

**INFLUENCING FACTORS OF THE DEVELOPMENT OF UTI  
AMONG THE SCI PATIENTS**

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

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BHPI, CRP, Savar, Dhaka-1343



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

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AMONG THE SCI PATIENTS**

Submitted by **Md. Rejaul Karim**, for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT).

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## **Declaration**

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of information of the study, I would be bound to take written consent of my supervisor and Head, Department of Physiotherapy, BHPI.

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## Acronyms

<b>BHPI</b>	Bangladesh Health Professions Institute
<b>CAUTI</b>	Catheter Associated Urinary Tract Infection
<b>CIC</b>	Clean Intermittent Catheterization
<b>CRP</b>	Center for the Rehabilitation of the Paralyzed
<b>IC</b>	Intermittent Catheterization
<b>ISC</b>	Injury of Spinal Cord
<b>REM</b>	Routine Microscopic Examination
<b>SCI</b>	Spinal Cord Injury
<b>SCL</b>	Spinal Cord Lesion
<b>SD</b>	Standard Deviation
<b>SPSS</b>	Statistical Package of Social Science
<b>UK</b>	United Kingdom
<b>USA</b>	United State of America
<b>UTI</b>	Urinary Tract Infection

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## Abstract

*Purpose:* To find out the influencing factors of urinary tract infection among SCI patients at CRP. *Objectives:* To examine the relationship between the demographic variables (sex and age) of patients and development of urinary tract infection among catheterized patients at CRP. To examine catheter related factors influencing the development of urinary tract infection among catheterized patients. To know the frequency of UTI among SCI patients. To determine the common associated factors with the development of UTI among SCI patients. *Methodology:* A cross sectional study design was used to conduct the study. About 30 patients were selected through simple purposive sampling technique from inpatient of Spinal Cord Injury (SCI) unit, of Center for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka, Bangladesh. The data were collected by using a questionnaire and were analyzed by using SPSS software version 16.0. *Results:* Among the thirty participants the mean age was 30( $\pm$ 14.14 years with range from 11-60) years. Male 76.67% (n=23) are predominantly higher than female 23.33% (n=7) Majority of the participants were Muslim and very few participants were Hindu, married person was more affected than unmarried and their frequent physical symptoms were nausea and abdominal pain. *Conclusion:* The results of this study provided more insight into the urinary tract infection among spinal cord injured patient. More research is needed to evaluate the influencing factors and complication of UTI in SCI patients.

*Key words:* Urinary Tract Infection (UTI), Spinal Cord Injury (SCI), Centre for the rehabilitation of the paralyzed (CRP).

### **1.1 Background**

The spinal cord is the main pathway for information connecting the brain and peripheral nervous system. The length of the spinal cord is much shorter than the length of the bony spinal column. Spinal cord has three sections: cervical, thoracic, and lumbar region. The two areas of the spinal cord most commonly injured are the cervical spine (C1-C7) and the lumbar spine (L1-L5). A spinal cord injury (SCI) refers to any injury to the spinal cord that is caused by trauma instead of disease. Depending on where the spinal cord and nerve roots are damaged, the symptoms can vary widely, from pain to paralysis to incontinence. Spinal cord injuries are described at various levels of "incomplete", which can vary from having no effect on the patient to a "complete" injury, which means a total loss of function (Rahimkhani et al., 2014).

One of the most problematic consequences of a spinal cord lesion (SCL) is alterations in lower urinary tract function. Although mortality related to urological complications has been reduced during the last decades (Dahlberg et al., 2004). Cause of mortality in individuals with SCI is mainly respiratory diseases with a rate of 21.7% while heart diseases rank second with a rate of 12.6% and infections rank third with a rate of 9.4%. While urinary system infections are major causes of mortality and morbidity in patients with SCI, mortality due to urinary sepsis has decreased to 10-15% with improved management (Garcia & Esclarin, 2003).

Urinary tract infection (UTI) is the single most common hospital-acquired infection, and the majority of cases of nosocomial UTI are associated with an indwelling urinary catheter (Trautner et al., 2010). A retrospective study of UK in total 185 patients who face the traumatic spinal cord injury, total complication rate at all stages was 62% and upper urinary tract disease accounted for 22.6% (Masri et al., 2012). In India total of 297 subjects (154 men and 143 women) of SCL were included. Common complications seen were urinary tract infections in 184 patients (Nair et al., 2005).

Urinary tract infection (UTI) has long been considered the most common healthcare-associated infection (HAI), with the vast majority of these infections occurring after placement of the convenient, uncomfortable (Meddings et al., 2013). Clean intermittent catheterization (CIC) is usually the primary recommendation for long-term bladder management (Dahlberg et al., 2004).

Leoni & De Ruz (2003) reported that the incidence of UTI varies widely from country to country, according to cause, study methodology, and source of data. The international literature shows incidence figures which range from 9 to 53 per million inhabitants per year. In the USA, 11000 people survive SCI each year. They also cited that in Europe the incidence is 3 to 32 per million. In Netherlands the incidence was found about just more than 10 per million, in Spain it's ranging from 12 to 20 per million.

Leoni & Ruz (2003) had also described that there is an increased risk of SCI patients to develop UTI as a complication secondary to it. From the history of World War I, there was approximately 80% death in SCI patients was due to pyelonephritis. Though the management has improved to decrease the mortality from renal sepsis about 10-15%, UTI represent a major cause of morbidity & mortality in patients with SCI. SCI alters the dynamics of voiding, and often requires catheters for bladder drainage. UTI account for up to 40% of nosocomial infections, and most of these are catheter related. They cause bacteremia in 2±4% of patients, and have been associated with a case-fatality rate three times higher than that in non-bacteriuric patients (11±14).

Several factors appear to be responsible for an increased risk of infection in the neurogenic bladder, with incomplete voiding, elevated intravesical pressure and catheter use contributing to an increased risk of symptomatic UTI. Frequent exposure to antibiotics increases the risk of infection by resistant organisms. UTI interfere with rehabilitation, and may lead to secondary urologic complications. Since in SCI patients there are different patterns of neurogenic bladders according to the neurologic level (the anatomic level of the spinal injury), the management and treatment are different. The majority of published studies evaluating this problem cover only selected types of

neurogenic bladders or specific groups of patients. In addition, patient populations are too varied and small, and there is no uniform definition of UTI. During catheterization bacteria may be introduced into the urinary tract. The source of the bacteria causing the infections during the intermittent catheterization (IC) is assumed to be the flora in the periurethral area (Levendoglu et al., 2004). Several studies have evaluated the risk factors for developing bacteriuria. Duration of catheterization is the single most important risk factor (Bursle et al., 2015).

Catheter-associated urinary tract infections (CAUTIs) are the most common health care-associated infection in the United States (Conway & Larson, 2012; Dudeck et al., 2013) and can lead to increased patient morbidity or mortality and considerable financial burden to hospitals (Gould et al., 2010). Each year, more than 30 million bladder catheters are used in the United States. Urinary catheters bypass normal host defenses to allow bacterial entry at a rate of approximately 3–10% per day, and they encourage bacterial persistence in the bladder. The majority (98%) of individuals who are catheterized for 30 days or longer will have bacteriuria with one or more species of uropathogens (Prasad et al., 2009).

It is estimated that about 8% of patients with SCI experience an episode of nephrolithiasis during their life with an increased incidence during the first three months after SCI. Development of nephrolithiasis results in urinary stasis and ultimately bacterial overgrowth and urinary infection (Dormanesh et al., 2013). General trends in the treatment of UTIs over the past decade have been toward the use of shorter regimens (even single-dose therapy); once-a-day dosing; and in the case of acute pyelonephritis and complicated UTI, the provision of therapy in the outpatient setting (for most patients) with fluoroquinolones and other broad-spectrum drugs that have excellent oral absorption and pharmacokinetics. Evidence-based treatment guidelines for acute uncomplicated UTI (cystitis and pyelonephritis) have recently been developed and published by the Infectious Diseases Society of America. Single-dose therapy is less effective than 3-day therapy, especially with  $\beta$ -lactam agents (Stamm & Norrby 2001).

## **1.2 Rationale**

Injuries and disease affecting the spinal cord and complicated by neurological damage are an important health problem in Bangladesh as they carry high rates of morbidity and mortality. There is no relevant research has been conducted in this field yet in Bangladesh. The great majority of individuals with SCI have important in bladder function which depends on the grade and level of injury. Urinary tract infections are one of the most common complications following spinal cord injury and may require hospitalization. In some adults, recurrent UTIs may cause scarring in the kidneys, which over time can lead to renal hypertension and eventual kidney failure. Most of these adults with kidney damage have other predisposing diseases or structural abnormalities. Recurrent urinary tract infections, even in the kidney, almost never lead to progressive kidney damage in otherwise healthy women. In most cases, urinary tract infections are annoyances that cause urinary discomfort. However, if left untreated, UTIs can develop into very serious and potentially life-threatening kidney infections that can permanently scar or damage the kidneys. The infection may also spread into the bloodstream (called sepsis) and then elsewhere in the body. Urinary retention is a major cause of neurological impairment for persons with spinal cord injury. As the Bangladesh is a developing country and trying to develop health care system. So the spinal cord injury patient needs a specialized and comprehensive rehabilitation services to continue their activities of daily living in the community. It also negatively impacts quality of life. It also finds out the physical signs of UTI in spinal cord injured patients. This study will help to liberate effective treatment for the patients with urinary infection which will in term reduce the mortality and morbidity of SCI

### **1.3 Research question**

What are the influencing factors for the development of UTI among the SCI patients at CRP?

### **1.4 Objectives of study**

#### **1.4.1 General objectives**

To identify the influencing factors of UTI among SCI patients at CRP.

#### **1.4.2 Specific objectives**

To examine the relationship between the demographic variables (sex and age) of patients and development of urinary tract infection among catheterized patients at CRP.

To examine catheter related factors influencing the development of urinary tract infection among catheterized patients.

To know the frequency of UTI among SCI patients.

To determine the common associated factors with the development of UTI among SCI patients.

## 1.5 List of Variables Conceptual Framework

### Independent variables

Socio demographic information:

- Age
- Sex
- Residential area
- Education
- Occupation etc.

Skeletal level of injury

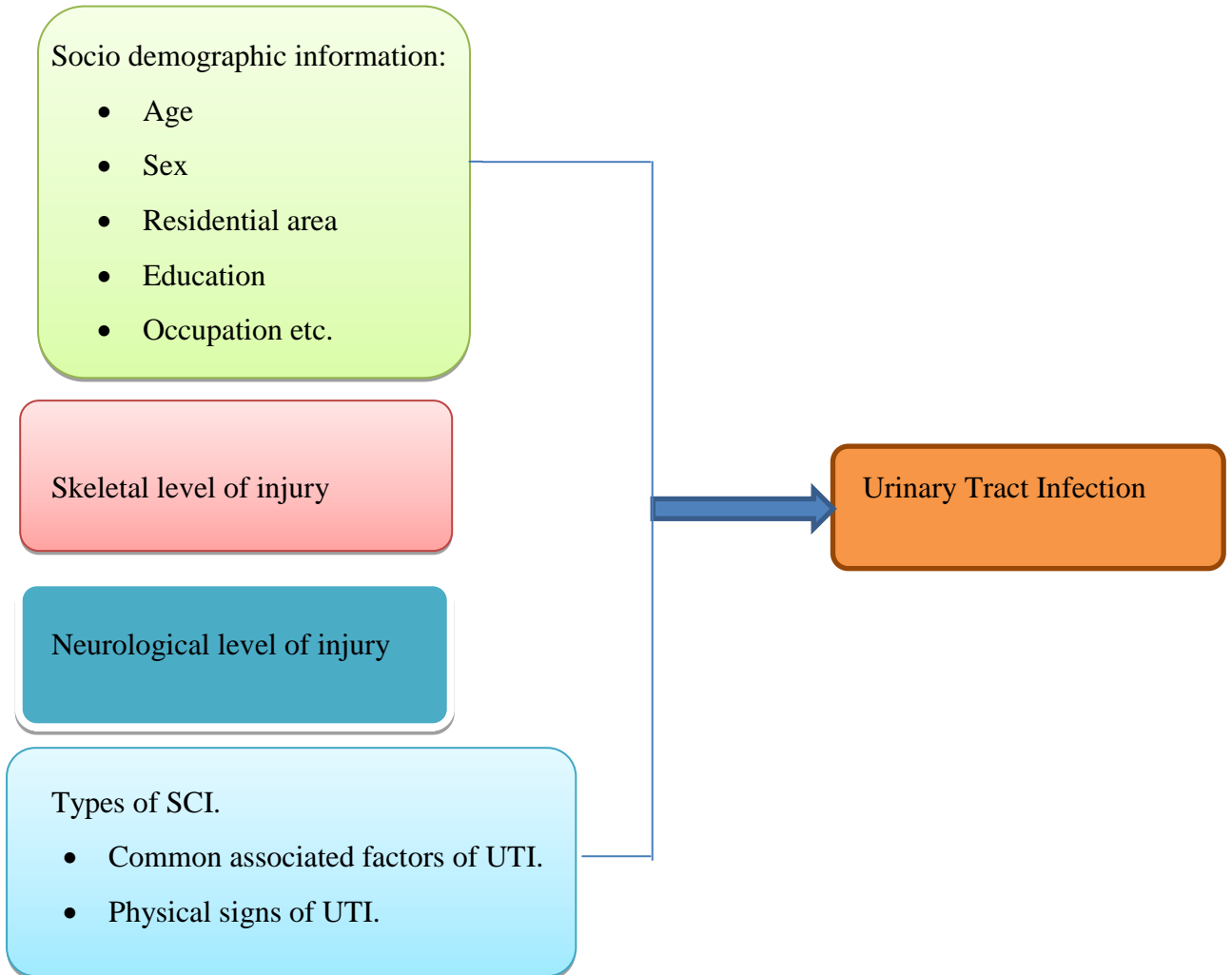
Neurological level of injury

Types of SCI.

- Common associated factors of UTI.
- Physical signs of UTI.

### Dependent variable

Urinary Tract Infection





## **1.6 Operational definition**

### **Spinal cord injury**

Spinal cord injury (SCI) is damage to the spinal cord that results in a loss of function such as mobility or feeling.

### **Urinary tract infection**

An infection of the kidney, ureter, bladder or urethra cases was identified with positive Routine Microscopic Examination (RME) test.

### **The bladder**

The bladder is a collapsible sac lying in the pelvis. It is able to stretch to hold urine until you are ready to urinate.

### **Paralysis**

Injury or disease to the nervous system can affect the ability to move a particular part of the body. This reduce motor ability is called paralysis.

### **Paraplegia**

Paralysis of both legs.

### **Tetraplegia**

Paralysis of both legs and both arms, it is also called quadriplegia.

### **Bladder control**

Problem related to bladder control, such as urine leakage at inappropriate times, impact your quality of life. This common problem prevents peoples of all ages from fully participating in their normal activities.

Spinal cord lesion (SCL) is sudden and unexpected. It can be devastating and costly in human and social terms. Owing to inadequate services, most people with SCL in low-resource countries died within 2 years of acquiring spinal injury. SCL continues to be a major cause of disability throughout Asia as well as in Bangladesh (Islam et al., 2011). Spinal cord injuries have traumatic or non-traumatic in etiology, but are typically associated with major trauma from motor vehicle accidents, falls, sports injuries, and violence (Rahimkhani et al., 2014).

Out of 107 patients about 44% patients had cervical lesion, 27% had thoracic and 29% had lumbar injury. Of the cervical Neurological conditions according to the American Spinal Injury Association (ASIA) scale showed about 78% of the patients falling in the complete a group. About 93% of the patients were traumatic (Islam et al., 2011). In the present study, the renal and urological complications and the associated factors were evaluated in the patients suffering from SCI. Renal and urological complications including chronic renal failure (4.8%), hydronephrosis (2.2%), nephrolithiasis (5.2%) and urinary tract infection (36.2%) were present in 40% of the patients (Dormanesh et al., 2013).

Urinary tract infection is a common problem among patients with spinal cord injuries and based on study accounting for 67.1% of complications following nontraumatic and traumatic spinal cord injuries. In his study, the prevalence of UTI was 43.89%. Certain structural and physiological factors, such as bladder over distention, vesicoureteral reflux, high-pressure voiding, large post void residuals, stones in the urinary tract, and outlet obstruction, increase the risk of infection. The method of bladder drainage also influences the risk of UTI, and most persons with spinal cord injury and an indwelling urinary catheter developed a UTI (Luo et al., 2008). Urinary tract infection (UTI) is the single most common hospital-acquired infection, and the majority of cases of nosocomial UTI are associated with an indwelling urinary catheter (Trautner, 2010).

Thirteen subjects underwent 19 insertions of study catheters. Eight subjects (62%) became successfully colonized for > 3 days after catheter removal. In these 8 subjects, the rate of UTI while colonized was 0.77 per patient-year, in comparison to the rate of 2.27 UTI per patient year prior to enrollment (Prasad et al., 2009). To determine the validity, accuracy, and predictive value of the signs and symptoms of urinary tract infection (UTI) for individuals with spinal cord injury (SCI) using intermittent catheterization (IC) and the accuracy of individuals with SCI on IC at predicting their own UTI. Overall, “cloudy urine” (83.1%) and “leukocytes in the urine” (82.8%) “fever” (99.0%); it had a very low sensitivity (6.9%). Subjects were able to predict their own UTI with an accuracy of 66.2%, and the negative predictive value (82.8%) was substantially higher than the positive predictive value 32.6% (Massa et al., 2009).

In addition to use of aseptic insertion technique and maintenance of closed drainage, guidelines also require ongoing assessment of the need for catheterization and removal as soon as possible (Meddings et al., 2014). Additional interventions found to be successful include use of silver alloy catheters, limiting catheter movement with a securing device, and assuring that the catheter tubing does not touch the floor (Clarke et al., 2013). Bacteriuria is a prerequisite for septicemia. Urinary catheterization is also an independent predictor for bacteremia UTIs (Bhagan et al., 2007).

In acute stage of SCI, with proper management, urine can be kept sterile for 15 - 20 days without antibiotic prophylaxis and for 16 - 55 days if prophylaxis is given. With urine analysis on a weekly basis they found in the group on sterile IC a 28.6% UTI incidence when in the non-sterile catheterization group 42.4% incidence was found (Wyndael, 2002). During the study period, 71 of the 501 subjects (14%) had Proteus and 90 (18%) had urinary stones. Twenty-seven percent of the subjects with Proteus had stones, and the association of Proteus with stones was significant (Hung et al., 2007). Although chronic urinary catheterization is essentially synonymous with bacteriuria, bacteriuria is not synonymous with symptomatic UTI.

The presence of bacteria in the urine does trigger an inflammatory response in terms of pyuria and urinary interleukins, 27–29 but more than 90% of cases of nosocomial catheter-associated bacteriuria are asymptomatic (Trautner&Darouiche, 2004).A study-group consisted of 129 (85%) subjects. In 14 (11%) subjects in the normal voiding group, 15 (12%) in the controlled voiding group, 16 (12%) in the clean intermittent catheterization (CIC) group, 30 (23%) in the mixed group, 31 (24%) in the suprapubic tapping group, 16 (12%) in the compression or straining group and seven (5%) in the catheter or conduit group. The frequency of UTI was highest in the mixed group (Dahlberg et al., 2004).

Urinary tract infection (UTI) is responsible for major morbidity in SCI patients.Despite improved methods of treatment, urinary tract morbidity still ranks as the second leading cause of death in SCI patients ( Singh et al., 2011).Bladder management is an essential element in improved outcomes following SCI. The goal is to prevent upper and lower tract complications by maintaining adequate bladder drainage with low-pressure urine storage and voiding.Urinary tract infection (UTI) is the most common urological complication in SCI patients (Edokpolo et al., 2012).

Among the 407 patients, 252 with neurogenic bladder, during an observation period of one year, 24.5% with non-clinical UTI, 58.6% with minor symptoms, 14.3% with more comprehensive or frequent symptoms, while 2.6% claimed major symptoms (Wyndaele, 2002).Long-term survival of patients with SCI is dependent on regular and close follow-up to detect complications and coexistent urologic conditions, combined with proper management. Since immediate post injury care and long term rehabilitation have advanced, renal failure is no longer the leading cause of death among persons with spinal cord injury (Ku et al., 2006).There is a large amount of fecal contamination of the perineum in patients who have their bowel program in bed during the initial stages of their rehabilitation in both sexes. Periurethral area is colonized with Gramnegative bacteria coming from bowel. The organism may spread from the meatus of the urethra and colonize in mucosa. It has been assumed that organisms are introduced into the bladder at the time of IC and colonize in the urine. Contamination and colonization of the perineum

with Gram-negative bacteria are reduced after starting the bowel management program. Regular antiseptic procedures performed periodically may provide an effective hygienic care in reducing the incidence of catheter-associated bacteriuria. Therefore, the infection rate may have been lowered (Levendoglu et al., 2004). Persistent injury to the urinary system by untreated UTI and hydronephrosis results in impaired renal function because of the scars caused by urinary reflux this may result in chronic renal failure. Urinary reflux has been known as a risk factor of pyelonephritis impaired pain sensation in SCI patients hides flank pain as a symptom of pyelonephritis and this may act as a predisposing factor for developing renal failure in these patients in long term. The prevalence of chronic renal failure was estimated as 4.8% in the present study. The prevalence of end stage renal disease in general population is estimated to be 1699 in one million individuals (0.17%). It is clear that a longer duration of SCI as a predisposing factor of renal complication increases the risk of developing chronic renal failure. Furthermore, lack of a caregiver for a patient who is not able to take care of him/herself provides a condition for developing all types of renal complications resulting in chronic renal failure (Dormanesh et al., 2013).

Treatment of UTI is necessary only when the infection is symptomatic and asymptomatic bacteriuria does not need to be treated with antibiotics. Long-term prophylactic antibiotics should be avoided in order to minimize the emergence of resistant organisms. In neurogenic patients on CIC, urethral trauma and false passage can be successfully managed by 6-weeks indwelling catheter and 5 days antibiotics. Urethral stricture can be treated by urethral dilation or internal urethrotomy (Igawa et al., 2008). Urinary tract infection is challenging, not only because of the large number of infections that occur each year, but also because the diagnosis of UTI is not always straight forward. UTI has to be distinguished from other diseases that have a similar clinical presentation, some UTIs are asymptomatic or present with atypical signs and symptoms, and the diagnosis of UTI in neutropenic patients (who do not typically have pyuria) may require different diagnostic criteria than those used for the general patient population (Kolawole et al., 2009).

### **3.1 Study design**

A cross sectional study was chosen to conduct the study. It is the simplest variety of descriptive or observational epidemiology and also known as surveys are a useful way to gather information on important health related aspects of people's knowledge, attitudes, and practices. Cross sectional study also known as snap short study. A survey is a research technique which involved collecting data from a large number of people, so that a general overview of the group could be obtained.

### **3.2 Study sites and area**

The study were conducted at Spinal cord injury Unit of Center for the Rehabilitation of Paralyzed (CRP) Chapain, Savar, Dhaka. 1343. The researcher selected the SCI unit of CRP for data collection. At first researcher developed a standard questionnaire and then selected the Urinary tract infection affected SCI patients of Spinal cord injury unit of CRP as sample for data collection. Hundred beaded SCI unit provides rehabilitation services for the patient with Spinal cord injury (SCI).

### **3.3 Study population and sampling**

The study population is any set of people or events from which the sample is selected and to which the study results was generalized. In this study population was all the SCI patients of CRP and the samples are the UTI affected SCI patient's whose staying in SCI unit of CRP Chapain, Savar, Dhaka. A group of people or events drawn from a population are known as sample. Thirty catheterized patients were taken as a sample for this study.

### **3.4 Sampling technique**

The researcher selected the convenience sampling technique to draw out the sample from the population. Purposive sampling is a type of probability sampling technique. Probability sampling focuses on sampling techniques that are based on the exclusion and inclusion criteria of the researcher. Purposive sampling is very easy to carry out with few rules governing how the sample should be collected.

### 3.5 Inclusion criteria

- The people who admitted in CRP.
- Both male and female people were selected.
- All age group was selected.
- Subject who were affected in UTI.

### 3.6 Exclusion criteria

- Subject who were not affected in UTI.
- Subject who had psychiatric problem who may give irrelevant information which will not helpful for study

### 3.7 Sample size

In this project study, the researcher selected 30 spinal cord injury patients from the spinal cord injury (SCI) unit of CRP through convenience sampling technique.

The equation of sample size calculation are given below-

$$n = \left\{ \frac{Z \left( 1 - \frac{\alpha}{2} \right)}{d} \right\}^2 \times pq$$

Here,

$$Z \left( 1 - \frac{\alpha}{2} \right) = 1.96$$

$$P = 0.72$$

$$q = 1 - p$$

$$= 1 - 0.72$$

$$= 0.37$$

$$d = 0.05$$

According to this equation the sample should be more than 398 but due to lack of time and opportunity the study was conducted with 30 patients attending at SCI unit of the physiotherapy department in CRP.

### **3.8 Data collection method and tools**

The face to face interview technique was used to collect data. A structured questionnaire for collecting information related to the study was used. The researcher collected data in male and female word through individual interviewing process in clam environment. The duration of data collection was 10-15 min for every individual patient. For this the materials to successfully complete the interview session and collect the valuable data from the participants were used such as- question paper, consent from, pen, file, etc.

### **3.9 Data analysis**

Data wasanalyzed with the software named Statistical Package for Social Science (SPSS) version 16.0. The data that the researcher collected is descriptive data. The researcher used the graph technique for analyzing data, calculated as percentages, and presented this using bar and pie charts by SPSS. SPSS is a comprehensive and flexible statistical analysis and data management solution.



### **3.10 Ethical consideration**

Research proposal was submitted for approval to the administrative bodies of ethical committee of Physiotherapy department of CRP to do the study. Bangladesh Medical Research Council (BMRC) and World Health Organization (WHO) guideline were followed. .Then permission was taken from the In-charge of SCI unit for data collection from the patients. The participant, who was interested to participate in the study, were informed verbally about the topic and purpose of study. They were informed about the number of interviews and each interview can take 10-15 minutes for every participants. The researcher maintained privacy issue and confidentiality. Each participant had the right to refuse to answer any question or withdraw them from the study. Written consent was given to all participants. The researcher explained about the detail of research questions and about his or her role in this study. The researcher received a written consent form every participants including signature of participants and career. Participants were assured that they could understand about the consent form and their participation was on voluntary basis. The participants were informed clearly that there information would be kept confidential. Participants were assured that the study would not be harmful for them. It was explained that there might not a direct benefit from the study for the participants but in the future SCI patients like them might get benefited from it. The researcher gave the full privacy of participants' related information. The participants have the right to withdraw consent and discontinue participants at any time without prejudice to present or future care at the SCI unit of CRP.

To examine the relationship between the demographic variables (sex and age) of patients and development of urinary tract infection among catheterized patients at CRP.

#### 4.1 Age range involvement

Among the 30 participants who were affected in UTI and their mean age were 30( $\pm$ 14.14) years. Among the age of the participants, 11-20 years were 26.67%, 21-30 years were 26.67%, 31-40 years were 23.33%, 41-50 years were 13.33% and 51-60 years were 10%.

#### Cross tabulation between age and sex

Age of participants	Gender		Total (%)
	Male	Female	
11- 20 Years	5	3	<b>8 (26.6)</b>
21- 30 Years	6	2	<b>8 (26.6)</b>
31-40 Years	5	2	<b>7 (23.3)</b>
41- 50 Years	4	0	<b>4 (13.33)</b>
51- 60 years	3	0	<b>3 (10)</b>
<b>Total</b>	<b>23</b>	<b>7</b>	<b>30 (100)</b>

Table-1: Age – Sex Cross Tabulation

## 4.2 Gender

The study found among the 30 patients with UTI almost 76.67% (n=23) were male and about 23.33% (n=7) were female.

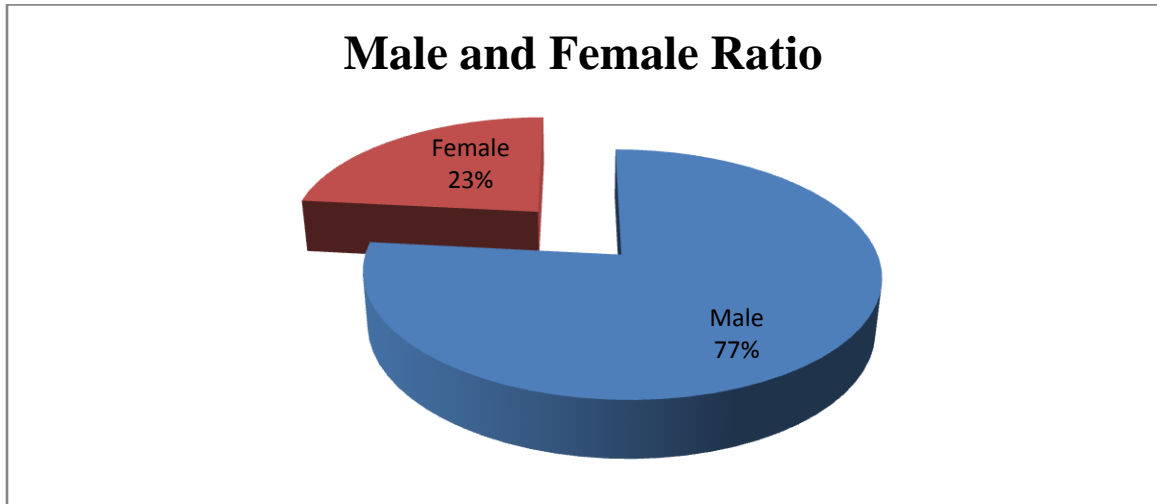


Figure-1: Involvement of Sex

## 4.3 Marital status

Among the 30 participants study found married person 63.33% (n=19), unmarried 36.67% (11). Most frequent status in married that was higher than unmarried. Most frequent vulnerable group was married person.

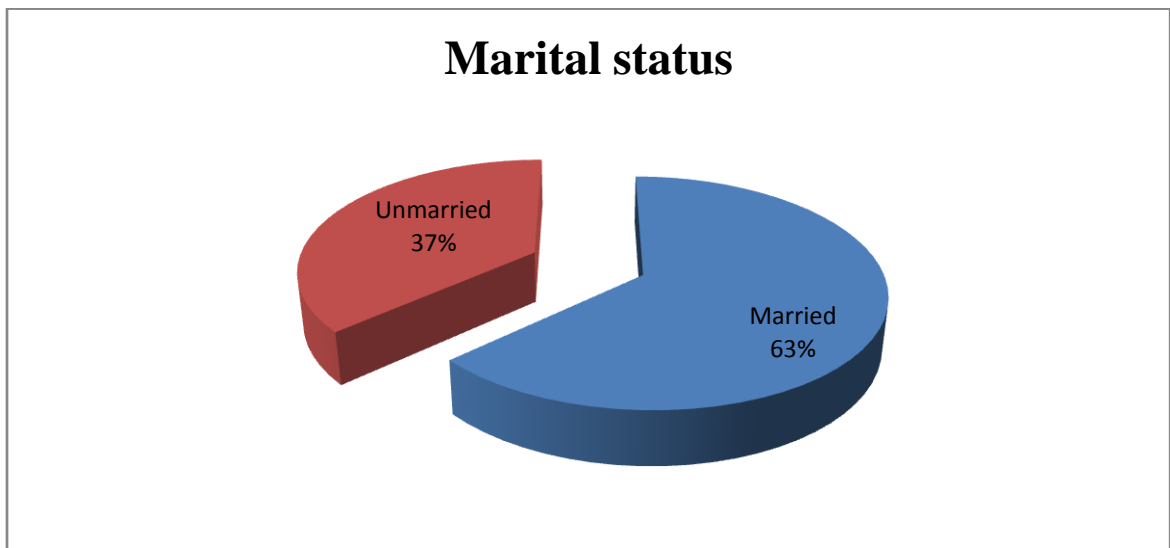


Figure-2: Marital status of Participants

#### 4.4 Type of family

The study shows among the 30 participants about 87% participants were came from nuclear family and 13% came from extended family.

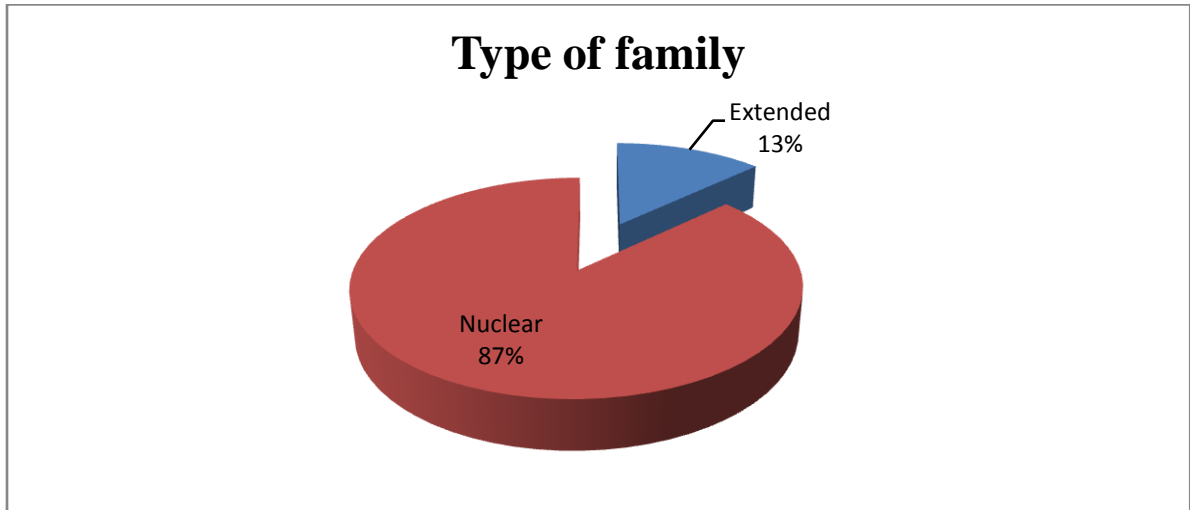


Figure-3: Type of Family of Participants

#### 4.5 Career

In these studies among the 30 participants almost 96% participants had career and 4% had no career. Most of the participants had career.

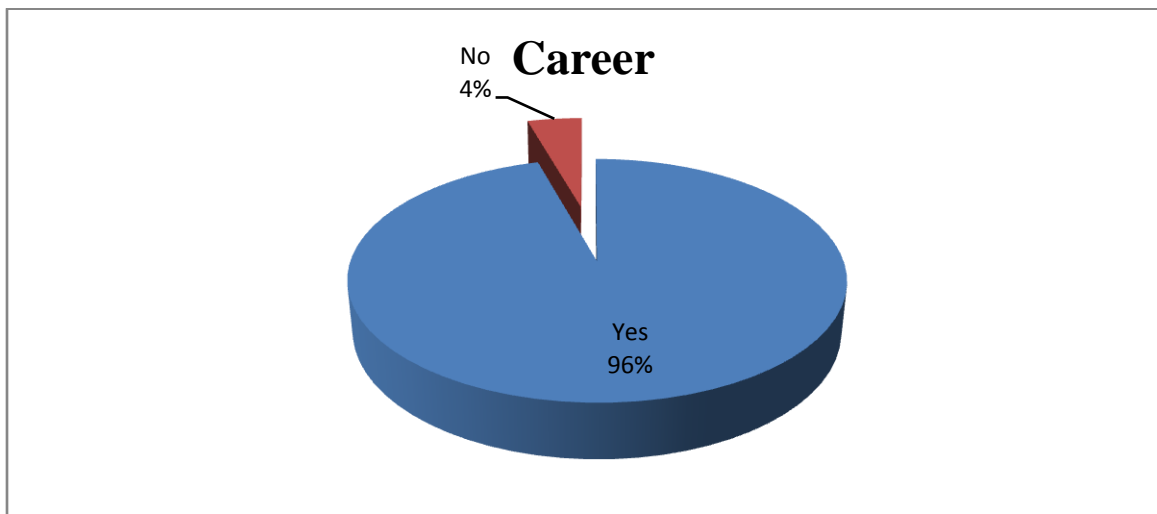


Figure-4: Career of the Participants

#### 4.6 Religion

The study found among the 30 participants of CRP SCI unit most of the patient's religion were Islam and percentage of them 96.67% and 1 participant were Hindu and percentage of them 3.33%. Statistics of Islam is higher rather than Hindu.

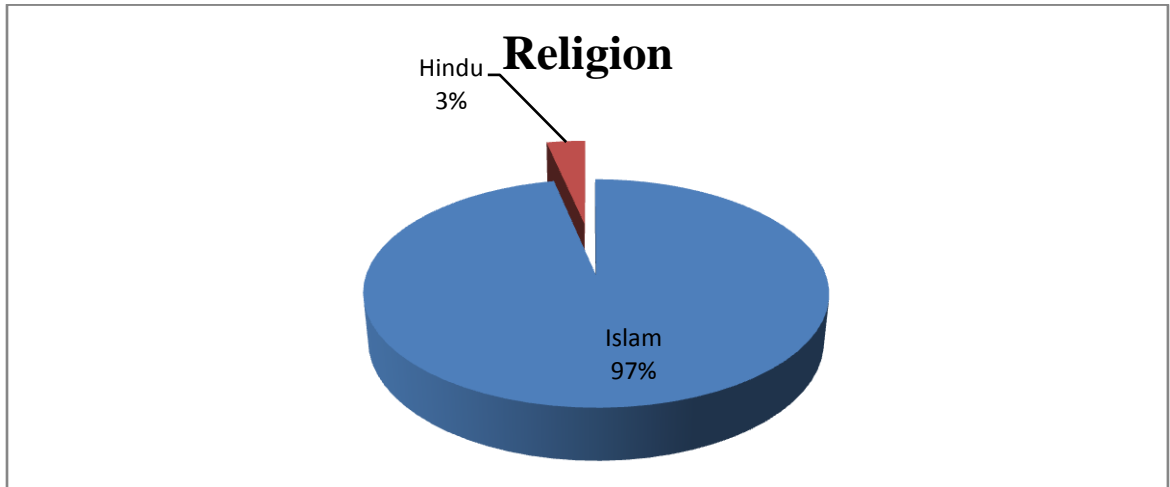


Figure-5: Religion of the Participants

#### 4.7 Type of injury

This study shows among the 30 participants where 96.67% injury was traumatic and 3.33% participant was nontraumatic.

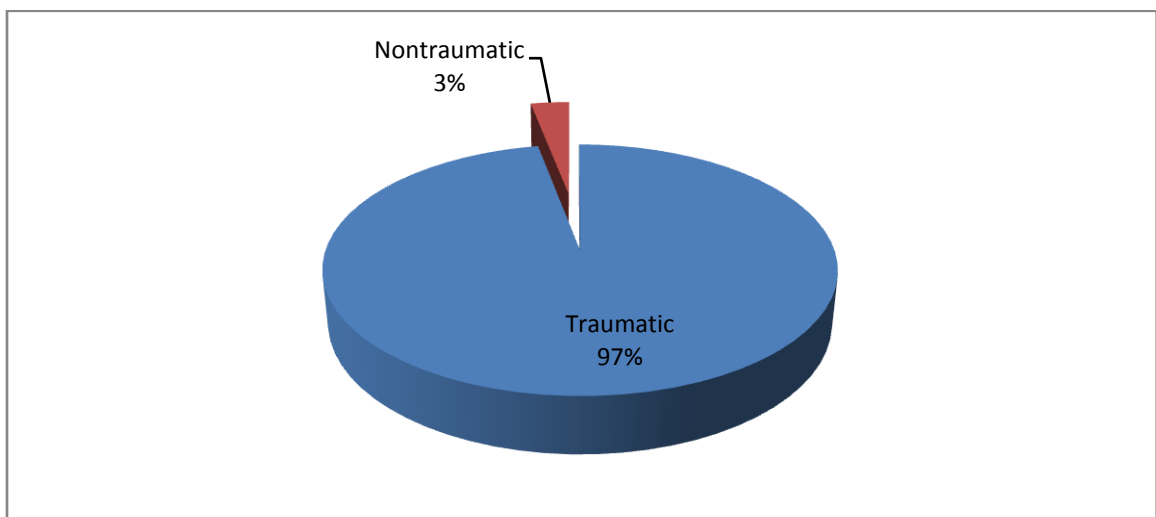


Figure-6: Type of injury of the Participants

#### 4.8 Type of paralysis

Among this 30 spinal cord injury patients, study found that 60%(n=18) were paraplegic spinal cord injured and 40%(n=12) tetraplegia spinal cord injured patients.

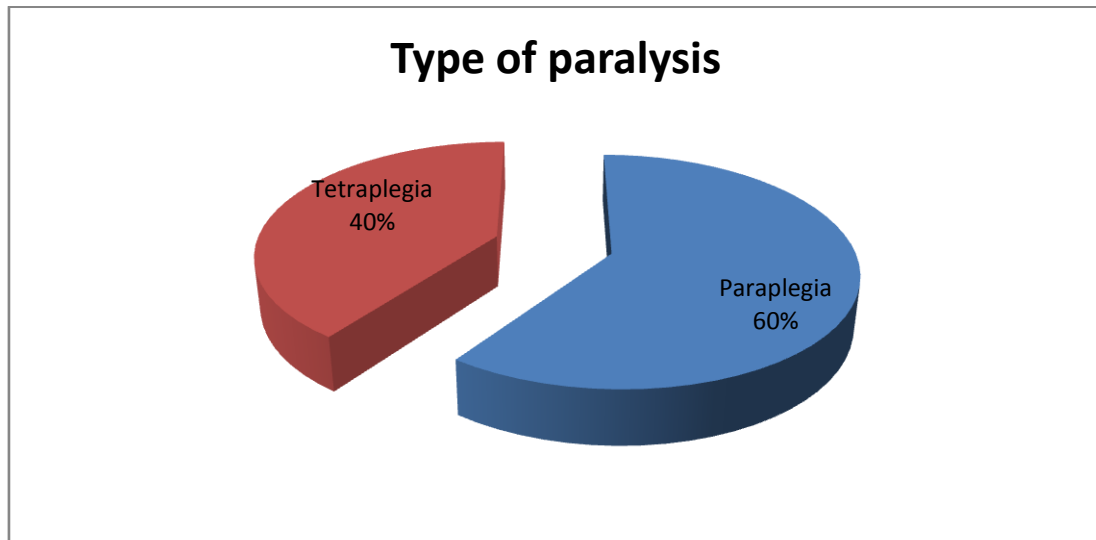


Figure-7: Type of Paralysis of the Participants

#### 4.9 Pressure ulcer of the participants

In this study, showed that among 30 participants, 50% (n=15) had pressure ulcer and 50%(n=15) had no pressure ulcer.

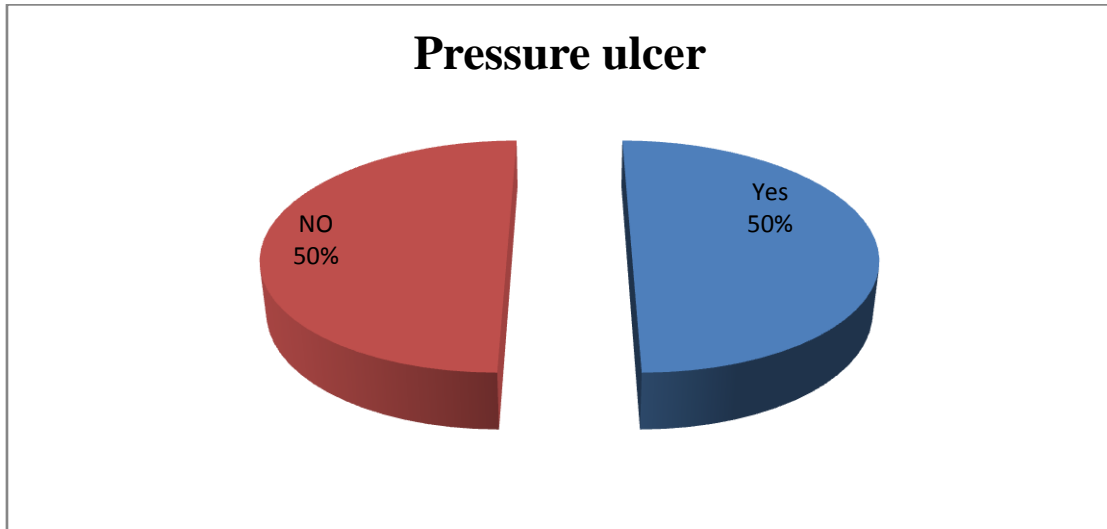


Figure-8: Pressure Ulcer of the Participants

#### 4.10 Educational status

From the data of the present study about 36.67% (n=11) spinal cord injury patients are illiterate, 43.33% (n=13) patients have read till PSC or equivalent level, 6.67% (n=2) patients have completed JSC or equivalent educational level, 3.33% (n=1) patients have passed or appeared at or gone to SSC or equivalent level and 10% (n=3) patients have read till HSC or equivalent educational level.

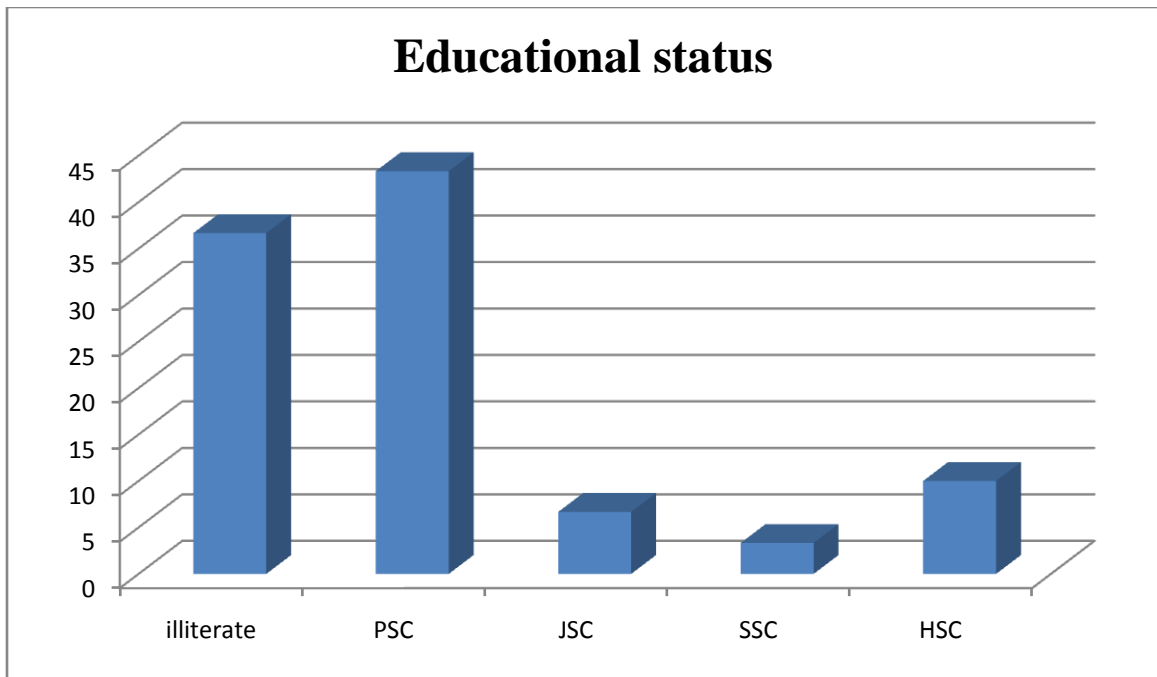


Figure-9: Educational Status of the Participants



#### 4.11 Residential area

In this study, showed that among 30 participants, 83% patients live in rural area, 17% patients have come from urban area. Among the 30 participants most frequent patients have come from rural area.

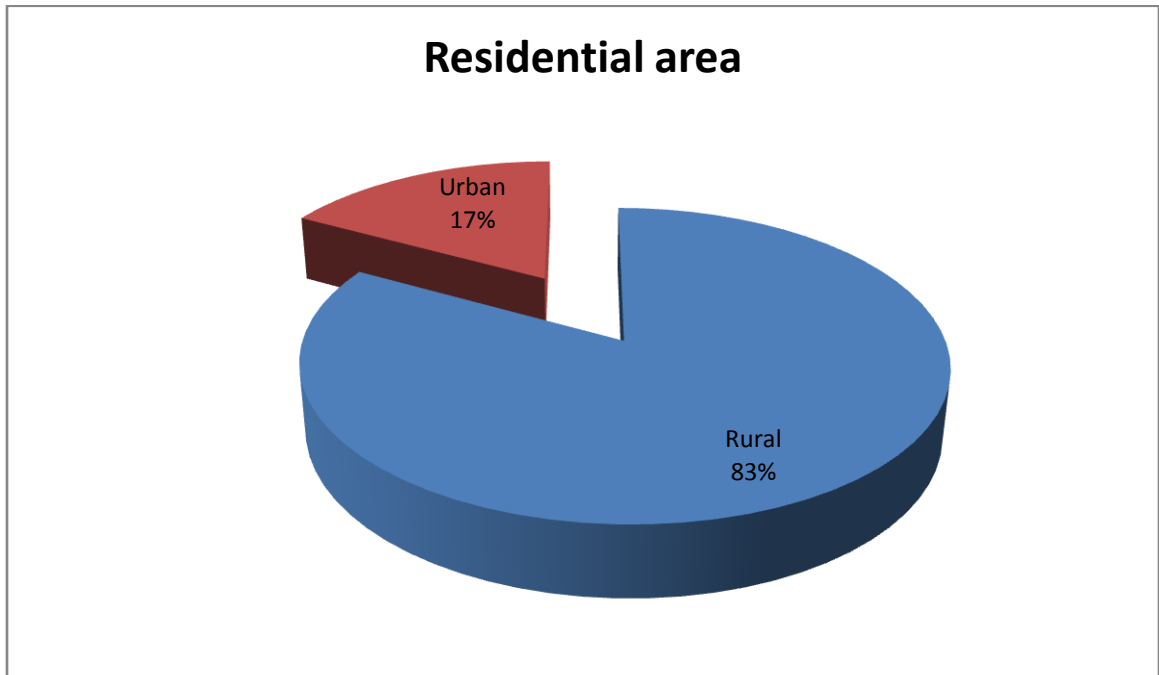


Figure-10: Residential Area of the Participants

#### 4.12 Symptoms of participants

In this study the several symptoms has found among the 30 UTI affected patients. About 63.33% (n=19) face fever, 73.33% (n=22) have abdominal pain, 16.67% (n=5) suffer from painful urination, 6.67% (n=2) patient's symptom is frequent or urgent need to urinate, 90% (n=27) face nausea, 36.67% (n=11) have vomiting and 63.33% (n=19) suffer from malaise. Among those symptoms most frequent symptoms are nausea and abdominal pain.

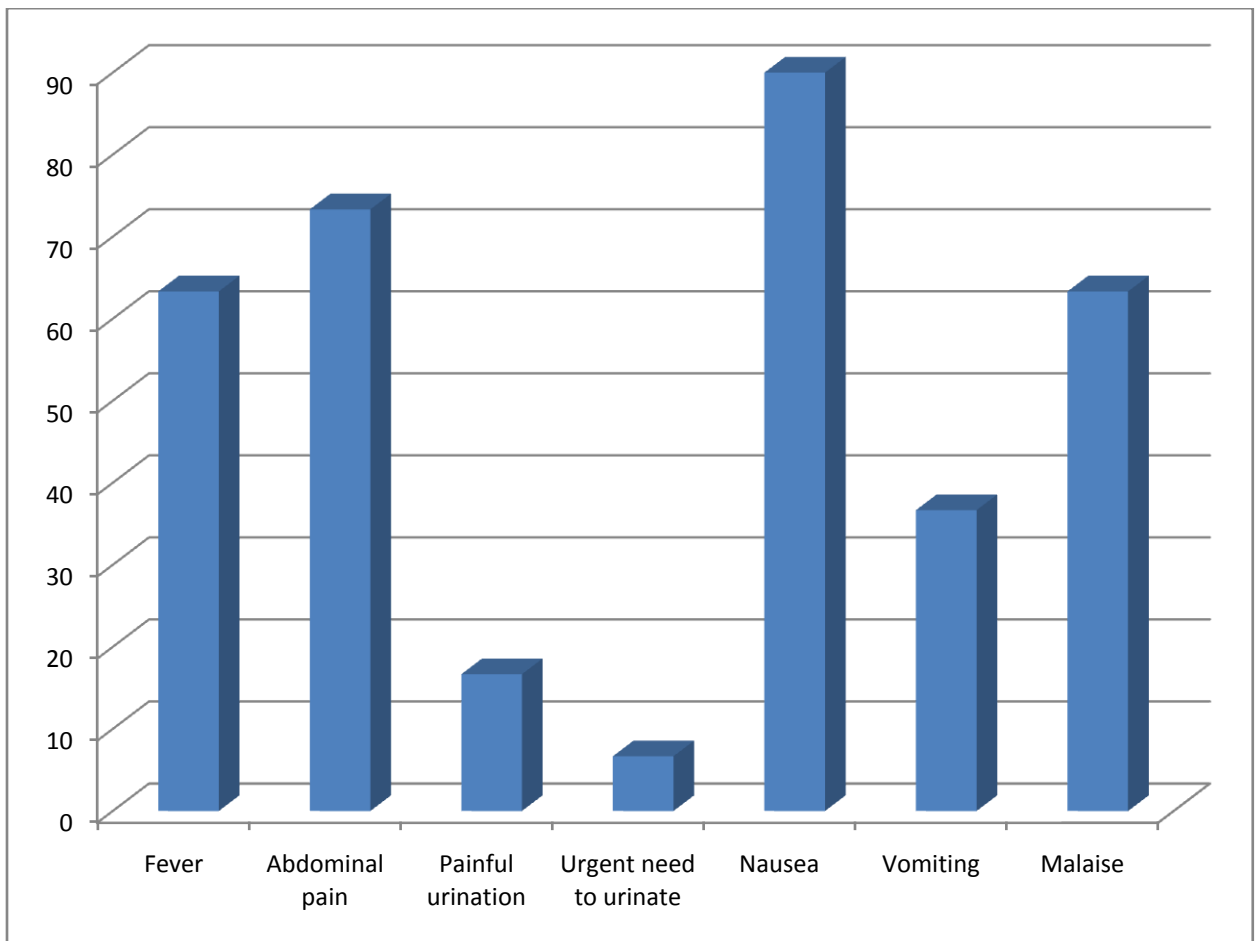


Figure-11: Symptoms of the Participants

#### 4.13 Cross Tabulation between sex and infectious bladder disease of participants

In this study cross tabulation between sex and infectious bladder disease of participants among male and female given in Table-2. This table show male count total 23 and female count total 7 and summation of male and female of 30.

Sex of participants	Infectious bladder disease		Total
	Yes	No	
Male	4	19	23
Female	3	4	7
<b>Total</b>	<b>7</b>	<b>23</b>	<b>30</b>

Table-2: Cross Tabulation between sex and infectious bladder disease of participants

#### **4.14 Cross Tabulation between marital status and infectious bladder disease of participants**

In this study cross tabulation between marital status and infectious bladder disease of participants among male and female is given in Table-3. This table show married 19 and Unmarried 11. Infectious bladder disease of married person is 4 and Unmarried is 3. Total infectious diseases of married and unmarried are 7. Summation of male and female marital status cross tabulation are 30.

<b>Marital Status</b>	<b>Infectious bladder disease</b>		<b>Total</b>
	<b>Yes</b>	<b>No</b>	
Married	4	15	19
Unmarried	3	8	11
<b>Total</b>	<b>7</b>	<b>23</b>	<b>30</b>

Table-3: Cross Tabulation between marital status and infectious bladder disease of participants

#### **4.15 Cross Tabulation between religion and infectious bladder disease of participants**

In this study cross tabulation between religion and infectious bladder diseases of participant among Islam and Hinduism is given in Table-4. Infectious bladder disease of Islam is 29 and Hinduism is 1. Total infectious diseases of Islam and Hinduism are 7. Summation of Islam is 29 and summation of Hinduism is 1.

<b>Religion of participants</b>	<b>Infectious bladder disease</b>		<b>Total</b>
	<b>Yes</b>	<b>No</b>	
Islam	6	23	29
Hinduism	1	0	1
<b>Total</b>	<b>7</b>	<b>23</b>	<b>30</b>

Table-4: Cross Tabulation between religion and infectious disease of participants

#### 4.16 Cross Tabulation between Catheterization and infectious bladder diseases of participants

In this study cross tabulation between Catheterization and infectious bladder diseases of participant is given in Table-5. The numbers of user of catheter are 28 and non-user of catheter is 2.

<b>Catheterization</b>	<b>Infectious bladder disease</b>		<b>Total</b>
	<b>Yes</b>	<b>No</b>	
Yes	7	21	28
No	0	2	2
<b>Total</b>	<b>7</b>	<b>23</b>	<b>30</b>

Table-5: Cross Tabulation between Catheterization and infectious diseases of participants

The aim of the study was to find out the influencing factors of urinary tract infection among spinal cord injured patients at CRP, Savar, Dhaka. Even it is not possible to know the total number of patient of spinal cord injury in Bangladesh and whose are suffer from UTI. In this study there was about 30 samples was taken. The data that were collected by the researcher through questions, analyzed and discussed as follows:

A study the researcher studied at 55 paraplegics who did not die immediately after injury. They had an average life expectancy of 53 months. Genito-urinary diseases were present in 90.2% (Jamil, 2001). The data for 1668 patients were analyzed. The rate of urinary complications was 74.4% (Klotz et al., 2002). In acute stage of SCI, with proper management, urine can be kept sterile for 15 - 20 days without antibiotic prophylaxis and for 16 - 55 days if prophylaxis is given. With urine analysis on a weekly basis they found in the group on sterile IC a 28.6% UTI incidence when in the non-sterile catheterization group 42.4% incidence was found (Wyndaele, 2002).

Male were predominantly higher than female within 30 participants which conduct in this study Here 76.67% were male and 23.33% were female. The study shows the sex distribution among the participants. Among the thirty participants the mean age was  $30 \pm (14.14)$  years with range from 11-60) years. Another study has found that 80% of spinal cord injury patients were male (Dowodu, 2007). So male are more affected than female in spinal cord injury. In this study it was found that male and female ratio was 4.1:1. In Bangladesh a few researches have been conducted on spinal cord injury and the result shown that male, female ratio was 7.5:1 (Hoque et al., 2002). Out of 105 participants there were 78 males (74. 3%) and 27 females (25.7%). The age at the moment of the spinal cord injury varied between 0 and 77 years, with a mean age of 31. 5 years (Kerrebroeck et al., 1993). In study of Greece have been found, out of 116 participant 95 patient are male gender and 31 patient are female. Where are male ratio higher then female (Rapidi et al., 2008).

In this study among the 30 spinal cord injury patients, researcher found that 60% (n=18) were paraplegic spinal cord injured and 40% (n=12) tetraplegia spinal cord injured patients. In these studies the greater numbers of the patients were paraplegic. So the paraplegic patients were comparatively higher than tetraplegics.

Out of 107 patients about 44% patients had cervical lesion, 27% had thoracic and 29% had lumbar injury. Of the cervical Neurological conditions according to the American Spinal Injury Association (ASIA) scale showed about 78% of the patients falling in the complete a group. About 93% of the patients were traumatic (Islam et al., 2011).

In this study the researcher has found several symptoms of 30 UTI affected patients. Among them 63.33% (n=19) face fever, 73.33% (n=22) have abdominal pain, 16.67% (n=5) suffer from painful urination, 6.67% (n=2) patient's symptom is frequent or urgent need to urinate, 90% (n=27) face nausea, 36.67% (n=11) have vomiting and 63.33% (n=19) suffer from malaise. Among those symptoms most frequent symptoms are nausea and abdominal pain. These are important symptoms before having urinary tract infection.



## **5.1 Limitation**

The limitation of this study was small sample size. It was taken only 30 samples and could not able to collect samples by random selection because, there were not adequate subjects and study period was short. Time and resources were limited which have a great deal of impact on the study. Existing sample size is not significant enough to represent wider population. The subjects were taken only form CRPwhich does not represent all SCI patients with Urinary tract infection all over the country. On this area, very few researches have been done before in Bangladesh. So there was little evidence for support of this project in the context of Bangladesh.Study was done from undergraduate level. So there were limited experience with techniques and strategies in terms of the practical aspects of research. As it was the first study so might be there were some mistakes that overlooked by the supervisor and the honorable teacher.

**6.1 Conclusion**

The number of spinal cord injury patient with UTI is increasing day by day. Urinary Tract Infection is one of the most destructive conditions for kidney. Infection of urinary tract or bladder is very serious condition for the spinal cord injured patient resulting in a chance of kidney failure or urinary incontinence. And UTI is more common in women than men although this study shows men is higher than women because of low sample size of women. Catheter associated UTI is more common in spinal cord injured patient and it is developed within 2-3 weeks after catheterization. Complication of UTI is increasing day by day in SCI patient or general people. This study was aimed to find out the influencing factors of urinary tract infection among SCI patients at CRP. For the fulfillment of the study the researcher was designed a cross sectional study design and collected 30 data from the samples through a standard questionnaire from the Spinal Cord Injury unit of CRP. Male are predominantly more affected than female. The Muslims are more affected then Hinduism. And married person are more affected then unmarried. It is difficult to stop the responsible cause of Spinal Cord Injury and urinary tract infection. The proper use of catheter and antibiotic treatment is better treatment for UTI of Spinal Cord Injured patient. It is very difficult process to management and rehabilitation of UTI affected SCI patient. This study is conducted to create awareness and receive proper step to reduce the risk of urinary tract infection.

## **6.2 Recommendations**

The aim of the study was to find out the influencing factors of urinary tract infection (UTI) among spinal cord injured patient at CRP. It was highly recommended the following things:

This study was conducted on 30 participants as the sample, in future the more sample size would be highly recommended.

The study was conducted in a single rehabilitation Centre which impact for the generalizability of the study finding.

The study was conducted at the Centre for the Rehabilitation of the Paralysees (CRP) where patients from around the country may not be come due to several reasons like accessibility, awareness and ways of referral system. So in future it may be recommended that another study should be conducted through the public – private initiative.

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## APPENDIX

### সম্মতিপত্র

আসসালামু আলাইকুম/নমস্কার, আমি মোঃ রেজাউল করিম, ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধীনে বাংলাদেশ হেল্থ প্রফেশন ইনস্টিটিউট (বিএইচপিআই) এর ৪র্থ বর্ষ বি. এসসি. ইন ফিজিওথেরাপি বিভাগ এর একজন শিক্ষার্থী | অধ্যায়নের অংশ হিসেবে আমাকে একটি গবেষণা সম্পাদন করতে হবে এবং এটা আমার প্রাতিষ্ঠানিক কাজের একটা অংশ।

আমার গবেষণা শিরোনাম "মেরুরজ্জুতে আঘাতপ্রাপ্ত মূত্র নিষ্কাশনের নল ব্যবহারকারী রোগীদের প্রসাবের নালীতে সংক্রমণের জন্য দায়ী কারন সমূহ" | আমি যদি আমার গবেষণাটি সার্থকভাবে সম্পূর্ণ করতে পারি তবে যেসব রোগীরা প্রসাবের নালীতে সংক্রমণে ভুগছেন তারা উপকৃত হবেন এবং এটি হবে একটি পরীক্ষামূলক প্রমাণ।

আমার গবেষণা প্রকল্প বাস্তবায়ন করার জন্য, আমি রোগীদের কাছ থেকে কিছু তথ্য সংগ্রহ করব | এজন্য আমি আপনার কাছ থেকে ও কিছু গবেষণামূলক তথ্য নেব। আমার গবেষণায় অংশগ্রহণে আপনার কোন ক্ষতি বা বিপদ হবে না। আপনি যে কোনো সময় নিজেকে এ গবেষণা থেকে প্রত্যাহার করতে পারেন। এই গবেষণার প্রাপ্ত তথ্য সম্পূর্ণভাবে গোপনীয় থাকবে এবং অংশগ্রহণকারীর ব্যক্তিগত তথ্য আপনার অনুমতি ব্যতিরেকে অন্য কোথাও প্রকাশ করা হবে না | গবেষণা সম্পর্কে যদি কোনো জিজ্ঞাসা থাকে তবে আপনি অনুগ্রহপূর্বক যোগাযোগ করতে পারেন মোঃ রেজাউল করিম অথবা মোঃ সফিকুল ইসলাম, সহকারী অধ্যাপক, ফিজিওথেরাপি বিভাগ, বিএইচপিআই, সিআরপি, সাভার, ঢাকা-১৩৪৩।

শুরু করার আগে আপনার কি কোন প্রশ্ন আছে?

আমি কি শুরু করতে পারি?

হ্যাঁ

না

অংশগ্রহণকারীর স্বাক্ষর ও তারিখ .....

গবেষকের স্বাক্ষর ও তারিখ .....

সাক্ষীর স্বাক্ষর ও তারিখ .....



## Questionnaires

### Part I: Patient's Identification

Patient name:

Date:

Age:

Ward:

Sex:

Bed:

Address:

Contact number:

### Part II: Patient's Socio-demographic Information

1 Marital status:

1= Married

2= Unmarried

3= Divorced

2 What type of family you are living?

1=Nuclear family

2=Extended family

3 Do you have any career?

1=Yes

2=No

4 Religions

1. Islam

2. Hinduism

3. Christianity

5. Other-----

5 Educational statuses: -----

6 Occupations: -----

7 Average monthly family income: -----

8 Earning member: -----

9 Residential Areas:

1= Rural

3= Urban

### **Part III: Injury related Information**

1 Date of injury:

2 Date of admission:

3 Type of injury:

A. Traumatic

B. Non traumatic

4 Causes of injury (traumatic):-----

5 Causes of non-traumatic injury: -----

6 Skeletal level of injury:

a. Cervical \_\_ \_\_

b. Thoracic \_\_ \_\_

c. Lumber \_\_ \_\_

d. Sacral \_\_ \_\_

7 Physical statuses at admission

A. Traumatic:

1. Paralyzed lower limbs

2. Paralyzed four limbs

B. Non-traumatic:

1. Weakness of lower limbs
2. Weakness of four limbs

8 Confirmed type of Paralysis

1. Paraplegia
2. Tetraplegia

9 Initial Neurological conditions according to ASIA Scale:

10 Initial Neurological levels:

1. C \_\_\_ T \_\_\_

2. L \_\_\_ S \_\_\_

11 Diagnosis (During admission):

1= T/P      2= T/T

12 Stages:

1= Acute      2= Stabilization      3= Rehabilitation

**Interview Schedule: (Disease related interview):**

How you came in CRP?

1=Parents      3=Relatives

2=Neighbor 4=Health professional

Are you suffering from UTI?

1= yes      2= no

How long you first suffer from UTI after SCI injury? -----

How many times you suffer from UTI after SCI injury? -----

Do you have laboratory test on UTI?

1=yes            2=no

What type of treatment you taken?

1. Medication            2. No treatment

What type of symptoms are you facing for UTI?

1= fever.

2= abdominal pain.

3= painful urination.

4= frequent or urgent need to urinate.

5= nausea.

6= vomiting.

7= malaise.

8=burning sensation during urination.

9= back and groin pain

10= others-----

Have you any pressure ulcer?

1= yes    2= no

Have you suffer from any infectious disease of bladder?

1= yes    2= no.

## **Catheter Related Questionnaire:**

Are you following intermittent catheterization?

1= yes            2= no

Route of Catheterization:

1= Urethra        2= Suprapubic

Type of Drainage System:

1= Open            2= Close

Obstruction of the Catheter:

1= Present        2= Absent

Duration of Catheterization ..... days

Leakage of Urine:

1= Present        2= Absent

Position of the Drainage Bag in relation to urinary bladder:

1= Above        2= at the same level    3= below

## প্রশ্নাবলী

### অংশ ১: রুগীর পরিচীতি

নাম :তারিখ:

বয়স:

ওয়াড়নং :

লিঙ্গ:

বেডনং :

ঠিকানা:

ফোননং:

### অংশ ২: রোগীর সামাজিক তথ্য

১. বৈবাহিক অবস্থা?

১= বিবাহিত

২= অবিবাহিত

২. পরিবারের ধরন?

১= ছোট পরিবার

২= বড় পরিবার

৩. আপনাকে পরিচর্যা কারী কেউ আছেন?

১=হ্যাঁ ২=না

৪. ধর্ম

১. ইসলাম

২. হিন্দু

৫. শিক্ষাগতযোগ্যতা: -----

৬.পেশা: -----

৭. গড়মাসিকআয়: -----

৮. উপার্জনকারীরসংখ্যা: -----

৯. আবাসিকএলাকা:

1= গ্রাম

3= শহর

### Part III: আঘাতসম্পর্কিততথ্য

১. আঘাতেরতারিখ:

২.ভর্তিরতারিখ:

৩.আঘাতেরধরন:

i. আঘাতজনিত

ii. অনাঘাতজনিত

৪.আঘাতেরকারণ (আঘাতজনিত) -----

৫.আঘাতেরকারণ (অনাঘাতজনিত): -----

6.মেরুদন্ডেরকাঠামোতেআঘাতেরস্থান

i.সারভাইক্যাল \_\_ \_\_

ii. থোরাসিক \_\_ \_\_

iii. লামবার \_\_ \_\_

iv. স্যাকরাল \_\_ \_\_

৭. ভর্তিরসময়শারিরিকঅবস্থা

i.আঘাতজনিত:

1. নীচেরঅংশঅবশ

2. চারহাত-পাঅবশ

ii.অনাঘাতজনিত:

i.নীচেরঅংশেদূর্বলতা

ii.চারহাত-পায়েদূর্বলতা

৮.নিশ্চিতভাবেঅবশ

i. প্যারাল্লেজিয়া

ii. টেটরাপ্লেজিয়া

৯. এসআইএমাপকাঠিঅনুযায়ীপ্রাথমিকস্নায়ুবীকঅবস্থা

১০.প্রাথমিকস্নায়ুবীকঅবস্থা:

i. সি \_\_\_ ii. টি \_\_\_

iii. এল \_\_\_ iv. এস \_\_\_

১১. রোগনিয়ম $\frac{1}{2}$  = টি/পি $\frac{2}{2}$  = টি/টি

১২. অবস্থা

i=প্রাথমিক ii=স্থায়ী iii= পুনরবাসন

রোগসম্পর্কিতমৌখিকআলাপ

আপনিকারমাধ্যমেসিআরপিতেআসলেন?

i=রোগী

ii=আস্বীয়

ii=প্রতিবেশী iv=স্বাস্থ্যপেশাজীবী

আপনিকিমূএনালীরসংএমনেভুগছেন?

i=হ্যা

ii=না



মেরুরঞ্জুতেআঘাতেরকতদিনপরআপনারপ্রথমমূএনালীতেসংএমনহয়েছিল? -----

মেরুরঞ্জুতেআঘাতেরপরকতবারআপনারমূএনালীতেসংএমনহয়েছে? -----

মূএনালীতেসংএমনেরকোনপরিষ্কারিয়েছেন?

i=হ্যা      ii=না

আপনিকোনধরনেরচিকিৎসানিয়েছেন?

i. ঔষধ      ii. কিছুইনা

মূএনালীতেসংএমনেরজন্যআপনিকিকিধরনেরলক্ষনঅনুভবকরেন?

i= স্বর

ii= পেটব্যথা

iii= মুএবিসর্জনেরসময়ব্যথা

iv= জরুরীমূএবিসর্জন

v= বমিবমিভাব

vi= বমিহওয়া

vii= মেজমেজভাব

viii=মূএবিসর্জনেসময়জালাপোরাকরা

ix= কোমরএবংউরুব্যাথা

x= অন্যান্য-----

আপনারকোনঘাআছে?

i= হ্যা      ii= না

আপনিমূএখলিতেসংএমনজনিতকোনরোগেভুগছেন?

i= হ্যা      ii= না

## মূএনিকাশননলসমপকিতপ্রশ্নপএ:

আপনিকিমূএনিকাশননলব্যবহারকরেন?

i= হ্যা      ii= না

মূএনিকাশনেরপথ:

i=মূএনালী      ii=সুপ্রাপিউবিক

নিকাশনেরধরন:

i= খোলা      ii= বন্ধ

মূএনিকাশননলেপ্রতিক্রকতা:

i=উপস্থিত      ii= অনুপস্থিত

মূএনিকাশননলেরস্থিতিকাল-----দিন

প্রঘ্নাবেরঅসাম্ভাবিকনিঃসরণ

i= উপস্থিত      ii= অনুপস্থিত

মূএথলিরসাথেসম্পর্করেখেমূএনিকাশননথলেরঅবস্থান

i=উপড়ে      ii= বরাবর      iii= নীচে

3<sup>rd</sup> March, 2015

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

CRP-Chapain, Savar, Dhaka-1343

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

**Subject: Seeking permission for data collection to conduct my research project.**

Sir,

With due respect and humble submission to state that I am Md. Rejaul Karim, student of 4<sup>th</sup> year B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The Ethical Committee has approved my research title on "Risk factors of urinary tract infection among spinal cord injured patient" under the supervision of Md. Shofiqul Islam, Assistant Professor, Department of Physiotherapy, BHPI. Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. The participants of my research project will be spinal cord injured patients who are admitted at CRP. I want to collect data for my research project from SCI unit at CRP. I would like to assure that anything of my study will not be harmful for the participants.

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

Yours faithfully

Md. Rejaul Karim

Md. Rejaul Karim  
4<sup>th</sup> year B.Sc. in Physiotherapy  
Session: 2009-2010  
Bangladesh Health Professions Institute (BHPI)  
(An academic Institution of CRP)  
CRP-Chapain, Savar, Dhaka-1343.

*Nusrat Khanum*  
20.03.15

*seen*  
*Shofiq*  
*03/03/2015*  
*Allow for data collection.*  
*Hossain*  
*Forwarded for Approval*  
*9/07/15*  
*07/03/15*  
*Given permission for data collection*  
*at CRP-PT Dept. SCI unit, please contact*  
*with Nusrat Khanum, CRP as your*  
*consultant.*  
*AS*  
*07/03/15*