



Faculty of Medicine
University of Dhaka

**LEVEL OF DEPRESSION OF SPINAL CORD INJURY PATIENTS BEFORE
AND AFTER PARTICIPATING SPORTS AT CRP: A COMPARISON STUDY**

By

Muzaffor Hossain
Master of Science in Physiotherapy
Registration No: 2260
Roll No: 302



Department of Physiotherapy

Bangladesh Health Professions Institute (BHPI)

May 2016



Faculty of Medicine

University of Dhaka

**LEVEL OF DEPRESSION OF SPINAL CORD INJURY PATIENTS BEFORE
AND AFTER PARTICIPATING SPORTS AT CRP: A COMPARISON STUDY**

By

Muzaffor Hossain
Master of Science in Physiotherapy
Registration No: 2260
Roll No: 302

Submitted in Partial Fulfillment of the Requirements for the
Degree of Master of Science in Physiotherapy



Department of Physiotherapy

Bangladesh Health Professions Institute (BHPI)

May 2016

We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for acceptance of this thesis entitled, **“Level of depression of spinal cord injury patients before and after participating sports at CRP: A comparison study”**, submitted by Muzaffor Hossain, for the partial fulfillment of the requirements for the degree of Master of Science in Physiotherapy.

Dr. Kamal Ahmed

Associate Professor (Guest Faculty), BHPI

Nasirul Islam

Associate Professor and Acting Principal,
BHPI

Professor Dr. K.M. Shahidul Islam

Professor and Head,
Department of Microbiology
Dhaka Medical College

Firoz Ahmed Mamin

Assistant Professor of Physiotherapy,
BHPI.

Date of approval: 2nd July, 2016

Supervisor's Statement

As supervisor of Muzaffor Hossain's M.Sc. Thesis work, I certify that his thesis "Level of depression of spinal cord injury patients before and after participating sports at CRP: A comparison study" is suitable for examination.

Dr. Kamal Ahmed

.....

Associate Professor

Bangladesh Health Professions Institute (BHPI)

CRP, Savar, Dhaka-1343

Date:

Declaration Form

- This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidature for any degree.

- This dissertation is being submitted in partial fulfillment of the requirements for the degree of MSc in Physiotherapy.

- This dissertation is the result of my own independent work/investigation, except where otherwise stated. Other sources are acknowledged by giving explicit references.
A Bibliography is appended.

- I confirm that if anything identified in my work that I have done plagiarism or any form of cheating that will directly awarded me fail and I am subject to disciplinary actions of authority.

- I confirm that the electronic copy is identical to the bound copy of the Thesis.

- In case of dissemination the finding of this project for future publication, research supervisor will highly concern and it will be duly acknowledged as post-graduate thesis.

Signature:.....

Name: Muzaffor Hossain

Date:

ACKNOWLEDGMENT

First I am paying my profound gratitude to the Almighty Allah for completing the study within the due time. I am immensely grateful to my supervisor, Prof. Dr. Kamal Ahmed for his guidance, cordial cooperation, support and encouragement during the entire period of the study. I would like to express my deepest gratitude to the Bangladesh Health Professions Institute, to give me the opportunity to perform this study. I would like to thank my honorable teacher Firoz Ahmed Mamin, Assistant Professor of Master of Science in Physiotherapy program, BHPI, and S.M. Ferdous Alam, Assistant Professor, Department of Rehabilitation Science and other board members for their support and guidance. I also pay my thanks to Samima Akter Ripa and Kazi Imdhadul Haque, Clinical Physiotherapist, Department of Physiotherapy for helping me at the data analysis section. I would like to give special thanks to Mohammad Morshedul Quadir, Assistant Professor, BHPI, for helping me in data analysis procedure. I also like to pay special gratitude to the staffs of the SCI Unit of CRP Savar for helping me in data collection.

I would like to express my gratitude to men and women with spinal cord injuries, who gave me their valuable time and provided the information, related to my study and helped me to make my work successful. I would like to express my heartiest thanks to Md. Nazmul Hassan, Intern Physiotherapist for his support to scoring and recording the data. I wish to thank all of the sports people for their continuous support and kind assistance during this research study. Lastly, I would like to thank those entire individual who are directly and indirectly involve with this study.

Contents

Introduction.....	01
Justification.....	05
Objectives of the study.....	08
General objective	08
Specific objectives	08
Hypothesis:	08
Null hypothesis	08
Conceptual framework.....	09
Operational definition:	11
Literature review.....	13
Methodology.....	30
Study design.....	30
Target Population.....	30
Study Site.....	31
Study Area	31
Study period:.....	31
Sampling Techniques.....	32
Sample Size.....	32
Inclusion Criteria	33
Exclusion Criteria	33
Data Collection Procedure	34
Data Management and Analysis	36
Quality control and Quality Assurance.....	36
Informed consent	37
Institutional review board	37
Rigor	38
Result	39
Discussion:.....	51
Limitation:	53
Recommendation:	54
Conclusion	55
Bibilography	56
Appendices.....	vii-xvi

Figure 1: Age range of the participants.....	39
Figure 2: Gender of the participants	39
Figure 3: Marital status of the participants	40
Figure 4: Average monthly income of the participants.....	41
Figure 5: Cause of injury	42
Figure 6: Type of Diagnosis	42
Figure 7: Skeletal level of the participants.....	43
Figure 8: Neurological level of the participants.....	44
Figure 9: Using mobility aids	44
Figure 10: Living area of the participants.....	45
Figure 11: ASIA scale among the participants	45

Table 1: Educational status of participants	41
Table 2: Pre and post-depression score:.....	46
Table 3: Effect of sports in depression.....	48
Table 4: Percentage of different depression level in pretest and post-test.....	48
Table 5 :Paired Samples Statistics	49
Table 6: Comparison between depression and sports activity for spinal cord injury patients .	50

Acronym

SCI	Spinal Cord Injury
USA	Unite States of America
CRP	Centre for the Rehabilitation of the Paralysed
CBR	Community Based Rehabilitation
ICU	Intensive Care Unit
NITOR	National institute of Traumatology Orthopedic and Rehabilitation
ICF	International Classification of Functioning, Disability and Health
WHO	World Health Organization
TB	Tuberculosis
DVT	Deep Venous Thrombosis
QOL	Quality Of Life
BD-II	Beck Depression Inventory Second edition
HADS	Hospital Anxiety and Depression Scale
BDI	Beck Depression Inventory
DS	Depression Scale
O	Observation
SPSS	Statistical Package for Social Sciences
BMRC	Bangladesh Medical and Research Council
ASIA	American Spinal Impairment Association
CES-D	Centre for Epidemiological Studies Depression Scale
QIDS	Quick Inventory of Depressive Symptomatology
SDS	Self-rating Depression Scale
M D	Major Depression

Abstract

Introduction: Spinal cord injury is one of the most debilitating and devastating injuries in the world. It is a catastrophic event that often affecting healthy and young individual. This debilitating condition not only creates enormous physical disability but also emotionally depress the patient. Depression found two or three times more often among people who are paralyze than the nondisabled. Depression is more common in the spinal cord injury (SCI) population-about 1 in 5 people. Estimated rates of depression among people with SCI range from 11% to 37% described by University of Washington.

Aim of the study: To identify the depression level of SCI patients before and after participates in sports.

Objectives: To evaluate the effectiveness of sports for reduce depression level in SCI patients. To compare the depression level for spinal cord injury patients before and after participates in ports.

Methodology: This study was done by using quantitative method, which was a pre-post-test design study in the inpatient setting of CRP Savar. 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 a standard structured questionnaire, which was developed by Md. Zahir uddin- National Institute of Mental health, Dhaka and Mohammad Mahmudur Rahman-Department of clinical psychology, University of Dhaka. Researcher maintained the all-ethical issues. Data were numerically captured in SPSS 20 version. Pair sample t test has chosen to saw the difference between before and Participation in Sports. Furthermore, Microsoft excel was used for the analysis of data and for the presentation of the data as well.

Result: Among the 40 participants Female was 7% (n=3) and male was 92% (n=37) among them 65% between 18-38 years of age. Married were 77% (n= 31), unmarried were 20 % (n=8) and widow were 2.5 % (n=1). Primary school 30% (n=12), literate 22.5% (n=9), No schooling 20% (n= 8), SSC 10 % (n= 4), Bachelor 10 % (n=4). Average monthly income 3000-5000 have 45% (n=18), 5000-10000 have 22.5% (n=9) participants, 10000-15000 have 17.5% (n=7), 15000-20000 have 7.5% (n= 3), above 20000 have 7.5% (n=3). 95% (n=38) traumatic cause and 5% (n=2) non-traumatic cause. 40%, (n=16) tetraplegia and 60% (n=24) paraplegia. 50% L1, D12 and C5 skeletal level. Neurological level C4 (n=7), D12 (n=5) and L4 (n= 3).

80% participants were using wheel chair and 20% using elbow crutch for their mobility.77% were from in rural area and 23% were in urban area.57% has Complete A and 43% incomplete. Before participating sports mean score was 94.90 ± 16.908 . After participating sports mean score was 63.50 ± 11.029 . Pair sample t test, t value was 11.981 and df was 39 and significance level was < 0.001 .That means result was statistically significant. Therefore, sports participation has an effective role to reduce depression level for spinal cord injury patients.

Conclusion: In this study, researcher found a significant difference between pre-treatment and post-treatment group. These are a good indicator sports for reducing depression level for spinal cord injury patients. Participating sports are effectiveness of social participation in leisure activities, improving quality of life and reducing depression in people with SCI.

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

1.1 Background

The disease and injury, which affect the spinal cord and damage the neurological structures, are the important health problem in this subcontinent, so they carry high rates of morbidity and mortality (Agarwal, et al., 2007). Spinal cord injury is one of the most debilitating and devastating injuries in the world. It is a catastrophic event that often affecting healthy and young individual. 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 in their environment. Long-term disability or death is the cause of Spinal Cord Injury (SCI) and leading to permanent paralysis by modern man. It is one of the most catastrophic lesions (Van den Berg, et al., 2010). The Spinal cord injury patients, the victims who are usually young and in their most productive stage of life multiple medical, social and vocational complications affect to them. Spinal cord injury causes burden and suffering not only the victim but also their families, the health care system and the community (Wyndaele and Wyndaele, 2006). 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). The annual incidence of SCI in developed countries varies from 11.5 to 53.4 per million populations (Hamid, et al., 2003). Published incidence rates for traumatic spinal-cord injury in the USA range between 28 and 55 per million populations, with about 10,000 new cases reported every year (Blackham, et al., 2009). Published reports showed that SCI incidence in the rest of the world is much lower than in the United States that vary from 25 to 59 new cases per million populations per year with an average of 40 per million (DeVivo, 2012). It

estimated that in Brazil approximately 11,300 individuals become paraplegic or tetraplegic every year (Medola, et al., 2011). The incident rate of SCI progressively increased as in Norway, the SCI incidence rate was increased from 6.2 per million to 26.3 per million populations in the last 50 years (DeVivo, 2012). The incidence of people having Spinal Cord injury in Bangladesh has been estimated as 2.5% cases per million (Hoque, et al., 2012). According to Simpson, et al. (2009) Spinal cord injury causes physiological and functional disorder and its severity is more or less depends on the level of the injury. These disorders have an impact on everyday life and often lead to a physiological reconditioning. The limited activity often negatively affects the health of these people and lead to a debilitating cycle.

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 expected, depression is very common among them (Kennedy, 2009). 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 and Wyndaele, 2006). Depression is a condition that causes feeling of sadness and hopelessness described by Jans, et al. (2007). 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 paralyzed 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. (2007). 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 have, the stronger they are, and the longer lasted (Beck, et al., 2009). Common symptom of 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).

Patients who have been suffering from spinal cord injury often face life-threatening complications so they need appropriate management and specialized rehabilitation. The patients of SCI are going into the different hospital for the treatment but they do not have enough facilities for their treatment. In Bangladesh there is only one non-government organization is Centre for the Rehabilitation of the Paralysed (CRP), which has conducting a rehabilitation program for the last 32 years through which the patients can improve their life style (Islam, et al., 2011).

The nongovernmental special organization named CRP manages the patients within multi and inter disciplinary team approaches which emphasis on the Community Based Rehabilitation (CBR) programs development. There are sufficient staffs that work there sincerely and supported by short term volunteers from home to abroad (Hoque, et al., 1999).

For developing effective program and policies the study will help to further enhancing our knowledge about SCI in Bangladesh. In developing countries, advance care Intensive Care Unit (ICU) and proper, accurate and long term management and rehabilitation have the survival rate and life expectancy which is available only in the non-government organization (Islam, et al., 2011). In CRP there are four stages as acute stage, stabilization stage, rehabilitation stage and re-integration stage in whole rehabilitation process (Islam, et al., 2011). In rehabilitation on stage, Patient is introducing with sports activity such as wheelchair sports, central ball throw, table tennis, badminton, ring throw, dart throw etc. These sports are elevated their emotion and mood as well as total psychological status. Recent studies showed that participation in sports improves psychological well-being, life satisfaction as well as quality of life among SCI patients (Rauch, et al., 2014). Although majority of research finds that, the benefits of sports reveal primarily a musculoskeletal gain (Hanson, et al., 2001). Groff, et al. (2009) showed that, participation in adapted sports could result in improved health of individuals with disabilities.

Despite the growing number of participants in sports, many individuals with disabilities still do not engage with sports and the most common reasons behind it is lack of facilities in the neighborhood, lack of time and money and fear of further injuries(Vanderstraeten and Oomen, 2010). A non-sports group of SCI usually has a lower level of community integration as well as poorer Quality of life when compared with a sports group (McVeighet, et al., 2009). SCI patients with low physical activities are usually coexisting with an increased number of medical complications and more dependency during daily life activities (Hjeltnes and Jansen, 1990).

It is important to stimulate non-active individuals to start participating in sports because able-bodied individuals and the people with disabilities are benefited

physically, psychologically and socially from the sports (Vanderstraeten and Oomen, 2010).

1.2 Justification

Injuries that are affecting the spinal cord and complicated by physical damage are an important health problem in Bangladesh as they carry a high rate of morbidity and mortality. SCI continues to be a major cause of disability throughout Asia as well as in Bangladesh (Islam, et al., 2011). Depression and anxiety disorders and/or symptoms are commonly reported after spinal cord injury (Tramonti, et al., 2013). Depression is a common illness that can affect anyone. About 1 in 20 Americans (over 11 million people) get depressed every year. Depression is even 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% (Anderson, et al., 2007). Bombardier, et al. (2004), found that major depression is a highly disabling Secondary condition associated with SCI and the point prevalence of major depression typically was estimated to be in the range of 15% to 23%. Emotional and behavioral problems may develop or worsen after a SCI. There is often a period of adjustment after a spinal cord injury. Sometimes feelings of sadness or anxiety may develop. In some cases, clinical depression may develop. Some people may benefit from psychological support after SCI. In many cases, medical treatment from a psychiatrist or use of anti-depressants may be indicated (Dijkers, 2005). SCI negatively influences physical and psychological aspects of health and quality of life. This disorder can have a profound impact on independence and their lifestyle; the high prevalence of depression after SCI is well-established (Kalpakjian, et al., 2009). Depressive disorders are the most common psychological problems in SCI patients (Krause, et al., 2000). Major depression (MD) is a highly prevalent (9.8% to 35%)

and disabling secondary condition associated with SCI (Graves & Bombardier 2008). Depression with the grieving persists long after the injury. Depressive symptoms are also associated with lack of social and occupational involvement (Radomski and Latham, 2008). Psychological issues such as stress are known to have correlations with the quality of life. The heightened stress levels in individuals with SCI further decrease their QOL (Ditor, et al., 2003). Sport begins to become part of the medical treatment due to the benefits of sports practice individuals with SCI. It helps to increase of life expectancy with higher level of community integration by decreasing the incidence of medical complications (urinary infections, renal infections), assist in the acquirer of independence, improvement of self-image, self-esteem and life satisfaction besides decrease in the probability of psychological disorder (Medola, et al., 2011). Sports is an important therapeutic tool in the rehabilitation process (Forchheimer and Tate, 2004) and it plays a crucial role in rehabilitation by stimulating and developing individual's physical, psychological and social aspects and favor independency of the persons with SCI (Medola, et al., 2011). Regular physical activity, sports participation and active recreation are essential for the prevention of disease, promotion of health and maintenance of functional independence (Haskell, et al., 2007).

Recent studies showed that participation in sports improves psychological well-being, life satisfaction as well as quality of life among SCI patients (Yazicioglu, et al., 2012). Studies also supporting the belief that exercise has been proven effective in improving depression and in some cases has been able to prevent it all together (Mota-Pereira, et al., 2011). 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 (VG, et al., 2007). Exercise can decrease self-reported stress, reduce pain and depression and can enhance physical self-concept and overall quality of life in person with SCI (Hicks, et al., 2003). Individuals with acquired SCI being actively involved in physical exercise and sports differ from physically inactive individuals (Rauch, et al., 2014).

There are several competitive sports for SCI people, which are grouped into three categories: recreational (participation consistent in a non-organized sport specifically for personal enjoyment), organized competitive (playing in an organized league regularly against other teams or individuals) and elite/professional (competing at national level, had previously participated in international competition). The most common sports for SCI people are wheelchair basketball, wheelchair tennis, wheelchair racing, and minor modes of sport such as archery and wheelchair table tennis (Yazicioglu, et al., 2012).

In Bangladesh, there are two institute-National institute of Traumatology Orthopedic and Rehabilitation (NITOR) and Center for the Rehabilitation of the Paralyzed (CRP) for the management of spinal cord injury (Momin, 2003). Different sports activity include wheelchair sports are introduce in rehabilitation phase in CRP. However, there is lacking of research to find out the depression level among the spinal cord injury patients before and after participation in sports.

This study will help the researcher to find out depression level among the participants and also will help to find out the effectiveness of sports over SCI patient. It will also help in drawing attention regarding depression and to explore the importance of sports among the patients with spinal cord injury that are very much necessary 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. This research will also help in raising awareness about depression and sports among the patients that will helps to improve their physical rehabilitation and psychological state.

Objectives of the study

General objectives

To compare the depression level in spinal cord injury patients before and after participates in sports.

Specific objectives

- a. To determine the socio-demographic information of the SCI patients.
- b. To figure out the level of depression among SCI patients before and after participating in sports.
- c. To evaluate the effectiveness of sports to reduce depression level in SCI patients.

Hypothesis:

- Sports activity is effective intervention to reduce depression level in spinal cord injury patient in rehabilitation stage.

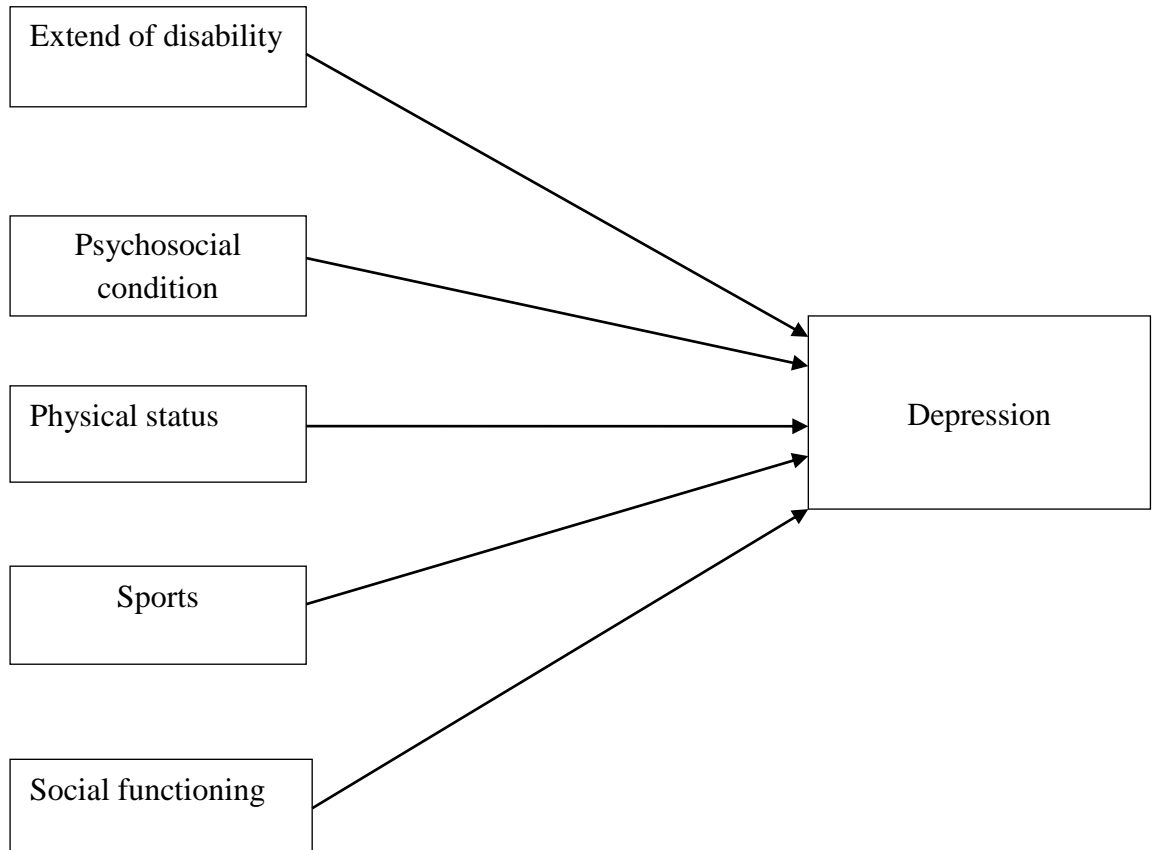
Null hypothesis

- Sports activity has no effect to reduce depression level in spinal cord injury patient in rehabilitation stage.

Conceptual framework

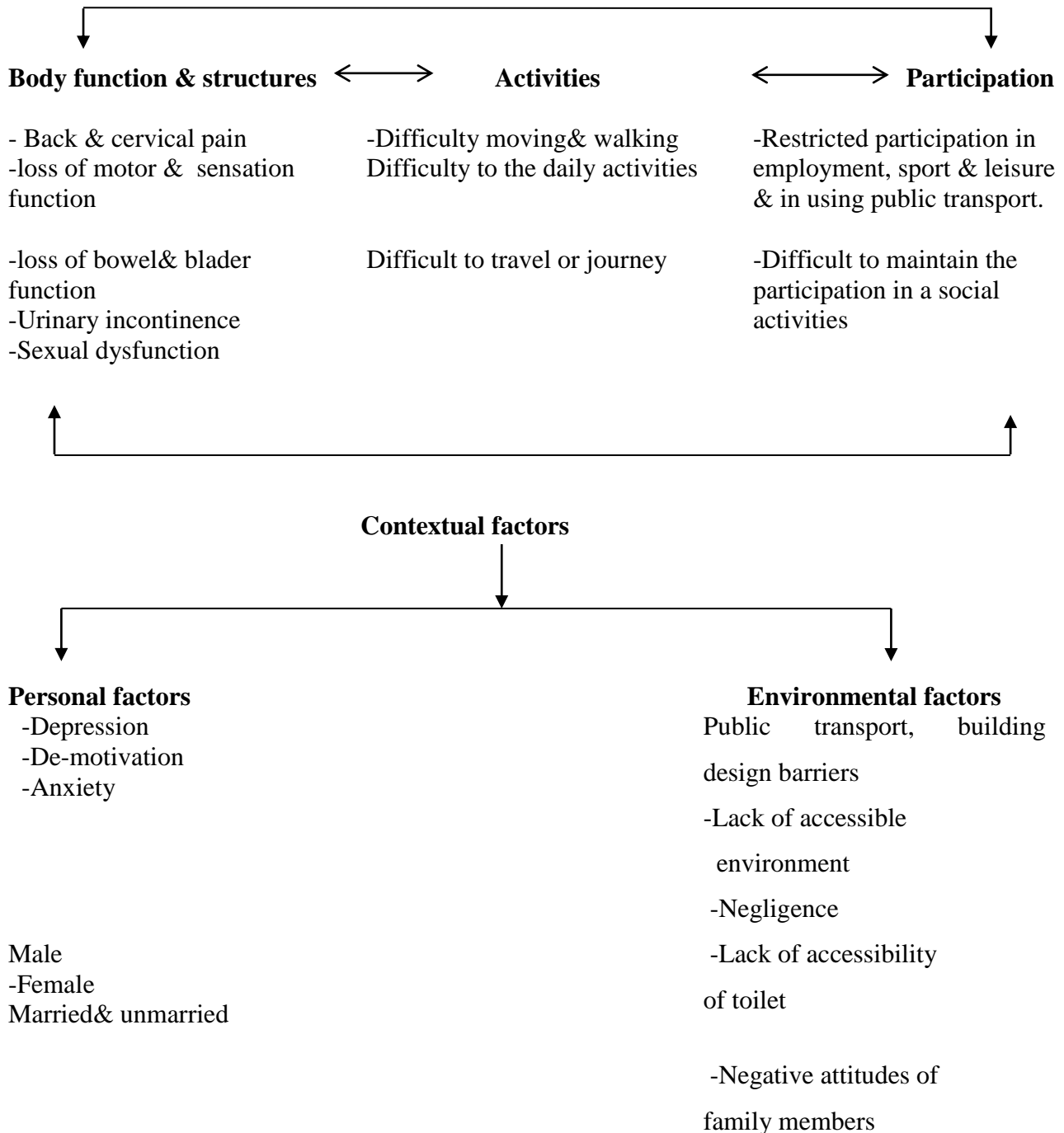
Independent variable

Dependent variable



ICF model for the patient with Spinal cord injury:

(Spinal Cord injury)



Operational definition:

Depression: Depression is a common mental disorder that presents with depressed mood, loss of interest or pleasure, decreased energy, feelings of guilt or low self-worth, disturbed sleep or appetite and poor concentration. Moreover, depression often comes with symptoms of anxiety. These problems can become chronic or recurrent and lead to substantial impairments in an individual's ability to take care of his or her everyday responsibilities. At its worst, depression can lead to suicide. Almost 1 million lives are lost yearly due to suicide, which translates to 3000 suicide deaths every day. For every person who completes a suicide, 20 or more may attempt to end his or her life (Olfiffe, et al., 2012). WHO defined depression- "Depression is a common mental disorder characterized by sadness, loss of interest in activities and by decreased energy. Depression is differentiated from normal mood changes by the extent of its severity, the symptoms and the duration of the disorder" (WHO, 2011).

Depression can cause some or all of the following physical and psychological symptoms: Changes in sleep, feeling down or hopeless, loss of interest or pleasure in activities, changes in appetite, diminished energy or activity, difficulty concentrating or making decisions, feelings of worthlessness or self-blame& thoughts of death or suicide. Although periods of sadness are normal after SCI (Kortte, et al., 2010)

Spinal cord injury (SCI):

According to (Kirshblum and Waring 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 and Waring 2014).

Wheelchair:

A wheelchair is a device used for mobility by people for whom walking is difficult or impossible, due to illness or disability.

Sports:

An activity involving physical exertion and skill in which an individual or team competes against another or others for entertainment. Sport' seems to have three qualifying elements – competition, rules and organizations (Moran, 2004)

Depression scale:

A scale is used to measure depressive symptomatology.

Spinal cord injury is devastating and costly event, which occur in sudden and unexpected for human and social life. Life threaten complications are developed after these injury (Islam, et al., 2011). The neural elements in the spinal canal that are spinal cord and cauda equina damage which can arise resolving or permanent neurological deficit (New and Marshall, 2013). The incidence of spinal cord injury lies down between 10.4 and 83 per million people affected per year (Kennedy and Chessell, 2013).

The life altering experience that affects not only the patients with SCI but also their spouses, parents, siblings and children and the significant cause of mortality and morbidity (Ali and Tawfiq, 2013). Spinal cord injury results in a high level of individual disability, which is reflected in radical changes in lifestyle (Kawanishi and Greguol, 2013). In developing country like Bangladesh, life expectancy of spinal cord injury patients was much lower than developed country (Razzak, et al., 2011).

Recent research (Kong, et al., 2013) suggests that primary nerve injury occurs due to acute injury to the spinal cord that causes secondary damage by producing inflammation, ischemia, and toxicity. Deficit function in motor control occurs after SCI that causes disturb in daily activities (Rahman, et al., 2012). One of the debilitating condition is SCI that causes paralysis of the limb and injury such as compression, contusion or laceration, disrupts autonomic function occurs at the site of injury or below, then permanent disability such as paralysis, loss of sensation, neuropathic pain etc. can occur depending on the level of the lesion (Mothe and Tator, 2013). Spinal cord injury or damage can cause a wide range of impairments, activity limitations and participation restrictions, which has an adverse impact on the society (New, et al., 2013).

Nwankwo and Uche (2013), found that in SCI, 31–45 years age group is the most frequently affected and male is more affected than female (4.3:1), 53% injury occurred in cervical spine, 22% thoracic spine and 25% lumbar spine injury. In United States the annual incidence of traumatic SCI is 40 cases per million or 1200 new cases each year (Rabadi, et al., 2013). In Australia, male is more affected than female in non-traumatic SCI and the ratio is 197:169 and the prevalence of paraplegia is more about 269 per million than tetraplegia (98 per million) (New, et al., 2013). The worldwide incidence of SCI is 10.4 and 83 per million per year and the mean age is 33 years old, male and female ratio is 3.8:1 and one- third of the patients are tetraplegic all over the world (Wyndaele and Wyndaele, 2006). Moreover, 2.5 million people live with SCI around the world (Oyinbo, 2011). In Asia the incidence rates of SCI is ranged from 12.06 to 61.6 per million and the average age is 26.8 to 56.6 years old, men are more vulnerable than women also in traumatic spinal cord injury main causes are motor vehicle collisions (MVCs) and falls (Ning, et al., 2012). In CRP, Bangladesh, 25-29 years aged peoples are most commonly affected among them males are more 83% than female and 92% came from rural area and 8% came from urban area also majority of the patients are paraplegia 56%, Cervical lesion present in 44% cases, thoracic lesion 27% and lumber lesion 29% (Islam, et al., 2011).

A person can experience by spinal cord injury, which is most common among the catastrophic injuries. Young adult people are more suffering lifelong disability than other ages. Fifty four percent of spinal cord injuries occur in ages between 16 and 30 years, 75% of injuries occur in those < 45 years old (Winslow and Rozovsky, 2003). Generally, spinal cord injury is male's disease. Younger men are more affected in complete injuries than older adults and women. In a study, there are many causes of SCI since 2010 vehicular (36.5%), falls (28.5%), violence (14.3%), sports (9.2%) and

other causes (11.4%). The affected rate is 80.7%. The average age of this injury is 46 years since 2010 (Carlson and Gorden, 2002).

Research shows that it is occurred by traumatic or non-traumatic etiologies (Kennedy and Chessell, 2013). Traumatic spinal cord injury is caused by direct or indirect trauma. In developing countries, there are three main causes that patient is admitted into hospital. Those are fall from height, transportation accident and being struck by an object. Study says that 561 traumatic spinal cord injury whose injuries occurred between 2001 and 2010. The annual incidence in Beijing is 60.6 per million which is more than other countries and regions. TSCI patient may suffer from different conditions such as spasticity, sensory changes, exaggerated reflex activities that is depending on the different level of lesion (Carlson and Gorden, 2002).

The spinal cord begins as a continuation of the medulla oblongata; the caudal part of the brainstem (Moore and Dalley, 2006). Spinal cord injury (SCI) is an insult to the spinal cord resulting in a change, either temporary or permanent, in its normal motor, sensory, or autonomic function (International Standards for Neurological Classifications of Spinal Cord Injury, 2000).

Incomplete injuries are injuries where partial preservation of sensory and/or motor functions is found below the neurological level and includes the lowest sacral segment (Hossain, et al., 2008). Another study also revealed that in general, inadequate services, poverty, negative attitudes of society towards the person with SCI, inequitable laws, the inaccessible built environment and transport systems, are the main causes of poor integration of persons with SCI into community life (Momin, 2003; Lysack, et al., 2007).

According to the American Spinal Injury Association (ASIA) impairment scale, the classification of SCI severity is –A (complete): no motor or sensory function is preserved in the sacral segments S4-S5. B (incomplete): sensory but no motor function is preserved below the neurological level and includes the sacral segment S4-S5. C (incomplete): Motor function is preserved below the neurological level, and more than a half of key muscles below the neurological level have a muscle grade of <3. D (incomplete): Motor function is preserved below the neurological level, and at least a half of key muscles below the neurological level have a muscle grade of ≥ 3 . E (normal): Motor and sensory functions are normal. C4 injury- tetraplegia, C6 injury- tetraplegia, T6 injury- paraplegia, L1 injury- paraplegia (Thuret, et al., 2006).

A 10yrs study aimed to investigate the life expectancy of people with SCI revealed that only 16.4% of the study population survived for 10 years in Bangladesh, which was much lower than in developed countries like Finland (97.9%), Australia (86%), Canada (92%), UK (85%), and USA (80.7%). Besides this, the study also found that the situation in Bangladesh is worse than other developing countries.

The data indicates that Bangladesh has very poor medical facilities to promote the safe and worthwhile life after having a spinal cord injury. The study also pointed out some possible causes of poor life expectancy of persons with SCI, including inadequate acute management and lack of proper social reintegration (Razzak, et al., 2011).

Spinal cord injury is defined as the occurrence of an acute traumatic lesion of neural elements in the spinal canal (spinal cord and cauda equina), resulting in temporary or permanent sensory and/or motor deficit (Norton, 2010).

The clinical definition of spinal cord injury excludes intervertebral disc disease, vertebral injuries in the absence of spinal cord injury, nerve root avulsions and injuries to nerve roots and peripheral nerves outside the spinal canal, cancer, spinal cord vascular disease, and other non-traumatic spinal cord diseases(National spinal cord injury statistical center, 2011).A lesion of the spinal cord, results in paralysis of certain areas of the body, along with the corresponding loss of sensation (Peterson, et al., 2009). Spinal cord injury is damage to the spinal cord. It may result from direct injury to the cord itself or indirectly from damage to surrounding bones, tissues, or blood vessels (Kakulas, 2004).

The cause of spinal cord injury may traumatic or non-traumatic. There are several causes of traumatic injury. They are categorizing in different sector. As like auto crash, including jeep, truck and bus. Fall: including jumping and being pushed accidentally, gunshot wound motorcycle crash: 2-wheeled, diving, bicycle, tricycles. Pedestrian, including falling/jumping into the path of a vehicle, auto racing, glider kite, slide, swimming, bungee jumping, scuba diving, lightning, kicked by an animal, machinery accidents, tractor, bulldozer, go-cart, steamroller, train, road grader, forklift, sledding, snow tubing, tobogganing, playing ice hockey, snowboarding. Personal contact, including hit with a blunt object, falls because of pushed and other penetrating wounds, stabbing, impalement, boat and parachuting, Para-sailing etc. Gymnastic activities other than trampoline baseball/softball, Football, water skiing, basketball/volleyball, high jump, bomb, grenade, dynamite and gasoline. Also Medical and surgical complications are Impairment of spinal cord function resulting from adverse effects of medical, surgical or diagnostic procedures and treatment these are traumatic cause. The non-traumatic cause is spinal tumor, Tuberculosis of spine, transverse myelitis, physical assault, physical weakness etc. (Chen, et al., 2013).

Damage to the spinal cord can result in chronic motor and sensory impairments that may lead to a lifetime profound disability like quadriplegia or paraplegia(Nash, 2005). An injury to the upper part of the spinal cord can leave an individual with little or no sensation or movement in their arms and legs, a condition called Tetraplegia (American academy of orthopedic surgery, 2001). According to American spinal cord injury association (2011) 'Paraplegia' is refer to the impairment or loss of motor and sensory function in the thoracic lumber or sacral segment of the spinal cord, secondary to damage of neural element within the spinal canal. The symptom of paraplegia differs from each other patient and it depend on the severity of the damage of the spine. It may include paralyzed muscle, especially in arm and leg, instability to move or feel anything below the damage area, inability to control bowel and bladder and chest complication.

The spinal cord injury causes serious injuries and permanent impairments due to incomplete documentation and transfers to tertiary institutions and creates a life threatening situation (Phalkey, et al., 2011). A five-scale subdivision was used: A = complete motor and sensory function disorder; B = motor complete and sensory incomplete function disorder; C = motor and sensory incomplete function disorder; D = useful motor function with or without auxiliary means; E = no motor or sensory function disorder which is the modified by Frankel and known as Frankel score (Capaul, et al., 1994). The epidemiological study in Japan showed that no survivors with complete tetraplegia, mostly paraplegics (89%), a significant pediatric population (17%), predominant female victims (ratio of 1:1.3) (Rathore et al., 2007). Patients with SCI have suffered from various medical complications after injury that includes pressure sore, pneumonia/ atelectasis, Deep Venous Thrombosis (DVT) and pulmonary embolism, renal calculi, autonomic dysreflexia and fracture. Long bone

fractures as result of osteoporosis are also known an additional secondary medical complication following a SCI (Cardenas, et. al., 2004). Rates of complications greatly increasing with advanced age. Among persons who has more than 60 years of age at injury, 47% had at least one pressure sore during initial hospitalization, 30% developed pneumonia, 11.4% had deep vein thrombosis, 10% had a gastrointestinal hemorrhage and 5.7% had a renal stone (Devivo, 2012). Long-term medical complication rates also increase with both older age and greater injury severity (Chen, et al., 2005). SCI causes significant losses in many areas: physical, functional, social, and financial. Typically, each patient was expected to experience shock, denial, depression, anger, dependency, and finally adjustment (Tate, et al., 2002). After SCI, as after any significant loss and people grieve. A variety of factors influence the manner these includes- personal characteristics such as personality; cognitive styles, values, attitudes, and psychological health prior to the injury; prior loss experiences; and age (Somers, 1992). Some factors influence the outcome of SCI such as family support, adjustment and coping, productivity, self-esteem, financial stability, education, and the physical and social environment (Whiteneck, et al., 2004). Other factors that affect psychological adjustment, chronic pain, chronic fatigue, medication, isolation, boredom, medical complications and body image, cognitive problems, family/Friends/Social Supports. Psychological adjustment is influenced by how people are treated during the rehabilitation phase (Dezarnaulds and Ilchef, 2014).

Loss of function is the symptom of spinal cord injury. Impaired functioning occurs by spinal cord injury. Severe headache, backache, tingling or loss of sensation in the hand, fingers, feet, or toes, feeling of pain or pressure in the neck, partial or complete loss of control over any part of the body, impaired breathing after injury, urinary or

bowel incontinence, or retention, difficulty with balance and walking, unusual lumps on the head or spine (Crag, et. al., 2013).

Social isolation and discrimination in society is the major and common problem. For the non-disabled majority must be undertaken and legal guarantees time honors and compulsory to improve the lives of those with disabilities, education. People with disabilities with some cultures are more tolerant than others. Believe to be the cause of disability (for example, bad blood, divine displeasure or punishment for actions in a previous life) by the people of a society's attitude towards disability is created in nature. Always such beliefs are not negative. For example, God often gives children with a disability to couples who are able to show them special compassion and care 16 influences the way the surrounding community responds to these children in northern Mexico that the belief. The manner in which families and communities, how people expect individuals with disabilities to contribute to society also shapes respond to children and youth with disabilities (Groce, 1999).

Physically ill people should respond to their illness by feeling anxious or depressed. These emotional reactions are often transient. Some patients emotional reactions are intense and sometimes psychiatric illnesses appear to be provoked by physical illness. The most common psychiatric illness is depressive disorder. Certain factors increase the risk of serious psychiatric disorder developing in the physically ill. The psychological consequences of physical illness can be divided into three groups. First, psychological symptoms may be directly induced by physical illness or drugs used to treat them. Second, psychiatric disorders may occur as psychological reaction to physical illness or their treatments. Third, psychological defense mechanism and certain kinds of behavior may be evoked by physical illness. Patients are more vulnerable if they have a history of previous psychological disorder or life long

physical disability or inability to deal with adversity. A physical illness is likely to have a greater psychological impact if it has special effect on patients' life. For example spinal cord injury of a patient (Gross, 2002).

Spinal cord injuries (SCI) often have psychological consequences, primarily anxiety and depression, which may interfere with rehabilitation possibilities, with adjustment to their impairment and therefore with the possibility of returning to previous familiar social life and work (Scivoletto, et al., 1997). WHO defined depression- "Depression is a common mental disorder characterized by sadness, loss of interest in activities and by decreased energy .Depression is differentiated from normal mood changes by the extent of its severity, the symptoms and the duration of the disorder" (WHO, 2011).

Depression may be described as feeling sad, blue, unhappy, miserable, or down in the dumps. Most of us feel this way at one time or another for short periods. True clinical depression is a mood disorder in which feelings of sadness, loss, anger, or frustration interfere with everyday life for weeks or longer (Khan, et al., 2006).

Some people describe depression as "living in a black hole" or having a feeling of impending doom. However, some depressed people don't feel sad at all they may feel lifeless, empty, and apathetic, or men in particular may even feel angry, aggressive, and restless (Smith, et al., 2011).

Depression varies from person to person, but there are some common signs and symptoms. It is important to remember that these symptoms can be part of life's normal lows. Nevertheless, the more symptoms it has, the stronger they are, and the longer they have lasted (Ansted, et al., 2011).

Common symptom of 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 (Anneken, et al., 2010).

There are some factor that may play a role in depression such as, alcohol or drug abuse, certain medical conditions, including underactive thyroid, cancer, or long-term pain, certain medications such as steroids, sleeping problems, stressful life events, such as death or illness of someone close, divorce ,childhood abuse or neglect, Job loss, social isolation (Zieve and Merril, 2011). About one in ten of the population will suffer from depression and women are twice as likely to be affected as men. The prevalence is higher in young women and tends to decrease with age, while the opposite pattern is found in male, where the prevalence is lower in young men and increase with age. Depression occurring as an unusually prolonged or intense reaction to loss is called reactive or exogenous depression is classified as a neurosis that is often called neurotic depression. Particularly severe depression may also arise without any discernible cause in external events, seems to arise from ‘within’ the patients. This type of depression is called endogenous depression and classified as a psychosis. In endogenous depression genetic and biochemical, factors are important, as opposed to environmental events. Endogenous depression may be part of an overall disorder of mood in which depression alternates with mania Beck (Beck and Alford, 2009).

Anxiety and depression may have a considerable impact on functioning. Severe depression episodes can cause health problems such as loss of weight, social problems such as loss of job and financial problems.

Depressive episodes can be even more negative for those with functional losses (for example SCI patients) (Osterthun, et al., 2014). Depending on the extent of their loss, SCI patients' often present anxiety and depression (Judd and Burrows, 1986). Women with SCI tend to suffer more from depression (Kent and Dorstyn, 2014). Female patients had 3.8-fold higher risk of depression than male patients had (Oh, et al., 2006). Non medication approaches can be effective, both alone or used with other treatments that used a combination of treatment such as medication, psychotherapy , sports and various leisure activities to reduce depression of spinal cord injury patients. Management of depression may be physical or non-physical. There are three major groups of drugs used in the treatment of depression such as tricyclic anti-depressant, mono-amine-oxidase inhibitors and lithium salts and others treatments are group psychotherapy, Relaxation therapy, Behavior modification, Social skills training, occupational, Industrial, music therapies, Psychodrama and sports or various leisure activities training (Bisson and Andrew, 2005).

Sports have an immense therapeutic value and play a great part in physical improvement for the person with disability (Wind, et al., 2004). It helps to develop strength, coordination, endurance, and respiratory fitness. Sports offer the opportunity to achieve success in a very short period, to use this success to build self-confidence and focus on possibilities instead of dwelling on what can no longer done (Hicks, et al., 2003). It has reported that higher frequency of sports activity in SCI patients reflects better psychological status, especially reduction of depression (Muraki, et al., 2000)

Exercise and sports have significant physical and psychosocial health benefits for people with SCI although there are many challenges to physical activity participation for them (Ginis, et al., 2012). Individuals with acquired SCI who actively involved in sports have better quality of life (QOL) within physical, psychological, social and context field than physically inactive individuals (Anneken, et al., 2010). Most of the studies showed that sports is positively associated with objective and subjective QOL among individuals with SCI whether few studies showing a significant negative or no significant relationship between sports and QOL (Tomasone, et al., 2013). Persons with SCI can improve their components of physical domain like improvement of strength, coordination, balance, endurance, pulmonary function and weight control etc. by engaging themselves in sports (Shapiro and Martin, 2010). Persons with SCI are more likely to engage themselves in enjoyable physical activities than the “prescriptive” health-promotion programs (Hanson, et al., 2001). Spinal cord injury often severely impairs the immune system and studies have shown that rehabilitation and exercise can have a significant impact in the return of near normal immune function (Atteya, et al., 2006).

According to Anneken, et al. (2010) individuals with acquired SCI being actively involved in Physical exercise and sports differ from physically inactive individuals. They report a comparatively better quality of life within physical, psychological, social and context field. Both the functional effects such as the increase of physical resistance, mobility and coordination, as well as social and psychological effects such as an increase in self-confidence, self-concept or mental state were identified. Their study confirmed that findings also apply to individuals with acquired SCI in Germany. The stratification of the interviewed individuals into ‘actively involved in physical exercise’ and ‘physically inactive’ demonstrated differences in the single

scales that are directly correlate with the existence of physical exercise. Owing to the quality of life construct used in that study was to be expected. Martin, et al. (2010) also assumed that the differences within the ingle scale ‘physical capacity in everyday life’ and ‘mobility’ are possibly due directly to the effects of physical exercise. In summary, they have clearly established a statistically significant, positive relationship between physical activity and state of well-being. Cerasa and Lucia (2015), demonstrated that sports activity is, in fact, associated with better psychological status in SCI patients. However, demographic factors did not emerge as having any specific role. In both tetraplegic and paraplegic patients, sports activity can provide desirable psychological status showing a particularly strong association with general level of anxiety. Therapeutic value of sports for spinal cord injured people, when a person first faced with the reality of a disability, many experience a loss of Confidence, depression and believe their lives have ended (Additional Sports and Disabilities resources, 2004). Disabled with SCI alienated from family and friends for this they could not share positive experience. At that time sports gives self-discipline, a Competitive spirit, comradeship, promoting health and physical strength (Hossain, et al., 2015).Sports offer the opportunity to achieve success in a very short period of time; to use success to build self-confidence. While sports have value in everyone’s life, it is even more important in the life of a person with disability because of sport’s rehabilitative influence, and the fact that it is a mean to integrate the person into society. Sport is use as treatment complementing the conventional methods of physiotherapy. It helps to develop strength, coordination and endurance. Participation in sports can help physically disabled people to regain self-esteem, promotes the development of positive mental attitudes , helps them to come to terms with their disability , achieve social reintegration and teaches independence (Additional Sports

and Disability resources, 2004). Sport is particularly valuable for persons with a disability as they often remain in the home environment, protected and guarded by their families. Participation in sport creates peer interaction, cooperative relationship and teamwork. Sports help prepare individuals to face the adversity of a disability in their lives and to learn to bounce back in the face of challenge and change. Sports are more than just a way to recreate or compete; it means sports contribute healthy minds and body. The physical, mental and social values and benefits derived from participation in sport and physical activity are widely accepted (Fox, 2000). There are different types of psychological factors that affect after SCI, among of them depression is very common. Psychological issues such as stress are well known to have a correlation with active of daily life. The heightened stress levels in individuals with SCI further decrease their quality of life. The changes in spirit as a result of the SCI are also believed to have correlation with satisfaction of life, onset of depression, and functional independence during inpatient rehabilitation after SCI (Shin, et al., 2012). Still there is no study in Bangladesh about the relationship in between depression and QOL following SCI. Depression have been found to have a major impact on health, lower performance of activities of daily living after SCI. Study will show the factors which affect the QOL after the injury. If this factor can be consider during the treatment session which can enhance the better QOL. According to Patrick (1997), enhancing quality of life is the goal of all health promotion, treatment and service provision for people with disabilities. Elliott, (2004) mentioned that, higher levels of depression-as measured by a variety of self-report measures that assess symptoms often associated with depressive syndromes and with decreased quality of life. By this study, Physiotherapy Therapists and other professionals can understand about the effect of depression over people with SCI.

Depression measurement scale:

For this study, a scale is use for depression measurement, which developed by Md. Zahir uddin-National Institute of Mental health, Dhaka, and Mohammad Mahmudur Rahman-Department of clinical psychology, University of Dhaka. This scale developed according to cultural context of the Bangladesh. To achieve this aim, the study was done in three phase. In first phase 48 items was constructed and 16 judges asked to evaluate these items. Based on the data available in the third phase, various reliability validity estimates obtained for this new scale of depression. A tentative norm also developed for assessing the severity of depression and a screening norm for obtaining the cut off point for deciding about the clinical level of depression for a given individual. The obtained results indicate that the newly constructed depression scale has reliability and validity at acceptable level, and with the norms developed on the scale, it is now ready for use in Bangladesh, for both research and clinical purposes. Some researchers showed that depression might have different manifestations in different cultures, for example, in an Indian study, it was found that depression had varied manifestations like depressed mood, anxiety, somatic features, insomnia, lack of interest, paranoid ideas, obsessions etc. In Bangladesh, prevalence of depression found to be 28.78 per thousands in a field study near Bangladesh. For assessment of depression, there are a lot of scales such as, Beck Depression Inventory Second edition-BD-II, Hamilton Rating scale, Hospital Anxiety and Depression Scale-HADS, Beck Hopelessness Scale, Dysfunctional Attitude Scale etc. For the assessment of severity, clinical psychologists are using Beck Depression Inventory (BDI), which is not yet standardize in Bangladesh.

This Depression scale considered to use it in therapeutic session and in research. The used scale of Depression in this study developed in three phases. They were as follows-

Phase-1: Construction of item.

Phase-2: Item analysis and selection of items for the final form of depression scale.

Phase-3: Determining Reliability and Validity of the final scale and developing norm for the Target population.

Instruments/Techniques used in this scale are- Newly constructed Depression scale, Depression sub-scale of hospital Anxiety and Depression Scale, Depression Rating by Psychiatrists and Clients self-rating of Depression, Psychiatric interview, Basic information about participants. The Depression scale consists of 30 items or statements with printed instruction. The answer options for each item of the scale were according to 5-point rating scale, such as not at all applicable, not applicable, moderately applicable, somewhat applicable, and fully applicable. Not at all applicable was scored = 1, not applicable was scored= 2, moderately applicable was scored =3, somewhat applicable was scored= 4, fully applicable was scored= 5. The highest possible score was 150 and lowest possible score was 30. Higher score indicated higher depression and lower score indicate low level of depression. According to Severity norm of the depression scale are classifies as follow minimal 30-100, mild, 101-114, moderate 115-123, severe 124- 150. This Depression scale is easy to administer, as it takes about only ten to fifteen minutes to respond. Therefore, it will be a very good depression assessment tools in routine assessment in psychotherapy session .It will also be a good tool for research purpose (Begum, 2005).

Severity norm of the depression scale and classification:

Severity of depression	Corresponding scores of depression scale
Minimal	30-100
Mild	101-114
Moderate	115-123
Severe	124-150

Study design

Quantitative research design focuses on descriptive study. Jack and Norman (2000) suggested that, Quantitative data are obtained when the variable being studied is measured along a scale that indicates how much of the variable is present. Quantitative data are reported in terms of scores. Higher scores indicate that more of the variable (Such as weight, academic ability, self-esteem, or interest in mathematics) is present than do lower scores. Descriptive studies are those data that can be describe, organize, and summarize. They include such things as frequencies, percentages, descriptions of central tendency (mean, median, and mode) and descriptions of relative position (range, standard deviation) (Baiely, 1997). Pre-post experimental design of quantitative research selected for this study. The researcher was conducted the study with a single group. The design had no have a control group to compare with the experimental group. The pre-post experimental design could show by:

One group pretest –posttest design:

O X O

The pretest-posttest design is valuable in describing what occurs after the introduction of the Independent variable.

Target Population

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

Study Site

The research was conducted the study at the Centre for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka. Researcher collected data from those peoples who are receiving treatment in SCI unit at CRP. The Centre for the Rehabilitation of the Paralyzed (CRP) has developed into an internationally respected organization (CRP-BANGLADESH). Researcher has chosen that setting because the participants were available in SCI unit. The hospital at CRP-Savar was the only hospital in Bangladesh that specializes in the treatment of spinal cord injuries. At CRP in- patient unit only admitted people with SCI. It consists of 100 beds, with 12 wards (one post-operative ward, one female and ten male wards, this is due to the majority of spinal cord injuries occurring in young males). The major causes of spinal cord injuries are via fall from height or tree, carrying heavy loads on head, diving into shallow water, heavy objects falling on their back, or road traffic accidents. Rehabilitation following a SCI consists of four phases: Acute, active, rehabilitation and community reintegration (CRP BANGLADESH, 2014).

Study Area

The study project conducted at Spinal Cord Injury (SCI) department of Centre for the Rehabilitation of the paralyzed (CRP), Savar, and Dhaka. CRP is one of largest rehabilitation centre in Bangladesh for spinal cord injury patients.

Study period:

The study had done as a part of the academic education of Masters in Physiotherapy Science. Therefore, it was going on from October 2015 to April 2016.

Sampling Techniques

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.

Sample Size

Forty -40, Samples was conveniently select for the study in the Centre for the Rehabilitation of the Paralyzed (CRP), Savar and Dhaka.

Field test:

A field test was conducted with five participants. Before starting a research project, it was necessary to do a field test that helps the researcher to understand whether the questionnaires were understandable by the participants or not. Before starting, the data collection researcher informed the participants about the aim and objectives of the study. The field test had done to ensure the validity of the questionnaire regarding our country context.

Inclusion Criteria

1. Age 18 years or more.
2. Patient is in Rehabilitation stage.
3. Voluntary participation.
4. Both male and female patient.

Exclusion Criteria

1. Patient with known others mental or physical illness.
2. Patients take medication for mental disorder.
3. SCI with speech problem
4. SCI patients with head injury

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. In this study there, 40 samples who were participating in this study and participate in sports at least 25 sessions. The researcher used pen, pencil, white page, data collection form with depression measurement scale, which is develop by Md. Zahir Uddin and Md. Mahmudur Rahman, Department of Clinical psychology, University of Dhaka. This scale was developing according to cultural context of the Bangladesh.

Data collection was consist with-

- i. Firstly, the researcher assessed the patients to confirm inclusion and exclusion criteria.
- ii. At the first day of data collection, the researcher introduced with the patients. Then given a consent form to the patients and explained the subject of research and objective of the research project to the patients.
- iii. When the participant permitted to collected data then started the interview with the form.

Step 1:

- Pre-testing: According to the time schedule, the researcher spent 5 days for the short field test of the questionnaire. It was helpful to ensure the validity & reliability of the research as well.
- Data were collect before participation in sports and after one-month, participation in sports then collect data to saw the difference between level of depression before participation and after participation in sports.

- The researcher controlled towards the data input flow and made a scheme and input the data weekly.

Step 2:

- SPSS variables were designed for the demographic information such as age, sex, educational level, occupation, religion etc.
- Then other columns were design according to the independent and dependent variables. Those were included level of depression before participation and after participation in sports.
- The researcher managed a logbook for these procedures and crossly checked the data with the original source.
- The researcher ensured the quality control by putting the data that the researcher had gathered from the pilot study.
- Then the researcher analyzed the data to find out the level of depression
- To analyze the data; Frequency countings, percentages, descriptive statistics were used. However, Pair t- test were used to find out the the effectiveness of spots participation to rduce the level fo depression.
- The files were systematically ordered.

Step 3:

- Data were representing through the bar graph and pie chart and table.
- Numbers of the prevalence (%).

Data Management and Analysis: The total subjects' names were coded to maintain confidentiality. Subjects were evaluated by depression measurement scale. Initial assessment was carried out in each participant that provides the pre-test score. After participating sports in the same way as the pre-test data were collected which gives the post-test score. The demographic information's were analyzed through the SPSS 20 version software program. Data were analyzed mostly in terms of analytic and descriptive statistics and were present in the form of table, graphs and charts. Throughout the analysis of the data, the researcher had identified the socio-demographic status of the participants with spinal cord injury who participate in sports. The researcher had identified the difference depression level before participation and after participation in sports.

Quality control and Quality Assurance:

Throughout the study process, it had tried to be rigorous in terms of sample selection, data collection and interpretation. The samples were not influenced to meet the aim of the study. For the entire sample, same procedure had followed which would ensure the validity of the study. The questionnaire had validated by ensuring the linguistic validation of it. Linguistic validation had done by forward translation "A" and forward translation "B". After that reconciliation had done. Then the version 1 and report had developed. After that, backward translation had done and compared with the original source of questionnaire. After that, version 2 and report were making. Field-test had done to ensure the validity of the questionnaire regarding our country context in later. However, discussion and modification had done and based on which final version of the questionnaire was made.

Informed consent

Written consent had taken from all participants prior to completion of the questionnaire. The researcher ensured that all participants were informed about their rights and reserves and about the aim and objectives of the study. Researcher also ensured that the organization (CRP) was not hampering by the study. All kinds of confidentiality highly maintained. The researcher explained to the participants about his or her role in this study. The researcher received a written consent form every participants including signature. Therefore, the participant assured that they could understand about the consent form and their participation will on voluntary basis. The participants were informing clearly that their information would keep confidential. The researcher assured the participants that the study would not be harmful to them. It was explain that there might not a direct benefit from the study for the participants but in the future cases like them might get benefit from it. The participants had the rights to withdraw consent and discontinue participation at any time without prejudice to present or future treatment at the spinal cord injury (SCI) unit of CRP. Information from this study will anonymously code to ensure confidentiality and will not personally identify in any publication containing the result of this study.

Institutional Review Board (IRB)

A research proposal was submitted for approval to the administrative the members of the Institutional Review Board (IRB) of ethical committee. The researcher has taken permission from Bangladesh Health Profession Institute and medical care unit, CRP, Savar. Patient permission has taken prior to data collection. The participants were explained the purpose and goal of the study. Subjects have participated voluntarily and confidentiality would maintain. Furthermore, the researcher would be available to answer any questions in regards to the study. All information kept in secure.

Ensure about patient safety. The study followed the World Health Organization (WHO) and Bangladesh Medical and Research Council (BMRC) guideline. It also strictly maintains the confidentiality.

Rigor:

This study conducted in a systematic way. The researcher followed all the steps of research sequentially. During the data collection the researcher avoided influencing the whole process by own perspectives, values and biases. The researcher never influenced the participants by his own perceptions during data collection. A trustful relationship with participants always maintained and the documents kept confidential. Biasness had avoided during data analysis and data analyzed by the specific way of SPSS.

Age group:

The study conducted among 40 participants. Among them 65% were between 18-38 years of age.

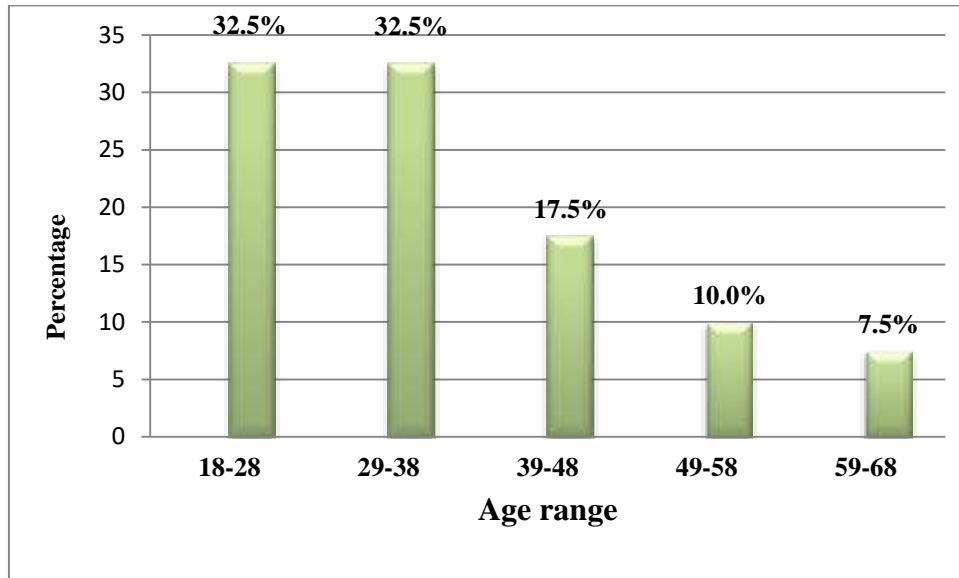


Figure 1: Age range of the participants

Gender: Female was 7% (n=3) and male was 92% (n=37).

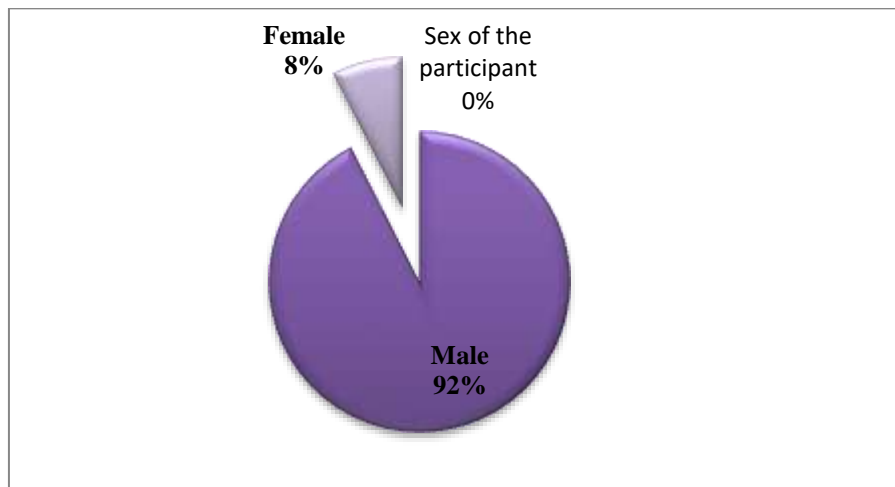


Figure 2 Gender of the participants

Marital status of participants: Among the participants married were 77 % (n= 31), unmarried were 20 % (n=8) and widow were 2.5 % (n=1).

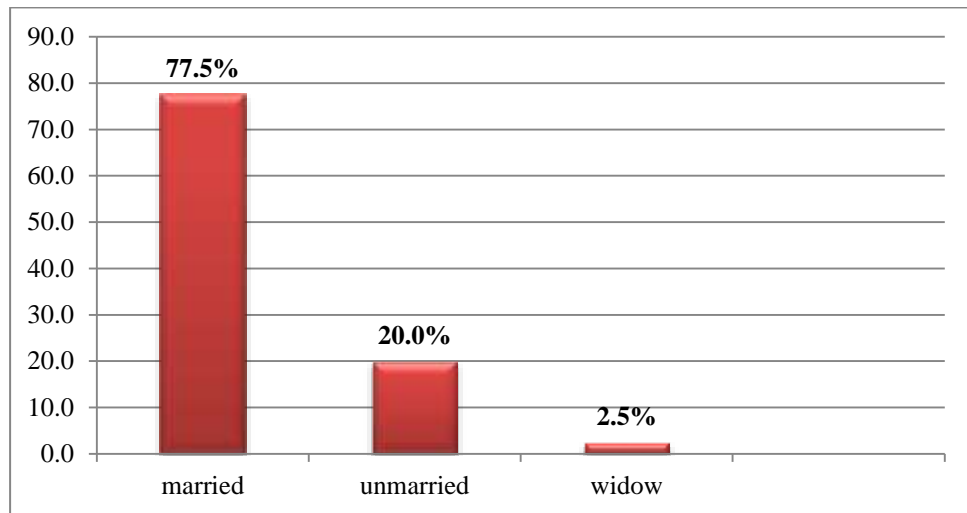


Figure 3: Marital status of the participants

Educational status of participants:

In this study of 40 participants, among them 72% were complete up to primary school. Primary school 30% (n=12), literate 22.5% (n=9), No schooling 20% (n= 8), SSC 10 % (n= 4), HSC 7.5 % (n=3) and Bachelor 10 % (n=4).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Schooling	8	20.0	20.0	20.0
	literate	9	22.5	22.5	42.5
	Primary	12	30.0	30.0	72.5
	SSC	4	10.0	10.0	82.5
	HSC	3	7.5	7.5	90.0
	Bachelor	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

Table 1: Educational status of participants

Average monthly income of participants:

Result shows that average monthly income 3000-5000 have 45% (n=18), 5000-10000 have 22.5% (n=9) participants, 10000-15000 have 17.5% (n=7), 15000-20000 have 7.5% (n= 3), above 20000 have 7.5% (n=3).

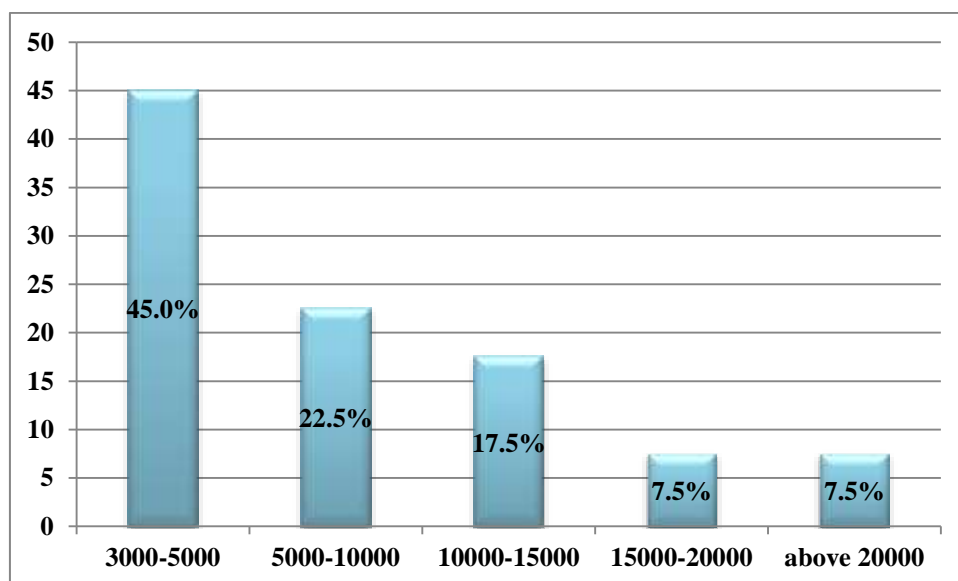


Figure 4: Average monthly income of the participants

Religion of participants: In this study, have 40 participants all of them were Muslim.

Causes of injury:

In the study 95% (n=38) participants has traumatic cause and 5% (n=2) participants non-traumatic cause.

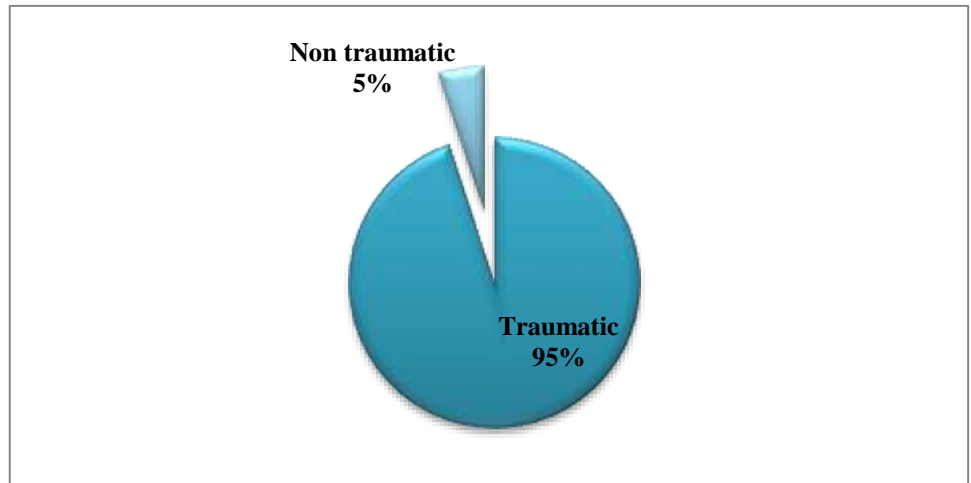


Figure 5: Cause of injury

Type of diagnosis:

In the study, among the participants 40%, (n=16) tetraplegia and 60% (n=24) paraplegia.

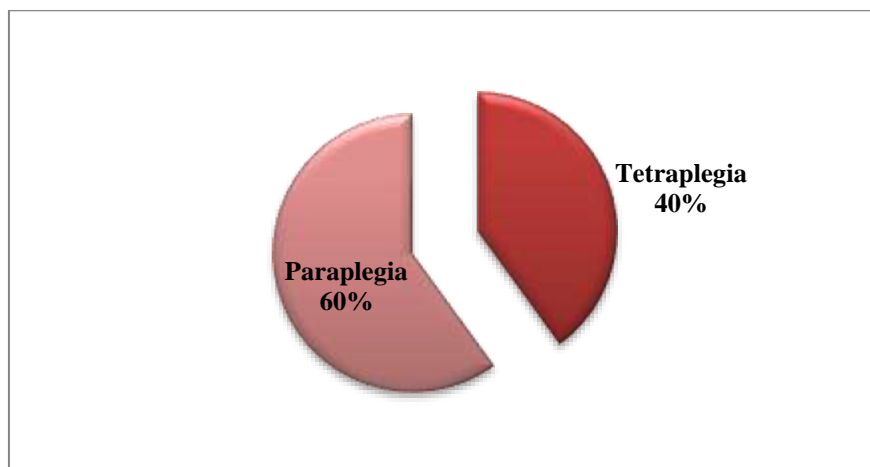


Figure 6: Type of Diagnosis

Skeletal level:

In this study skeletal level among the participants L1 (n=9), C5 (n=5), D12 (n=7).
About 50% have L1, D12 and C5 skeletal level.

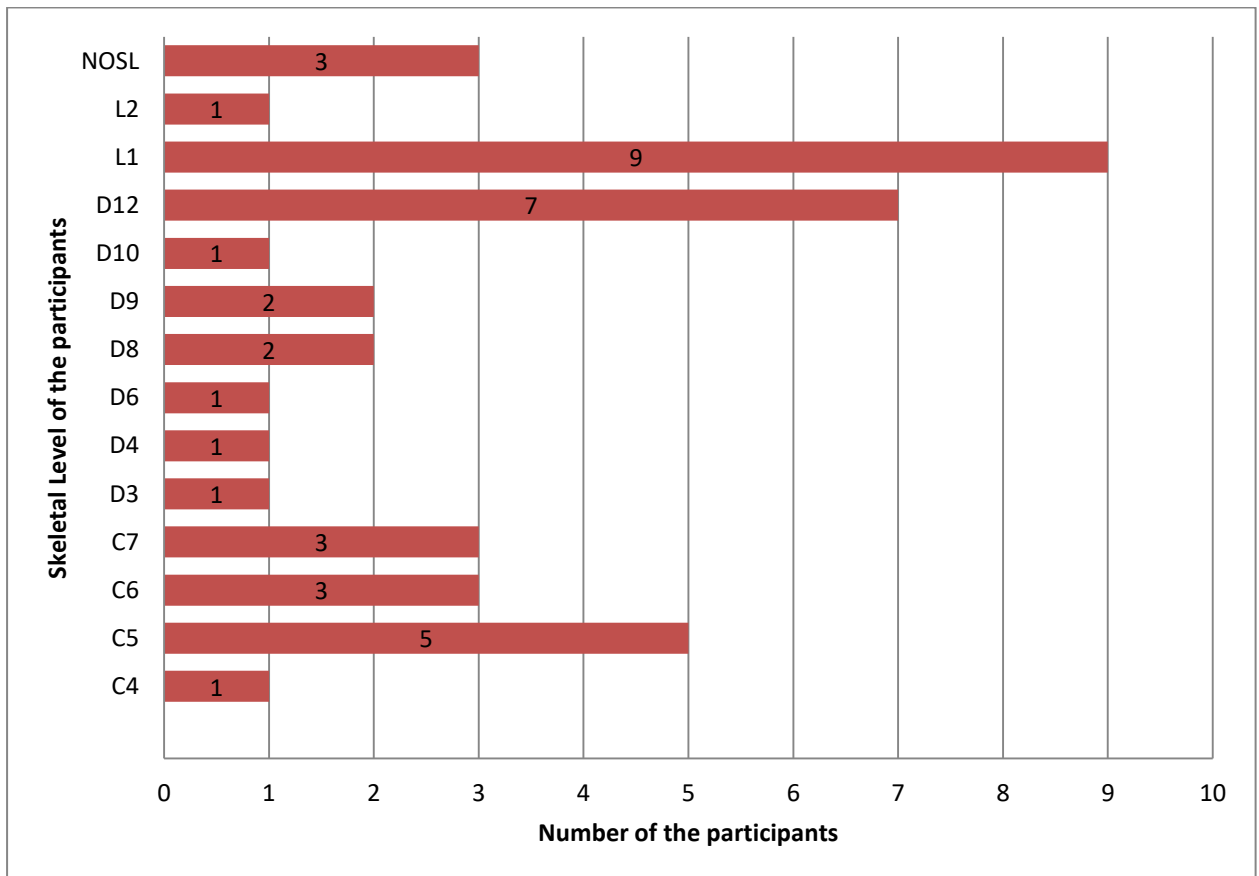


Figure 7: Skeletal level of the participants

Neurological level:

Among the participants C4 neurological level has (n=7), D12 (n=5) and L4 (n= 3).

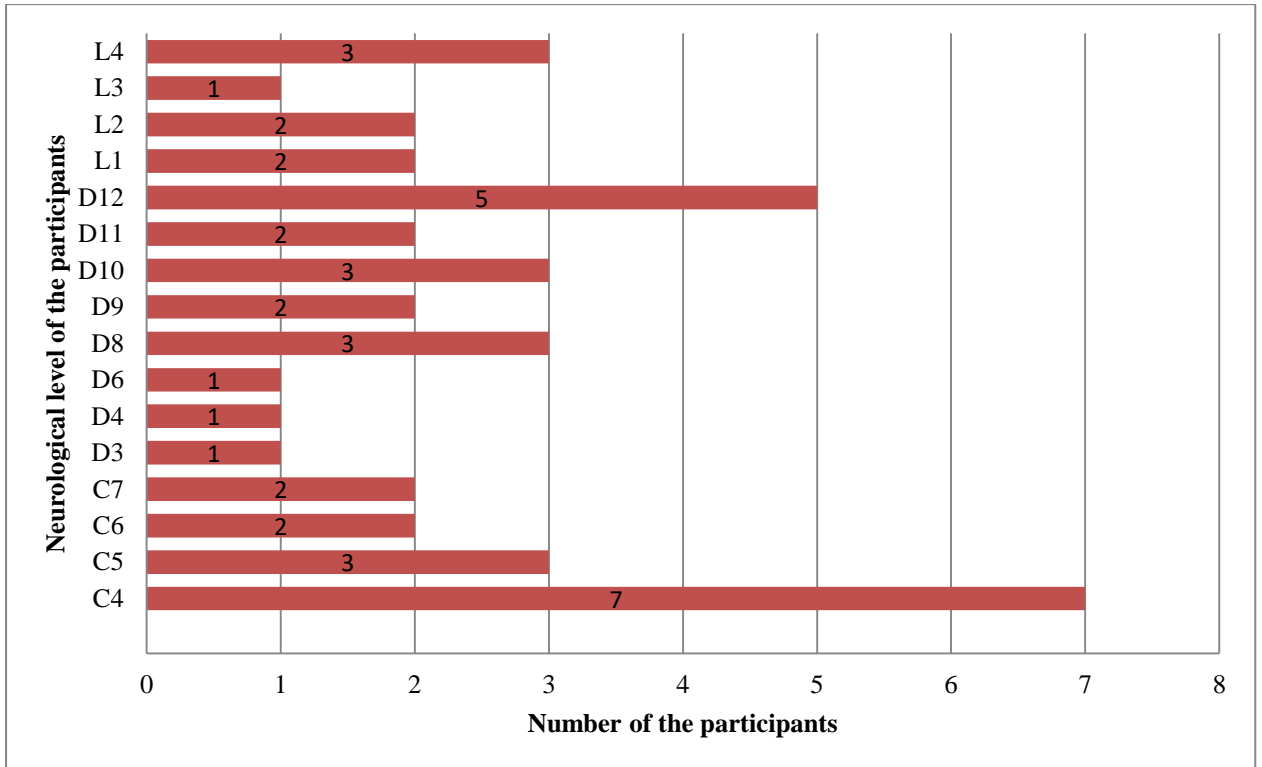


Figure 8: Neurological level of the participants

Mobility aids: During the study period, 80% participants were using wheel chair and 20% using elbow crutch for their mobility.

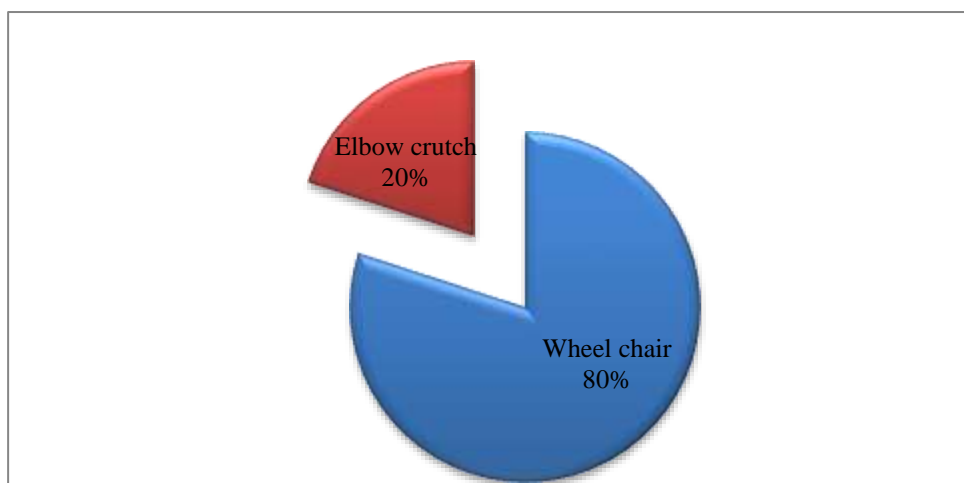


Figure 9: Using mobility aids

Living area:

In this study, 77% participants were from in rural area and 23% participants were in urban area.

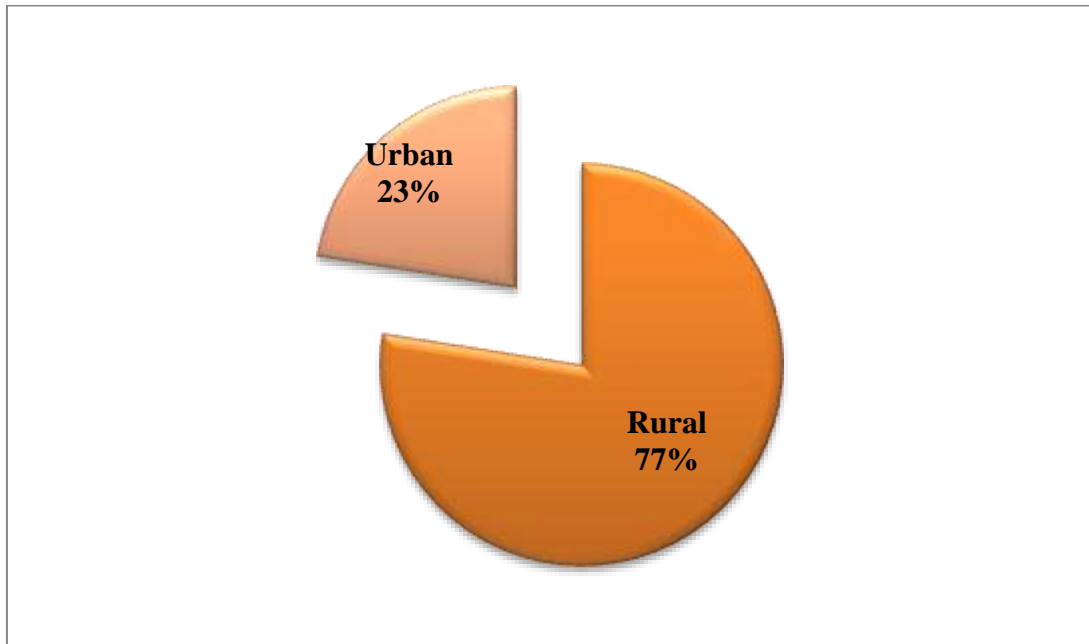


Figure 10: Living area of the participants

ASIA Scale:

In the study 57% participants has Complete A and 43% incomplete case.

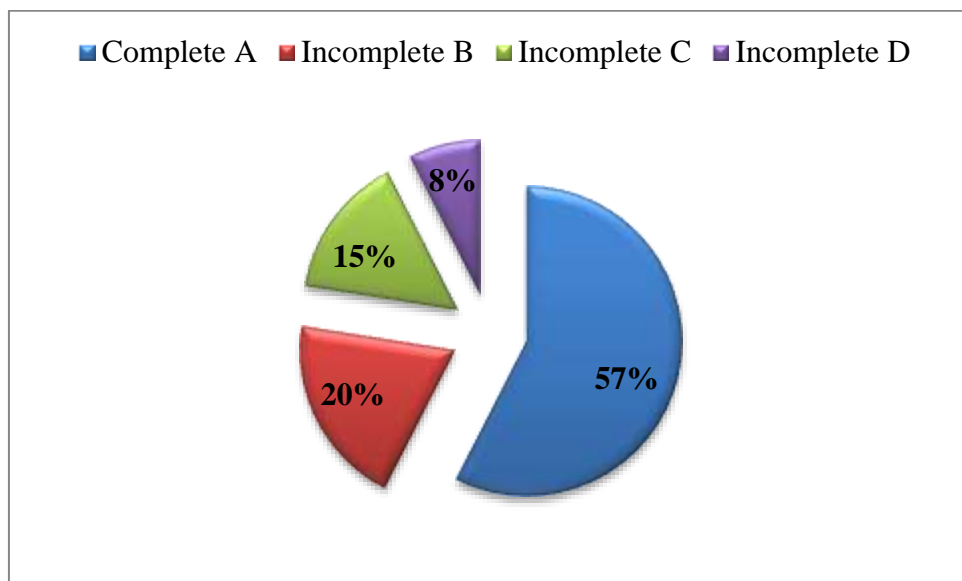


Figure 11: ASIA scale among the participants

Table 2: Pre and post-depression score:

Participant number	Pretest Score	Post test Score	Difference
1.	89	63	26
2.	75	64	11
3.	87	48	39
4.	62	59	3
5.	52	31	21
6.	120	51	69
7.	122	54	68
8.	99	65	34
9.	123	65	58
10.	120	62	58
11.	99	53	46
12.	89	65	24
13.	112	54	58
14.	75	53	22
15.	75	59	16
16.	88	68	20
17.	93	74	19
18.	77	69	8
19.	89	67	22
20.	97	57	40
21.	101	60	41
22.	89	56	33
23.	86	48	38
24.	86	66	20
25.	72	50	22
26.	91	61	30
27.	90	60	30
28.	90	65	25
29.	126	69	57
30.	98	77	21
31.	84	78	6
32.	121	79	42
33.	94	72	22
34.	94	59	35
35.	104	68	36
36.	96	83	13
37.	110	67	43
38.	109	77	32
39.	102	88	14
40.	110	76	34
	3796	2540	1256

Pre and post-depression mean score difference:

Mean pretest depression score was 94.90 and mean posttest depression was 63.50 where mean difference in 31.40. Before participating sports mean score was 94.90 ± 16.908

After participating sports mean score was 63.50 ± 11.029 .

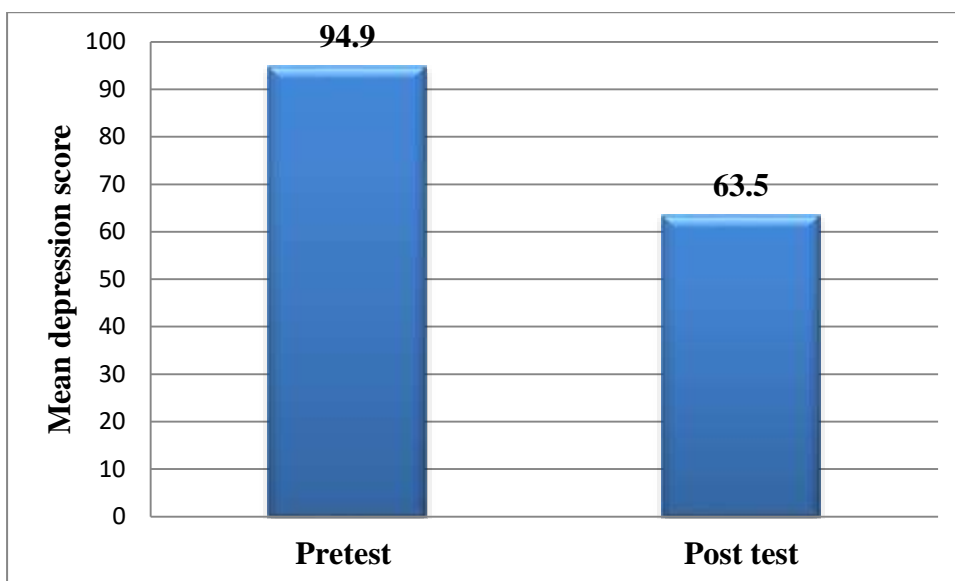


Figure 13: Pre and post-depression mean score difference

Mean score of pre -test and post –test:

Result showed that within participants 47.5% persons were suffering from depression. It is highlighted that depressed people with SCI who were participated in CRP's sports program causing improvement in psychological health resulting strengthen rehabilitation process.

Table 3: Effect of sports in depression

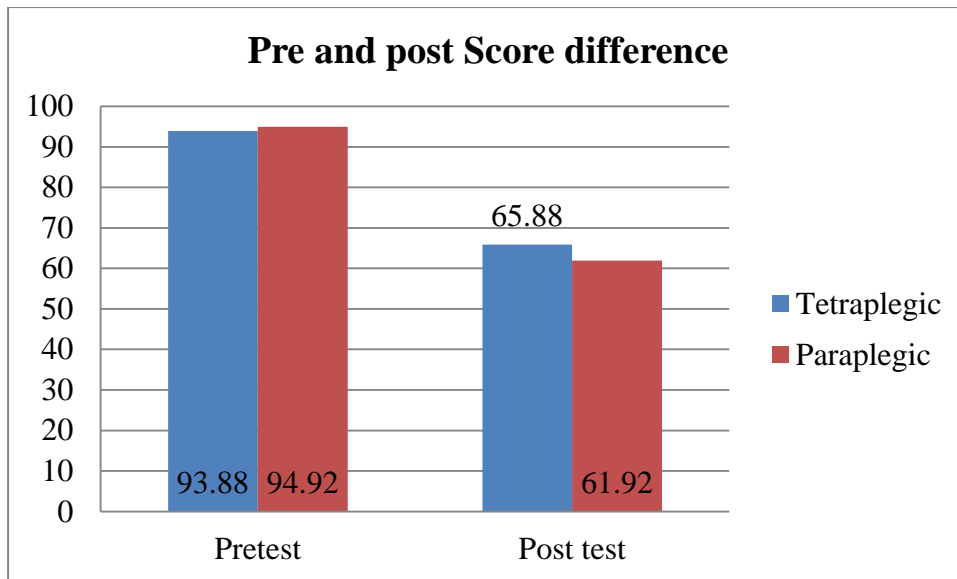
Stage	Scores percentage of Non-depressed 30-94	Percentage of Clinical Depressed >94
Pre-test	52.5%	47.5%
Post-test	100%	00%

Depression: Depression Scale had used to find out the level of depression of the study participants. Most of the participants had minimal 67.5% (n=27) depression after SCI. Others hands mild 17.5% (n=7), moderate 12.5% (n=5) and severe 2.5% (n=1). Results indicated that after spinal cord, injury goes through in psychological/emotional problems and sports have a vital role in upgrading psychological health.

Stage Level	Minimal (%)	Mild (%)	Moderate (%)	Severe (%)
Pre-test	67.5	17.5	12.5	2.5
Post-test	100	00	00	00

Table 4: Percentage of different depression level in pretest and post-test

Category	Pretest	Post test
Tetraplegic	93.88	65.88
Paraplegic	94.92	61.92



In this study, Tetraplegic patients were a mean score of 93.88 before participating in sports while the Paraplegic patients with mean score of 94.92 and after participation, the mean was 65.88 among the tetraplegic and 61.92 among the paraplegic.

T- Test result:

Before participating sports mean score was 94.90 ± 16.908

After participating sports mean score was 63.50 ± 11.029

Table 5: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-depression score	94.90	40	16.908	2.673
	Post-depression score	63.50	40	11.029	1.744

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
p a i r 1	Pre depression score – post depression score	31.40	16.576	2.621	26.099	36.71	11.98	39	.000

Table 6: Comparison between depression and sports activity for spinal cord injury patients

Table 1 showed that t value is 11.981 and df is 39 and significance level is < 0.001. That means result is statistically significant. So sports have an effective role in reduce depression level for spinal cord injury patients.

The purpose of this study was to find out the effectiveness of sports activity to reduce the level of depression after spinal cord injury patients. Also, evaluate the effect of demographic factors on psychological benefits. Our results demonstrated that sports activity was significantly reduce the level of depression in spinal cord injury patients. However, demographic factors did not emerge as having any specific role. First, researcher found that sports activity reduce the depression level for spinal cord injury patients. These findings were in agreement with previously published (Muraki, et al., 2000) data showing better education of depression and trait anxiety in tetraplegic and paraplegic groups participating with higher frequency in sports activity. On the contrary, (Gioia, et al., 2006) showed no significant difference in depression between sports participants and non-participants. The reason for the difference between their findings and ours could be associated with the psychological scales used. (Gioia, et al., 2006) evaluated depression using the Centre for Epidemiological Studies Depression Scale (CES-D) while we used the QD. Muraki, et al. (2000) obtained findings similar to ours using the Self-rating Depression Scale (SDS). Further, we agree with Muraki, et al. (2000) that the CES-D test (Gioia, et al., 2006) adopted cannot completely clarify the effects of sports activity on depression. Moreover, with respect to previous studies we found that different levels of injury result in different scores on QD. The lack of significance of the interaction analysis suggests that these differences could relate to the a priori psychological status differentiating these two SCI groups and not to the influence of sports activity.

Physical activity like sports has the potential to promote health and to enhance the quality of life. Sports can improve physical status as strength, coordination power,

cardiovascular status, pulmonary function and that all can improve their psychological status and reduce depression.

Hicks, et al., (2003) also state that a 9 month programmed twice-weekly can decrease self-reported stress, pain, depression and can enhance physical concept and overall quality of life in person with disability.

According to (Post and Leeuwen, 2012) a significant decrease of depressive symptoms during intervention, although this effect was not always maintained at follow up. The result showed that at group level, life satisfaction improves from a low level early after Spinal Cord injury (SCI). Intervention has an effect on decrease of anxiety and depression but no change of coping strategy found after SCI.

We found that African& American race was a protective factor for the development of depression at 5 years post-SCI (Hoffman, et al., 2011).

Regarding investigation of the psychological benefits of sports activity for persons with SCI, most studies have conducted using qualitative methodology. Muraki, et al. (2000) compared a group of wheelchair basketball players with a group of varsity college players and a control group of college men. The participants who used wheelchairs found to have significantly better mental health profiles than the two comparison groups. (Tasiemski, et al., 2004) reported the psychological profiles of wheelchair athletes compared to non-athletes; while Scelza, et al. (2007) and Shepard (1991) showed that participation in sports could provide new opportunities for individuals with disabilities and facilitate their reintegration in the community. In previous studies Tasiemski, et al. (2000) investigated the psychological benefits in SCI without making any distinction between tetraplegic and paraplegic subjects. Muraki, et al. (2000) showed marked psychological benefits from sports activity in tetraplegics as well as in paraplegics. However, level of injury not found to relate to

either depression or anxiety levels. Anneken, (2010) found benefits related to sport, pre-existing norms, values, attitudes, preferences and achieving a positive personal evaluation, sport may positively influence the intention to perform psychological well-being, social participation, and overall quality of life.

SCI patients who did not practice sports showed higher anxiety and depression scores and lower extraversion scores than sports participants. Gioia, et al. (2006), in addition, with respect to the paraplegics, the tetraplegic group showed the lowest depression scores. Following multiple regression analysis, only the sports activity factor remained as an independent factor of anxiety scores

Limitation:

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.

- The study was only the depression level of the spinal cord injury patients, in further study would be carry out the other sectors of the Spinal cord injury.

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 depression is major and common problem. This will hamper their daily life. There are many researches in various aspects of SCI. However, there a few research in this aspect. Nevertheless, it is a very important part for spinal cord injury patients to reduce depression and depression is a major complication of spinal cord injury patients. So, here need a lot of study.

After spinal cord injury patients first faced with reality of disability, many experience depression, loss of confidence as a result reduced quality of life. SCI is a condition which can occur with traumatic or non-traumatic causes. It can hamper a person's full life at any age. This study found significant level of depression after spinal cord injury. Depression is a prominent terminal psychiatric disorder and so should be considered with priority. Early detection as well as proper management of this condition is essential. Participating in sports is an effectiveness of social participation in leisure activities, improving quality of life and reducing depression level in people with SCI. Sports have an immense therapeutic value and play a great part in physical, mental or psychological and social rehabilitation. There are different aspects of sports- like recreational, Therapeutic and Competitive. Many sporting activities that can be used for rehabilitation have become possible for disabled people. Sport can play a key role in the lives and communities of people with SCI. Sport is increasingly being used as treatment complementing the conventional methods of physiotherapy. It helps to develop strength, coordination, endurance, and respiratory fitness. In this study, the researcher found significant difference between pre-treatment and post-treatment groups. These are good indicators of sports for reducing depression levels in spinal cord injury patients. The null hypothesis was rejected in this research. So, the hypothesis of the study was proven. According to this study, the researcher claims that sports are effective in reducing the depression level of SCI patients.

BIBLIOGRAPHY

- Agarwal, P., Upadhyay, P. and Raja, K. (2007). A demographic profile of traumatic and non-traumatic spinal injury cases: a hospital-based study from India. *Spinal cord*, 45(9), pp.597-602.
- Anderson, K.D., Borisoff, J.F., Johnson, R.D., Stiens, S.A. and Elliott, S.L. (2007). The impact of spinal cord injury on sexual function: concerns of the general population. *Spinal cord*, 45(5), pp.328-337.
- Anneken, V., Hanssen-Doose, A., Hirschfeld, S., Scheuer, T. and Thietje, R. (2010). Influence of physical exercise on quality of life in individuals with spinal cord injury. *Spinal Cord*, 48(5), pp.393-399.
- Beck, A.T. and Alford, B.A. (2009). *Depression: Causes and treatment*. University of Pennsylvania Press.
- Bombardier, C.H., Richards, J.S., Krause, J.S., Tulskey, D. and Tate, D.G. (2004). Symptoms of major depression in people with spinal cord injury: implications for screening. *Archives of physical medicine and rehabilitation*, 85(11), pp.1749-1756.
- Capaul, M., Zollinger, H., Satz, N., Dietz, V., Lehmann, D. and Schurch, B. (1994). Analyses of 94 consecutive spinal cord injury patients using ASIA definition and modified Frankel score classification. *Spinal Cord*, 32(9), pp.583-587.
- Carlson, G.D., and Gorden, C. (2002). Current developments in spinal cord injury research. *The Spine Journal*, 2(2):116-128.
- Devivo, M.J. (2012). Epidemiology of traumatic spinal cord injury: trends and future implications. *Spinal cord*, 50(5), pp.365-372.
- Dijkers, M. (1997). Quality of life after spinal cord injury: a meta-analysis of the effects of disablement components. *Spinal cord*, 35(12).

- Dijkers, M.P. (2005). Quality of life of individuals with spinal cord injury: a review of conceptualization, measurement, and research findings. *Journal of Rehabilitation Research and Development*, 42(3), p.87.
- Ditor, D.S., Latimer, A.E., Ginis, K.M., Arbour, K.P., McCartney, N. and Hicks, A.L. (2003). Maintenance of exercise participation in individuals with spinal cord injury: effects on quality of life, stress and pain. *Spinal cord*, 41(8), pp.446-450.
- Elliott, T.R. and Kennedy, P. (2004). Treatment of depression following spinal cord injury: an evidence-based review. *Rehabilitation Psychology*, 49(2), p.134.
- Forchheimer, M. and Tate, D.G. (2004). Enhancing community re-integration following spinal cord injury. *Neuro Rehabilitation*, 19(2), pp.103-113.
- Foreman, P.E., Cull, J. and Kirkby, R.J. (1997). Sports participation in individuals with spinal cord injury: demographic and psychological correlates. *International Journal of Rehabilitation Research*, 20(2), pp.159-168.
- Fox, K.R. (2000). Self-esteem, self-perceptions and exercise. *International journal of sport psychology*.
- Fraenkel, J.R., Wallen, N.E. and Hyun, H.H (1993). *How to design and evaluate research in education* (Vol. 7). New York: McGraw-Hill.
- Ginis, K.A.M., Jörgensen, S. and Stapleton, J. (2012). Exercise and sport for persons with spinal cord injury. *PM&R*, 4(11), pp.894-900.
- Ginis, K.M., Jetha, A., Mack, D.E. and Hetz, S. (2010). Physical activity and subjective well-being among people with spinal cord injury: a meta-analysis. *Spinal Cord*, 48(1), pp.65-72.
- Ginis, K.M., Jetha, A., Mack, D.E. and Hetz, S. (2010). Physical activity and subjective well-being among people with spinal cord injury: a meta-analysis. *Spinal Cord*, 48(1), pp.65-72.

Gioia, M.C., Cerasa, A., Di Lucente, L., Brunelli, S., Castellano, V. and Traballes, M. (2006). Psychological impact of sports activity in spinal cord injury patients. *Scandinavian journal of medicine & science in sports*, 16(6), pp.412-416.

Graves, D.E. and Bombardier, C.H. (2008). Improving the efficiency of screening for major depression in people with spinal cord injury. *The journal of spinal cord medicine*, 31(2), p.177.

Groff, D.G., Lundberg, N.R. and Zabriskie, R.B. (2009). Influence of adapted sport on quality of life: Perceptions of athletes with cerebral palsy. *Disability and Rehabilitation*, 31(4), pp.318-326.

Hanson, C.S., Nabavi, D. and Yuen, H.K. (2001). The effect of sports on level of community integration as reported by persons with spinal cord injury. *American Journal of Occupational Therapy*, 55(3), pp.332-338.

Hartoonian, N., Hoffman, J.M., Kalpakjian, C.Z., Taylor, H.B., Krause, J.K. and Bombardier, C.H. (2014). Evaluating a Spinal Cord Injury–Specific Model of Depression and Quality of Life. *Archives of physical medicine and rehabilitation*, 95(3), pp.455-465.

Haskell, W.L., Lee, I.M., Pate, R.R., Powell, K.E., Blair, S.N., Franklin, B.A., Macera, C.A., Heath, G.W., Thompson, P.D. and Bauman, A.(2007). Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Circulation*, 116(9), p.1081.

Hicks, A.L., Martin, K.A., Ditor, D.S., Latimer, A.E., Craven, C., Bugaresti, J. and McCartney, N. (2003). Long-term exercise training in persons with spinal cord injury: effects on strength, arm ergometry performance and psychological well-being. *Spinal cord*, 41(1), pp.34-43.

- Hjeltnes, N. and Jansen, T. (1990). Physical endurance capacity, functional status and medical complications in spinal cord injured subjects with long-standing lesions. *Spinal Cord*, 28(7), pp.428-432.
- Hoffman, J.M., Bombardier, C.H., Graves, D.E., Kalpakjian, C.Z. and Krause, J.S.(2011). A longitudinal study of depression from 1 to 5 years after spinal cord injury. *Archives of physical medicine and rehabilitation*, 92(3), pp.411-418.
- Hoque, M.F., Grangeon, C. and Reed, K. (1999). Spinal cord lesions in Bangladesh: an epidemiological study 1994–1995. *Spinal cord*, 37(12).
- Hossain, M.S., Hossain, A., and Kulsum, U. (2008). Analysis of functional abilities with T7-L1 level of spinal injury patient at CRP. Bangladesh compared with standard functional expectation guide line, *Bangladesh Physiotherapy Journal*, 4(1):8-12.
- Hossain, M.S., Rahman, M.A., Herbert, R.D., Quadir, M.M., Bowden, J.L. and Harvey, L.A. (2015). Two-year survival following discharge from hospital after spinal cord injury in Bangladesh. *Spinal cord*.
- Islam, M.S., Hafez, M.A., and Akter, M. (2011). Characterization of spinal cord lesion in patients attending a specialized rehabilitation centre in Bangladesh. *Spinal Cord*, 49(7):783-6.
- Jans, L.A.W., Riedel, W.J., Markus, C.R. and Blokland, A. (2007). Serotonergic vulnerability and depression: assumptions, experimental evidence and implications. *Molecular psychiatry*, 12(6), pp.522-543.
- Judd, F.K. and Burrows, G.D. (1986). Liaison psychiatry in a spinal injuries unit. *Spinal Cord*, 24(1), pp.6-19.
- Kakulas, B.A. (2004). Neuropathology: the foundation for new treatments in spinal cord injury. *Spinal Cord*, 42(10), pp.549-563.

- Kalpakjian, C.Z., Bombardier, C.H., Schomer, K., Brown, P.A. and Johnson, K.L. (2009). Measuring depression in persons with spinal cord injury: a systematic review. *J Spinal Cord Med*, 32(1), pp.6-24.
- Kawanishi, C.Y., and Greguol, M. (2013). Physical activity, quality of life, and functional autonomy of adults with spinal cord injuries. *Adapted Physical Activity Quarterly*, 30(4):317–37.
- Kennedy, P., and Chessell, Z.J. (2013). Traumatic versus non-traumatic spinal cord injuries: are there differential rehabilitation outcomes?. *Spinal Cord*, 51:579-583.
- Kent, M.L. and Dorstyn, D.S. (2014). Psychological variables associated with employment following spinal cord injury: a meta-analysis. *Spinal cord*, 52(10), pp.722-728.
- Khan, M.S., Mahmood, S., Badshah, A., Ali, S.U. and Jamal, Y. (2006). Prevalence of depression, anxiety and their associated factors among medical students in Karachi, Pakistan. *JOURNAL-PAKISTAN MEDICAL ASSOCIATION*, 56(12), p.583.
- Kirshblum, S.C., Botticello, A.L., Dyson-Hudson, T.A., Byrne, R., Marino, R.J. and Lammertse, D.P. (2016). Patterns of Sacral Sparing Components on Neurologic Recovery in Newly Injured Persons with Traumatic Spinal Cord Injury. *Archives of physical medicine and rehabilitation*.
- Kong, C.Y., Hosseini, A.M., Belanger, L.M., Ronco, J.J., Paquette, S.J., Boyd, M.C., Dea, N., Street, J., Fisher, C.G., Dvorak, M.F., and Kwon, B.K. (2013). A prospective evaluation of hemodynamic management in acute spinal cord injury patients. *Spinal Cord*, 51(6):466–71.

- Krause, J.S., Kemp, B. and Coker, J. (2000). Depression after spinal cord injury: relation to gender, ethnicity, aging, and socioeconomic indicators. *Archives of Physical Medicine and Rehabilitation*, 81(8), pp.1099-1109.
- Lysack, C., Komanecky, M., Kabel, A., Cross, K., and Neufeld, S. (2007). Environmental factors and their role in community integration after spinal cord injury. *Canadian Journal of Occupational Therapy*, 74(5):243-254.
- Martin, J.J. (2013). Benefits and barriers to physical activity for individuals with disabilities: a social-relational model of disability perspective. *Disability and rehabilitation*, 35(24), pp.2030-2037.
- McVeigh, S.A., Hitzig, S.L. and Craven, B.C. (2009). Influence of sport participation on community integration and quality of life: a comparison between sport participants and non-sport participants with spinal cord injury. *The journal of spinal cord medicine*, 32(2), p.115.
- Medola, F.O., Busto, R.M., Marçal, Â.F., Achour Junior, A. and Dourado, A.C. (2011). The sport on quality of life of individuals with spinal cord injury: a case series. *Revista Brasileira de Medicin角度o Esporte*, 17(4), pp.254-256.
- Momin, A.K.M. (2003). Levels of Integration for People with Spinal Cord Injury in Bangladesh.
- Moore, K. L., and Dalley, A.F. (2006). Clinically oriented anatomy. Philadelphia, PA: Lippincott, Williams & Wilkins.
- Mota-Pereira, J., Silverio, J., Carvalho, S., Ribeiro, J.C., Fonte, D. and Ramos, J. (2011). Moderate exercise improves depression parameters in treatment-resistant patients with major depressive disorder. *Journal of psychiatric research*, 45(8), pp.1005-1011.

- Mothe, A.J., and Tator, C.H. (2013). Review of transplantation of neural stem progenitor cells for spinal cord injury. *International Journal of Developmental Neuroscience*, 31(7):701–713.
- Muraki, S., Tsunawake, N., Hiramatsu, S. and Yamasaki, M.(2000).The effect of frequency and mode of sports activity on the psychological status in tetraplegics and paraplegics. *Spinal Cord*, 38(5).
- Nash, M.S. (2005). Exercise as a Health-Promoting Activity Following Spinal Cord Injury. *Journal of Neurologic Physical Therapy*, 29(2), pp.87-103.
- New, P.W., Farry, A., Baxter, D., and Noonan, V.K. (2013). Prevalence of non-traumatic spinal cord injury in Victoria, Australia. *Spinal Cord*, 51:99–102.
- New, PW. and Marshall, R. (2013). International spinal cord injury data sets for non-traumatic spina cord. *Spinal Cord*, doi:10.1038/sc.2012.160.
- Ning, Wu, G.Z., Li, Q., Feng, Y.L., and Shi-Qing, (2012). Epidemiology of traumatic spinal cord injury in Asia: a systematic review. *Journal of Spinal Cord Medicine*, 35(4): 229–239.
- Norton, L. (2010). *Spinal Cord Injury, Australia, 2007-08* (No. 52). Australian Institute of Health and Welfare.
- Nwankwo, O.E., and Uche, E.O., (2013). Epidemiological and treatment profiles of spinal cord injury in southeast Nigeria. *Spinal Cord*, 51:448–52.
- Oh, S.J., Shin, H.I., Paik, N.J., Yoo, T. and Ku, J.H. (2006). Depressive symptoms of patients using clean intermittent catheterization for neurogenic bladder secondary to spinal cord injury. *Spinal Cord*, 44(12), pp.757-762.

Oliffe, J.L., Ogradniczuk, J.S., Bottorff, J.L., Johnson, J.L. and Hoyak, K. (2012). "You feel like you can't live anymore": Suicide from the perspectives of Canadian men who experience depression. *Social Science & Medicine*, 74(4), pp.506-514.

Osterthun, R., Post, M.W.M., van Asbeck, F.W.A., van Leeuwen, C.M.C. and van Kopenhagen, C.F. (2014). Causes of death following spinal cord injury during inpatient rehabilitation and the first five years after discharge. A Dutch cohort study. *Spinal cord*, 52(6), pp.483-488.

Oyinbo, C.A., (2011). Secondary injury mechanisms in traumatic spinal cord injury : a nugget of this multiply cascade. *Acta Neurobiologiae Experimentalis*, 71:281–299.

Patrick, D.L. (1997). Rethinking prevention for people with disabilities Part I: a conceptual model for promoting health. *American Journal of Health Promotion*, 11(4), pp.257-260.

Phalkey, R., Reinhardt, J.D. and Marx, M. (2011). Injury epidemiology after the 2001 Gujarat earthquake in India: a retrospective analysis of injuries treated at a rural hospital in the Kutch district immediately after the disaster. *Global health action*, 4.

Post, M.W.M. and Van Leeuwen, C.M.C. (2012). Psychosocial issues in spinal cord injury: a review. *Spinal Cord*, 50(5), pp.382-389.

Rabadi, M.H., Mayanna, S.K., and Vincent, A.S., (2013). Predictors of mortality in veterans with traumatic spinal cord injury. *Spinal Cord*, 51(10):784–88.

Rathore, M.F.A., Rashid, P., Butt, A.W., Malik, A.A., Gill, Z.A. and Haig, A.J. (2007). Epidemiology of spinal cord injuries in the 2005 Pakistan earthquake. *Spinal cord*, 45(10), pp.658-663.

Rauch, A., Fekete, C., Oberhauser, C., Marti, A. and Cieza, A. (2014). Participation in sport in persons with spinal cord injury in Switzerland. *Spinal cord*, 52(9), pp.706-711.

- Razzak, A.T.M.A., Helal, S.U., and Nuri, R.P., (2011). Life expectancy of persons with spinal cord injury (SCI) treated in a rehabilitation centre at Dhaka, Bangladesh. *Disability, CBR and Inclusive Development Journal*, 22(1):114-123.
- Scelza, W.M., Kirshblum, S.C., Wuermsler, L.A., Ho, C.H., Priebe, M.M. and Chiodo, A.E. (2007). Spinal cord injury medicine. 4. Community reintegration after spinal cord injury. *Archives of physical medicine and rehabilitation*, 88(3), pp.S71-S75.
- Scivoletto, G., Petrelli, A., Lucente, L.D. and Castellano, V. (1997). Psychological investigation of spinal cord injury patients. *Spinal cord*, 35(8), pp.516-520.
- Shapiro, D.R. and Martin, J.J. (2010). Multidimensional physical self-concept of athletes with physical disabilities.
- Shin, J.C., Goo, H.R., Yu, S.J., Kim, D.H. and Yoon, S.Y. (2012). Depression and quality of life in patients within the first 6 months after the spinal cord injury. *Annals of rehabilitation medicine*, 36(1), pp.119-125.
- Simpson, E.L., Duenas, A., Holmes, M.W., Papaioannou, D. and Chilcott, J. (2009). Spinal cord stimulation for chronic pain of neuropathic or ischaemic origin: systematic review and economic evaluation.
- Stillson, V.G. (2006). *Case study of participation and perceptions of wheelchair athletes in wheelchair sports*. ProQuest.
- Tasiemski, T., Bergström, E., Savic, G. and Gardner, B.P. (2000). Sports, recreation and employment following spinal cord injury—a pilot study. *Spinal cord*, 38(3).
- Tasiemski, T., Kennedy, P., Gardner, B.P. and Blaikley, R.A. (2004). Athletic Identity and Sports Participation in People with Spinal Cord Injury. *Adapted Physical Activity Quarterly*, 21(4), pp.364-378.

- Tate, D.G., Kalpakjian, C.Z. and Forchheimer, M.B. (2002). Quality of life issues in individuals with spinal cord injury. *Archives of physical medicine and rehabilitation*, 83, pp.S18-S25.
- Thuret, S., Moon, L.D., and Gage, F.H., (2006). Therapeutic interventions after spinal cord injury. *Nature Reviews Neuroscience*, 7(8):628-643.
- Tramonti, F., Gerini, A. and Stampacchia, G.(2014).Individualised and health-related quality of life of persons with spinal cord injury.*Spinal cord*, 52(3).
- Van den Berg, M.E., Castellote, J.M., de Pedro-Cuesta, J. and Mahillo-Fernandez, I. (2010). Survival after spinal cord injury: a systematic review. *Journal of neurotrauma*, 27(8), pp.1517-1528.
- Whiteneck, G, Meade, M.A, Dijkers, M, Tate, D.G, Bushnik, T, and Forchheimer, M.B. (2004) „Environmental Factors and Their Role in Participation and Life Satisfaction after Spinal Cord Injury“, *Archives of Physical Medicine and Rehabilitation*, 85, pp.1793-803
- Wilder, E.I. (2006). *Wheeling and dealing: living with spinal cord injury*. Vanderbilt University Press.
- Wind, W.M., Schwend, R.M. and Larson, J. (2004).Sports for the physically challenged child.*Journal of the American Academy of Orthopaedic Surgeons*, 12(2), pp.126-137.
- Winslow, C., and Rozovsky, J., (2003). Effect of spinal cord injury on the respiratory system. *American Journal of Physical Medicine & Rehabilitation*, 82(10):803-814.
- Wollaars, M.M., Post, M.W., van Asbeck, F.W. and Brand, N. (2007). Spinal cord injury pain: the influence of psychologic factors and impact on quality of life. *The Clinical journal of pain*, 23(5), pp.383-391.

Wu, Q., Li, Y.L., Ning, G.Z., Feng, S.Q., Chu, T.C., Li, Y., Hao, Y. and Wu, Q.L. (2012). Epidemiology of traumatic cervical spinal cord injury in Tianjin, China. *Spinal cord*, 50(10), pp.740-744.

Wyndaele, M. and Wyndaele, J.J. (2006). Incidence, prevalence and epidemiology of spinal cord injury: what learns a worldwide literature survey. *Spinal cord*, 44(9), pp.523-529.

Wyndaele, M., and Wyndaele, J.J., (2006). Review incidence , prevalence and epidemiology of spinal cord injury : what learns a worldwide literature survey. *Spinal Cord*, 44:523–52.

Yazicioglu, K., Yavuz, F., Goktepe, A.S. and Tan, A.K.(2012). Influence of adapted sports on quality of life and life satisfaction in sport participants and non-sport participants with physical disabilities. *Disability and health journal*, 5(4), pp.249-253.

APPENDICES

প্রশ্নবলী

সনাক্তকারী সংখ্যাঃ

সাক্ষাৎকারগ্রহণেরতারিখঃ

মোবাইল নাম্বার :

ঠিকানা :

ভূইল চেয়ার ক্রীড়ায়অংশগ্রহণ : হ্যাঁ: না:

বিষয়তাপরিমাপক

নিচেরবিবৃতি গুলোপড়েগত এক সপ্তাহেরমধ্যে এই বিবৃতি গুলোআপনার ক্ষেত্রে কতটাপ্রযোজ্য তাবিবৃতিরপার্শ্বের সম্ভাব্য পাঁচটিউত্তরের যেটিপ্রযোজ্য সেটিরঘরেটিক(V) চিহ্নদিয়েনির্দেশ করুন। আপনাকে সম্ভাব্য এই পাঁচটিউত্তর থেকে যে কোনএকটিকে বেছেনিতেহবেএবং সবগুলোপ্রশ্নেরউত্তরদিতেহবে। অনুগ্রহকরে লক্ষ্য করুন সবগুলোবিবৃতিরউত্তর দিয়েছেনকিনা।

বিবৃতিসমূহ	একেবারেইপ্রযোজ্য নয়	প্রযোজ্য নয়	মাঝামাঝি	কিছুটা প্রযোজ্য	পুরোপুরি প্রযোজ্য
১. আমার অশালিড় লাগে।					
২. ইদানিং আমি মনমরা থাকি।					
৩. আমার ভবিষ্যত অন্ধকার।					
৪. ভবিষ্যতে আমার অবস্থা দিন দিন আওঁ খারাপ হবে।					
৫. আমার সব শেষ হয়ে গেছে।					
৬. আমি মনে করি যে, জীবনটা বর্তমানে খুব বেশীকষ্টকর।					

৭. বর্তমানে আমি অনুভব করি যে মানুষ হিসাবে আমি সম্পূর্ণ ব্যর্থ।					
৮. আমি কোথাও আনন্দ-ফুর্তি পাই না।					
৯. নিজেকে খুব ছোট মনে হয়।					
১০. সবকিছুতে আমার আত্ম বিশ্বাস কমে গেছে।					
১১. আমার মনে হয় মানুষ আমাকে করুণা করে।					
১২. জীবনটা অর্থহীন।					
১৩. প্রায়ই আমার কান্না পায়।					
১৪. আমি প্রায়ই বিরক্ত বোধ করি।					
১৫. আমি কোন কিছুতেই আগ্রহ পাইনা।					
১৬. আমি ইদানিং চিন্ত্র করতে ও সিদ্ধান্তে নিতে পারিনা।					
১৭. আমি আজকাল অনেক কিছুতেই মনোযোগ দিতে পারিনা।					
১৮. আমি আগের মতো মনে রাখতে পারিনা।					
১৯. আমি দুর্বল বোধকরি এবং অল্পতেই ক্লান্ত হয়ে পড়ি।					
২০. আমি এখন কম ঘুমাই।					
২১. আমি এখন বেশী ঘুমাই।					
২২. আমার মেজাজ খিঁচখিঁটে হয়ে গেছে।					
২৩. আমার ক্ষুধা কমে গেছে।					
২৪. আমার ক্ষুধা বেড়ে গেছে।					
২৫. আমার ওজন কমে গেছে (ইচ্ছাকৃতভাবে ওজন নিয়ন্ত্রণের চেষ্টা করার ফলে নয়)।					

২৬.আমার মনে হয় যে আমার কাজকর্মের গতি কমে গেছে।					
২৭.হাসির কোন ঘটনা ঘটলেও আমি আর হাসতে পারি না।					
২৮.যৌন বিষয়ে আমার আগ্রহ কমে গেছে।					
২৯.সামাজিক কাজকর্মে আগের মতো অংশগ্রহণ করতে পারি না।					
৩০.শিক্ষা বা পেশাগত কাজকর্ম আগের মতো করতে পারি না।					

Total:

Severity norm of the depression scale and classification:

Severity of depression	Corresponding scores of depression scale
Minimal	30-100
Mild	101-114
Moderate	115-123
Severe	124-150

Developed by: Zahir Uddin and Dr. MahMudur Rahman, Department of Clinical Psychology, D.U.

Questionnaire

Identification number:	Date of Interview
Contact number:	
Address:	
Date of injury	Date of assessment

Participation on sports: - Yes No

Depression Measurement Scale

Dear Sir/Madam, Please read the following statements and indicate how much each or those statements are applicable for you in the last month. Please indicate your answer by putting tick (✓) mark to one of the possible five answers given in right side of each statement. You should not give more than one answer for each item. Please check that you answer all the statements. Thank you for your co-operation. Let us start now.

SL No	Statement	Not At all Applicable	Not Applicable	Moderately Applicable	Somewhat Application	Fully Applicable
1.	I feel lack of peace in my mind.					
2.	Now a days I experience low mood.					
3.	My future is dark.					
4.	My condition will be worse in future.					
5.	I am finished.					
6.	Currently I think that my life is very painful.					
7.	Currently I feel that I am a complete failure.					
8.	I find no pleasure anywhere.					
9.	I feel myself very inferior.					
10.	Myself-esteem has reduced in every respect.					
11.	I think that I am an object of pity to the people.					
12.	Life is meaningless.					
13.	I often feel like crying.					
14.	Often I feel irritated.					
15.	I feel no interest in anything.					

16.	Now a days I cannot think and cannot take decisions.					
17.	Now a days cannot concentrate in many things.					
18.	I cannot remember as before.					
19.	I feel become weak and become exhausted easily.					
20.	Currently I sleep less.					
21.	Currently I sleep more.					
22.	My temper has turned irritable.					
23.	My appetite has reduced					
24.	My appetite has increased					
25.	My weight has reduced (No intentional attempt to control weight).					
26.	I think speed of my work has reduced					
27.	I cannot laugh even when there is a funny event					
28.	My desire in 6 has reduced					
29.	I cannot participate in social activities as I used to					
30.	I cannot do academic or professional activities as I used to.					
Total =						

Severity norm of the depression scale and classification:

Severity of depression	Corresponding scores of depression scale
Minimal	30-100
Mild	101-114
Moderate	115-123
Severe	124-150

Developed by :Zahir Uddin and Dr. Mahmudul Rahman, Department of clinical psychologi

Date: January 11, 2016

January 21, 2016

The Chairman
Institutional Review Board (IRB)
Bangladesh Health Professions Institute (BHPI)
CRP-Savar, Dhaka-1343, Bangladesh

Subject: Application for review and ethical approval.

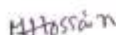
Sir,

With due respect I would like to draw your kind attention that I am a student of M.Sc. in Physiotherapy program at Bangladesh Health Professions Institute (BHPI)- an academic institute of CRP under Faculty of Medicine of University of Dhaka (DU). This is a 2-year full-time course under the Medicine faculty of Dhaka University. I have to conduct a thesis entitled, "level of depression of spinal cord injury patients before and after participating sports at CRP: a comparison study" under honorable supervisor, Dr. Kamal Ahmed, Associate Professor, BHPI, CRP, Savar, Dhaka-1343. The purpose of the study is to explore the effectiveness of wheelchair sports to reduce depression level for spinal cord injury patients.

The sample will collect from the Spinal cord Injury unit of Centre for the Rehabilitation of the Paralyzed (CRP). The data will be collect by a standard questionnaire. The participants will be selected including who has started at least wheelchair mobility. Confidentiality and anonymity will be maintained. Informed consent will be taken from every participant before participating the study.

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

Sincerely yours,



Muzaffor Hossain
Student of M.Sc. in Physiotherapy
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Recommendation from the thesis supervisor:



Dr. Kamal Ahmed
Associate professor
BHPI, CRP, Savar, Dhaka-1343.

Attachment: Thesis Proposal including Questionnaire.



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

Ref. CRP-BHPI/IRB/02/16/036

Date: 27.02.2016

To,
Muzaffor Hossain
Part – II, M.Sc. in Physiotherapy
Session: 2013-2014, DU Reg. No.:2260
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

Subject: Approval of the thesis proposal – “Level of depression of spinal cord injury patients before and after participating sports at CRP: A comparison study” by ethics committee.

Dear Muzaffor Hossain,
Congratulation!

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on January 21, 2016 to conduct the above mentioned thesis, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

SL#	Name of the Documents
1	Thesis Proposal
2	Questionnaire
3	Information sheet & consent form.

Since the study involves questionnaire have no likelihood of any harm to the participants and have possibility of benefit patients by measuring the Level of depression of spinal cord injury patients before and after participating sports at CRP, the members of the Ethics committee has approved the study to be conducted in the presented form at the meeting held at 08:30 AM on February 25, 2016 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 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,

S M Ferdous Alam
Assistant Professor
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

Permission Letter

Dated: 2nd February, 2016

To

The Head of Medical Service,

Centre for the Rehabilitation of the Paralysed (CRP)

Savar, Dhaka-1343

Through: The course co-coordinator, M. Sc. in Physiotherapy, BHPI, Savar, Dhaka-1343.

Sub: Prayer for permission to collect data from Spinal Cord Injury unit at CRP-Savar CRP-to conduct a research project.

Sir,

With due respect and humble submission to state that, I am a student of M.Sc. in Physiotherapy at Bangladesh Health Professional Institute (BHPI). As a part of our course curriculum, I have to conduct a research project for the partial fulfillment of the requirement for the degree of M.Sc. in Physiotherapy. My dissertation title is "LEVEL OF DEPRESSION OF SPINAL CORD INJURY PATIENTS BEFORE AND AFTER PARTICIPATION IN SPORTS AT CRP: A COMPARISON STUDY". The aim of the study is to identify Level of depression of spinal cord injury patient before and after participating sports. This study will be done by using quantitative method (Quasi Experimental design) which will be an experimental study in the clinical setting at CRP-Savar. I have chosen Spinal Cord Injury unit to collect data as CRP is the specialized hospital for spinal cord lesion patient rehabilitation. So for collecting the data from the Patient with Spinal Cord Injury who are receiving treatment in Spinal Cord Injury unit under your department.

So, I therefore pray and hope that you would kind enough to give me the permission to collect data and complete the project successfully from your department and oblige thereby.

Yours faithfully

Muzaffor Hossain
Muzaffor Hossain
M.Sc. in Physiotherapy
BHPI, CRP, Savar, Dhaka-1343

Permitted.
Sgt 02/02/2016
DR. SAYEED UDDIN HELAL
Head of the Department of Physiotherapy &
Head of the Centre for the Rehabilitation of the Paralyzed (CRP)

সম্মতিপত্র / অনুমতিপত্র

চিকিৎসাকেন্দ্র : পক্ষাঘাতগ্রস্থদেরপুনর্বাসন কেন্দ্র (সি.আর.পি) সাভারশাখা।

এ অধ্যায়ন'পক্ষাঘাতগ্রস্থ' রোগীদের ক্রীড়ায় অংশ গ্রহণের আগে এবং পরে বিষন্নতা পরিমাপক তুলনাসম্পর্কিত গবেষণা। গবেষক মুজাফফর হোসেন এম পিটি দ্বিতীয় বর্ষের একজন ছাত্র এবং এই গবেষণাতার অধ্যয়নের অংশ। (নিম্নোক্ত তথ্যাদি পাঠকরর পর অধ্যয়নে অংশগ্রহণকারীগণ অংশগ্রহণ করার জন্য আমন্ত্রিত। এই অধ্যয়ের লক্ষ্য হল 'পক্ষাঘাতগ্রস্থ' রোগীদের ক্রীড়ায় অংশগ্রহণের আগে এবং পরে বিষন্নতা পরিমাপ করা এবং তাতেও বিষন্নতার তুলনাকরায় পরবর্তী সময়ে বিষন্নতা চিকিৎসার ক্ষেত্রে সহায়ক হবে। গবেষণাটিতে বিষন্নতাকমাতে খেলাধুলার ভূমিকা বের করতে সাহায্য করবে। এই গবেষণায় অংশগ্রহণের কারণে আপনার চিকিৎসার কোনরকমের অসুবিধা/ক্ষতি হবেনা এবং আপনার ব্যক্তিগত সকল তথ্য গোপন রাখা হবে/ গবেষক গোপনীয়তার ক্ষা করবেন।

প্রশ্নোত্তরপর্বের যে কোনমুহুর্তে আপনি সম্মতিপ্রত্যাহার এবং কোনপ্রশ্নের উত্তর প্রদানের অপারগতা প্রকাশের ব্যাপারে আপনার সম্পূর্ণ অধিকার রয়েছে। এই গবেষণায় প্রাপ্ত তথ্য সম্পূর্ণভাবে গোপনীয় থাকবে এবং অংশগ্রহণকারীকে ব্যক্তিগতভাবে গবেষণার ফল প্রকাশের সময় চিহ্নিত করা হবেনা।

.....

রোগীর স্বাক্ষর

.....

তারিখ :

.....

গবেষকের স্বাক্ষর

.....

তারিখ :

Consent form

Clinical setting- Centre for the Rehabilitation of the paralyzed (CRP)—Savar.

The title entitled “Level of depression of spinal cord injury patients before and after participating sports at CRP: A comparison study”. The researcher Muzaffor Hossain is a student of B.H.P.I in M. S.c PT 2nd year and it is a part of his study. The participant is invited to participate in the study after reading the following information.

The purpose of the study is to explore the effectiveness of sports to reduce depression level for spinal cord injury patients.

. This will help to find out role of sports to reduce the depression level of spinal cord injury patients. For this research, the participant would need to answer some questions. This will take 30 minute. The study does not cause any risk or harm for your treatment. All information provided by you will be treated as confidential.

Your participation in this study is voluntary you may withdraw 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.

In the event of any report or publication, it will be ensured that the source of information remains anonymous.

.....

Signature of the patient

.....

Date:

.....

Signature of Interviewer

.....

Date: