 24 (60%) of the participants diagnosed as paraplegia. (Figure-4)

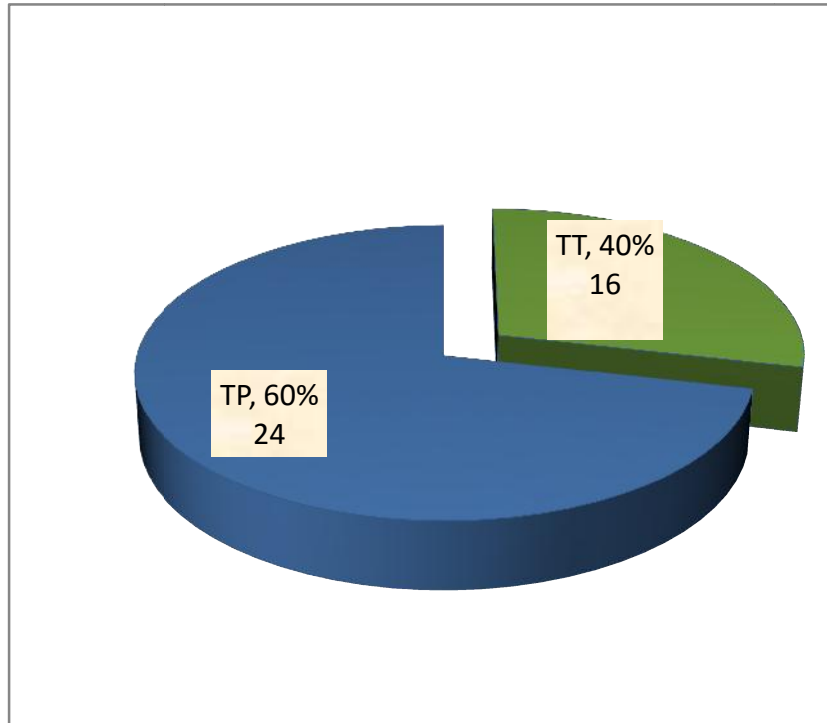


Figure-4: Type of paralysis the participants



#### 4.1.5 Monthly family income of the participants

Result shows that average monthly income of the participants are 11600 BDT and standard deviation is 8568.876. Overall participants income range (0-10000) BDT have 47% (n=19), (11000-20000) BDT have 40% (n=16) participants, (21000-30000) BDT have 10% (n=4), (31000-40000) BDT have 3% (n=1).

Table-1: Monthly family income of the participants

Monthly Income	Number (n)	Percentage
(0-10000) BDT	19	47%
(11000-20000) BDT	16	40%
(21000-30000) BDT	4	10%
(31000-40000) BDT	1	3%
Total	40	100%

#### 4.1.6 Residential area of the Participant

This figure demonstrates the residential area of the participant. Among all the participants, there 78% who lived in the rural area and the rest of the participants which is 22% lived in urban area (Figure-5).

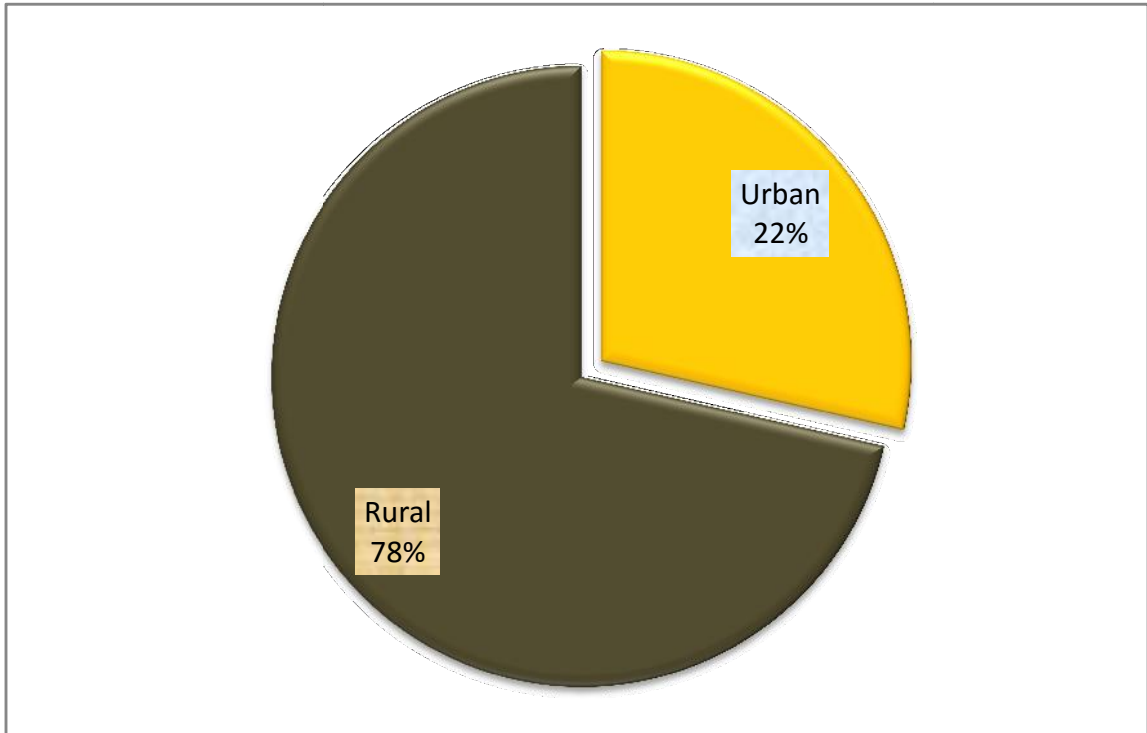


Figure-5: Residential area of the Participant

#### 4.1.7 Marital status of the Participant

This figure shows the marital status of the participants. There 40 participants which are included in this study. Among them 28 (70%) participants are married, 12 (30%) participants are unmarried.

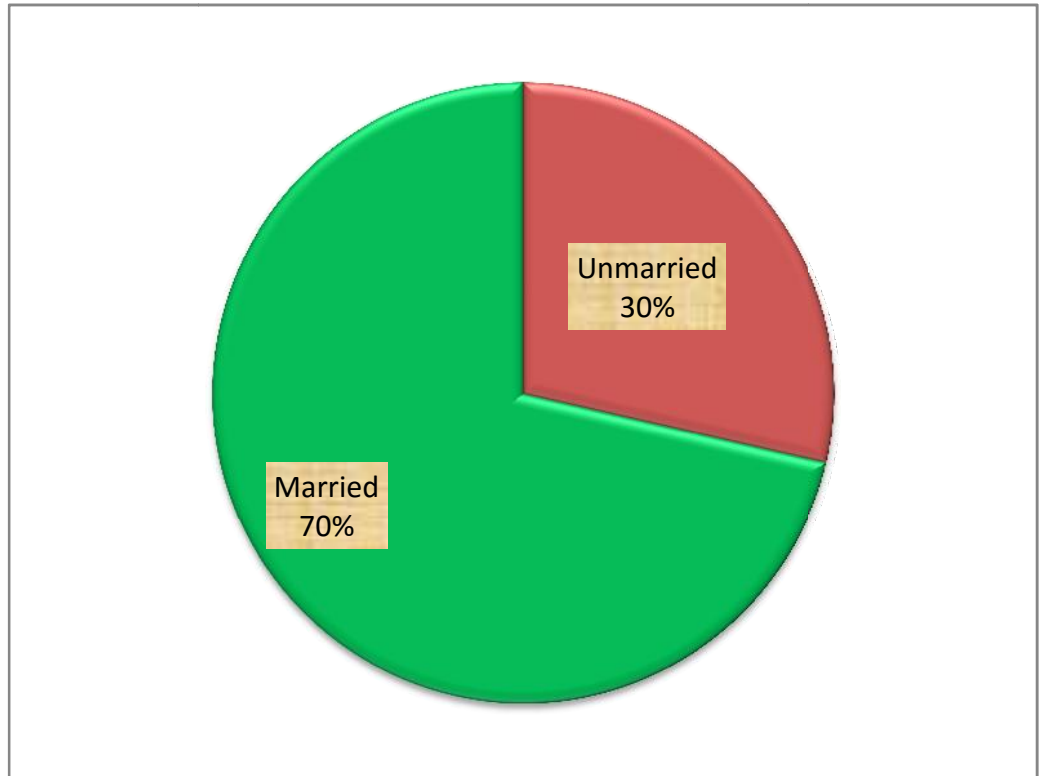


Figure-6: Marital status of the Participant

#### 4.2 Association between age and the depressed man may think himself guilty without blaming

In this study there was a significant association in between age and anxiety. In 21-40 age group participants, 11 were in true for the depressed man may think himself guilty without blaming and chi square value was 13.965 and p value was 0.03 which was highly significant. So the depressed man may think himself guilty without blaming depends on age of the participants.

Table-2: Association between age and the depressed man may think himself guilty without blaming

<b>The depressed man may think himself guilty without blaming</b>							
<b>Age Group</b>	<b>True</b>	<b>False</b>	<b>Unknown</b>	<b>Chi-square</b>	<b>P value</b>	<b>Significance</b>	<b>Total</b>
1-20	8	0	0				8
21-40	11	8	2	13.965	0.03	Significant	21
41-60	7	1	0				8
61-80	0	2	1				3
<b>Total</b>	<b>26</b>	<b>11</b>	<b>3</b>				<b>40</b>

#### 4.2.1 Association between sex and depression does not interfere with your memory and attention

In this study there was a significant association in between sex and anxiety. “Depression does not interfere with your memory and attention” this statement 28 male were in false and chi square value was 9.118 and p value 0.01 which was highly significant with sex. So depression does not interfere with your memory and attention depends on complications of the participants.

Table-3: Association between sex and depression does not interfere with your memory and attention

<b>Depression does not interfere with your memory and attention</b>							
	<b>True</b>	<b>False</b>	<b>Unknown</b>	<b>Chi-square</b>	<b>P value</b>	<b>Significance</b>	<b>Total</b>
<b>Sex</b>							
Male	4	28	0	9.118	0.01	Significant	32
Female	0	6	2				8
<b>Total</b>	<b>4</b>	<b>34</b>	<b>2</b>				<b>40</b>

#### 4.2.2 Association between Marital status and anxiety

In this study there was a significant association in between marital status and anxiety. 12 married participants were in several days and 13 married were in more than half the days feeling bad about yourself — or that you are a failure or have let yourself or your family down and chi square value was 10.397 and p value was 0.015 which was strongly significant with anxiety. 23 married participants were in true to Confidence and low self-esteem may be a symptom of depression and chi square value was 6.633 and p value was 0.036 which was strongly significant with anxiety. So anxiety depends on marital status of the participants.

Table-4: Association between Marital status and anxiety

<b>Socio-demographic variable</b>	<b>Anxiety</b>	<b>Chi- square</b>	<b>P value</b>	<b>Significance</b>
<b>Marital status</b>	Feeling bad about yourself — or that you are a failure or have let yourself or your family down	10.397	0.015	Significant
	Confidence and low self- esteem may be a symptom of depression	6.633	0.036	Significant

#### 4.2.3 Association between skeletal level and anxiety

In this study 13 participants C4 (n=6) and T12 (n=7) were in true about depressed people often talk unplanned and random and chi square value was 34.715 and p value was 0.041 which was highly significant. In this study “normally all medicines of depression are more sleeping” which can lead to difficulties working in the daytime 14 were in true C4 (n=7) and T12 (n=7) participants and chi square value was 35.692 p value was 0.033 which was highly significant. So anxiety depends on skeletal level of the participants.

Table-5: Association between skeletal level and anxiety

<b>Socio-demographic variable</b>	<b>Anxiety</b>	<b>Chi- square</b>	<b>P value</b>	<b>Significance</b>
	Depressed people often talk unplanned and random	34.715	0.041	Significant
<b>Skeletal level</b>	Normally all medicines of depression are more sleeping, which can lead to difficulties working in the daytime	35.692	0.033	Significant

#### 4.2.4 Association between complications and depression

There was a significant association in between depression and complication in this study. “Poor appetite or overeating” in this statement 17 participants of bowel and bladder complications were in several days and chi-square value was 22.362 and p value was 0.034 which was significant with complications. So depression depends on complications of the participants.

Table-6: Association between complications and depression

<b>Socio-demographic variable</b>	<b>Depression</b>	<b>Chi- square</b>	<b>P value</b>	<b>Significance</b>
<b>Complications</b>	Poor appetite or overeating	22.362	0.034	Significant

#### 4.2.5 Association between Income and depression

In this study there was a significant association in between depression and income. “Feeling bad about yourself — or that you are a failure or have let yourself or your family down” 9 were in several days at the range of income in (0-10000) BDT and 9 were in more than half the days in (11000-20000) BDT and chi-square value was 23.565 and p value was 0.023 which was significant with income. So depression depends on income of the participants.

Table-7: Association between Income and depression

<b>Socio-demographic variable</b>	<b>Depression</b>	<b>Chi- square</b>	<b>P value</b>	<b>Significance</b>
<b>Income</b>	Feeling bad about yourself — or that you are a failure or have let yourself or your family down	23.565	0.023	Significant

#### 4.2.6 Association between Income and anxiety

In this study there was a significant association between income and anxiety. “The depressed man may think himself guilty without blaming” in this statement 15 participants were in true and their income range was less than 10000 BDT and their chi-square value was 18.125 and p value was 0.02 which was strongly significant with income. “It may be a symptom of excess sleep or very low sleeping depression” in this statement 18 were in true at the income range of less than 10000 BDT and 15 were in true income range (11000-20000) BDT and chi-square value was 22.579 and p value was 0.004 which was strongly significant. “Excessive eating or losing a taste can be a symptom of depression” this statement 13 were in true at the income range of less than



10000 BDT and 10 were in true of (11000-20000) BDT and chi-square value was 17.673 and p value was 0.024 which was strongly significant with income. “Medical psychologists can provide medicines for depression” this statement 9 were in false and 9 were in unknown at the income range of (0-10000) BDT and chi-square value was 20.88 and p value was 0.007 which was strongly significant with income. So anxiety depends on income of the participants.

Table-8: Association between Income and anxiety

<b>Socio-demographic variable</b>	<b>Anxiety</b>	<b>Chi- square</b>	<b>P value</b>	<b>Significance</b>
	The depressed man may think himself guilty without blaming	18.125	0.02	Significant
<b>Income</b>	It may be a symptom of excess sleep or very low sleeping depression	22.579	0.004	Significant
	Excessive eating or losing a taste can be a symptom of depression	17.673	0.024	Significant
	Medical psychologists can provide medicines for depression	20.88	0.007	Significant

#### 4.2.7 Association of Causes of injury and Severity of D-Lit

21 participants who are falling from height have moderate level of anxiety and 7 participants of RTA have moderate level of anxiety and chi square value was 10.054 and p value was 0.007 which was strongly significant. Anxiety depends on causes of injury of the SCI patients.

Table-9: Association of Causes of injury and Severity of D-Lit

Causes of injury	Level of anxiety				Chi-square	p value	Significance
	Mild	Moderate	Severe	Total			
Fall from height	0	21	3	24	10.054	0.007	Significant
RTA	0	7	4	11			
Others	0	1	4	5			
Total	0	29	11	40			

### 5.1 Discussion

The purpose of this study was to find out the association and level of anxiety and depression of spinal cord injury patient during rehabilitation. Results demonstrated that psychological upset is a reality for a significant number of SCI persons after spinal injury. This study was found, male participants 80 % (n=32) were higher than the female participants 20% (n=8). Most of the injured participants of this study were male following injury. According to Rahman et al., (2017) found that among 2184 participants 86.8% (n=1897) were male and 13.1% (n=287) were female. Anderson et al., (2009) found that among 231 participants male were 63% and female were 37% following SCI. Razzak et al., (2013) found that, among 56 participants 84% were male and 16.0% were female. So, it seems that male participants are more permeable than female participants in spinal cord injury.

In this study most of the participants were from (21-40 years) age group which was 53% (n=21). Similarly Bombardier et al. (2008) in their study found 29.7% was from (25-35 years) age group. Rahman et al., (2017) also noted that the distribution of age in this study showed more people in their 2nd decade and 3rd decade was vulnerable to spinal cord injury. All results claim that active younger (age around 20-40) are more vulnerable with the incidence of spinal cord injury.

There were total 40 participants in this study, among them Tetraplegia were 40% (n=16) and paraplegia were 60% (n=24). Arafat et al., (2018) found that among 437 participants majority of the participants of this study had traumatic paraplegia (63.6%). Rahman et al., (2017) also noted same type of result in 2184 respondents, 51.9% had the diagnosis of traumatic paraplegia and 42.6% had tetraplegia. There is no any significant difference between the type of injury (paraplegia and tetraplegia), anyone with spinal cord injury would be paraplegia or tetraplegia.

There were total 40 participants in this study, 78% who lived in the rural area and the rest of the participants which is 22% lived in urban area. Rahman et al., (2017) also noted that 69.2% of the respondent was from villages.

Spinal Cord Injury, which may occur suddenly but its effect can be devastating. In this study was found that there are highly association of anxiety and depression after spinal cord injury. Individuals with spinal cord injury will experience anxiety and depression and depression is the most common form of psychological distress after spinal cord injury (Anderson et al., 2009). In this study found that anxiety is associated with the age of the participants. Similarly, Bombardier et al., (2008) study found that, a significant association with psychological condition such as anxiety and age of SCI peoples. Shin et al., (2012) stated that the high levels of depression may reflect the adjustment process itself. High level of anxiety and depression patients who lived the longest with SCI may be because of their aging as a secondary condition. Arango-Lasprilla et al., (2013) also found association between age and depression at their study. In this study found that anxiety are associated with the sex, marital status and income. Krause et al., (2000) also found the association of the anxiety after spinal cord injury.

In this there also found that significant association in between depression and complications. Jackson Krause et al., (2008) also found the association of complication and depression.

In this study there was a significant association in between depression and income. Another study Ahern et al., (2006) also found the association between the income of the participants and the level of the depression. Krause et al., (2008) also noted depression after SCI association in relation to income.

## **5.2 Limitations:**

Complete accuracy is not being possible in any research so that some limitations may exist.

- Regarding this study, there were some limitations or barrier to consider the result of the study as follows.
- This study has limited sample size and only one study site used for this study.
- There was no control group to compare.
- Therefore, the result does not generalize.
- This study did not have opportunity for blinding of researcher. Intervention duration was short period.
- Female participants were less in number compare to male participants.
- As the study was conducted at selected area of Center for the Rehabilitation of the Paralyzed (CRP) in Spinal Cord Injury (SCI) unit which might not represent the whole population with SCI in Bangladesh.

### 6.1 Conclusion

A significant decrease in mental status and anxiety and depression were present after spinal cord injury. When spinal cord injury patients first faced with reality of disability, many experience in anxiety and depression, loss of confidence as a result reduced quality of life. Anxiety and depression are prominent terminal psychiatric disorder and so should be considered with priority. So early detection and proper management of this condition is essential. In this study data was taken from 40 participants according to the inclusion criteria. Among those forty participants there is higher rate of illiterate participants and also it is found that there is higher chance of developing anxiety and depression among those illiterate participants. It has such a harmful effect on a spinal cord injury person's ability to function in day-to-day life. It can make pain worse, make sleep difficult, sap the energy, take away the enjoyment and make it difficult to take good care of health. In this study the level of anxiety and depression of spinal cord injury patients has been found. It has been seen in this research that there has association in between level of anxiety and depression and socio-demographic information that has been significant. So it is immensely essential to assess anxiety and depression in patients having spinal cord injury and make proper treatment plan during rehabilitation period and always should be considered with priority.

## 6.2 Recommendation

- Further study will do with more sample size which result will generalize. A randomized control trial study would be beneficial for spinal cord injury patients.
- Should take more samples for pilot study to establish the accuracy of the questionnaire and should take more time.
- Sample should collect from the only rehabilitative institute in Bangladesh. Future research that includes other environmental, social and or personal factors would be useful in examining factors that may be associated with the mental health outcomes of depression and clinically significant stress in these patients.
- For SCI patient's anxiety and depression is major and common problem. This will hamper their daily life. So, the necessity is to give more attention to this psychological aspect which is linked to spinal cord injury (SCI). There are so many studies based on spinal cord injury but there are few amount of studies related to the concept of this patient's psychology such as anxiety and depression.

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## APPENDIX

15<sup>th</sup> July 2018

The Head  
Department of Physiotherapy  
Centre for the Rehabilitation of the paralysed (CRP)  
CRP, Chapain, Savar, Dhaka-1343

**Through:** Head, Department of Physiotherapy, BHPI.

**Subject:** Application for permission for data collection.

Dear Sir,

With due respect and humble submission to state that I am Md. Saruar Hossain Bhuiyan, student of 4<sup>th</sup> Professional B.Sc in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical board of BHPI has approved my research project entitled on “**Anxiety and Depression of SCI Patients during staying at CRP.**” To conduct this research, I want to collect data from the SCI patients who are admitted in SCI unit at CRP. So, I need your permission for data collection from SCI unit at CRP. I would like to assure that anything of my study will not be harmful for the participants.

I therefore, pray and hope that you would be kind enough to give me the permission to make this research project successful.

Sincerely

*SARUAR*

**Md. Saruar Hossain Bhuiyan**

4<sup>th</sup> professional B.Sc in physiotherapy  
Class Roll-11, Session: 2013-2014  
Bangladesh Health professions Institute (BHPI)  
CRP, Chapain, Savar, Dhaka-1343.

*Forwarded for kind permission  
Shafiq 15-07-2018*

**MD. SHOFIQUUL ISLAM**  
Assistant Professor  
Department of Physiotherapy  
Bangladesh Health Professions Institute (BHPI)  
CRP-Chapain, Savar, Dhaka-1343

*Allow for data  
Collection from  
SCI Patients.  
Hossain*

*Approved*

*AKI*  
*19/07/18*  
**Mohammad Anwar Hossain**  
Associate Professor & Head  
Physiotherapy Dept., CRP  
CRP-Chapain, Savar, Dhaka-1343

*9/15.07.18*  
**Prof. Md. Obaidul Haque**  
Head, Department of Physiotherapy  
BHPI, CRP, Savar, Dhaka-1343

**EFFOR HOSSAIN**  
Head & IFO Incharge  
Department  
1343





বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)  
**Bangladesh Health Professions Institute (BHPI)**

(The Academic Institute of CRP)

Ref. CRP-BHPI/IRB/10/18/1255

Date: 22/10/2018

To  
Md. Saruar Hossain Bhuiyan  
B.Sc. in Physiotherapy  
Session: 2013-2014, Student ID: 112130206  
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

**Subject:** Approval of the thesis proposal "Anxiety and Depression of SCI Patients during staying at CRP" by ethics committee.

Dear Md. Saruar Hossain Bhuiyan

Congratulations,

The Institutional Review Board (IRB) of BHPI has reviewed the above mentioned dissertation, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

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

The purpose of the study is to determine the factors responsible for anxiety and depression of SCI patients during staying at CRP. The study involves use of "Patient Health Questionnaire (PHQ) and D-Lit" questionnaire to identify or find out the factors responsible for anxiety and depression of SCI patients during stay at CRP that may take 20-30 minutes to answer the questionnaire, there is no likelihood of any harm to the participants. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 11:00 AM on 24<sup>th</sup> January, 2018 at BHPI.

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

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ, ফোন : ৭৭৪৫৪৬৪-৫, ৭৭৪১৪০৪ ফ্যাক্স : ৭৭৪৫০৬৯

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404, Fax : 7745069, E-mail : contact@crp-bangladesh.org, www.crp-bangladesh.org

## সম্মতিপত্র

আসসালামুয়ালাইকুম / নমস্কার

আমি মোঃ সারোয়ার হোসেন ভূইয়া, বাংলাদেশ হেলথ প্রফেশন্স ইন্সটিটিউট এর বি এস সি ইন ফিজিওথেরাপি বিভাগের একজন ছাত্র। আমি একটি গবেষণা করছি যার শিরোনাম হল, “**পুনর্বাসনরত অবস্থায় মেরুদন্ডে আঘাতপ্রাপ্ত রোগীদের মধ্যে উদ্বেগ ও বিষন্নতার প্রভাব**” যেটা আমার কোর্সের অন্তর্ভুক্ত। এই জন্য আমি আপনার কাছে কিছু প্রশ্নের উত্তর জানতে চাচ্ছি, যেটাতে প্রায় ২০-২৫ মিনিট সময় লাগবে। আমি এই সময়ের মধ্যে আপনার আর্থ সামাজিক প্রেক্ষাপট, আপনার মানসিক অবস্থা, উদ্বেগ ও বিষন্নতার প্রভাব এবং কিছু ব্যক্তিগত প্রশ্ন করব। আমি আপনাকে নিশ্চিত করছি যে আপনি যেসব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে। এখানে অংশগ্রহণ আপনার নিজের ইচ্ছার উপর নির্ভর করে। আপনি চাইলে আমার গবেষণার পর্যবেক্ষক মোঃ সফিকুল ইসলাম, সহকারী অধ্যাপক, বিএইচপিআই, সিআরপি, সাভার, ঢাকা এর সাথে যোগাযোগ করতে পারেন। উল্লেখ্য আপনি চাইলে যেকোন সময় অংশগ্রহণের তালিকা থেকে নিজের নাম বাদ দিয়ে চলে যেতে পারেন।

গবেষণাটি শুরু করার আগে আপনার কোন প্রশ্ন আছে?

আমি কি আপনার অনুমতি পেয়ে সাক্ষাতকারটি আরম্ভ করতে পারি?

হ্যাঁ.....

না.....

গবেষকের স্বাক্ষরঃ

তারিখঃ

মোবাইলঃ ০১৭১০৮৩৫৪৬২

অংশগ্রহণকারীর স্বাক্ষরঃ

তারিখঃ

মোবাইলঃ

## Consent Form

Assalamualaikum/Namaskar

I am Md. Saruar Hossain Bhuiyan 4th year student of Bsc in Physiotherapy in Bangladesh Health Professions Institute. I am conducting a research and the title is-“**Anxiety and Depression of SCI Patients during staying at CRP.**” which is included in my course. For that I'm asking you to answer some questions, which will take time about 20-25 minutes. Within that time I will ask you some socio demographic information, mental status and some personal question. It also ensures that the information you provide will be kept confidential. Participation here depends on your own will. If you want you can contact with my research supervisor Md. Shofiqul Islam, Assistant Professor of Physiotherapy department, BHPI, CRP, Savar, Dhaka. In addition, you can skip your name from the list of participants at any time.

Do you have any questions before starting the research?

Can I start this interview with your permission?

Yes.....

No.....

Researcher signature:

Date:

Mobile: 01710835462

Participant's signature:

Date:

Mobile:

# Questionnaire

(English)

**Title: Anxiety and depression of SCI patients during staying at CRP**

Personal details:		
Reg. No:		
Name:		
Age:		
Sex:		
Address:		
Consent form Taken	Yes	No

Socio-demographic Questionnaire:	
Marital status:	<ol style="list-style-type: none"><li>1. Married</li><li>2. Unmarried</li><li>3. Widow</li><li>4. Separate</li><li>5. Divorce</li></ol>
Religious:	<ol style="list-style-type: none"><li>1. Islam</li><li>2. Hindu</li><li>3. <u>Vudho</u></li><li>4. Christen</li><li>5. Others.....</li></ol>
Education:	<ol style="list-style-type: none"><li>1. Illiterate</li><li>2. Primary Education</li><li>3. SSC</li><li>4. HSC</li><li>5. Honors/ Masters</li></ol>
Income:	.....BDT

Occupation:	<ol style="list-style-type: none"> <li>1. Service Holder</li> <li>2. Businessman</li> <li>3. Teacher</li> <li>4. Driver</li> <li>5. Others.....</li> </ol>
Previous job:	.....
Resident:	<ol style="list-style-type: none"> <li>1. Urban</li> <li>2. Rural</li> </ol>

### Medical History Questionnaire:

Diagnosis	<ol style="list-style-type: none"> <li>1. TT</li> <li>2. TP</li> </ol>		
Causes of injury:	<ol style="list-style-type: none"> <li>1. Fall from height</li> <li>2. RTA</li> <li>3. Fatal disease</li> <li>4. Violence</li> <li>5. Others.....</li> </ol>		
Neurological level:	<ol style="list-style-type: none"> <li>1. C1</li> <li>2. C2</li> <li>3. C3</li> <li>4. C4</li> <li>5. C5</li> <li>6. C6</li> <li>7. C7</li> <li>8. C8</li> </ol>	<ol style="list-style-type: none"> <li>1. T1</li> <li>2. T2</li> <li>3. T3</li> <li>4. T4</li> <li>5. T5</li> <li>6. T6</li> <li>7. T7</li> <li>8. T8</li> <li>9. T9</li> <li>10. T10</li> <li>11. T11</li> <li>12. T12</li> </ol>	<ol style="list-style-type: none"> <li>1. L1</li> <li>2. L2</li> <li>3. L3</li> <li>4. L4</li> <li>5. L5</li> <li>6. S1</li> <li>7. S2</li> <li>8. S3</li> <li>9. S4-5</li> </ol>

Skeletal level:	<ol style="list-style-type: none"> <li>1. C1</li> <li>2. C2</li> <li>3. C3</li> <li>4. C4</li> <li>5. C5</li> <li>6. C6</li> <li>7. C7</li> </ol>	<ol style="list-style-type: none"> <li>1. T1</li> <li>2. T2</li> <li>3. T3</li> <li>4. T4</li> <li>5. T5</li> <li>6. T6</li> <li>7. T7</li> <li>8. T8</li> <li>9. T9</li> <li>10. T10</li> <li>11. T11</li> <li>12. T12</li> </ol>	<ol style="list-style-type: none"> <li>1. L1</li> <li>2. L2</li> <li>3. L3</li> <li>4. L4</li> <li>5. L5</li> </ol>
ASIA level:	<ol style="list-style-type: none"> <li>1. Complete paraplegia</li> <li>2. Incomplete paraplegia</li> <li>3. Complete <u>Tetraplegia</u></li> <li>4. Incomplete <u>Tetraplegia</u></li> <li>5.</li> </ol>		
Complications:	<ol style="list-style-type: none"> <li>1. Pressure sore</li> <li>2. Respiratory problem</li> <li>3. Bowel and bladder problem</li> <li>4. Sexual problem</li> <li>5. Others.....</li> </ol>		

## PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

NAME: \_\_\_\_\_

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 every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3

## Questionnaire

(বাংলা)

### PHQ-9 Bangla

আপনার উত্তর চিহ্নিত করার জন্য বক্সে $\sqrt{\quad}$ ব্যবহার করুন।	একদমই না	কয়েকদিন	অর্ধেকরও বেশী দিন	প্রায় প্রতিদিনই
১ কাজ করতে অল্প আগ্রহ বা অনন্দ পান	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
২ মন খারাপ, বিষন্ন বা আশাহীন মনে হয় নিজেকে	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
৩ আপনার ঘমাতে অসবিধা হয় বা বেশী ঘম হয়	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
৪ ক্লান্ত লাগে বা অল্প এনার্জী বা শক্তি পান	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
৫ খাবার খেতে ইচ্ছা করে না বা বেশী খাওয়া হয়	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
৬ নিজেকে ছোট লাগে- নিজেকে ব্যর্থ মনে হয় বা মনে হয়	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
৭ কোন কিছুতে মনোযোগ দেয়া সমস্যা হয়- যেমন সংবাদপত্র	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
৮ এত আশে চলাফেরা করেন বা কথা বলেন যে অন্য মানষেরা সেটা লক্ষ্য করে? বা একবোরে উল্টেটা- এতটাই চঞ্চল যে আপনি সাধারণ মানষের চেয়ে বেশী চলাফেরা করেন	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
৯ আপনার মনে হয় যে মরে গেলে ভাল বা নিজেকে নিজে আঘাত করলে ভাল	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## D-Lit Bangla Questionnaire

- ১। বিষন্ন মানুষ প্রায়ই অপরিকল্পিত ও এলোমেলো কথা বলে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ২। বিষন্ন মানুষ দোষ না করেও নিজেকে দোষী ভাবতে পারে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ৩। বেপরোয়া ব্যবহার বিষন্নতার একটি সাধারণ লক্ষণ।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ৪। আত্মবিশ্বাসহীনতা এবং কম আত্মমর্যাদাবোধ বিষন্নতার একটি উপসর্গ হতে পারে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ৫। বিষন্নতায় থাকা মানুষ প্রায়শই এমন কণ্ঠ শুনতে পারে যা আসলে অবাস্তব।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ৬। অতিরিক্ত ঘুমানো অথবা খুব কম ঘুমানো বিষন্নতার একটি লক্ষণ হতে পারে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ৭। অতিরিক্ত খাওয়া বা রুচি কমে যাওয়া বিষন্নতার একটি লক্ষণ হতে পারে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ৮। বিষন্নতা আপনার স্মৃতিশক্তি এবং মনযোগের ব্যাঘাত ঘটায় না।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ৯। বিষন্নতার কারণে একজন মানুষের চলাফেরার গতি কমে যেতে পারে বা চলাফেরায় চঞ্চলতা দেখা যেতে পারে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ১০। চিকিৎসা মনোবিজ্ঞানীগণ বিষন্নতার ঔষধ দিতে পারেন।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ১১। মাঝারি মাত্রার বিষন্নতার একজন মানুষের জীবনকে হাপানি বা বধিরতার মতোই বিঘ্নিত করতে পারে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ১২। অধিকাংশ বিষন্ন মানুষকে হাসপাতালে ভর্তি হতে হয়।  
ক) সত্য খ) মিথ্যা গ) জানা নেই

- ১৩। বহু বিখ্যাত ব্যক্তি বিষন্নতায় ভুগেছেন।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ১৪। বিষন্নতার অন্যান্য চিকিৎসা বিষন্নতার ঔষধের চেয়ে বেশি কার্যকর।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ১৫। কাউসেলিং কম থেকে মাঝারি মাত্রার বিষন্নতার ঔষধ (অ্যান্টিডিপ্রেসেন্ট) এর মতোই কার্যকর।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ১৬। বিষন্নতার ক্ষেত্রে জীবনযাত্রা পরিবর্তন ও অন্যান্য চিকিৎসার মধ্যে ভিটামিনই সবচেয়ে উপকারী হতে পারে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ১৭। বিষন্ন মানুষ ভালো বোধ করার সাথে সাথে ঔষধ বন্ধ করে দেওয়া উচিত।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ১৮। বিষন্নতার ঔষধ নেশা জাতীয়।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ১৯। বিষন্নতার ঔষধ সাধারণত তৎক্ষণাৎ কাজ করে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই
- ২০। সাধারণত বিষন্নতার সকল ঔষুধে ঘুম বেশি হয় যার ফলে দিনের বেলায় কাজ করতে অসুবিধা হতে পারে।  
ক) সত্য খ) মিথ্যা গ) জানা নেই