“Level of cognitive status among the person with spinal cord injury (SCI) patients in tertiary rehabilitation Hospital”

By:

Mst. Sharmin Aktar

February, 2021 held in March, 2022

This thesis is submitted in total fulfilment of the requirements for the subject RESEARCH 2 & 3 and partial fulfilment of the requirements for the degree of

Bachelor of Science in Occupational Therapy

Bangladesh Health Professions Institute (BHPI)

Faculty of Medicine

University of Dhaka

Project paper completed by:

Mst. Sharmin Aktar
4th year, B.Sc. in Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Centre for the Rehabilitation of the Paralysed (CRP)
Chapain, Savar, Dhaka: 1343

……
Signature

Supervisor's name, designation, and signature:

Md. Saddam Hossain
Lecturer, Department of Occupational Therapy
Department of Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Centre for the Rehabilitation of the Paralysed (CRP)
Chapain, Savar, Dhaka: 1343

……
Signature

Head of the department's name, designation, and signature:

Sk. Moniruzzaman
Associate Professor & Head
Department of Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Centre for the Rehabilitation of the Paralysed (CRP)
Chapain, Savar, Dhaka: 1343

……
Signature

Statement of authorship

Except where it is made in the text of the thesis, this thesis contains no material published elsewhere or extracted in whole or in part from a thesis presented by me for any other degree or seminar. No other person's work has been used without due acknowledgement in the main text of the thesis. This thesis has not been submitted for the award of any other degree in any other tertiary institution. The ethical issue of the study has been strictly considered and protected. In case of dissemination of the findings of this project for future publication, the research supervisor will be highly concerned, and it will be duly acknowledged as an undergraduate thesis.

Mst. Sharmin Aktar
4th year, B.Sc. in Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Centre for the Rehabilitation of the Peralysed (CRP)
Chapain, Savar, Dhaka: 1343

……
Signature

Acknowledgement

I would wish to pay my respect and gratitude's to Almighty and merciful Allah who has given me the ability, confident and talent to perform my study with a perfect manner and way. I also gave my special thanks to my beloved parents who continuously encouraged me to complete my study from the start to the end. It might not are possible without their help and also the sacrifices that they made. Throughout this journey, there have many of us by whom I'm forever grateful.

I'd first and foremost wish to dedicate my acknowledgement to my honorable supervisor, Md. Saddam Hossain, Lecturer of Occupational Therapy Department for his continual support, guidance, patience and encouragement throughout this research. My special thanks attend Arifa Jahan Ema madam, lecturer of Occupational Therapy Department, Md. Moshiur Rahman sir, lecturer of Occupational Therapy Department and Kamrunnahar Koly madam, Senior Clinical Occupational Therapist for supporting me throughout the study.

I would wish to thank my senior sister Salma Sultana, Intern Occupational Therapist. I'm so grateful to my dearest two friends Bethi akther and Hafizur Rahman for helping me to translate my study tool English to Bengali and Bengali to English. I also give the special thanks to all participants who gave me the outstanding and authentic information to satisfy my study. Thanks to all of my friends for giving their direct and indirect inspiration. My apologies go t with the persons if I miss out anyone unintentionally. Finally, I would like to dedicate my research to my honorable parents.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

BCRS - Brief Cognitive Rating Scale

BHPI- Bangladesh Health Professions Institute

CRP – Centre for the Rehabilitation of the Paralysed

GDS – Global Deterioration Scale

IRB – Institutional Review Board

ICRD - International Collaboration on Repair Discoveries

MTBI – Mild Traumatic Brain Injury

NIHTB-CB – National Institute of Health Toolbox- Cognitive Battery

QOL - Quality of Life

SCI - Spinal Cord Injury

SPSS – Statistical Package for Social Science

TBI – Traumatic Brain Injury

Abstract

Background: SCI is both physical and psychological challenge in which a person has changed life immediately and often permanently. Individuals with SCI face different types of additional challenges during rehabilitation process such as cognitive impairment. Cognitive impairment affects the rehabilitation and community re- integration and also changes their Quality of Life (QOL).

Objective: This study aim is to identify the level of cognitive status in patients with SCI in a tertiary rehabilitation hospital and showed the association between demographic information (age, gender, education, injury type, neurological level) and cognitive status.

Methodology: The study design was cross-sectional design in quantitative study. Participants (n=65) were selected purposively from a tertiary rehabilitation hospital.

Result: Participants mean age was 36.62 years and SD ± 13.29**.** Male was 76.9% and female was 23.1% and ratio 3.3:1. Participant's cognitive status according to BCRS scale: overall level of cognitive is 77.15%, level of concentration is 69.72%, recent memory 79.96%, past memory 78.61%, orientation 78.2% and functioning and self-care 79.3%. There were no strong association between demographic information (age, gender, education level, injury type and neurological level) and level of cognitive.

Conclusion: These study findings provided information about cognitive impairment of SCI patient, though the percentage is little. So, cognitive assessment is important for the individuals with SCI that it may help to simplify and predict the functional challenges of SCI patient.

Key word: SCI, Level of cognitive status, Quality of Life, Community re-integration etc.

Chapter: I

1.1 Background:

Suffering from a spinal cord injury (SCI) is both physically and psychologically traumatic experience. When a person suffers a SCI, their life is changed immediately, profoundly, and often permanently. Many people with SCI are transferred to an inpatient rehabilitation facility after acute stabilization and treatment of their most serious physical concerns, to begin the difficult process of learning, practicing, and integrating the myriad new skills required for daily living with a SCI. Persons with SCI often face the additional challenge of undergoing rehabilitation with pre-injury or accident-related cognitive impairment due to both the nature of how the majority of SCIs occur and the variety of possible sources of premorbid cognitive impairment (Ann Marie, 2008).

Despite the fact that cognition has an impact on self-care and community reintegration (Bradbury et al, 2008), little research on the cognitive correlates of SCI has been published. Cognitive limitations may be misinterpreted in clinical settings as noncompliance with treatment, inability to learn, poor coping, and / or low motivation (Bradbury et al., 2008, Inoue et al., 2013, Kushner & Alvarez, 2014). As a result of a traumatic injury or disease, the spinal cord is severely bruised, compressed, lacerated, or severed, resulting in SCI (Molina, et al. 2018).

SCI causes a loss or reduction in sensation and motor control in body areas normally served by nerves projecting to and from the spinal cord below the injury level. High-level tetraplegia can result from damage to the spinal cord (e.g., regions C4 C5) (paralysis of

all four limbs and respiratory musculature). Over the last two decades, advances in medical care have resulted in an ever-increasing number of SCI patients surviving the initial trauma and medical sequelae of such injuries, with an ever-increasing number of these patients living into old age. As these increasing numbers of SCI patients get older, they, like other older adults, can expect to experience more age-related cognitive changes. Changes in sensory acuity, memory ability, particularly in the domain of working memory, and other mental performance changes associated with a general slowing of perceptual and cognitive functions may occur as part of normal aging (Wingfield A, et al. July 2003).

SCI is thought to be linked to a high rate of cognitive impairment, which can make recovery more difficult (Ashley Craig, et al. 2017). Nearly 29% of adults with SCI had lower cognitive performance that was thought to be indicative of cognitive impairment. An adult with SCI had a nearly 13-fold higher risk of cognitive impairment than someone without a SCI (Ashley Craig, et al. 2017). SCI is a physically and psychologically debilitating event in which a person's life is altered immediately and possibly permanently (Sachdeva, et al. 2018).

Low scores across the most key areas of cognition, including attention and concentration, processing speed, episodic memory, and executive functioning, have been documented in studies of specific cognitive deficits following SCI (Cohen et al., 2017). A systematic review research conducted in America with international collaboration there were five studies reported the incidence of cognitive impairment using Functional Independence Measure (FIM) instrument. The largest of these (n = 233,778) found that following SCI, understanding (35%), expression (34%), social interaction (39%), memory (45%), and

problem-solving (50%) all showed acute impairment. Impaired cognition was seen in 52% of tetraplegia patients and 33% of paraplegia patients at the time of admission, and 19 percent in both groups at discharge (Sachdeva et al., 2018).

Individually, the incidence of cognitive impairment in the chronic stage was established. For the first time, this study revealed that cognitive impairment in the chronic stage is more severe and common than in the subacute stage. In the memory domain, the change could indicate a problem with the semantic strategy of recognition and encoding (this strategy is worse in chronic SCI patients than in subacute SCI patients). There was no evidence of cognitive impairment in this investigation that was exclusively evident in the subacute stage of the SCI. The majority of the altered cognitive processes were compromised in the subacute stage and gradually worsened. From a clinical point of view, the presence of cognitive impairment has been proven, which may obstruct the most intensive and critical period of rehabilitation. Furthermore, cognitive impairment might affect an individual's quality of life and potential reintegration into society after the initial stage of rehabilitation is completed (Molina, et al. 2018).

1.2 Justification of the study:

In this study, the student researcher will find out the cognitive status among the person with spinal cord injury patients. Cognitive dysfunction may be important beyond the end of the first stage of rehabilitation as it can affect an individual’s quality of life and possible integration in society (Brígida Molina-Gallego, et al. 2021). Cognitive impairment has been identified as a potential point of intervention for protecting and improving QOL (Quality of Life) (Shauna Dudley-Javoroski, et al. 2020). There are several international studies on cognition of spinal cord injury patients. In Bangladesh,

there is lots of research on spinal cord injury but no research regarding their cognition. That is why, the student researcher chose to research on Cognition among individuals with the spinal cord injury patient. In this research, cognitive status of the spinal cord injury patients will be known, and it will give a new insight for the spinal cord injury patient. If the result is positive, the clinicians will be able to work on the prevention of possible risk for the patient who has mild to severe cognitive impairment in the rehabilitation process.

1.3 Operational definition:

Cognition: Cognition is the process of acquiring and understanding knowledge through our thoughts, experiences, and senses (Cognitive Processes in Learning: Types, Definition & Examples, n.d). It is the process of knowing where awareness and judgment both are the part of cognition. The mental processes that lead to the acquisition of information. Perception, logic, and possibly intuition are among them (*Cognition*, 2021).

Spinal Cord Injury: A spinal cord injury is damage to the spinal cord that causes temporary or permanent changes in its function. Symptoms may include loss of muscle function, sensation or autonomic function in the parts of the body served by the spinal cord below the level of injury ("spinal cord injury", 2004). A spinal cord injury (SCI) is a medically complex and life-disrupting condition which leads to a wide range of functional impairments and health-related problems (Kirchberger I et al. 2010).

Concentration: The ability to control one's attention according to one's will is known as concentration. It is a term that describes the capacity to control one's attention. It is the ability to concentrate one's thoughts on a single topic, object, or thinking without being distracted (Sasson, 2021).

Memory: Memory is the ability of the brain to encode, store, and retrieve data or information as needed. It is the process of storing information in order to impact future behavior through time. Language, relationships, and personal identity would be hard to grow if past events could not be remembered (Wikipedia contributors, 2022).

Orientation: Orientation is a mental process in which you are aware of three dimensions: time, place, and person. Disorientation is caused by problems with orientation, which can be caused by a variety of circumstances ranging from delirium to intoxication. Disorientation usually occurs first in time, then in place, and eventually in person (Wikipedia contributors, 2022).

Chapter: II

2. Literature review:

Studies on cognition after spinal cord injury were searched using PubMed and Goggle Scholar database. 27 literatures were checked. From them 11 articles were directly related with my study and 16 articles were omitted. After reviewing related articles, the findings are given below:

Cognitive impairment after spinal cord injury:

Sachdeva et al., 2018 reported that persons with spinal cord injuries have cognitive impairment which is strongly reported in several studies. A quantitative study at Sydney said that the risk of cognitive impairment in an adult with SCI is about 13 times higher than in a person without SCI (Craig et al., 2017). A systematic review study conducted at America with International collaboration; there were 70 studies which selected to report cognitive impairments after SCI. For this review, 21 studies directly compared cognitive function between persons with SCI and able-bodied control. The results of the remaining 49 studies, which did not include an able-bodied control group, were reported on the basis of normative data. From the 21 studies which were able-bodied controls reported that cognitive deficit showed in 15 studies and 6 studies have no significant changes in persons with SCI. Of the 49 studies where there were no able-bodied controls, significant deficits reported in cognitive functioning of 23 studies, whereas scores in 26 studies were reported to be within normative range (Sachdeva et al., 2018). Another study at Sydney reported that approximately 29% of adults with SCI are believed to have decreased cognitive performance, indicating that this is an indicator of cognitive impairment (Craig

et al., 2017). In University of Delaware, Newark, 156 community-dwelling persons with SCI were recruited to compare the cognitive profiles of a well-characterized sample of adults with or without SCI. Lower score were shown of persons with SCI on NIHTB-CB (National Institutes of Health Toolbox Cognitive Battery) and also reported that most difficulty had found on cognition of individuals with SCI (Cohen et al., 2017). A meta-analytic study conducted in USA, this study compared to people who only had a traumatic SCI, those who had a co-occurring MTBI (Mild Traumatic Brain Injury) showed no signs of significantly more impairment on neuropsychological tests. More diversity in neuropsychological test performance was explained by socio-demographic, pre-injury, and medical variables than by MTBI. Education was positively associated with better neuropsychological test performance, which was consistent with previous research, whereas African-American race and self-reported pre-injury history of learning problems were associated with lower test performance. Days from injury to rehabilitation admission, as well as the type of injury, had better links to neuropsychological test performance than medically verified MTBI. (Macciocchi et al.,2013). A prospective observational study was conducted in Canada; this study reported that individuals with SCI frequently experience cognitive impairment. This study looked at the relationship between cognitive functional profiles during inpatient hospitalization and depression and life satisfaction six months later in people with SCI. There were three distinct groups of people, each distinguished by their cognitive abilities. The majority of people (class 1 [54%]) had normal cognition in all domains. According to the findings, there is a group of people with delayed memory impairment (class 2 [26%]), as well as a group of people with impaired cognition across various domains (class 3 [20%]) (Elizabeth et al. 2009).

The causes of cognitive deficit of spinal cord injury:

Merrill et al., 2009 said that there are many reasons why people with spinal cord injury may have cognitive deficiency. Firstly, they may obtain premorbid challenges those challenges can affect their cognition. Secondly, in another study reported that, person with spinal cord injury may have concomitant Traumatic Brain Injury (TBI) for this reason may happen the incidence of cognitive impairment (Hagen et al., 2010). Finally, some of the results and secondary complications (such as Mood disorders) also can be the cause of cognitive deficit (Bonanno et al., 2012). A systematic review study with international collaboration quantitatively reported that the reason behind the cognitive impairment of SCI patient is brain injury, psychological or somatic comorbidities, decentralized cardiovascular control, and sleep apnea that works as potential co-contributors and also reported that age is negatively correlated with cognitive functioning (Sachdeva et al., 2018). A cohort study at Norway compared the cognitive performance of individuals with SCI and who occurs MTBI (Mild Traumatic Brain Injury) to individuals who has SCI alone. This study reported that effect of cognitive functioning is negligible on MTBI with SCI patients at 90 or more days post-injury (Macciocchi et al., 2013).

The student researcher mentioned five studies to identify the cause of cognitive impairment. According to these articles the causes are:

- Traumatic Brain Injury
- Obtaining premorbid challenges
- Secondary complications
- Psychological or somatic comorbidities

- Decentralized cardiovascular control
- Sleep apnea etc.

There one quantitative study reported that the cause of cognitive impairment is TBI (Traumatic Brain Injury) but another cohort study reported that the effect of cognitive functioning is negligible for MTBI (Mild Traumatic Brain Injury).

Domains of cognition:

Attention, memory and processing speed:

A study was conducted in USA to determine cognitive function in persons with SCI. Results showed that memory was significantly impaired and there was a trend toward slowed attention and processing speed (Jegede et al., 2009). A Cross-sectional study was designed in Spain to assess the impact of SCI on cognitive function in individuals with subacute and chronic SCI. They also found cognitive deficit in the domain of attention, processing speed, memory (Molina et al., 2018). Another study conducted at Newark in the community to compare the cognitive profiles of a well characterized sample of adults with SCI and Without SCI. this study also said persons with SCI showed difficulty on the test of episodic memory and processing speed (Cohen et al., 2017). A cohort study conducted to compare cognitive functioning between SCI with Mild Traumatic Brain Injury and SCI alone. This study showed impaired working memory and processing speed (Macciocchi et al., 2013). There are lots of study said that attention, memory and processing speed domains of cognition has impairment. But a research study conducted in New York, USA with 60 chronic SCI persons to identify cognitive deficit of persons with SCI. They showed that attention and working memory has no difficulty (Chiaravalloti et al., 2018). Adejoke, et al. 2010 conducted a quantitative research at

USA, according to this study cognitive function in people with SCI, 10% to 60% of the population has some level of cognitive impairment in the areas of attention, concentration, memory, problem solving, abstract reasoning, new learning, and high-level cognitive skills. But their sample size was small.

The student researcher showed five studies to find out the domains of cognition. All the study found cognitive impairment in those domains (attention, memory, processing speed).

Executive function:

Cohen et al., 2017 conducted a research with community SCI people and Molina et al., 2018 conducted a cross sectional research at Spain. Both study said that executive functioning domain has difficulty of SCI patient. The domain of executive functioning was not found any other studies by the student researcher.

New learning and verbal fluency:

In New York, a study showed that persons with SCI may have difficulty in both of new learning and verbal fluency (Chiaravalloti et al., 2018). In Spain, a cross sectional study said that persons with SCI may have deficit in new learning (Cohen et al., 2017). Another cohort study found deficit in verbal fluency of SCI patient (Macciocchi et al., 2013). Nancy, et al. 2018 conducted a research at USA, in this study the neuropsychological battery used to assess verbal fluency included executive functioning in this investigation. On the letter fluency subtest, however, there were significant differences between the groups, but not on the category fluency subtest. Although it is easy to link problems in verbal fluency to speed of processing because fluency tests necessitate rapid processing

speed, the fact that deficits were reported on the letter but not the category fluency refutes this explanation.

Some study found difficulty in recognition, perceptual reasoning, visual problem and inhibit interference of persons with SCI (Molina et al., 2018, Macciocchi et al., 2013 and Wingfield et al., 2003).

Injury type and cognition:

In Newark, persons with SCI were recruited to compare cognitive profiles with SCI patient and Without SCI patient. But this study also finds out the tetraplegic and paraplegic SCI patient's cognitive status. Results showed that persons with tetraplegia produced lower scores on cognitive test than the persons with paraplegia (Cohen et al., 2017).

Gap of these studies: Student researcher found all the study out of South Asia region, there was not a single study on cognition of Spinal Cord Injury patients in South Asia.

Chapter: III

Methodology:

This section outlines the method of the study designed by the student researcher to check out "Cognitive status among the person with spinal cord injury (SCI) patients in Bangladesh." To fulfill the aim of this issue of the researcher, methodology is the path way to reach.

3.1 Research question:

What is the level of cognitive status among the person with spinal cord injury patients in tertiary rehabilitation Hospital?

Research Aim:

To identify the level of cognitive status in patients with Spinal Cord Injury (SCI) in tertiary rehabilitation Hospital

Research Objectives:

- To find out the socio-demographic profile of the participants
- To find out the level of cognitive status
- To determine the level of concentration, recent memory, past memory, orientation and functioning & self-care
- To find out the association between demographic information's and cognitive level

3.2 Study design:

The student researcher selected quantitative methodology for this study. Quantitative research is the process of collecting and analyzing numerical data (Pritha Bhandari, 2020). A descriptive cross-sectional study is a sort of research design in which researchers gather information from a large number of people at one time (Leuren Thomas, 8 May 2020). The student researcher chooses descriptive cross-sectional study design because the data collected from a specific period of time.

3.3 Study setting:

As the participants were staying in SCI Unit, CRP, the study has conducted from SCI Unit, CRP, Chapain, Savar, Dhaka-1343. There is the head office for the Centre for the Rehabilitation of the Paralysed (CRP) and occupies approximately 13 acres of land.CRP originally began its operation in 1979 from two cement storerooms in the grounds of the Shaheed Suhrawardy Medical College Hospital, Dhaka. The current CRP-Savar Centre's size and complexity, as well as the construction of nine other CRP sub-centers around Bangladesh and the wide range of high-quality services now available to people with disabilities. Bangladesh Health Professions Institute (BHPI), CRP Nursing College, William and Marie Taylor School and various other activities also operate from this Centre.

Study period: The period of this study was from October 2021 to February 2022.

3.4 Study participants:

Study population:

Patients who has been admitted in SCI unit at Centre for the Rehabilitation of Paralysed (CRP)

Sample size:

When surveying a large population of respondents, the term "sample size" is often used in statistics research. It has something to do with how large-scale research is conducted. For accurate, statistically significant results and a successful study, the sample size is important (How to Determine the Correct Sample Size, 2021).

For calculating sample size the investigator used the principle of sample size determination: $n=(z)^2.pq/r^2$ (Hicks,2000). Sample size was estimated for this study according to the formula -95% confidence interval and 5% sampling error. Here the confidence interval is (z) = 1.96 and the sampling error is (r) = 0.5 Precise number of SCI patient was unknown as well as prevalence of assumed p= 0.5 where q= 0.5 (1-p) and then the sample size it was stand for:

$$n = (1.96)2 \times 0.5 \times 0.5/(0.05)2$$

$$= 0.9604/0.0025$$

$$= 384.16$$

The calculated sample size is 384. But it was an educational study for the researcher and there were some limitations to the research work, such as time limitations, cost limitations etc. So, the researcher collected (n=65) participants for this study.

Sampling and requirement:

In this study, the student researcher selected purposive sampling to recruit participant.

A Purposive sample is non-probability sample that is selected based on characteristics of a population and the objective of the study (Ashley Crossman, 19 March.2020). In this research, the student researcher has set some inclusion and exclusion criteria to meet the

exact population for the study. That's why the purposive sampling is the best way to recruit participants for this research.

Inclusion and exclusion criteria:

Inclusion criteria:

- All participants hospitalized at the inpatient Unit CRP
- Patients who had both traumatic and no-traumatic SCI
- Age range above 18 years
- Both male and female

Exclusion criteria:

- Who has speech difficulty that restricts their communication
- Age below 18years

Participant recruitment process: Written consent has been taken from the participants as they have interviewed face to face.

3.5 Ethical consideration:

Consent from IRB: Consent form has been taken from the Institutional Review Board (IRB) through the Department of Occupational Therapy; BHPI explained the purpose of the research. After getting their permission, information of study population has been taken from the Spinal Cord Injury (SCI) Unit, CRP. CRP with their permission and data has been collected from required area.

Consent from the participants:

-Written consent has been taken from the participants as they will be interviewed face to face.

Right of refusal to participate or withdraw: In this study, participants were free to choose, weather to participate or not. They were also free to withdraw participation from the study before analysis.

Confidentiality: The information provided by the participants was confidential.

Informed consent: The student researcher has been taken written consent from participants.

Unequal relationship: The student researcher didn't have any unequal relationship with the participants.

Risk and beneficence: There were no risk for the participants and the student researcher has not provided any beneficence.

3.6 Data collection instrument:

The Brief Cognitive Rating Scale (BCRS). It is developed by Reisberg & Ferris, 1988 and is used to assess functional and cognitive abilities in both normal aging and progressive dementia. The BCRS is part of the Global Deterioration Scale Staging System (GDS; Reisberg, Ferris, de Leon, Crook, 1993). This assessment tool test 5 different areas known as axis (4 cognitive and 1 functional). For the first 4 axis, the tester asks a variety of question to determine the level of impairment. The results of the 5th axis are determined primarily by observation. Tester can use the Functional Assessment Staging test for more accurate assessment. After a score is determined for each axis, have to total the results and divided by 5. This answer will result in a stage corresponding on the GDS.

Data collection method:

The student researcher contacted with the SCI Unit, CRP to collect data. All the patients who meet inclusion & exclusion criteria have been selected for the survey. After taking their written consent, the student researcher collected data using a structured questionnaire.

3.7 Data analysis:

For any researcher's data must be properly analyzed, so data analysis is essential. There is lots of method to analyze data. The researcher chose descriptive statistics over other statistical methods. Descriptive statistics describe, organize, and summarize data by using terms such as frequencies, percentages, and central tendency descriptions. Data was entered into the Statistical Package for Social Science (SPSS) version 20 and analyzed with a Microsoft Excel spreadsheet and the descriptive statistic method. To organize the data presentation, SPSS and Microsoft Office Word were used. All of the information was compiled into a single SPSS variable. Chi-square test was performed to show the association between demographic information and level of cognitive domains. For the reader's ease of comprehension, specific findings were presented as a bar graph, a graph, and various tables.

3.8 Quality control and quality assurance:

This study was carried out in a trustworthy manner. This entire study was carried out in a systematic manner with research steps being followed under the supervision of an experienced supervisor. During data collection and analysis, the researcher never tries to influence the results of her own worth or perspectives. The researcher accepted the participant’s responses whether they would be able to deliver. The researcher did forward

and backward translation of the English version scale. The piloting was completed by interviewing 5 people. Before beginning the data collection, participants were asked to fill out a questionnaire.

Chapter: IV

Result:

4.1 Socio-demographic characteristics of the respondents:

This study included spinal cord injury patients who were receiving inpatient rehabilitation services at the Centre for Rehabilitation of the Paralyzed, the largest specialized hospital for spinal cord injury patients. According to the inclusion criteria, 65 people were eligible. The following table categorizes the demographic data of spinal cord injury patients:

Table 4.1: Socio-demographic characteristics of the Participants:

Socio-demographic characteristics		**Frequency (N)**	**Percentage (%)**	
Age (in years)	15-25 years	14	21.5	Mean Age
	26-35 years	21	32.3	36.62 years
	36-45 years	13	20.0	and
	46-55 years	11	16.9	SD ± 13.29
	56-65 years	6	9.2	
Sex	Male	50	76.9	Male-female
	Female	15	23.1	Ratio is 3.3:1
Marital status	Married	50	76.9	
	Unmarried	10	15.4	
	Divorced	4	6.2	
	Separated	1	1.5	
Living area	Urban	6	9.2	
	Semi-urban	22	33.8	
	Rural	37	56.9	
Level of education completed	Primary Education	27	41.5	
	Secondary school	23	35.4	
	Higher secondary	11	16.9	

	school		
	B.Sc Degree & M.Sc	4	6.2
Occupational status before injury of the participants	Service holder	21	32.3
	Business	5	7.7
	Day labor	17	26.2
	Unemployment	1	1.5
	Abroad	4	6.2
	Student	7	10.8
	Farmer	4	6.2
	Housewife	6	9.2

Table-4.1 shows that among (n=65) participants, about 21.5% (n=14) were 15-25 years age group, about 32.3% (n=21) 26-35 years age group, about 20% (n=13) were 36-45 years age group, about 16.9% (n=11) were 46-55 years age group and about 9.2% (n=6) were 56-65 years age group. According to this table, from (n=65) respondents 76.9% (n=50) were male and 23.1 % (n=15) were female. The ratio of male is 3.3:1.

This table also indicate that, 76.9% (n=50) respondents were married, 15.4% (n=10) respondents were unmarried, 6.2% (n=4) respondents were divorced and 1.5% (n=1) were separated. Most of the respondents lived in rural area, about 56.9% (n=37) lived in urban area, 33.8% (n=22) lived in semi-urban area and 9.2% (n=6) lived in urban area.

From this table, 41.5% (n=27) respondents were completed primary education, 35.4% (n=23) respondents completed secondary school, 16.9% (n=11) respondents were completed higher secondary school and 6.2% (n=4) were B.Sc and Masters Degree.

Respondent's occupational statuses are: 32.3% (n=21) were service holders, 7.7% (n=5) were Businessmen, 26.2% (n=17) were day labors, 1.5% (n=1) was unemployment, 6.2%

(n=4) were abroad, 10.8% (n=7) were students, 6.2% (n=4) were farmers and 9.2% (n=6) were housewives.

Table-4.2: Physical characteristics of the Participants:

Physical characteristics		**Frequency (N)**	**Percentage (%)**
Types of injury	Paraplegic	41	63.1
	Tetraplegic	24	36.9
Pressure sore	Yes	27	41.5
	No	38	58.5
Neurological level	C2-C6	26	40.0
	T2-T12	27	41.5
	L1-L4	12	18.5
Duration of injury	1 month-1 year	55	84.6
	2 years-5 years	7	10.8
	6 years-10 years	1	1.5
	11 years above	2	3.1
Mobility aids	Wheelchair	36	55.4
	Long trolly	6	9.2
	No mobility aid (Bed rest)	23	35.4

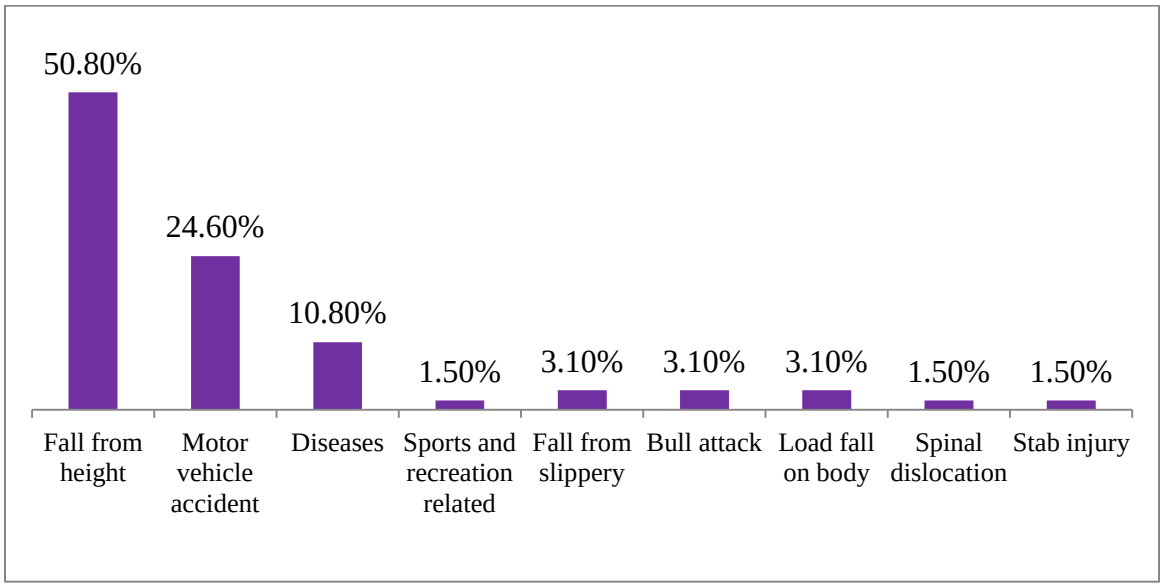
Table-2 shows that most of the respondents were paraplegic, about 63.1% (n=41) were paraplegic and 36.9% (n=24) were tetraplegic. Pressure sore were presents in 41.5% (n=27) and 58.5% (n=38) had no pressure sore. This participants neurological level (C2-C6) were 40.0% (n=26) and this was the majority, (T2-T12) were 41.5% (n=27) and L1-L4 were 18.5% (n=12).

From above table-2, 1month to 1 year injury duration were 84.6% (n=55) participants, 2 years to 5 years injury duration were 10.8% (n=7) participants, 6years to10 years injury

duration were 1.5% (n=1) participants and 11 years above injury duration were 3.1% (n=2) participants.

This table mentioned that 55.4% (n=36) were wheelchair users, 9.2% (n=6) had long trolly and 35.4% (n=23) had no mobility aids and they were in bed rest.

Figure-4.1: Causes of injury among the participants:



The common cause of SCI patient's is fall from height. Figure-4.1 also indicating that 50.8% participants cause of injury were fall from height. 24.6% were motor vehicle accident, 10.8% were diseases, 1.5% was sports and recreation related injury, 3.1% fall from slippery, 3.1% were bull attack, 3.1% were load fall on the body, 1.5% was spinal dislocation and 1.5% was stab injury.

Table-4.3: Cognitive status among the participants:

Axes: 1 (Concentration)	**Normal**	**Very mild**	**Mild**	**Moderate**	**Moderately Severe**	**Severe**	**Very Severe**
How far did you go for school?	63 (96.9%)						2 (3.1%)
How are you at subtraction?	54 (83.1%)	1 (1.5%)	3 (4.6%)		2 (3.1%)		5 (7.7%)
What is the subtraction of 100 to 7?	51 (78.5%)	2 (3.1%)		1 (1.5%)	4 (6.2%)		7 (10.8 %)
What is the subtraction of 93 to 7?	43 (66.2%)	1 (1.5%)	1 (1.5%)	2 (3.1%)	1 (1.5%)	4 (6.2%)	13 (20.0 %)
What is the subtraction of 86 to 7?	38 (58.5%)	2 (3.1%)	2 (3.1%)	1 (1.5%)	2 (3.1%)	4 (6.2%)	16 (24.6 %)
Axes: 2 (Recent Memory)							
What did you do last weekend?	54 (83.1%)					1 (1.5%)	10 (15.4 %)
What did you have for breakfast?	62 (95.4%)					1 (1.5%)	2 (3.1%)
How is the weather today?	60 (92.3%)	2 (3.1%)					3 (4.6%)
Who is the current	60 (92.3%)		2 (3.1%)				3 (4.6%)

president?							
What is your current address?	63 (96.9%)	1 (1.5%)					1 (1.5%)
Axes: 3 (Past Memory)							
What primary schools did you go to?	58 (89.2%)			1 (1.5%)			6 (9.2%)
Where was it located?	62 (95.4%)						3 (4.6%)
Who were your primary school teachers?	51 (78.5%)	1 (1.5%)	1 (1.5%)	1 (1.5%)		1 (1.5%)	10 (15.4 %)
Where were you born?	62 (95.4%)	1 (1.5%)					2 (3.1%)
Who were your childhood friends?	58 (89.2%)	2 (3.1%)				1 (1.5%)	4 (6.2%)
What kind of things did you do with your childhood friends?	58 (89.2%)	2 (3.1%)				1 (1.5%)	4 (6.2%)
Axes: 4 (Orientation)							
What time is it now?	58 (89.2%)	6 (9.2%)					1 (1.5%)

What day of week is it today?	56 (86.2%)	3 (4.6%)		1 (1.5%)			5 (7.7%)
What date is today?	47 (72.3%)	3 (4.6%)	2 (3.1%)	3 (4.6%)		2 (3.1%)	8(12.3 %)
Where do you live now?	58 (89.2%)	1 (1.5%)				2 (3.1%)	4 (6.2%)
What is your identity?	62 (95.4%)		1 (1.5%)				2 (3.1%)
Axes: 5 (Functioning and self-care)							
Have you forgotten the location of your essentials?	53 (81.5%)	2 (3.1%)	2 (3.1%)	1 (1.5%)	3 (4.6%)		4 (6.2%)
What do you do from waking up in the morning to having breakfast?	20 (30.8%)			1 (1.5%)			1 (1.5%)
Can you manage your personal finances?	53 (81.5%)	1 (1.5%)	1 (1.5%)		1 (1.5%)		9 (13.8 %)
Can you choose the right outfit for a special day, season	57 (87.7%)	2 (3.1%)					6 (9.2%)

or occasion? Or do you mistakenly wear the same clothes over and over again?							
Do you make mistake in dressing?	57 (87.7%)	1 (1.5%)					6 (9.2%)

Table-3 shows the cognitive status of the participants. There are 5 domains and every domains have five or six question. The scale has (1-7) score from normal to very severe. This table mentioned each questions percentages with normal, very mild, mild, moderate, moderately severe, severe and very severe. The 1st domain (concentration) shows highest percentage 54 (83.1%) which is normal and the lowest percentage 1 (1.5%) shows in very mild, mild, moderate and moderately severe. In the 2nd domain (recent memory), the highest percentage 63 (96.9%) shows in normal and there are no percentage in moderate and moderately severe. The lowest percentage 1(1.5%) are mentioned in very mild and severe. In the 3rd domain (past memory) shows highest percentage 62 (95.4%) in normal and there are no percentage in moderately severe. The lowest percentage 1(1.5%) are shows in very mild, mild, moderate and severe. In the 4th domain (Orientation) highest percentage 62 (95.4%) in normal and moderately point has no percentage. The lowest percentage 1(1.5%) are shows in very mild and moderate part. In the last and 5th domain (functioning and self-care) mentioned highest percentage 57 (87.7%) in normal and there are no percentage in severe. The lowest percentage 1(1.5%) shows in very mild, mild,

moderate, moderately severe part. From the above-mentioned discussion, we have come to the conclusion that all five domains highest score are in normal point and most of the time moderately severe point has no percentage. The lowest percentage shows all the domains in very mild, mild, moderate and severe point.

Figure-4.2: level of cognitive status among the participants:

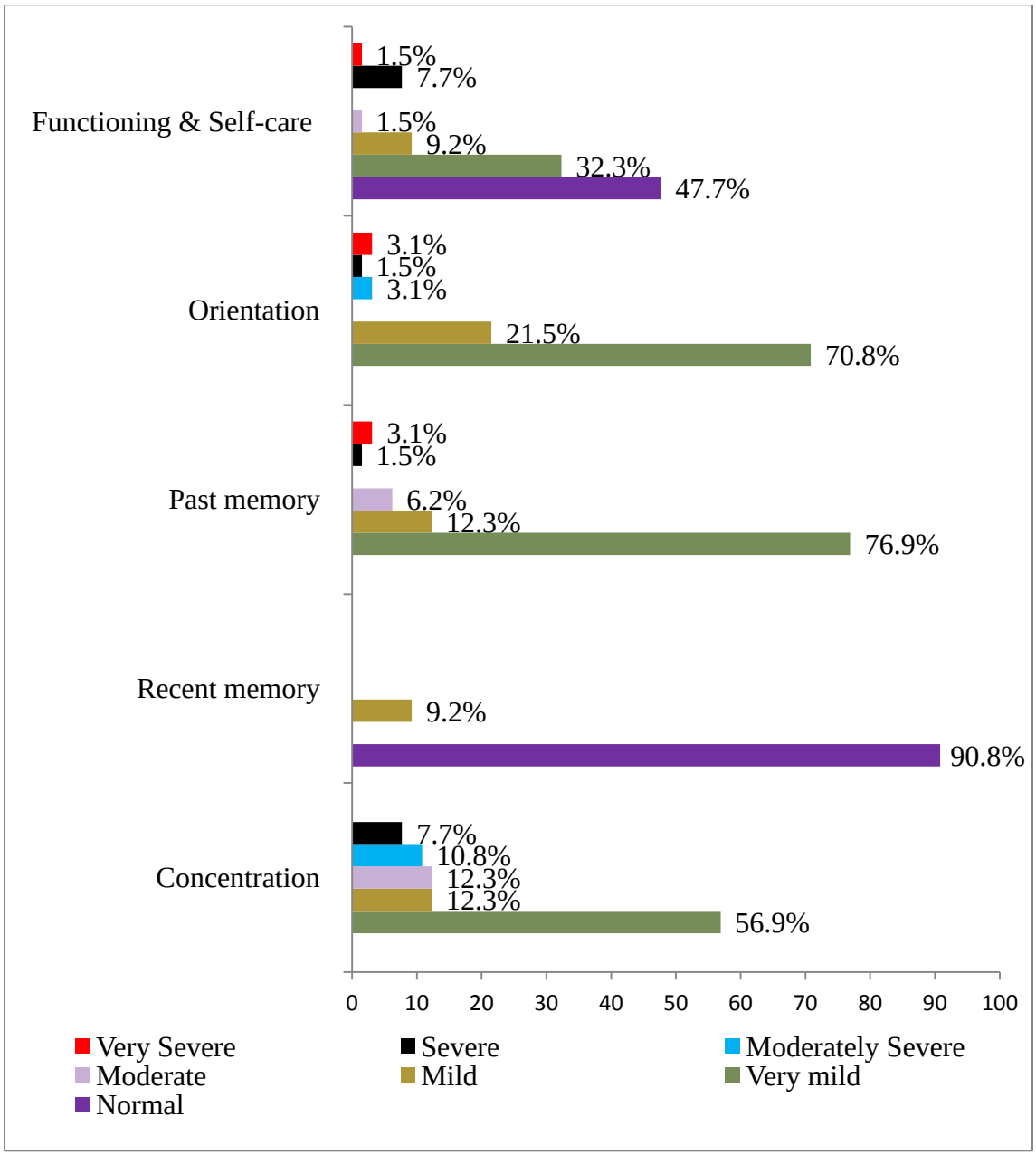


Figure-4.2 state that level of cognitive status in axis-1 (Concentration), very mild 56.9%, mild 12.3%, moderate 12.3%, moderately severe 10.8% and 7.7% severe. In axis-2 (Recent memory), 90.8% is normal and 9.2% mild. In axis-3 (Past memory), 76.9% is very mild, 12.3% mild, 6.2% moderate, 1.5% severe and 3.1% very severe. In axis-4 (Orientation), 70.8% is very mild, 21.5% mild, 3.1% normal, 1.5% severe and 3.1% very severe. In axis-5 (Functioning and self-care), 47.7% is normal, 32.3% very mild, 9.2% mild, 1.5% moderate, 7.7% severe and 1.5% very severe.

Figure-4.3: Overall level of cognitive status:

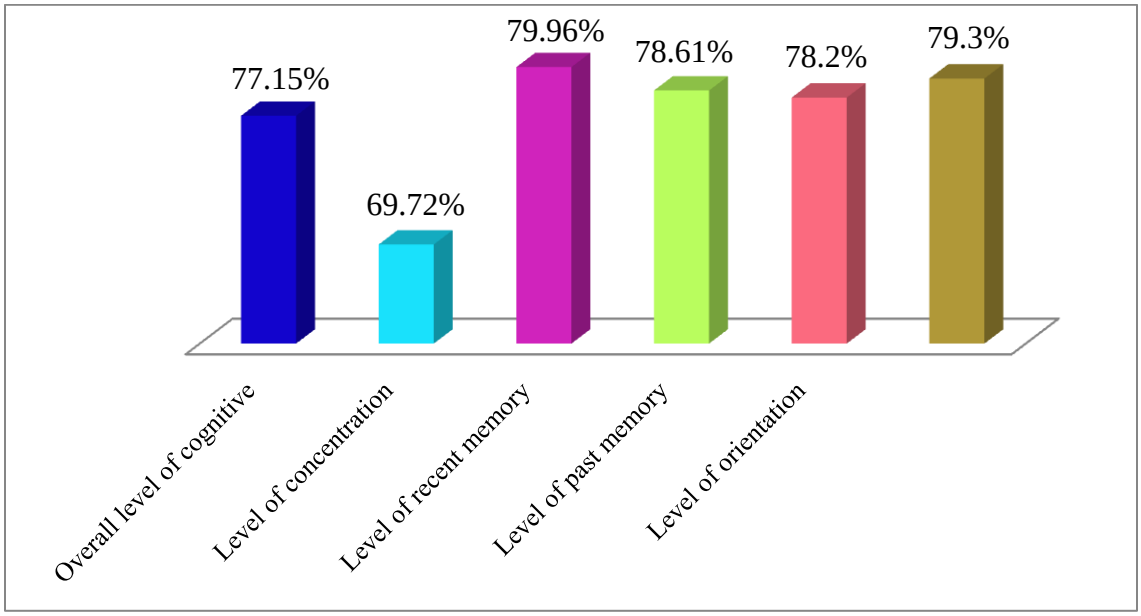


Figure-4.3 shows that, overall level of cognitive status is 77.15%, level of concentration is 69.72%, level of recent memory is 79.96%, level of past memory is 78.61%, level of orientation is 78.2% and level of functioning and self-care is 79.3%. This is confirmed by this figure-4.3 that, recent memory, past memory, orientation and functioning and self-care cognitive status is better than concentration. An overall 77.15% participant cognitive status is normal and only 22.85participants has cognitive impairment.

The association between demographic factors (age, education level, gender, injury type, neurological level) and cognitive domains (Concentration, Recent memory, Past memory, Orientation and functioning and self-care): Chi-square test was performed to show the association between these variables.

Variable	Category	Concentration level					Chi-square, *P*, value
		Very mild	Mild	Moderate	Moderately severe	Severe	
Age	15-25 years	57.1% (8)	.0% (0.0)	7.1% (1)	21.4% (3)	14.3% (2)	χ^2= 28.87, *P* = 0.07
	26-35 years	52.4% (11)	19.0% (4)	9.5% (2)	4.8% (1)	14.3% (3)	
	36-45 years	69.2% (9)	15.4% (2)	7.7% (1)	7.7% (1)	.0% (0.0)	
	46-55 years	81.8% (9)	.0% (0.0)	18.2% (2)	.0% (0.0)	.0% (0.0)	
	56-65 years	.0% (0.0)	33.3% (2)	33.3% (2)	33.3% (2)	.0% (0.0)	
Education level	Primary Education	44.4% (12)	22.2% (6)	11.1% (3)	11.1%(3)	11.1% (3)	χ^2= 9.73, *P*= 0.639
	Secondary school	60.9% (14)	4.3% (1)	13.0% (3)	17.4% (4)	4.3% (1)	
	Higher secondary school	72.7% (8)	9.1% (1)	9.1% (1)	.0% (0.0)	9.1% (1)	
	B.Sc Degree, M.Sc	75.0% (3)	.0% (0.0)	25.0% (1)	.0% (0.0)	.0% (0)	
Gender	Male	62.0% (31)	12.0% (6)	12.0% (6)	6.0% (3)	8.0% (4)	χ^2= 5.61 *P*= 0.230
	Female	40.0% (6)	13.3% (2)	13.3% (2)	26.7% (4)	6.7% (1)	
Injury type	Paraplegic	58.5% (24)	12.2% (5)	9.8% (4)	9.8% (4)	9.8% (4)	χ^2= 1.36 *P*= 0.851
	Tetraplegic	54.2% (13)	12.5% (3)	16.7% (4)	12.5% (3)	4.2% (1)	

Neurological level	C2-C7	61.5% (16)	7.7% (2)	15.4% (4)	11.5% (3)	3.8% (1)	χ^2= 8.64 *P*= 0.373
	T1-T12	63.0% (17)	7.4% (2)	7.4% (2)	11.1% (3)	11.1% (3)	
	L1-L5	33.3% (4)	33.3% (4)	16.7% (2)	8.3% (1)	8.3% (1)	

This table showed that, there is no strong association between the participant's (age, education level, gender, injury type, neurological level) and level of Concentration. The founded P value is p<0.051, while n= 65.

Variable	Category	Recent memory level		Chi-sq, P value
		Normal	Mild	
Age	15-25 years	92.9% (13)	7.1% ((1)	χ^2= 2.43 *P*= 0.657
	26-35 years	85.7% (18)	14.3% (3)	
	36-45 years	100.0% (13)	.0% (0.0)	
	46-55 years	90.9% (10)	9.1% (1)	
	56-65 years	83.3% (5)	16.7% (1)	
Gender	Male	90.0% (45)	10.0% (5)	χ^2= .153 *P*= 0.577
	Female	93.3% (14)	6.7% (1)	
Educational level	Primary Education	92.6% (25)	7.4% (2)	χ^2= 3.00 *P*= 0.392
	Secondary school	95.7% (22)	4.3% (1)	
	Higher secondary school	81.8% (9)	18.2% (2)	
	B.Sc Degree, M.Sc	75.0% (3)	25.0% (1)	
Injury type	Paraplegic	92.7% (38)	7.3% (3)	χ^2= .485 *P*= 0.389
	Tetraplegic	87.5% (21)	12.5% (3)	
Neurological level	C2-C7	88.5% (23)	11.5% (3)	χ^2= 0.284 *P*= 0.868
	T1-T12	92.6% (25)	7.4% (2)	
	L1-L5	91.7% (11)	8.3% (1)	

This table showed that, there is no strong association between the participant's (age, education level, gender, injury type, neurological level) and level of recent memory. The founded P value is p<0.051, while n= 65.

Variable	Category	Past memory level					Chi-sq, P value
		Very mild	Mild	Moderate	Severe	Very severe	
Age	15-25 years	71.4% (10)	21.4% (3)	.0%(0.0)	7.1%(1)	.0%(0.0)	χ^2= 16.2 *P*= 0.439
	26-35 years	76.2% (16)	4.8%(1)	9.5% (2)	.0%(0.0)	9.5%(2)	
	36-45 years	92.3% (12)	.0%(0. 0)	7.7%(1)	.0%(0.0)	.0%(0.0)	
	46-55 years	72.7% (8)	18.2% (2)	9.1%(1)	.0%(0.0)	.0%(0.0)	
	56-65 years	66.7% (4)	33.3% (2)	.0%(0.0)	.0%(0.0)	.0%(0.0)	
Gender	Male	76.0% (38)	14.0% (7)	6.0% (3)	2.0% (1)	2.0% (1)	χ^2= 1.553 *P*= .799
	Female	80.0% (12)	6.7% (1)	6.7% (1)	.0% (0.0)	6.7% (1)	
Educational level	Primary Education	70.4% (19)	11.1% (3)	11.1%(3)	3.7%(1)	3.7%(1)	χ^2= 9.135 *P*= 0.691
	Secondary school	82.6% (19)	17.4% (4)	.0%(0.0)	.0%(0.0)	.0%(0.0)	
	Higher secondary school	81.8% (9)	.0%(0. 0)	9.1%(1)	.0%(0.0)	9.1%(1)	
	B.Sc Degree, M.Sc	75.0% (3)	25.0% (1)	.0%(0.0)	.0%(0.0)	.0%(0.0)	
Injury type	Paraplegic	75.6% (31)	14.6% (6)	4.9%(2)	2.4%(1)	2.4%(1)	χ^2= 1.539 *P*= .820
	Tetraplegic	79.2% (19)	8.3%(2)	8.3%(2)	.0% (0.0)	4.2%(1)	
Neurologi	C2-C7	80.8%	7.7%(	7.7%(2)	.0%(0.0)	3.8%(1)	χ^2=

cal level		(21)	2)				5.131
	T1-T12	74.1% (20)	14.8% (4)	7.4%(2)	3.7%(1)	.0%(0.0)	*P*= .744
	L1-L5	75.0% (9)	16.7% (2)	.0%(0.0)	.0%(0.0)	8.3%(1)	

This table showed that, there is no strong association between the participant's (age, education level, gender, injury type, neurological level) and level of Past memory. The founded P value is p<0.051, while n= 65.

Variable	Category	Orientation level					Chi-sq, *P* value
		Very mild	Mild	Moderately severe	Severe	Very severe	
Age	15-25 years	78.6% (11)	21.4% (3)	.0%(0.0)	.0% (0.0)	.0% (0.0)	χ^2= 19.205 *P*=0.258
	26-35 years	71.4% (15)	19.0%(4)	4.8%(1)	.0% (0.0)	4.8% (1)	
	36-45 years	76.9% (10)	23.1%(3)	.0%(0.0)	.0% (0.0)	.0% (0.0)	
	46-55 years	72.7% (8)	18.2%(2)	.0%(0.0)	.0% (0.0)	9.1% (1)	
	56-65 years	33.3% (2)	33.3%(2)	16.7%(1)	16.7% (1)	.0% (0.0)	
Gender	Male	70.0% (35)	22.0% (11)	2.0%(1)	2.0% (1)	4.0% (2)	χ^2=1.756 *P*=0.780
	Female	73.3% (11)	20.0%(3)	6.7%(1)	.0% (0.0)	.0% (0.0)	
Educational level	Primary Education	70.4% (19)	25.9%(7)	3.7%(1)	.0% (0.0)	.0% (0.0)	χ^2= 20.25 *P*=0.062
	Secondary school	73.9% (17)	21.7%(5)	.0%(0.0)	4.3% (1)	.0% (0.0)	
	Higher secondary school	63.6% (7)	18.2%(2)	.0%(0.0)	.0% (0.0)	18.2% (2)	
	B.Sc	75.0%	.0%(0.0)	25.0%(1)	.0%	.0%	

	Degree, M.Sc	(3)			(0.0)	(0.0)	
Injury type	Paraplegic	75.6% (31)	22.0%(9)	2.4%(1)	.0% (0.0)	.0% (0.0)	χ^2= 5.64 *P*=0.227
	Tetraplegic	62.5% (15)	20.8%(5)	4.2%(1)	4.2% (1)	8.3% (2)	
Neurological level	C2-C7	65.4% (17)	19.2%(5)	3.8%(1)	3.8% (1)	7.7% (2)	χ^2= 7.075 *P*=0.629
	T1-T12	74.1% (20)	25.9%(7)	.0%(0.0)	.0% (0.0)	.0% (0.0)	
	L1-L5	75.0% (9)	16.7%(2)	8.3%(1)	.0% (0.0)	.0% (0.0)	

This table showed that, there is no strong association between the participant's (age, education level, gender, injury type, neurological level) and level of Orientation. The founded P value is p<0.051, while n= 65.

Variable	Category	Functioning and self-care level						Chi-sq, *P* value
		Normal	Very mild	Mild	Moderate	Severe	Very severe	
Age	15-25 years	50.0% (7)	28.6% (4)	14.3% (2)	.0%	7.1% (1)	.0% (0.0)	χ^2= 30.64 *P*=0.060
	26-35 years	61.9% (13)	23.8% (5)	.0%(0.0)	4.8% (1)	9.5% (2)	.0% (0.0)	
	36-45 years	53.8% (7)	23.1% (3)	23.1% (3)	.0%(0.0)	.0% (0.0)	.0% (0.0)	
	46-55 years	18.2% (2)	72.7% (8)	.0%(0.0)	.0%(0.0)	.0% (0.0)	9.1% (1)	
	56-65 years	33.3% (2)	16.7% (1)	16.7% (1)	.0%(0.0)	33.3% (2)	.0% (0.0)	
Gender	Male	42.0% (21)	38.0% (19)	8.0%(4)	2.0% (1)	8.0% (4)	2.0% (1)	χ^2= 4.62 P=0.63
	Female	47.7% (31)	32.3% (21)	9.2%(6)	1.5% (1)	7.7% (5)	1.5% (1)	

Educational level	Primary Education	48.1% (13)	25.9% (7)	18.5%(5)	3.7%(1)	3.7% (1)	.0% (0.0)	χ^2= 14.43 P=0.493
	Secondary school	52.2% (12)	34.8% (8)	4.3%(1)	.0%(0.0)	8.7% (2)	.0% (0.0)	
	Higher secondary school	36.4% (4)	45.5% (5)	.0%(0.0)	.0%(0.0)	9.1% (1)	9.1% (1)	
	B.Sc Degree, M.Sc	50.0% (2)	25.0% (1)	.0%(0.0)	.0%(0.0)	25.0% (1)	.0% (0.0)	
Injury type	Paraplegic	48.8% (20)	36.6% (15)	7.3%(3)	2.4%(1)	4.9% (2)	.0% (0.0)	χ^2= 4.53 P=0.475
	Tetraplegic	45.8% (11)	25.0% (6)	12.5%(3)	.0%(0.0)	12.5% (3)	4.2% (1)	
Neurological level	C2-C7	46.2% (12)	26.9% (7)	11.5%(3)	.0%(0.0)	11.5% (3)	3.8% (1)	χ^2=4.68 P=0.911
	T1-T12	48.1% (13)	37.0% (10)	7.4%(2)	3.7%(1)	3.7% (1)	.0% (0.0)	
	L1-L5	50.0% (6)	33.3% (4)	8.3% (1)	.0% (0.0)	8.3% (1)	.0% (0.0)	

This table showed that, there is no strong association between the participant's (age, education level, gender, injury type, neurological level) and level of Functioning and self-care. The founded P value is $p<0.051$, while $n= 65$.

Chapter: V

5.1 Discussion:

Cognitive deficits after SCI are not the subject of many scientific studies, and they may be misinterpreted clinically as noncompliance with treatment, inability to learn, poor coping, and / or low motivation. This misunderstanding and neglect is unfortunate because cognitive limitations may have an impact on some people's rehabilitation, community reintegration, and / or quality of life (Cohen et al., 2017; Bradbury et al.,2008; Inoue et al.,2014).

The purpose of the study was to identify the cognitive status in patients with Spinal Cord Injury (SCI) in Bangladesh. In the other hand, socio-demographic information and physical characteristics of the participants also showed through this study. To identify the cognitive status of the participants, Brief Cognitive Rating Scale (BCRS) was used. This scale had 5 domains and the student researcher showed an overall level of cognitive status and also showed the level of cognitive status according to these domains (concentration, recent memory, past memory, orientation and functioning & self-care).

In this study, 65 participants were recruited, among them 76.9% (n=50) were male and 23.1 % (n=15) were female. The ratio of male is 3.3:1. Age range was 18years to 65years, mean was 36.62 and SD was ±13.29. Paraplegic and tetraplegic both types were included. A study in USA represented the patterns of cognitive deficits in persons with SCI and older individuals without SCI. This study participants were 60, age range was 30 years to 60 years and both participant’s paraplegic and tetraplegic were included (Cohen

et al., 2017). A cross sectional study in Spain is designed to assess the impact of SCI on cognitive function, there were 66 participants, age range were 18 years to 85 years and they only included tetraplegic type of injury (Molina et al., 2018). In USA a study conducted to compare the cognitive profiles of a well-characterized sample of adults with and without SCI among community-dwelling individuals. In this study, 156 participants were recruited, age range was 18 years to 85 years, both tetraplegic and paraplegic types were included (Cohen et al., 2017).

In addition educational qualifications of the participants, 41.5% (n=27) respondents were completed primary education, 35.4% (n=23) respondents completed secondary school, 16.9% (n=11) respondents were completed higher secondary school and 6.2% (n=4) were B.Sc and Masters Degree.

In this study, 50.8% Participants cause of injury were fall from height. 24.6% were motor vehicle accident, 10.8% were diseases, 1.5% was sports and recreation related injury, 3.1% fall from slippery, 3.1% were bull attack, 3.1% were load fall on the body, 1.5% was spinal dislocation and 1.5% was stab injury. In a study showed that the most common cause of SCI was automobiles Crashes (31.5%) and falls (25.3%), Gunshot (10.4%), motorcycle accidents (6.8%), diving incidents (4.7%), and Medical / surgical complications (4.3%) (Chen et al. 2013). Another study said that the most common cause of injury is falling. Gunshot wounds, stabbings, and attacks with blunt objects account for 17.8% of SCI, with gunshot wounds, stabbings, and attacks with blunt objects causing the most violent injuries. SCI is caused by sports-related accidents, which account for 10.7% of all SCI. The remaining 6.6 percent of injuries are caused by a variety of other factors,

with medical or surgical complications or unclassified causes being the most common (Ann Marie, 2008).

In this study from 65 participants, an overall level of cognitive status is 77.15%, level of concentration is 69.72%, level of recent memory is 79.96%, level of past memory is 78.61%, level of orientation is 78.2% and level of functioning and self-care is 79.3%. As overall 77.15% participant's cognitive status is normal, so 22.85% had cognitive deficits.

A study showed that cognitive functioning among 89 SCI individuals is classified into 3 categories: Class 1 (average level of cognitive performance across all assessed domains; n = 48), Class 2 (average cognitive performance, excluding memory and recall; n = 23), and Class 3 (Cognitive efficacy across multiple domains of cognition; n = 18) (Pasipanodya et al., 2021). Another study said that cognition test is completed by 208 individuals. (25.0%) of these SCI participants had minimum one missing of the 7 cognitive test scores. (Cohen et al., 2017).

In this study, no strong associations were found between the participant's (age, education level, gender, injury type and neurological level) and level of Concentration, Recent memory, Past memory, Orientation and Functioning and self-care. A systematic review research conducted in America with international collaboration, this study showed that the patients who had brain injury, psychological or somatic co-morbidities, sleep apnea, and decentralized cardiovascular control, they were most likely to cognitive impairments. This study reported that there were no correlation between age and cognitive functioning and also reported that there were no clear association between cognitive function and level of injury (Sachdeva et al., 2018). Another prospective observational study showed significant association between education, history of smoking, history of substance use

and cognitive profiles of SCI patient. They divided in three classes: class-1 (average level of cognitive performance in all domain), P=0.045, class-2 (average cognitive performance except in recall and memory), P=0.057 and class-3 (low cognitive performance in multiple domains of cognition), P<0.05 (Elizabeth et al. 2009).

Chapter: VI

6.1 Strengths of the study:

This study was about the level of cognitive status among individuals with Spinal Cord Injury (SCI) patient. The strengths of the study are given below:

- In this study to find the cognitive status, Brief Cognitive Rating Scale (BCRS) was used which was a developed questionnaire.
- This is the first study about cognition of SCI patients in South Asia countries.
- Data analysis has been done using SPSS.

Limitations:

This study, there were some limitations. These limitations student researcher faced to prepare the project. Limitations are:

- Only sixty five participants actively participate in this study. So this may not generalize and may not give the actual result. Because, the student researcher couldn't collect more data lack of enough time for data collection.
- The participants were taken from selected hospital which not generalizable for country perspective.
- In axis-5 (Functioning & self-care), Question two was not applicable to all the participants.
- The researcher found all the articles outside of the country. There is no literature on cognition of SCI patient in our country. So it was so difficult to present any

information in the context of Bangladesh and also no significant statistics result was included in this study in the basis of Bangladeshi culture.

- The student researcher has not been able to access one ward in this hospital which is the post operative ward. Interview was conducted in Bangla. However the study is presented in English. The interview data has to be translated from Bengali to English by the researcher.
- The student researcher couldn't access the commonly used scale for screening cognitive status of SCI patient that has been used by the authors around the world.

5.2 Recommendations:

The researcher has some recommendations. The recommendations are:

- The clinicians should consider the cognitive issues, while working with SCI patient. Rehabilitation will be more fruitful.
- Cognitive assessment scale should be included in the assessment form of SCI.
- Further research should be conducted with a large numbers of participants on this study design. If researcher conducts the study with large samples then it will be easy to generalize the result.

5.3 Conclusion:

In summary, SCI is a condition which can occurs at any age with traumatic or non-traumatic cause. This study is conducted to find out the level of cognitive status of SCI patients. The study investigated the level of cognitive status and the Brief Cognitive Rating Scale (BCRS) used to measure the cognitive status. There were five domains such

as concentration, recent memory, past memory, orientation and function & self-care. The tool is useful to screen the cognitive status of individuals with SCI. These study findings provided important information to clinicians. Cognitive assessment is important for the individuals with SCI that it may help to simplify and predict the functional challenges which will be faced by these individuals. If clinicians keep eye on cognition of SCI patient, it may help to move forward in treatment and smooth in rehabilitation and community re-integration and also improve the Quality of Life (QOL) of SCI patients.

List of References

References:

Bonanno, G. A., Kennedy, P., Galatzer-Levy, I. R., Lude, P., & Elfström, M. L. (2012). Trajectories of resilience, depression, and anxiety following spinal cord injury. *Rehabilitation Psychology*, *57*(3), 236–247. https://doi.org/10.1037/a0029256

Chen, Y., Tang, Y., Vogel, L., & DeVivo, M. (2013). Causes of Spinal Cord Injury. *Topics in Spinal Cord Injury Rehabilitation*, *19*(1), 1–8. https://doi.org/10.1310/sci1901-1

Chiaravalloti, N. D., Weber, E., Wylie, G., Dyson-Hudson, T., & Wecht, J. M. (2018). Patterns of cognitive deficits in persons with spinal cord injury as compared with both age-matched and older individuals without spinal cord injury. *The Journal of Spinal Cord Medicine*, *43*(1), 88–97. https://doi.org/10.1080/10790268.2018.1543103

Cognition. (n.d.). TheFreeDictionary.com. https://medical-dictionary.thefreedictionary.com/cognition

Cohen, M. L., Tulsky, D. S., Holdnack, J. A., Carlozzi, N. E., Wong, A., Magasi, S., Heaton, R. K., & Heinemann, A. W. (2017). Cognition among community-dwelling individuals with spinal cord injury. *Rehabilitation Psychology*, *62*(4), 425–434. https://doi.org/10.1037/rep0000140

Craig, A., Guest, R., Tran, Y., & Middleton, J. (2017). Cognitive Impairment and Mood States after Spinal Cord Injury. *Journal of Neurotrauma*, *34*(6), 1156–1163. https://doi.org/10.1089/neu.2016.4632

Hagen, E. M., Eide, G. E., Rekand, T., Gilhus, N. E., & Gronning, M. (2010). Traumatic spinal cord injury and concomitant brain injury: a cohort study. *Acta Neurologica Scandinavica*, *122*, 51–57. https://doi.org/10.1111/j.1600-0404.2010.01376.x

How to Determine the Correct Sample Size. (2021, November 29). Qualtrics. https://www.qualtrics.com/experience-management/research/determine-sample-size/

Jegede, A. B., Rosado-Rivera, D., Bauman, W. A., Cardozo, C. P., Sano, M., Moyer, J. M., Brooks, M., & Wecht, J. M. (2009). Cognitive performance in hypotensive persons with spinal cord injury. *Clinical Autonomic Research*, *20*(1), 3–9. https://doi.org/10.1007/s10286-009-0036-z

Macciocchi, S. N., Seel, R. T., & Thompson, N. (2013). The Impact of Mild Traumatic Brain Injury on Cognitive Functioning Following Co-occurring Spinal Cord Injury. *Archives of Clinical Neuropsychology*, *28*(7), 684–691. https://doi.org/10.1093/arclin/act049

Merrill, R., Lyon, J., Baker, R., & Gren, L. (2009). Attention Deficit Hyperactivity Disorder and Increased Risk of Injury. *Advances in Medical Sciences*, *54*(1). https://doi.org/10.2478/v10039-009-0022-7

Molina, B., Segura, A., Serrano, J. P., Alonso, F. J., Molina, L., Pérez-Borrego, Y. A., Ugarte, M. I., & Oliviero, A. (2018). Cognitive performance of people with traumatic spinal cord injury: a cross-sectional study comparing people with

subacute and chronic injuries. *Spinal Cord*, *56*(8), 796–805. https://doi.org/10.1038/s41393-018-0076-0

Pasipanodya, E. C., Dirlikov, B., Castillo, K., & Shem, K. L. (2021). Cognitive Profiles Among Individuals With Spinal Cord Injuries: Predictors and Relations With Psychological Well-being. *Archives of Physical Medicine and Rehabilitation*, *102*(3), 431–439. https://doi.org/10.1016/j.apmr.2020.06.022

Sachdeva, R., Gao, F., Chan, C. C., & Krassioukov, A. V. (2018). Cognitive function after spinal cord injury. *Neurology*, *91*(13), 611–621. https://doi.org/10.1212/wnl.0000000000006244

Sasson, R. (2021, October 24). *What is Concentration - Explanations and Information*. Success Consciousness | Positive Thinking - Personal Development. https://www.successconsciousness.com/blog/concentration-mind-power/what-is-concentration/?fbclid=IwAR3WqF1OXfCSB0qC_jlbUP7EjEP_3HRJRjnAaAz1jcW4snHUg6VVKqUC4t8

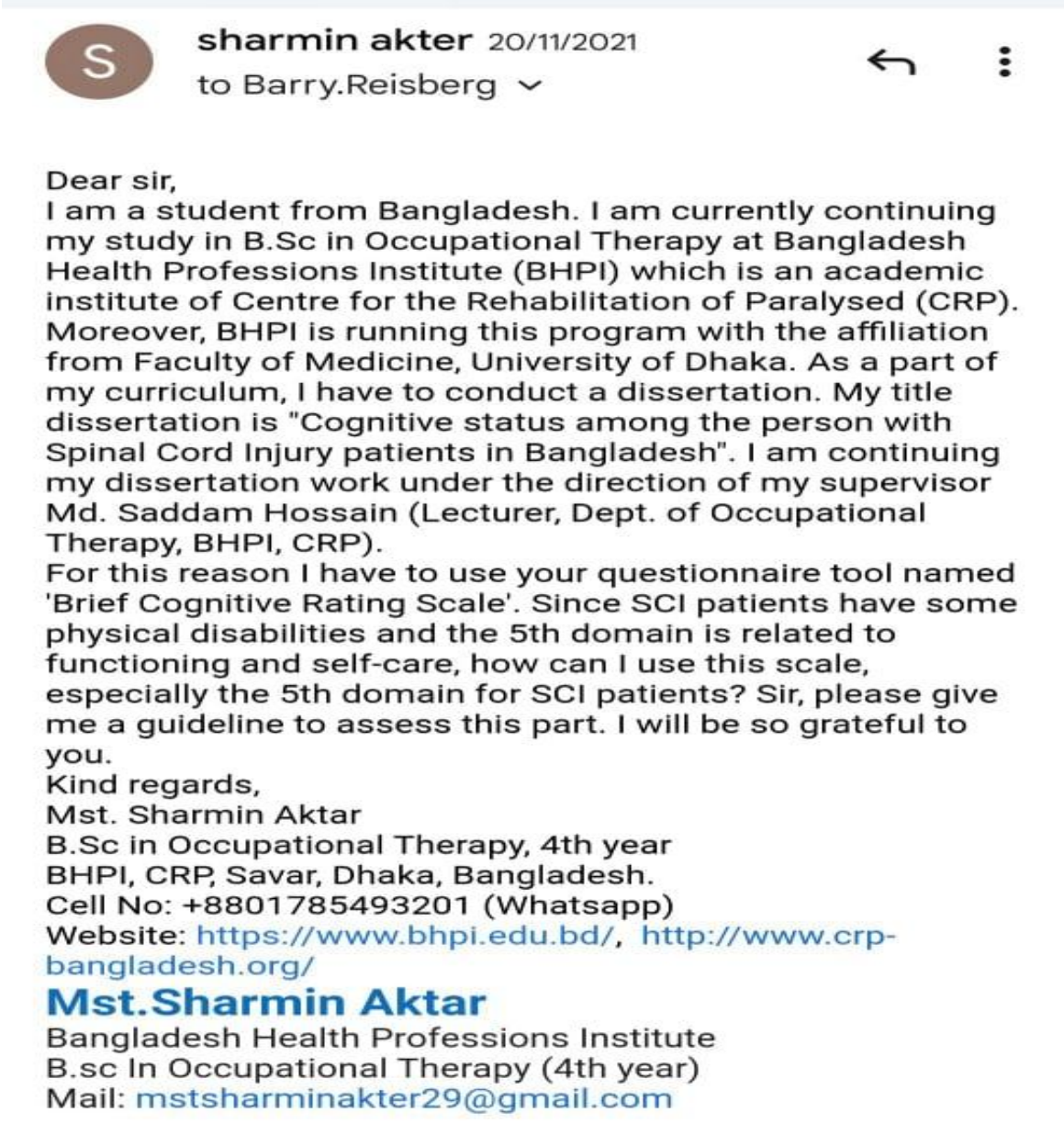
Wikipedia contributors. (2022, January 11). *Orientation (mental)*. Wikipedia. https://en.wikipedia.org/wiki/Orientation_(mental)?fbclid=IwAR1nlYF20lan5bn_tNlljfwdj4ASCl9VGBmek-j6GzZ9YVAXbXpUVl9szDg

Wingfield, A., Tun, C. G., Gomez, P. T., & Tun, P. A. (2003). Preservation of Cognitive Function After Long-Term Tetraplegia. *American Journal of Physical Medicine & Rehabilitation*, *82*(7), 547–555. https://doi.org/10.1097/01.phm.0000073829.37568.8f

Resberg, B., Staven, H., & Ferris. (1998). The Brief Cogntive Rating Scale (BCRS). *PsychopharmacologyBulletin*, *24*. https://books.google.com.bd/books?hl=en&lr=&id=YwsUP_RGuKkC&oi=fnd&pg=PA629&dq=Reisberg,+B#v=onepage&q=Reisberg%2C%20B&f=false

Appendices

Appendix A: Ethical approval and permission letter-



sharmin akter 20/11/2021
to Barry.Reisberg

Dear sir,
I am a student from Bangladesh. I am currently continuing my study in B.Sc in Occupational Therapy at Bangladesh Health Professions Institute (BHPI) which is an academic institute of Centre for the Rehabilitation of Paralysed (CRP). Moreover, BHPI is running this program with the affiliation from Faculty of Medicine, University of Dhaka. As a part of my curriculum, I have to conduct a dissertation. My title dissertation is "Cognitive status among the person with Spinal Cord Injury patients in Bangladesh". I am continuing my dissertation work under the direction of my supervisor Md. Saddam Hossain (Lecturer, Dept. of Occupational Therapy, BHPI, CRP).
For this reason I have to use your questionnaire tool named 'Brief Cognitive Rating Scale'. Since SCI patients have some physical disabilities and the 5th domain is related to functioning and self-care, how can I use this scale, especially the 5th domain for SCI patients? Sir, please give me a guideline to assess this part. I will be so grateful to you.
Kind regards,
Mst. Sharmin Aktar
B.Sc in Occupational Therapy, 4th year
BHPI, CRP, Savar, Dhaka, Bangladesh.
Cell No: +8801785493201 (Whatsapp)
Website: https://www.bhpi.edu.bd/, http://www.crp-bangladesh.org/
Mst.Sharmin Aktar
Bangladesh Health Professions Institute
B.sc In Occupational Therapy (4th year)
Mail: mstsharminakter29@gmail.com

Reisberg, Barry <Barry.Reisberg@nyulangone.org> Sun, Nov 21, 2021, 3:38 PM

to me

Dear Mst. Sharmin Akter,

I am pleased to grant you permission to use my Brief Cognitive Rating Scale (BCRS) in your work towards a B.Sc in Occupational Therapy at the Bangladesh Health Professions Institute Centre for Rehabilitation of Paralyzed (CRP) in Savar, Dhaka. Bangladesh provided that the the reference for the scale and the copyright are noted in all reproductions.

I suggest that you use the following reference:

Reisberg, B., Ferris, S.H., The Brief Cognitive Rating Scale (BCRS). Psychopharmacology Bulletin, 1988, 24:629-636.

You can cite the copyright as: Copyright 1984 Barry Reisberg, M.D.

With sincere best wishes for success with your research studies.

Barry Reisberg, M.D.

Director, Fisher Alzheimer's Disease Program
New York University Langone Health

Tel: 212 263-8550
Fax: 212 263-6991
Email: barry.reisberg@nyumc.org

BANGLADESH HEALTH PROFESSIONS INSTITUTE

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

Ref:

Date:

CRP/BHPI/IRB/11/2021/527

15/11/2021

To
Mst, Sharmin Aktar
4th Year, B.Sc. in Occupational Therapy
Session: 2016-17
BHPI, CRP, Savar, Dhaka- 1343, Bangladesh

Subject: Approval of the research project proposal **"Level of cognitive status among the patients with spinal cord injury in a tertiary rehabilitation hospital"** by ethics committee.

Dear Mst. Sharmin Aktar,
Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator and Md. Saddam Hossain, Lecturer of Occupational Therapy Department, BHPI as thesis supervisor. The Following documents have been reviewed and approved:

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

The purpose of the study is to identify the level of cognitive status in patients with Spinal Cord Injury (SCI) in tertiary rehabilitation Hospital. Should there any interpretation, type, spelling and grammatical mistakes in the title, it is the responsibilities of the investigator. Since the study involves questionnaire that takes maximum 20-30 minutes and have no likelihood of any harm to the participants, the members of the Ethics Committee approved the study to be conducted in the presented form at the meeting held at 9:15 AM on 15th September, 2021 at BHPI 29th IRB Meeting.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

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

Appendix B: Information sheet and consent form [English Version]

Consent Form:

Assalamualaikum,

I am Mst. Sharmin Aktar, 4th year B.Sc. in Occupational Therapy student at Bangladesh Health Professions Institute (BHPI) under the Faculty of Medicine, University of Dhaka. To obtain my Bachelor degree, I have to conduct a research project and it is a part of my study. My research title is **"Level of cognitive status among the person with the spinal cord injury (SCI) patients in tertiary rehabilitation Hospital."** To fulfill my research project, I need some information from you to collect data. So, you can be a respected participant of this research and the conversation time will be 20-30 minutes.

I would like to inform you that this is a purely academic study and will not to be used for any other purposes. I assure that all data will be kept confidential. Your participation will be voluntary. You may have the right to withdraw your consent at any time within one week of data collection but not after one week of data collection.

If you have any query about the study, you may contact with researcher Mst. Sharmin Aktar and/or supervisor, Md. Saddam Hossain (Dept. of Occupational Therapy, BHPI, CPR, Savar, and Dhaka-1343).

Do you have any questions before start this session?

So, I can proceed with the interview.

Yes ☐ No ☐

Signature of the participant and Date: …….

Data collector signature and date: ……..

Researcher signature and Date: …….……

BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)
Department of Occupational Therapy
CRP-Chapain, Savar, Dhaka-1343, Tel: 02-7745464-5, 7741404, Fax: 02-7745069

Code no-

Participants Information and Consent sheet

Research topic: Level of cognitive status among the person with the spinal cord injury (SCI) patients in tertiary rehabilitation Hospital.

Researcher: Mst. Sharmin Aktar, B.Sc. in Occupational Therapy (4th year), Session: 2016-2017, Bangladesh Health Professions Institute.

Supervisor: Md. Saddam Hossain, Lecturer in Occupational Therapy, Department of Occupational Therapy, Bangladesh Health Professions Institute.

Place of Research: The study will be conducted in the Inpatient Unit of CRP, Savar, Dhaka.

Part-1 Information sheet:

Introduction:

I am Mst. Sharmin Aktar, student of 4th year B.Sc in Occupational Therapy, session (2016-2017) studying under the Medicine Faculty of Dhaka University in Bangladesh Health Professions Institute. To complete B.Sc in Occupational Therapy from BHPI conduct a research project is mandatory. This research project will be done under the supervision of Md. Saddam Hossain, Lecturer in Occupational Therapy. The purpose of the research project is the collection of data and how it will be related to the research and this will be presented to you in detail through this participant paper. If you are willing to participate in this research, in that case the clear idea about the research topic will be easier for decision making. Of course, you do not have to make sure you participate now. Before taking any decision, you can discuss with your relatives, or guardian about this. On the other hand after reading the information sheet if the participant's problem to understand the content or if you need to know more about something, you can freely ask.

Research Background and Objectives:

You are being invited to be a part of this research because in Bangladesh, there is no research on Cognition among individuals with Spinal Cord Injury. Your information will be helpful to reveal the understanding of your cognition status after Spinal Cord Injury

through your voluntary participation in this study. The general purpose of the study is to know the level of cognitive status after Spinal Cord Injury.

Let's know about the topic related to participation in this research work:

Before singing the consent form from you, the details of managing the research project will be presented to you in detail through this participation note. If you want to participate in this study, you will have to sign the agreement. If you ensure the participation, a copy of your consent will be given. After a representative of collection data till by the researcher will go to you. At any given time taken from you by a question paper information will be collected. Your participation in this research project is optional. If you do not agree then you do not have to participate. Despite your consent, you can withdraw your participation at any time without giving any explanation to the researcher.

The benefits and risks of participation:

You will not get any benefit directly to participate in this research project. Participation in this study can lead to many difficulties in your daily work. However, we are hopeful that the benefits direct from the results of this research will remove the disadvantages. Don't worry about the questions that may know about your identity, it's a request. Patients name, address will not be included in the data analysis software to reduce the risk of uncover identity.

Confidentialities of information:

By signing this agreement, you are allowing the research staff to study this research project to collect and use your personal resources. Any information gathered for this research project, which can identify you, will be confidential. The information collected about you will be mentioned in a symbolic way. Only the concerned researcher and supervisor will be able to access this information directly. Symbolic ways identified data will be used for the next data analysis. Information sheets will be kept into a locked drawer. Electronics version of data will be collected in BHPI's Occupational Therapy department and researcher's personal laptop. It is expected that the results of this research project will be published and presented in different forums. In any publication and presentation, the information will be provided in such a way that you cannot be identified in any way without your consent. Data will be initially collected in papers.

Information about promotional result:

The result of this study will be published in various social media, websites, conference, discussion, and reviewed journals.

Participant's fees:

There is no stimulus and remuneration for participation in this study.

Source of funding to manage research:

The cost of this research will be spent entirely by researchers own funds. This study will be done in small areas and no money come from external source.

Information about withdrawal from participation:

Despite your consent, you can withdraw your participation at any time without giving any explanation to the researcher. If the information can be used after the cancellation, its permission will be mentioned in the participant's withdrawal letter (application only volunteer withdrawal)

Contact address with the researcher:

If you have any question about the research, you can ask me now or latter. If you wish to ask question later, you may contact any of following: Mst. Sharmin Aktar, B.Sc in Occupational Therapy, Department of Occupational Therapy and Contact number: 01785493201.

Complaints:

If there is any complaint regarding the conduct of this research project, contact with the Association of Ethics (77454645). This proposal has been reviewed by institutional Review Board (IBR), Bangladesh Health Professions Institute (BHPI), CRP, Savar, Dhaka-1343, Bangladesh, which is committee whose task it is to make sure that research participants are protected from harm. If you wish to find about more about the IBR, contact Bangladesh Health Professions Institute (BHPI), CRP, Savar, Dhaka-1343, Bangladesh.

Participant's Withdrawal From

(Applicable only for voluntary withdrawal)

Reason for withdrawal:

……
……
……
……
……

Whether permission to previous information is used?

Yes/No

Participant's Name:

Participants Signature:

Date: ……

Information sheet and consent form [Bengali Version]

সম্মতিপত্র

আসসালামুয়ালাইকুম,

আমি মোছাঃ শারমিন আকতার, ৪র্থ বর্ষ, ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধীনে বাংলাদেশ হেলথ প্রফেশনস ইনস্টিটিউটে (বিএইচপিআই) বি.এসসি. ইন অকুপেশনাল থেরাপির একজন ছাত্রী। আমার ব্যাচেলর ডিগ্রী পেতে, আমাকে একটি গবেষণা প্রকল্প পরিচালনা করতে হবে এবং এটি আমার অধ্যয়নের একটি অংশ। আমার গবেষণার শিরোনাম হল **"বাংলাদেশে মেরুরজ্জুতে আঘাতপ্রাপ্ত রোগীদের মধ্যে উপলব্ধির অবস্থা।"** আমার গবেষণা প্রকল্পটি পূরণ করতে, ডেটা সংগ্রহ করার জন্য আমার আপনার কাছ থেকে কিছু তথ্য দরকার। সুতরাং, আপনি এই গবেষণার একজন সম্মানিত অংশগ্রহণকারী হতে পারেন এবং কথোপকথনের সময় হবে ২০-৩০ মিনিট।

আমি আপনাকে জানাতে চাই যে এটি একটি সম্পূর্ণরূপে একাডেমিক অধ্যয়ন এবং অন্য কোন উদ্দেশ্যে ব্যবহার করা হবে না। আমি আশ্বাস দিচ্ছি যে সমস্ত তথ্য গোপন রাখা হবে। আপনার অংশগ্রহণ স্বেচ্ছায় হবে। ডেটা সংগ্রহের এক সপ্তাহের মধ্যে যে কোন সময় আপনার সম্মতি প্রত্যাহার করার অধিকার থাকতে পারে তবে ডেটা সংগ্রহের এক সপ্তাহের পরে প্রত্যাহার করতে পারবেন না।

এই গবেষণা সম্পর্কে আপনার কোন প্রশ্ন থাকলে, আপনি গবেষক মোছাঃ শারমিন আকতার, এবং/অথবা সুপারভাইজার, সাদ্দাম হোসেন (অকুপেশনাল থেরাপি বিভাগ, বিএইচপিআই, সিপিআর, সাভার, ঢাকা-১৩৪৩) এর সাথে যোগাযোগ করতে পারেন।

তথ্য প্রদান শুরু করার আগে আপনার কোন প্রশ্ন আছে?

তাই, আমি ইন্টারভিউ নিয়ে এগিয়ে যেতে পারি।

হ্যাঁ ☐ না ☐

অংশগ্রহণকারীর স্বাক্ষর এবং তারিখ: .....

তথ্য সংগ্রাহকের স্বাক্ষর এবং তারিখ: .....

গবেষকের স্বাক্ষর এবং তারিখ: .....

বাংলাদেশ হেলথ্ প্রফেশন্স ইনষ্টিটিউট (বিএইচপিআই)

অকুপেশনাল থেরাপি বিভাগ

সিআরপি- চাপাইন, সাভার, ঢাকা-১৩৪৩. টেলি: ০২-৭৭৪৫৪৬৪-৫,৭৭৪১৪০৪, ফ্যাক্স: ০২-৭৭৪৫০৬

কোড নং:

অংশগ্রহণকারীদের তথ্য এবং সম্মতিপত্র

গবেষনার বিষয়ঃ "বাংলাদেশে মেরুরজ্জুতে আঘাতপ্রাপ্ত রোগীদের মধ্যে উপলব্ধির অবস্থা।"
গবেষক: মোছাঃ শারমিন আক্তার, বি.এস.সি ইন অকুপেশনাল থেরাপি (৪র্থ বর্ষ), সেশন: ২০১৬-২০১৭ ইং, বাংলাদেশ হেলথ্ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই), সাভার, ঢাকা-১৩৪৩

তত্বাবধায়ক: মোঃ সাদ্দাম হোসেন, প্রভাষক, অকুপেশনাল থেরাপি বিভাগ, বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট।

গবেষনার স্থান: অভ্যন্তরীণ ইউনিট, সিআরপি, চাপাইন, সাভার, ঢাকা-১৩৪৩।

পর্ব-১ তথ্যপত্র:

আমি মোছাঃ শারমিন আক্তার, ঢাকা বিশ্ববিদ্যালয়ে চিকিৎসা অনুষদের অধীনে বাংলাদেশ হেল্থ প্রফেশনস ইনস্টিটিউটে বি.এস.সি.ইন অকুপেশনাল থেরাপি বিভাগে ৪র্থ বর্ষের ছাত্রী হিসেবে স্নাতক শিক্ষাকার্যক্রম (২০১৬-২০১৭ ইং) সেশনে অধ্যয়নরত আছি। বিএইচপিআই থেকে অকুপেশনাল থেরাপি বি.এস.সি শিক্ষাকার্যক্রমটি সম্পন্ন করার জন্য একটি গবেষনা প্রকল্প পরিচালনা করা বাধ্যতামূলক। এই গবেষণা প্রকল্পটি অকুপেশনাল থেরাপি বিভাগের প্রভাষক মোঃ সাদ্দাম হোসেন, এর তত্বাবধায়নে সম্পন্ন করা হবে। এই অংশগ্রহনকারী তথ্যপত্রের মাধ্যমে গবেষণার প্রকল্পটির উদ্দেশ্য, উপাত্ত সংগহের প্রণালী ও গবেষণাটির সাথে সংশ্লিস্ট বিষয় কিভাবে রক্ষিত হবে তা বিস্তারিত ভাবে আপনার কাছে উপস্থাপন করা হবে। যদি এই গবেষণায় অংশগ্রহন করতে আপনি ইচ্ছুক থাকেন, সেক্ষেত্রে এই গবেষণার সম্পৃক্ত বিষয় সম্পর্কে স্বচ্ছ ধারনা থাকলে সিদ্ধান্ত গ্রহন সহজতর হবে। অবশ্য এখন আপনার অংশগ্রহন আমাদের নিশ্চিত করতে হবে না। যে কোন সিদ্ধান্ত গ্রহনের পূর্বে, যদি চান তাহলে আপনার আত্মীয়-স্বজন, বন্ধু অথবা আস্থাভাজন যেকারো সাথে এই ব্যাপারে আলোচনা করে নিতে পারেন। অপরপক্ষে, অংশগ্রহনকারী তথ্যপত্রটি পড়ে, যদি কোন বিষয়বস্তু বুঝতে সমস্যা হয় অথবা যদি কোন কিছু সম্পর্কে আরো বেশি জানার প্রয়োজন হয়, তবে নির্দ্বিধায় প্রশ্ন করতে পারেন।

গবেষনার প্রেক্ষাপট ও উদ্দেশ্য:

এই গবেষণাতে মেরুরজ্জুতে আঘাতপ্রাপ্ত ব্যাক্তিদের অন্তর্ভুক্ত হবার জন্য আমন্ত্রণ জানানো হবে, এর জন্য আপনাকেও উক্ত গবেষণা প্রকল্পে অংশগ্রহণের জন্য আমন্ত্রণ জানানো হলো।এই গবেষণায় আপনার উপলব্ধির অবস্থা সম্পর্কে জানার জন্য আপনাকে গবেষণায় অংশগ্রহণের জন্য আমন্ত্রণ জানানো হলো। আপনার তথ্যসমূহ আপনার উপরোক্ত অবস্থা সম্পর্কে ধারনা দিতে সাহায্য করবে। গবেষণাটির সাধারণ উদ্দেশ্য হল : "মেরুরজ্জুতে আঘাতপ্রাপ্ত হাসপাতালে ভর্তি ব্যক্তিদের মধ্যে উপলব্ধির অবস্থা তদন্ত করা। আপনার কার্যকরী অংশগ্রহণ গবেষণার উদ্দেশ্য পূরণে সহায়তা করবে বলে আমরা আশাবাদী।

এই গবেষনা কর্মটিতে অংশগ্রহনের সাথে সম্পৃক্ত বিষয়সমূহ কি সে সম্পর্কে জানা যাক।

আপনার থেকে অনুমতিপত্রে স্বাক্ষর নেবার আগে, এই অংশগ্রহনকারী তথ্যপত্রের মাধ্যমে গবেষনা প্রকল্পটির পরিচালনা করার তথ্যসমূহ বিস্তারিত ভাবে আপনার কাছে উপস্থাপন করা হবে। আপনি যদি এই গবেষনায় অংশগ্রহন করতে চান, তাহলে সম্মতিপত্রে আপনাকে স্বাক্ষর করতে হবে। আপনি যদি সাক্ষর জ্ঞান সম্পন্ন না হন বা অন্য কোন কারনে স্বাক্ষর প্রদানে ব্যর্থ হন, সেক্ষেত্রে আপনার কাছ থেকে একজন স্বাক্ষীর উপস্থিতিতে বৃদ্ধাঙ্গুলির ছাপ সম্মতি পত্রে নেওয়া হবে। আপনি অংশগ্রহন নিশ্চিত করলে, আপনার সংরক্ষনের জন্য সম্মতিপত্রটির একটি অনুলিপি দিয়ে দেয়া হবে। পরবর্তীতে গবেষক কর্তৃক গঠিত তথ্য-উপাত্ত সংগ্রহের একটি দলের প্রতিনিধি আপনার কাছে যাবে। আপনার থেকে চেয়ে নেওয়া যে কোন একটি নির্দিষ্ট সময়ে একটি প্রশ্নপত্রের মাধ্যমে তথ্য সংগ্রহ করা হবে। এই গবেষনার প্রকল্পে আপনার অংশগ্রহণ ঐচ্ছিক। যদি আপনি সম্মতি প্রদান না করেন তবে আপনাকে অংশগ্রহন করতে হবে না। আপনি সম্মতি প্রদান করা স্বত্বেও যে কোন সময় গবেষককে কোন ব্যাখ্যা প্রদান করা ছাড়াই নিজের অংশগ্রহন প্রত্যাহার করতে পারবেন।

অংশগ্রহনের সুবিধা ও ঝুঁকিসমূহ কি?

গবেষনা প্রকল্পটিতে অংশগ্রহনের জন্য আপনি সরাসরি কোন সুবিধা পাবেন না। এই গবেষণায় অংশগ্রহনে আপনার দৈনন্দিন কাজে সাময়িক অসুবিধার কারন হতে পারে। তবে আমরা আশাবাদী যে, এই গবেষনার ফলাফল থেকে প্রাপ্ত উপকারীতা এই অসুবিধাকে অতিক্রম করবে। যে সমস্ত প্রশ্নের মাধ্যমে আপনার পরিচয় সর্ম্পকে অন্যরা জানতে পারে, সেই বিষয়ে উদ্বিগ্ন না হবার জন্য অনুরোধ করা হচ্ছে। অংশগ্রহণকারীর নাম, ঠিকানা উপাত্ত বিশ্লেষণের সফটওয়্যারে উল্লেখ না করে পরিচয় উন্মুক্ত হবার ঝুঁকি কমানো হবে।

তথ্যের গোপনীয়তা কি নিশ্চিত থাকবে?

এই সম্মতিপত্রে স্বাক্ষর করার মধ্য দিয়ে, আপনি এই গবেষনা প্রকল্পে অধ্যয়নরত গবেষনা কর্মীকে আপনার ব্যক্তিগত তথ্য সংগ্রহ ও ব্যবহার করার অনুমতি দিয়েছেন। এই গবেষনা প্রকল্পের জন্য সংগৃহীত যেকোন তথ্য, যা আপনাকে সনাক্ত করতে পারে তা গোপনীয় থাকবে। আপনার সম্পর্কে সংগৃহীত তথ্যসমূহ সাংকেতিক উপায়ে উল্লেখ থাকবে। শুধুমাত্র এর সাথে সরাসরি সংশ্লিষ্ট গবেষক ও তার তত্বাবধায়ক এই তথ্যসমূহে প্রবেশাধিকার পাবেন। সাংকেতিক উপায়ে চিহ্নিত উপাত্ত সমূহ পরবর্তী উপাত্ত বিশ্লেষনের কাজে ব্যবহৃত হবে। তথ্যপত্রগুলো তালাবদ্ধ ড্রয়ারে রাখা হবে। বিএইচপিআই এর অকুপেশনাল থেরাপি বিভাগে ও গবেষকের ব্যক্তিগত ল্যাপটপে উপাত্তসমূহের ইলেকট্রনিক ভার্সন সংগৃহীত থাকবে।

প্রত্যাশা করা হচ্ছে যে, এই গবেষণা প্রকল্পের ফলাফল বিভিন্ন ফোরামে প্রকাশিত এবং উপস্থাপিত হবে। যে কোন ধরনের প্রকাশনা ও উপস্থাপনার ক্ষেত্রে তথ্যসমূহ এমন ভাবে সরবরাহ করা হবে, যেন আপনার সম্মতি ছাড়া আপনাকে কোন ভাবেই সনাক্ত করা না যায়। তথ্য-উপাত্ত প্রাথমিক ভাবে কাগজপত্র সংগ্রহ করা হবে ।

ফলাফল প্রচার সর্ম্পকিত তথ্য

এই গবেষনার ফলাফল বিভিন্ন সামাজিক মাধ্যম, ওয়েবসাইট, সম্মেলন, আলোচনাসভায় এবং পর্যালেচিত জার্নালে প্রকাশ করা হবে।

অংশগ্রণকারীর পারিশ্রমিক

এই গবেষণায় অংশগ্রহনের জন্য কোন উদ্দীপনা ও পারিশ্রমিক দেবার ব্যবস্থা নেই।

গবেষণা পরিচালনার ব্যয়কৃত অর্থের উৎস

এই গবেষণাটির খরচ সম্পূর্ণ গবেষকের নিজস্ব তহবিল থেকে ব্যয় করা হবে। এই গবেষণাটি ছোট পরিসরে করা হবে এবং এখানে কোন অর্থ বহিরাগত উৎস থেকে আসবে না।

অংশগ্রহণ থেকে প্রত্যাহার সর্ম্পকিত তথ্যসমূহ

আপনি সম্মতি প্রদান করা স্বত্তেও যে কোন সময় গবেষককে কোন ব্যাখ্যা প্রদান করা ছাড়াই নিজের অংশগ্রহন প্রত্যাহার করতে পারবেন। বাতিল করার পর তথ্যসমূহ কি ব্যবহার করা যাবে কি যাবেনা তার অনুমতি অংশগ্রহণকারীর প্রত্যাহারপত্রে (শুধুমাত্র স্বেচ্ছায় প্রত্যাহারকারীর জন্য প্রযোজ্য) উল্লেখ করা থাকবে।

<u>গবেষকের সাথে যোগাযোগের ঠিকানা</u>

গবেষনা প্রকল্পটির বিষয়ে যোগাযোগ করতে চাইলে অথবা গবেষনা প্রকল্পটির সর্ম্পকে কোন প্রশ্ন থাকলে,এখন অথবা পরবর্তীতে যে কোন সময়ে তা জিজ্ঞাসা করা যাবে। সেক্ষেত্রে আপনি গবেষকের সাথে উল্লেখিত ০১৭৮৫৪৯৩২০১ (মোছাঃ শারমিন আক্তার) নাম্বারে যোগাযোগ করতে পারেন।

<u>অভিযোগ</u>

এই গবেষনা প্রকল্প পরিচালনা প্রসঙ্গে যেকোন অভিযোগ থাকলে প্রাতিষ্ঠানিক নৈতিকতা পরিষদের সাথে এই নাম্বারে (৭৭৪৫৪৬৪-৫) যোগাযোগ করবেন। এই গবেষনা প্রকল্পটি বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট, সাভারের প্রাতিষ্ঠানিক নৈতিকতা পরিষদ থেকে সিআরপি-বিএইচপিআই/আইআরবি/১০/১৮/১২৩৪ পর্যালোচিত ও অনুমোদিত হয়েছে।

<u>অংশগ্রহণকারীর প্রত্যাহার পত্র</u>

(শুধুমাত্র স্বেচ্ছায় প্রত্যাহারকারীর জন্য প্রযোজ্য)

অংশগ্রহনকারীর নাম: .....

প্রত্যাহার করার কারন:

.....
.....
.....
.....
.....

পূর্ববর্তী তথ্য ব্যবহারের অনুমতি থাকবে কিনা?

হ্যাঁ/না

অংশগ্রহনকারীর নাম:
অংশগ্রহনকারীর স্বাক্ষর:
তারিখ:.....

যদি নিরক্ষর হয়,
অংশগ্রহনকারীর আঙ্গুলের ছাপ

Appendix C: Questionnaire – (English & Bengali):

Demographic Information

Patient's ID/Code no: Mobile no:

Date of admission:

Age in this year:

Sex:

- Male
- Female
- Transgender

Living area:

- Urban
- Semi-urban
- Rural

Marital status:

- Married
- Unmarried
- Divorced
- Separated
- Widowed

Occupational status:

- Service holder
- Business
- Day labor
- Unemployment
- Student
- Housewife
- Abroad

Educational status:

- Illiterate
- Primary School
- Secondary school
- Higher secondary school
- B.Sc. Degree, M.Sc.

Types of injury:

- Paraplegic
- Tetraplegic

Date of injury:

Duration of injury: …….

Neurological level: …… Skeletal level: ……

Duration of hospitalized: ……..

Causes of injury:
……...

Types of mobility aids:

- Wheelchair
- Crutch
- Walker
- Stick
- Long troly

Pressure sore: Yes/No

Brief Cognitive Rating Scale

Scoring system:

1 = Normal, no problem with concentration, average or good performance.

2 = Very few, thematic obstacles may be mild.

3 = Mild, minimal problem that is clinically verifiable with detailed interrogation.

4 = Moderate, noticeable problem that is easily clinically proven.

5 = Moderately serious, serious problem in evaluation.

6 = serious. Very serious problem; There will be little good in some places of evaluation.

7 = There will be very serious, very serious problems; Very little capacity will remain.

Questions	**Score**						
Axes: 1 (Concentration)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. How far did you go for school?							
2. How are you at subtraction?							
3. What is the subtraction of 100 to 7?							
4. What is the subtraction of 93 to 7?							
5. What is the subtraction of 86 to 7?							

Questions	**Score**						
Axes: 2 (Recent Memory)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. What did you do last weekend?							
2. What did you have for breakfast?							
3. How is the weather today?							
4. Who is the current president?							
5. What is your current address?							

Questions	Score						
Axes: 3 (Past Memory)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. What primary schools did you go to?							
2. Where was it located?							
3. Who were your primary school teachers?							
4. Where were you born?							
5. Who were your childhood friends?							
6. What kind of things did you do with your childhood friends?							

Questions	Score						
Axes: 4 (Orientation)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. What time is it now?							
2. What day of week is it today?							
3. What date is today?							
4. Where do you live now?							
5. What is your identity?							

Questions	Score						
Axes: 5 (Functioning and self-care)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Have you forgotten the location of your essentials?							
2. What do you do from waking up in the morning to having breakfast?							
3. Can you manage your personal finances?							
4. Can you choose the right outfit for a special day, season or occasion? Or do you mistakenly wear the same clothes over and over again?							
5. Do you make mistake in dressing?							

জনসংখ্যা সংক্রান্ত তথ্য

রোগীর আইডি/কোড নম্বর: মোবাইল নম্বরঃ

বয়স: .....

ভর্তির তারিখ: .....

লিঙ্গ:

- পুরুষ
- মহিলা
- ট্রান্সজেন্ডার

বসবাসের এলাকা:

- শহুরে
- আধা শহুরে
- গ্রামীণ

বৈবাহিক অবস্থা:

- বিবাহিত
- অবিবাহিত
- তালাকপ্রাপ্ত
- বিচ্ছিন্ন
- বিধবা

পেশাগত অবস্থা:

- চাকুরীজীবি
- ব্যবসা
- দিন মজুর
- বেকার

শিক্ষাগত অবস্থা:

- নিরক্ষর
- প্রাথমিক বিদ্যালয়
- মাধ্যমিক বিদ্যালয়
- উচ্চ মাধ্যমিক বিদ্যালয়
- স্নাতক

আঘাতের ধরনঃ

- পেরাপ্লেজিক
- টেট্রাপ্লেজিক

আঘাতের সময়কাল: .....

নিউরোলজিকেল লেভেল: ..... স্কেলিটাল লেভেল: .....

আঘাতের তারিখ: ..... হাসপাতালে ভর্তির সময়কাল: .....

আঘাতের কারণ: .....

চলাফেরার সহায়ক:

- হুইলচেয়ার
- ক্রাচ
- ওয়াকার
- স্টিক
- লং ট্রলি

চাপজনিত ঘা: হ্যাঁ/না

তথ্য সংগ্রহের তারিখ: .....

ব্রিফ কগনেটিভ রেটিং স্কেল

স্কোরিং সিস্টেম:

1 = স্বাভাবিক, মনোযোগ, গড় বা ভাল কর্মক্ষমতা নিয়ে কোন সমস্যা নেই।

2 = খুব কম, বিষয়গত সমস্যা হালকা হতে পারে।

3 = হালকা, ন্যূনতম সমস্যা যা বিশদ জিজ্ঞাসাবাদের সাথে ক্লিনিক্যালি যাচাইযোগ্য।

4 = মাঝারি, লক্ষণীয় সমস্যা যা সহজেই ক্লিনিক্যালি প্রমাণিত।

5 = মাঝারি গুরুতর, মূল্যায়নে গুরুতর সমস্যা।

6 = গুরুতর। খুব গুরুতর সমস্যা; মূল্যায়নের কিছু জায়গায় সামান্য ভালো হবে।

7 = খুব গুরুতর, খুব গুরুতর সমস্যা হবে; সামর্থ্য খুব কম থাকবে।

প্রশ্ন	স্কোর						
অঙ্ক: ১ (মনোযোগ)	১	২	৩	৪	৫	৬	৭
১. আপনি স্কুলের জন্য কতদূর গিয়েছিলেন?							
২. আপনি বিয়োগ এ কেমন?							
৩. ১০০ থেকে 7 এর বিয়োগ কত ?							
৪. ৯৩ থেকে ৭ এর বিয়োগ কত ?							
৫. ৮৬ থেকে ৭ এর বিয়োগ কত ?							

প্রশ্ন	স্কোর						
অঙ্ক: ২ (সাম্প্রতিক স্মৃতি)	১	২	৩	৪	৫	৬	৭
১. আপনি গত সপ্তাহান্তে কি করেছেন?							

২. আপনি সকালের নাস্তার জন্য কি খেয়েছেন?							
৩. আজকের আবহাওয়া কেমন?							
৪. বর্তমান রাষ্ট্রপতি কে?							
৫. আপনার বর্তমান ঠিকানা কি?							

প্রশ্ন	স্কোর						
অক্ষ: ৩ (অতীত স্মৃতি)	১	২	৩	৪	৫	৬	৭
১. আপনি কোন প্রাথমিক বিদ্যালয়ে গিয়েছিলেন?							
২. এটি কোথায় অবস্থিত ছিল?							
৩. আপনার প্রাথমিক বিদ্যালয়ের শিক্ষক কারা ছিলেন?							
৪. আপনি কোথায় জন্মগ্রহণ করেন?							
৫. আপনার শৈশব বন্ধু কারা ছিল?							
৬. আপনি আপনার শৈশবের বন্ধুদের সাথে কি ধরনের কাজ করতেন?							

প্রশ্ন	স্কোর						
অক্ষ: ৪ (ওরিয়েন্টেশন)	১	২	৩	৪	৫	৬	৭
১. কয়টা বাজে এখন?							
২. আজ সপ্তাহের কোন দিন?							
৩. আজ কত তারিখ?							
৪. আপনি এখন কোথায় থাকেন?							

৫. আপনার পরিচয় কি?							

প্রশ্ন	স্কোর						
অঙ্ক: ৫ (কাজ এবং নিজের যত্ন)	১	২	৩	৪	৫	৬	৭
১. আপনি কি আপনার প্রয়োজনীয় জিনিসের অবস্থান ভুলে যান?							
২. আপনি কি বিল দিতে ভুলে যান? নাকি মার্কেটিং করতে কোনো অসুবিধা হয়?							
৩. আপনি কি আপনার ব্যক্তিগত অর্থ পরিচালনা করতে পারেন?							
৪. আপনি একটি বিশেষ দিন, ঋতু বা অনুষ্ঠানের জন্য সঠিক পোশাক চয়ন করতে পারেন? নাকি আপনি ভুল করে একই পোশাক বারবার পরেন?							
৫. আপনি কি পোশাক পরতে ভুল করেন?							