CHARACTERISTICS OF URINARY TRACT INFECTION AMONG SPINAL CORD INJURED PATIENT AT CRP

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

Session: 2007-2008

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Bangladesh

February, 2013

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Submitted by **Mst. Sanzida Akter,** 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.

Signature: **Date:**

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Acknowledgement

First of all, I would like to pay my gratitude to Almighty Allah who given me the ability to complete this project in time with great success. I would like to pay my gratitude towards my parents who constantly encouraged me to carry out this project. My deepest great-fullness goes to my honorable supervisor and class teacher Md. Shofiqul Islam, Assistant professor of BHPI, Physiotherapy Department, CRP, Savar, Dhaka, for his keen supervision, tireless effort with excellent guidance and support without which I could not able to complete this project.

I would like to thanks all Physiotherapy staffs and nursing students of the Spinal Cord Injury department for helping me at the time of data collection.

I would like to thanks Md. Salauddin intern Physiotherapist, Zenat Rehana putul, Sanchita, and Mayesa Nujhat, 4th year B.sc. in PT and Mehedi Hasan Lecturer of BIAM model college, Bogra for helping in computer work throughout the project.

Finally, I would also like to thanks librarian of Bangladesh Health Professions Institute (BHPI) and their associates for their kind support to find out related books, journals and also access to internet.

Acronyms

ASIA	American Spinal Injury Association
BHPI	Bangladesh Heath Professions Institute
CAUTI	Catheter associated Urinary tract infection
CIC	Clean intermittent catheterization
CRP	Center for the Rehabilitation of the Paralyzed
CRP	C-reactive protein
IC	Intermittent catheterization
ISC	Injury of Spinal Cord
NGO	Non Government Organization
REM	Routine Microscopic Examination
SCI	Spinal Cord Injury
SCL	Spinal Cord Lesion
SD	Standard deviation
SPSS	Statistical Package of Social Science
UK	United Kingdom
USA	United state of America
UTI	Urinary tract infection

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Abstract

Purpose: To find out the Characteristics of urinary tract infection among SCI patients at CRP. *Objectives:* To explore socio demography, for example age, sex, education, and religion of UTI affected spinal cord injured patients, to determine the common associated factors with the development of UTI among SCI patients, to evaluate the frequency of UTI among SCI patients, to identify the physical sign of development of UTI. *Methodology:* A cross sectional study design was used to conduct the study. About 47 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:* Forty seven participants were included as sample. Among them most of the participants were age range from (42-60) years including male and female. Male (93.6%) are predominantly higher than female (6.4%). Majority of the participants was Muslim and very few participants are Hinduism, married person was more affected then unmarried and their frequent physical symptoms ware nausea and painful urination (21.3%). *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 characteristics and complication of UTI in SCI patients.

Key word: UTI, SCI, CRP.

CHAPTER-I: INTRODUCTION

1.1 Background

Bangladesh is one of the most densely populated countries in the world and is situated in the South Asian subcontinent. The total population of this country is about 130 million and about 830 people live in per square kilometer area. More than 80% population lives in the village and about 60% of the total labor forces are involved in agriculture (Jahan, 2008). At present study, following analysis of clinical and radiological data of 100 sequential patients, indicates that morphological complication of UTI are common (63% in patients studied) and that a significant number (70%-75%) develop complications within the 1st year following onset of spinal cord dysfunction (Gupta & Chawla, 1994).

The National Spinal cord injury statistical center in Birmingham, Alabama, there are approximately 780 new Spinal cord injuries a year in the United States, 82% are male; 18% are female. The majority of these patients have complete injuries resulting in naturopathic bladder dysfunction. Intermittent catheterization leads to Urinary tract infection majority of those people (Bennett et al., 1995).

A study of 160 male patients admitted to the Shepherd Spinal Center for bladder management program on the risk of developing upper urinary tract distress following acute spinal injury. 34 subjects with preservation of detrusor function managed their bladders by spontaneous voiding. 70 patients with detrusor reflexes managed their bladders via intermittent catheterization; and 56 males who had detrusor hyperreflexia on urodynamic managed by a reflex voiding program with condom drainage. 7% of those on intermittent catheterization and 32% of those managed by a reflex voiding program experienced upper tract distress. The presence of detrusor hyperreflexia with or without vesicosphincter dyssynergia influenced the likelihood that subject would experience upper urinary tract distress following spinal injury (Killorin et al., 1992).

There is a heightened risk of urinary tract infection (UTI) in patients with a spinal cord injury (SCI). Lower rates occur in those with incomplete injuries. In patients practicing clean intermittent catheterization, the mean incidence of UTIs is 10.3% per 1000 catheter days; after 3 months, the rate is fewer than 2 per 1000 catheter days.

Once a urethral catheter is in place, the daily incidence of bacteriuria is 3-10%. Because most patients become bacteriuria by 30 days, that is a convenient dividing line between short- and long-term catheterization (John, 1997). SCI is a risk factor for infection. Hence, nosocomial infection rates are high especially during the acute hospitalization period with reports of a proportion of 25.8% of patients being significantly greater than that for non-SCI admissions (Penders et al., 2003). A study of Copenhagen and Denmark 151 patient with SCL were included in the study during 7 year period. At present study of 46 patients with recurrent abnormal urological problem and 105 patients with normal urological investigation (Moser et al., 1998).

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). A study of USA up to 90% of spinal cord injury patients develops bacteriuria within 2-3 weeks of beginning intermittent catheterization (Sandock et al., 1995). In France 80% of spinal cord injured patients are affected by upper urinary tract stones, an overall 10 years mortality rate of 50% (Robert et al., 1995). A study of USA total 10945 patients were performed catheterizations and 75 infections identified, overall infected rate was 0.68% or one infection for every 146 catheterization (Bennett et al., 1995).

A review of Netherlands is given of 105 patients with a traumatic spinal cord injury, 93 patients was evaluated lower urinary tract infection (Kerrebroeck et al., 1993). In Japan 700 rehabilitated spinal cord injury patients showed higher incidences of urinary tract disease and pressure ulcer, age between ≤15 years 36.5% and ≥16 years 56.9% (Nakajima et al.,1989). In Belgium lower urinary tract infection was found in 26 patients (32 tests) (Wyndaele et al., 1983). In France a study of 730 patients which are recurrent urinary tract infection 80% and urinary leaking 85% (Leriche et al., 1976).

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). Amelioration of urinary tract disease remains a challenging problem in patients with spinal cord injury. Renal failure due to infection is the most frequent cause of death (Klein et al., 1967). In Japan made a retrospective comparative study of 88

cervical cord injury patients concerning their long term urological prognosis. In all, 129 urinary complications have occurred in 54 cases (61.4%) (Morita et al., 1994). Chronic or recurrent urinary tract infection (UTI) is a significant problem for patients with spinal cord lesions (SCL). UTIs are thought to be a major factor in the development of reduced renal function (Moser et al., 1998).

A study of Thailand urinary tract infection in patients on chronic ISC has a prevalence of 13.6 infections per 1000 patient-days 0.34 Genito-urinary complications such as urethritis or epididymo-orchitis are rare 0.35 Prostatitis is under-estimated and probably has prevalence around 5% to 18%. 36 Urethral bleeding is frequent (Wyndaele et al., 2001). A study of Turkey suggested that urethral flora was a significant source for the development of urinary infection in spinal cord-injured patients (Levendoglu et al., 2004). One of the most frequent complications is infection of the urinary tract (UTI). Prevalence of UTI varies widely in the literature (Wyndaele, 2002).

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 (Barbara and Trautner**,** 2010). A study of USA the 12 months infection rate for 1987, on our spinal cord injury unit of 29 beds, was 0.17% for patients with indwelling catheters and 0.19% for patients on intermittent catheterization (Lindan, 1990). In Austria only 5 out of 15 patients had sterile urine when last seen, and among them was a patient who catheterised himself intermittently over a period of 34 years, whereas the other 10 patients had a positive urine culture with a history of recurrent urinary tract infection more than twice a year (Madersbacher, 1987).

1.2 Rationale

Bangladesh is a developing country among the third world. The rate of education is very low; besides government and non government activities in health sector are not significant for the people live in here. Physiotherapy is not a new profession in Bangladesh, but it is a developing health profession which is dominated by other professionals due to lack of skilled manpower. Now at present situation lots of NGOs working on disability are included this clinical practice. 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 mobility 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 grad and level of injury. Urinary tract infections are one of the most common complications following spinal cord injury and may required 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 incontinence which will in term reduce the mortality and morbidity of SCI.

1.3 Research question

What are the Characteristics of UTI among SCI patients affected at CRP?

1.4 Objectives of study

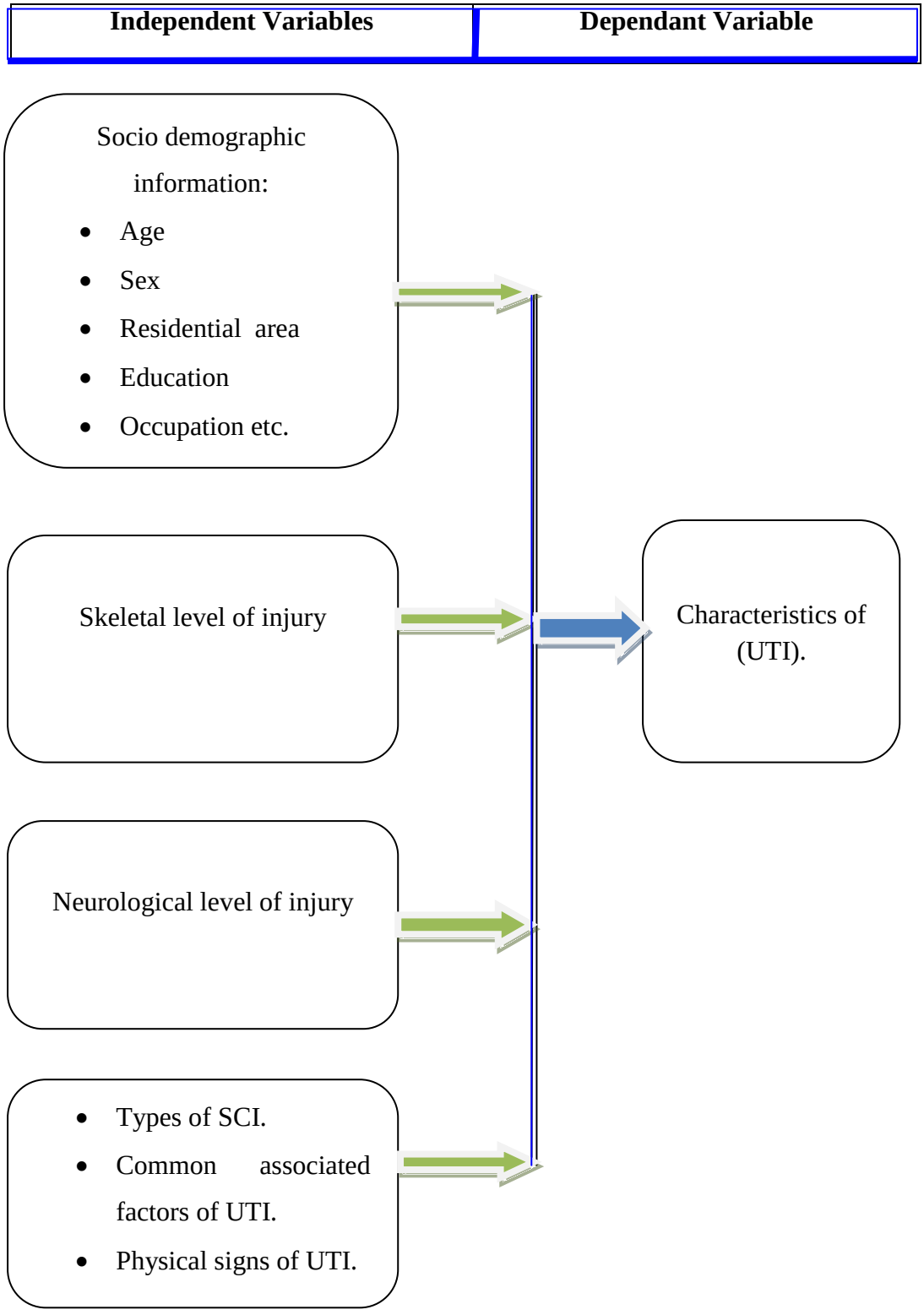
1.4.1 General objectives

- To identify the Characteristics of UTI among SCI patients at CRP.

1.4.2 Specific objectives

- To explore socio demography, for example age, sex, education, and religion of UTI affected spinal cord injured patients.
- To determine the common associated factors with the development of UTI among SCI patients.
- To evaluate the frequency of UTI among SCI patients.
- To identify the physical sign of development of UTI.

1.5 List of variables



1.6 Operational definition

Urinary tract infection

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

Pelvic floor

The pelvic floor or pelvic diagram is composed of muscle fiber of levatorani, the coccygious, and associated connective tissue which span the area underneath the pelvis.

Pelvic floor muscle weakness

Factors contributing pelvic floor muscle weakness: Pregnancy, child birth, straining to empty the bladder or bowel with or without constipation, persistent heavy lifting, and changes in hormonal levels at menopause growing older, chronic cough, overweight and lake of general fitness.

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.

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 injury

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

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.

CHAPTER-II: LITERATURE REVIEW

Approximately 8000 persons survive spinal cord injury (SCI) each year in the United States. About 200,000 Americans have spinal cord injuries, and this number is increasing as life expectancy increases normal levels for this persons. Nosocomial infection is common in patients with spinal cord injuries because this patient are admitted to the hospital immediately after their injuries occur, because of the prolonged stay, these patients are greater risk of developing infection with resistant micro-organisms including methicillin-resistant Staphylococcus aureus and multiresistant gram-negative bacilli (Montgomerie, 1997).

Computed incidence of catheter, related UTI was 51.4%, 91% were acquired within seven days of catheterization. E. coli was the most common pathogen (22.3%) along with other gram-negative organisms. Gram-positive organisms and Candida species were isolated in 15.7% and 17.4%, respectively. Three risk factors were significantly associated with the acquisition of the infection. They are duration of catheterization, female gender and diabetic's mellitus. The urinary tract of catheterized patients is highly susceptible to infection (Karina et al., 1999).

There are two types of UTI: Lower UTI is an infection of the lower part of the urinary tract, which includes the bladder and the urethra. An infection of the bladder is called cystitis, and an infection of the urethra is known as urethritis. Upper UTI is an infection of the upper part of the urinary tract, which includes the kidneys and the ureters. Upper UTIs are potentially more serious than lower UTIs because there is a risk of kidney damage (Nehb, 2013).

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). A review is given of 105 patients with a traumatic spinal cord

injury. In 93 patients with a minimum follow up of one year the morbidity due to lower urinary tract infection (Kerrebroeck et al., 1993). A reviewed study of England 25 patients who developed carcinoma of the bladder following spinal cord injury among a series of 6744 paraplegic and tetraplegic patient (Masri & Fellows, 1981).

A study of Dublin despite careful catheter technique, there is a high incidence of urinary infection and as many as 70 per cent of spinal cord injury cases may have urinary infection at some time during rehabilitation. In intermittently catheterized cases the source of infection is the urethra (Dermot, 1974). A total of 126 significant urinary isolates, as expected, the majority of the infections were caused by Gram negatives (overall 88%; tetraplegics 89%; paraplegics 86%)(Penders et al., 2003). A second point on which there is general agreement is that the sequelae of infection of the urinary tract, especially the late sequelae, are the chief cause of fatalities among paraplegics. From a general survey of the literature Comarr (1961) puts the mortality from renal disease in paraplegics as 27 per cent (Mcleod et al., 1970).

The high incidence of chronic renal failure in patients with spinal cord lesions is well recognized. It is usually due to one or more of the following factors: ascending urinary infection, stones, obstruction or dilatation of the urinary tract with stasis, hypertension and amyloidosis (Grundy et al., 1982). Urinary tract disease remains a challenging problem in patients with spinal cord injury. Renal failure due to infection is the most frequent cause of death (Klein et al., 1967). A study of Turkey demonstrate that organisms causing urinary tract infection in spinal cord injured patients are also recoverable from the genital skin flora of the patients and suggest that urinary infection originates from organisms colonizing the genitalia (Hamamci et al.,1998).

A total of bacteriuria occurred. The mean incidence of significant bacteriuria in males was I per 190 catheterizations, i.e. on average 0'5 per cent. Of catheterizations resulted in an episode of significant bacteriuria (Pearman, 1970). 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).

Urinary infections are common in 50 per cent of hospitalized patients with the same rate among both populations of self catheterization and other patients. This frequency is only 25 per cent of the self catheterization patients after discharge home (Berard et al., 1985). Fifty-seven isolates of Gram-negative bacteria species from urinary tract infections in spinal cord injured patients were tested for their sensitivity. In an I2-month period a total of 57 isolates of Gram-negative bacilli were examined. The most common genera were Proteus, Providencia and Pseudomonas (Strickler et al., 1981).

Urinary tract infections (UTI) remain a significant problem for the spinal cord injured (SCI) patient throughout his or her life and a major cause of morbidity. Use of intermittent catheterization (IC) as part of the acute and long term management of SCI Correspondence: patients, urinary colonization and infections continue to occur in many individuals (Donovan et al., 1996). There are few reports about urinary bladder recovery in children with SCI. As is reported by Bedbrook (1981), the life expectancy of the younger patients is not possible to estimate, for few have been managed collectively in spinal units (Fanciullacci et al., 1988).

Eight hundred and nineteen spinal cord damaged patients were regularly assessed at the Mersey Regional Spinal Injuries Centre over a 37-year period. Forty-nine patients, of whom 41 were male and eight female, had upper urinary tract calculi (Gardner et al., 1985). At any stage a patient with a neuropathic bladder may suddenly develop acute urinary retention having previously been voiding satisfactorily. This may be precipitated by urinary infection, constipation or perianal pathology such as an anal fissure (Gardner et al., 1986). In a preliminary retrospective study of 30 patient les, we discovered that prophylactic antimicrobial therapy with trimethoprim-sulfamethoxazole, signicantly reduced the incidence of symptomatic urinary tract infections (Reid & Howard, 1997).

The dependence of lower urinary tract functions on complex central neural networks renders these functions susceptible to a variety of neurological disorders (Groat, 1995). Intermittent catheterization (IC) is considered to be the gold standard for the management of Neurological Lower Urinary Tract Dysfunction. Intermittent catheters or single-use disposable catheters, the use of lubricants or reusable catheters, genitals washed’. While clean IC remains common practice, concerns have been raised

complications associated with urethral trauma and recurrent urinary tract infections (Hudson & Murahata, 2005). A 52-year-old man presenting with fever and septicemia was diagnosed with a perineal abscess due to a bulbar urethral lesion caused by acute false passage during intermittent catheterization (Pannek et al., 2008).

C-reactive protein (CRP) was measured serially in 16 patients with an acute spinal injury. Twelve episodes of acute urinary tract infection (UTI) occurred during the study period. These were all associated with an increased concentration of CRP > 50 mg/I, which returned to normal after successful treatment (Galloway et al., 1986). For Comarr (1961), infection is usually established when an indwelling catheter has been in situ for three days and often persists long after the catheter has been withdrawn. Dick (1952), reviewing 178 cases treated at Winwick between 1940 and 1948, found that although six different techniques were adopted, all were followed by infection (Mcleod et al., 1970).

The past history according to the duration of SCI showed higher incidences of urinary tract disease and pressure ulcer in longer duration groups with a significant difference (Urinary tract disease; < 15 years, 30'5%, > 16 years 53·9%) (Pressure ulcer; < 15 years 36'5%, > 16 years 56'9%) (Nakajima et al., 1989). 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).

Catheter-associated urinary tract infection (CAUTI) is a common problem with considerable economic impact. Thus, individuals with an indwelling urinary catheter develop bacteriuria at the rate of 3–10% per day, and the incidence of bacteriuria approaches 100% in individuals who are chronically catheterized (Trautner et al., 2005). 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 Trautner and Darouiche more than 90% of cases of

nosocomial catheter-associated bacteriuria are asymptomatic (Trautner & Darouiche, 2004).

A review of 52 female patients with spinal cord injury is presented. Twenty five of 38 patients seen within 3 months of their injury were discharged on a clean intermittent catheterization regime. The 14 patients seen at an interval of 3 months or greater after the injury, only 3 practiced clean intermittent catheterization but 8 had a long term indwelling urethral catheter as the method of management. And recurrent symptomatic urinary tract infection occurred in 10 (36%) (Timoney & Shaw., 1990). The final 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).

UTI at a glance

In Copenhagen	A review study of 151 patients of spinal cord injury 46 patients was affected urinary tract infection (Moser et al., 1998).
In UK	In between 119 patients of spinal cord injury 60% patient was affected urinary tract infection (Masri et al., 2012).
In Japan	Including 700 rehabilitated patient of SCI between male and female 93.4% was affected UTI (Nakajima et al., 1989).
In USA	Between 10945 patients of spinal cord injury 90% patient was affected urinary tract infection (Bennett et al., 1995).
In Netherland	Including 109 patient of SCI between male and female 93 patients was affected UTI (Kerrebroeck et al., 1993).
In Thailand	A study of Thailand urinary tract infection in patients on chronic ISC has a prevalence of 13.6 infections per 1000 patient-days (Wyndaele et al., 2001).
In France	Including 730 patient of spinal cord injury in between male and female 80% was affected urinary tract infection (Leriche et al., 1976).

CHAPTER-III: METHODOLOGY

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. 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. These types of research were primarily used to determine characteristics (Mann, 2003).

3.2 Study sites and area

The study ware conducted at Spinal cord injury Unit of Center for the Rehabilitation of Paralyzed (CRP) Chapain, Savar, Dhaka. 1243**.** 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. Forty seven UTI affected patients were taken as a sample for this study (Bailey, 1997).

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. The Purposive

sampling may help you gathering useful data and information that which require more formal access to lists of populations.

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.
- Subject who had REM reports.

3.6 Exclusion criteria

- Subject who were not affected in UTI.
- Subject who had no diagnosis.

3.7 Sample size

In this project study, the researcher selected 47 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= 0.80 (Here P=Prevalence and P=8%, d= 0.05)

q= 1-p

=1-0.80 =0.2

According to this equation the sample should be more than 245 people but due to lack of accessibility and time the study was conduct with 47 Spinal cord injured patient by purposive sampling.

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 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, clip, board etc.

3.9 Data analysis

Data will be analyzed 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. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and conduct complex statistical analyses.

3.10 Inform consent

Written consent was given to all participants prior to the completion of the pre test questionnaire. 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.

3.11 Ethical consideration

The researcher took approval from the ethical committee of Physiotherapy department of BHPI to do the study. 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, was informed verbally about the topic and purpose of study. They were informed about the number of interviews and each interview can take 10 minutes for every participants. Future Urinary tract infected patients with SCI might be benefitted understanding the purpose of the study. The researcher maintained privacy issue and confidentiality. Each participant had the right to refuse to answer any question or withdraw them from the study.

3.12Limitations

- The limitation of this study was small sample size. It was taken only 47 samples and could not able to collect samples by random selection because, there were not adequate subjects and study period was short.
- Existing sample size is not significant enough to represent wider population.
- Time and resources were limited which have a great deal of impact on the study.
- The subjects were taken only for CRP which does not represent all SCI patients with Urinary tract infection.
- There are no previous researches in Bangladesh, for which all of the information taken from other country researches.
- This study conducted with very small sample of female and unmarried participants.

CHAPTER-IV: RESULTS

4.1 Age range involvement

Among the 47 participants who were affected in UTI and their mean age were 36.96 with standard deviation (12.485). Median was 35.00 and mode was 35. Among the age of the participants, 16-30 years were 31.91%, 32-37 years were 31.91% and 42-60 years were 36.17%. Among the 47 participants age, most frequent age group is 42-60 years (Table-1).

Age	Number (n)	Percentage
16-30 years	15	31.91%
32-37 years	15	31.91%
42-60 years	17	36.17%
Total	**47**	**99.99%**

Table-1: Age of the participants

4.2 Gender

In this study the mean was 1.06 with standard deviation (0.247), median was 1.00 and mode was 1 of 47 participants who were affected in UTI. Male were predominantly higher than female within 47 participants which conduct in this study Here 93.6% were male and 6.4% were female. The study shows the sex distribution among the participants (Figure-1).

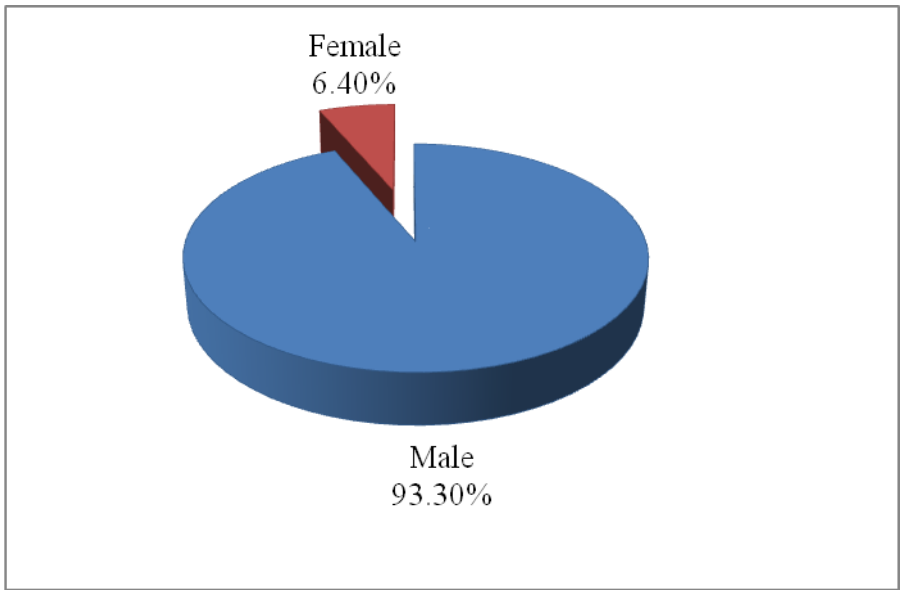


Figure-1: Male and female ratio

4.3 Marital status

Among the 47 participants researcher found married person 80.9%, unmarried 19.1%. Their mean ware 1.19, median 1.00, mode 1, SD 0.398 and range 1. Most frequent status in married that was higher than unmarried. Most frequent vulnerable group was married person. They were living in high risk that ratio show in (Figure-2).

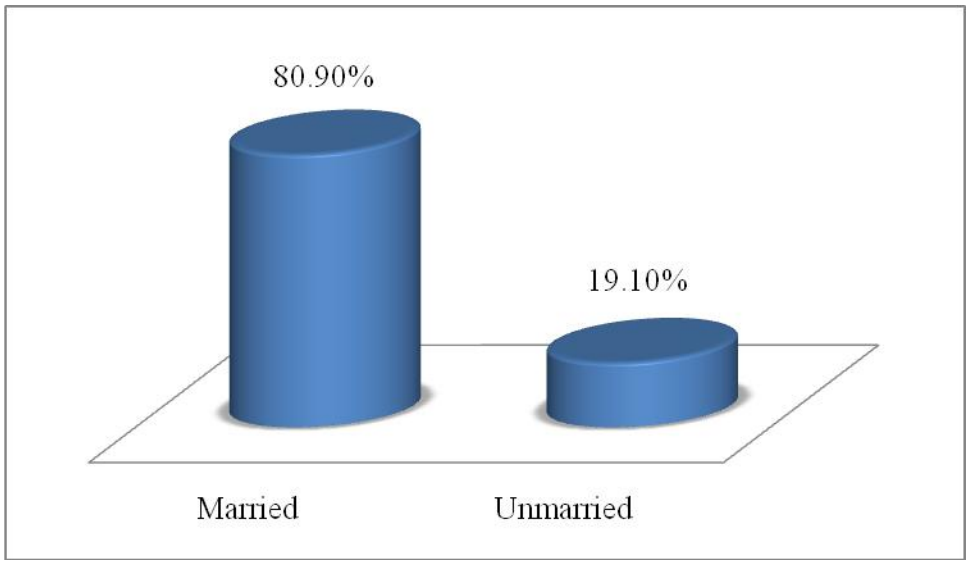


Figure-2: Marital status of participants

4.4 Religion

Researcher studied at 47 participants of CRP, Savar, Dhaka, most of the patient's religion was Islam and presentence of them 95.7 and few amounts of participants was Hinduism and percentage of them 4.3. Mean of those participants 1.04, median 1.00, mode 1, SD 0.204 and range 1. Statistics of Islam is higher than Hinduism. The ratio is shown below (Figure-3).

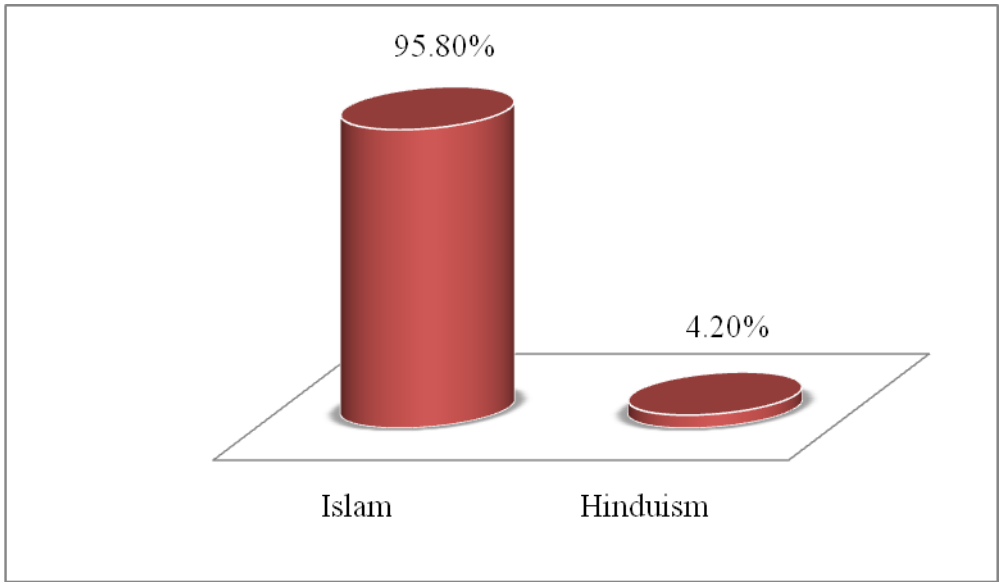


Figure-3: Religion of participants

4.5 Type of injury

Researcher studied at 47 participants where was 97.90% injury was traumatic and 2.10% participant was non traumatic. Where mean 1.02, mode 1, median 1.00, SD 0.146 and range 1.The ratio of injury show in (Figure-4).

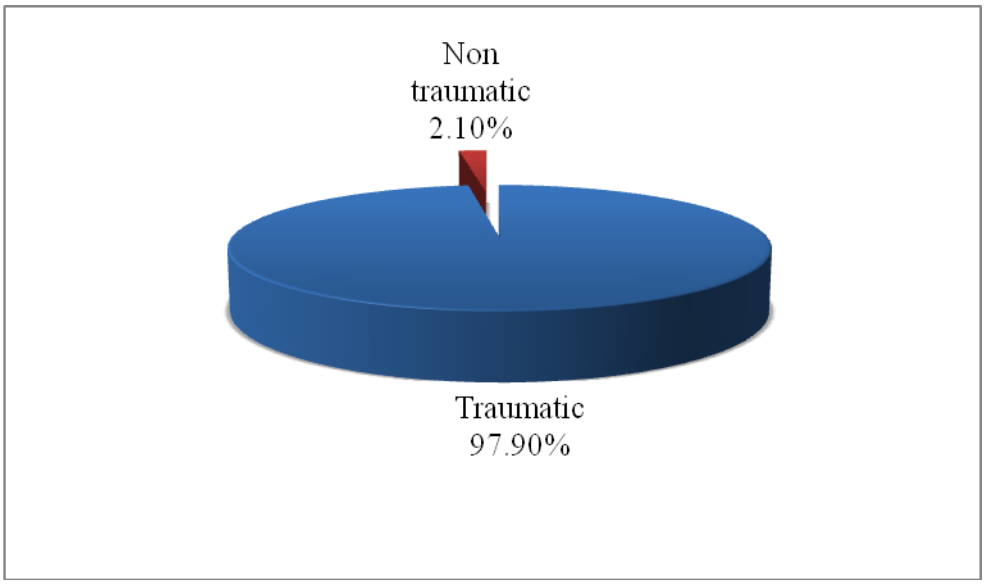


Figure-4: Type of injury

4.6 Type of paralysis

Among this 47 spinal cord injury patients, researcher found that 51.10% were paraplegic spinal cord injured and 48.90% tetraplegia spinal cord injured patients. In this study, it is shown that incomplete spinal cord injuries are lower than complete spinal cord injury. Where mean 1.49, mode 1, median 1.00, SD 0.505 and range 1.

The ratio of paraplegic and tetraplegic patients is given in (Figure-5).

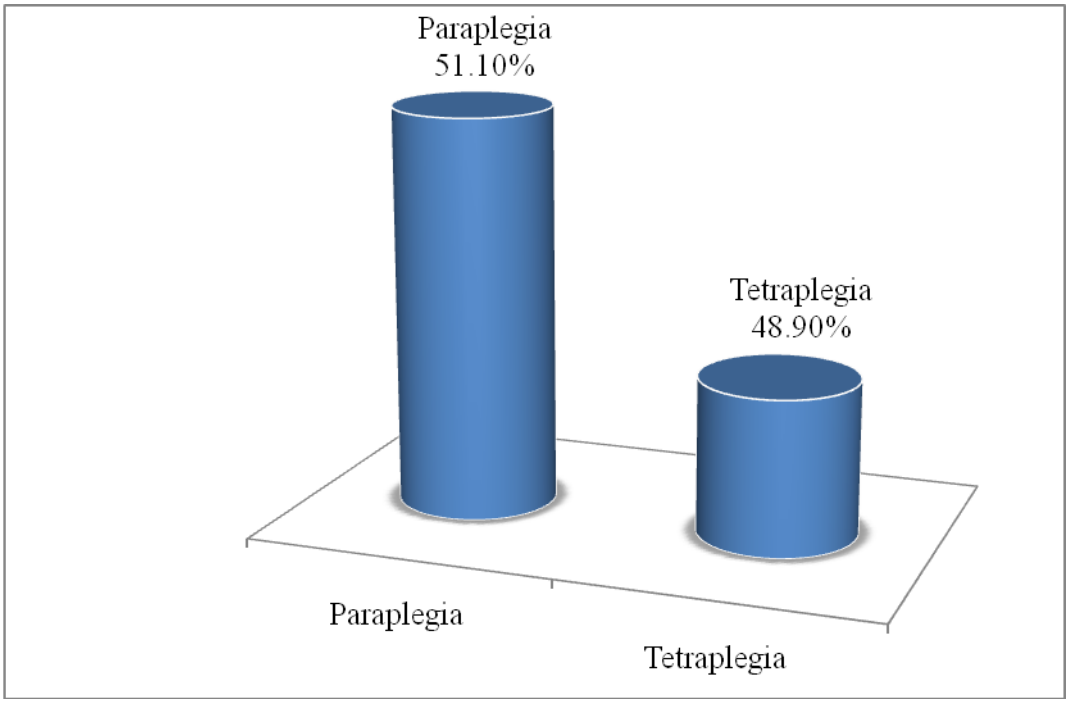


Figure-5: Type of paralysis of participants

4.7 Ratio of the catheterization

From the data of the present study, the researcher was found that about 97.90% spinal cord injury patient performed catheterization and 2.10% patient were did not perform catheterization (show in Figure no-6) . In this study researcher found that mean is 1.02, median 1.00, mode 1, SD is 0.146.

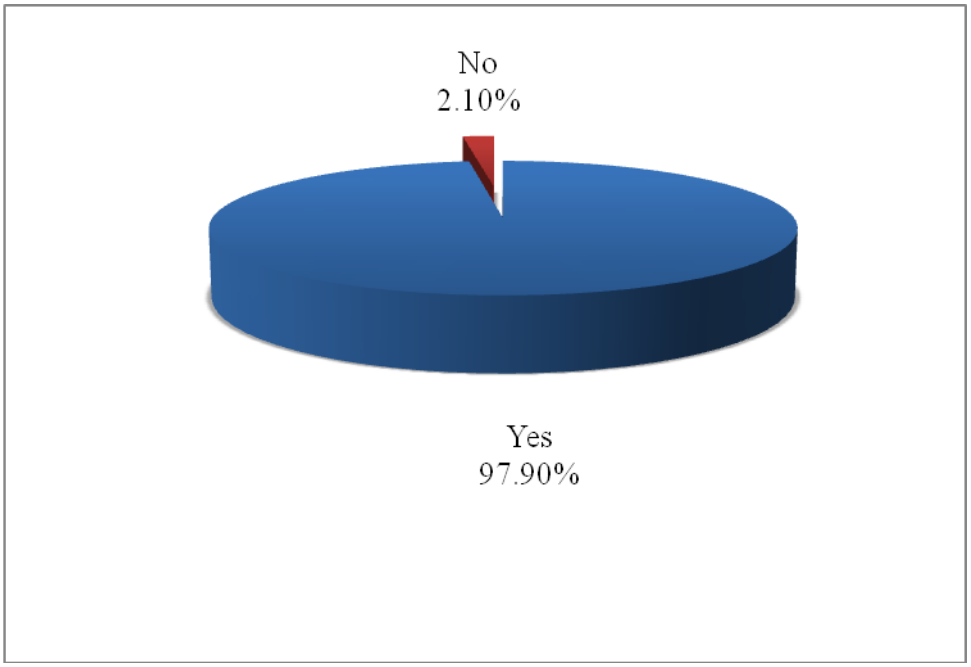


Figure-6: Ratio of catheterization

4.8 Ratio of pressure ulcer

In this study, showed that among 47 participants, 42.5% have pressure ulcer and 57.5% have no pressure ulcer (show in Figure no-7). The mean in the study is 1.58, median 2.00, mode is 2 and SD is 0.498.

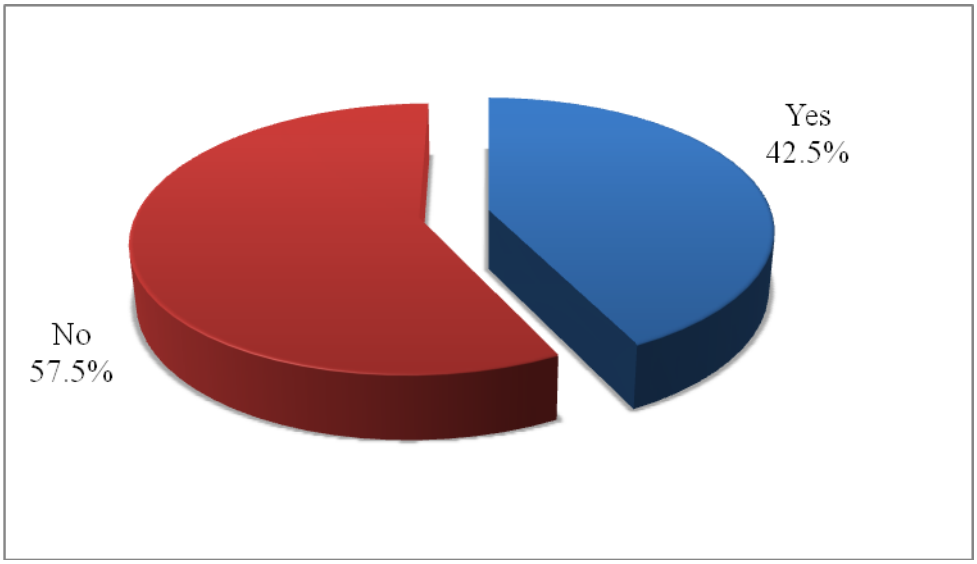


Figure-7: Ratio of pressure ulcer

4.9 Ratio of bladder disease

Among 47 spinal cord injured participants, the researcher found that about 21.30% have bladder problem and 78.70% have no bladder problem during the admitted in CRP (show in Figure-8). Mean of bladder disease is 1.79, mode is 2, median is 2.00 and SD is 0.410.

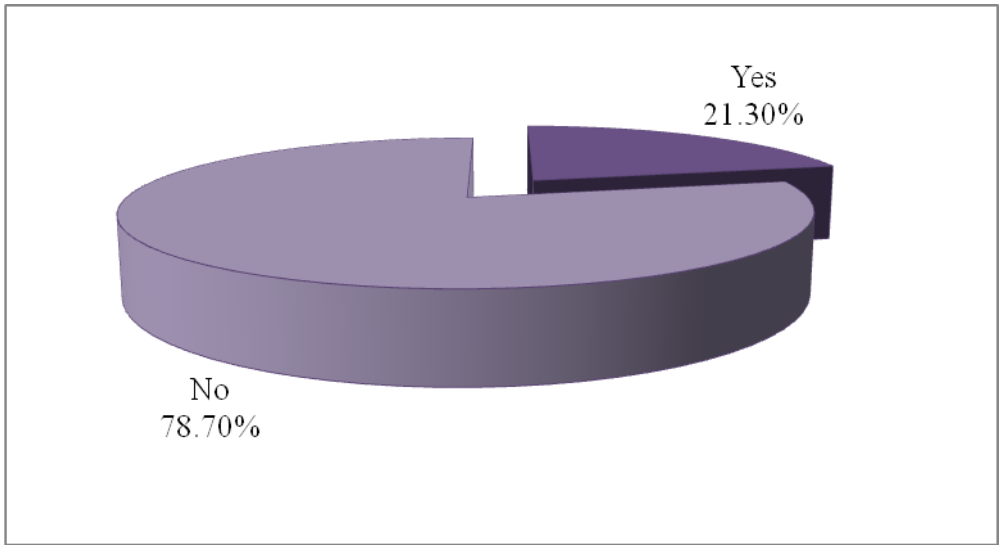


Figure-8: Ratio of Bladder disease

4.10 Educational level

From the data of the present study, the researcher was found that about 38.3% spinal cord injury patients are illiterate, 21.3% patients have read till PSC or equivalent level, 6.4% patients have completed JSC or equivalent educational level, 8.4% patients have passed or appeared at or gone to SSC or equivalent level, 10.6% patients have read till HSC or equivalent educational level and 14.9% patients have faced other educational stage (show in Table no-2 and Figure no-9). In this study researcher found that mean is 3.681, median 3.000, mode 1.0 and SD is 2.8216.

Education	Number	Percentage
Illiterate	18	38.3%
PSC	10	21.3%
JSC	03	6.4%
SSC	04	8.5%
HSC	05	10.6%
Other	07	14.9%
Total	**47**	**100%**

Table-2: Educational level of participants

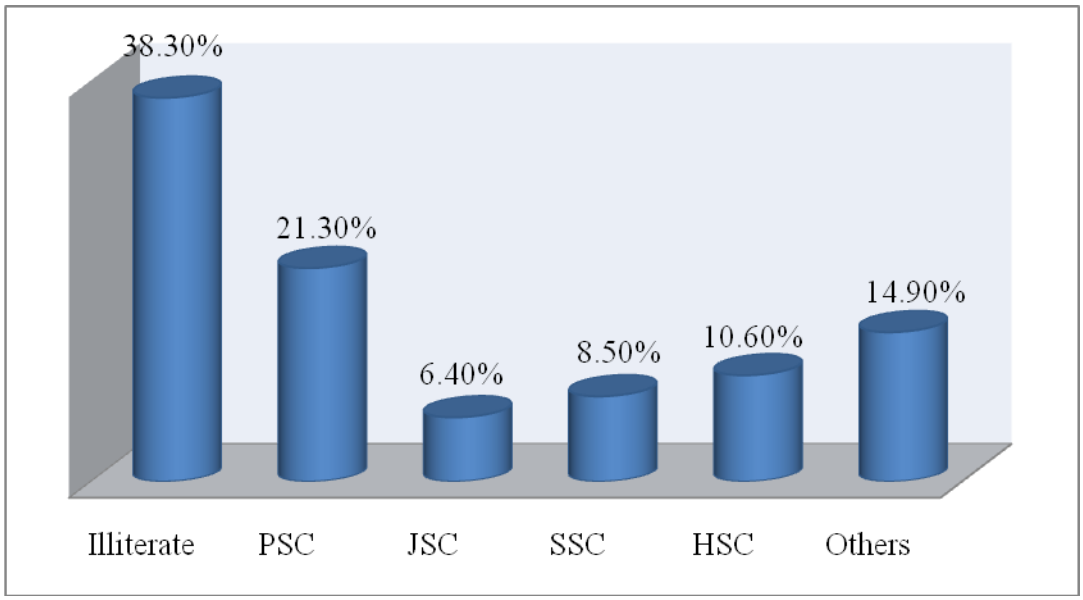


Figure-9: Educational level

4.11 Residential area

In this study, showed that among 47 participants, 72.3% patients live in rural area, 14.9% patients have come from semirural area and 12.8% patients are the member of urban area (Table no-3). Among the 47 participants most frequent patients have come from rural area (Figure no-10). The mean in the study is 1.404, median 1.000, mode is 1.0 and SD is 0.7120.

Residential area	Number	Percentage
Rural	34	72.3%
Semirural	07	14.9%
Urban	06	12.8%
Total	**47**	**100%**

Table-3: Residential area of participants

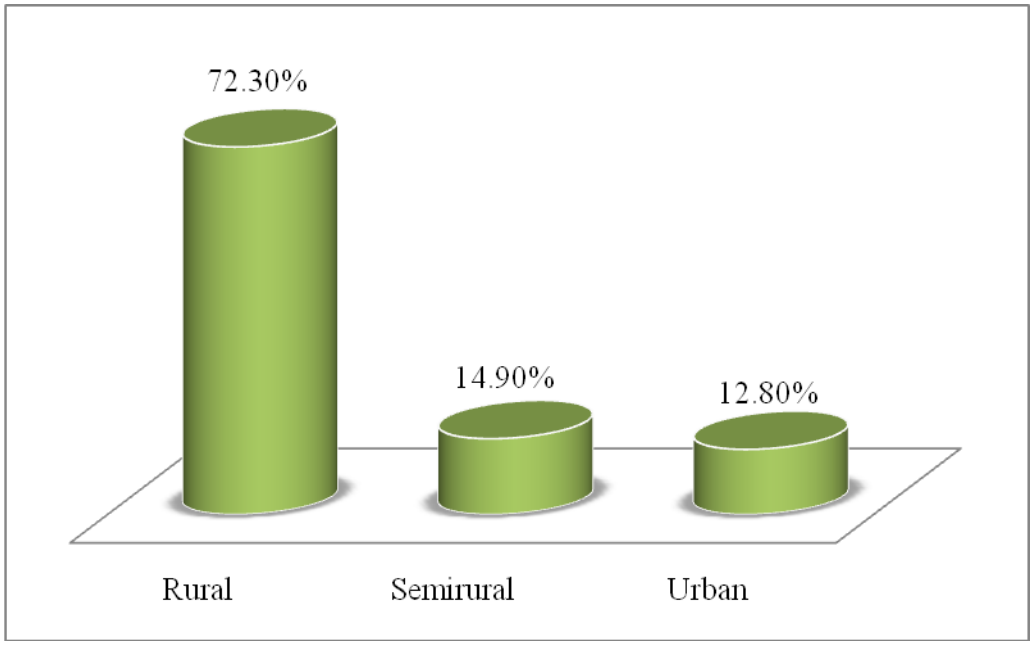


Figure-10: Residential area

4.12 Symptoms of participants

In this study the researcher has found several symptoms of 47 UTI affected patients. Among them 2.1% face fever, 14.9% have abdominal pain, 21.3% suffer from painful urination, 4.3% patient's symptom is frequent or urgent need to urinate, 21.3% face nausea, 4.3% have vomiting, 12.8% suffer from malaise, 6.4% feel fatigue and general ill feel, 2.1% face mental change and confusion and 10.6% suffer from bowel incontinence (show in Table no-4). Among those symptoms most frequent symptoms are painful urination and nausea (show in figure no-11). The mean in the study is 5.96, median 6.00, mode is 3 and SD is 3.464.

Symptoms	Number	Percentage
Fever	01	2.1%
Abdominal pain	07	14.9%
Painful urination	10	21.3%
Frequent or urgent need to urinate	02	4.3%
Nausea	10	21.3%
Vomiting	02	4.3%
Malaise	06	12.8%
Fatigue and general ill feel	03	6.4%
Mental change and confusion	01	2.1%
Bowel incontinence	05	10.6%
Total	**47**	**100%**

Table-4: Symptoms of participants

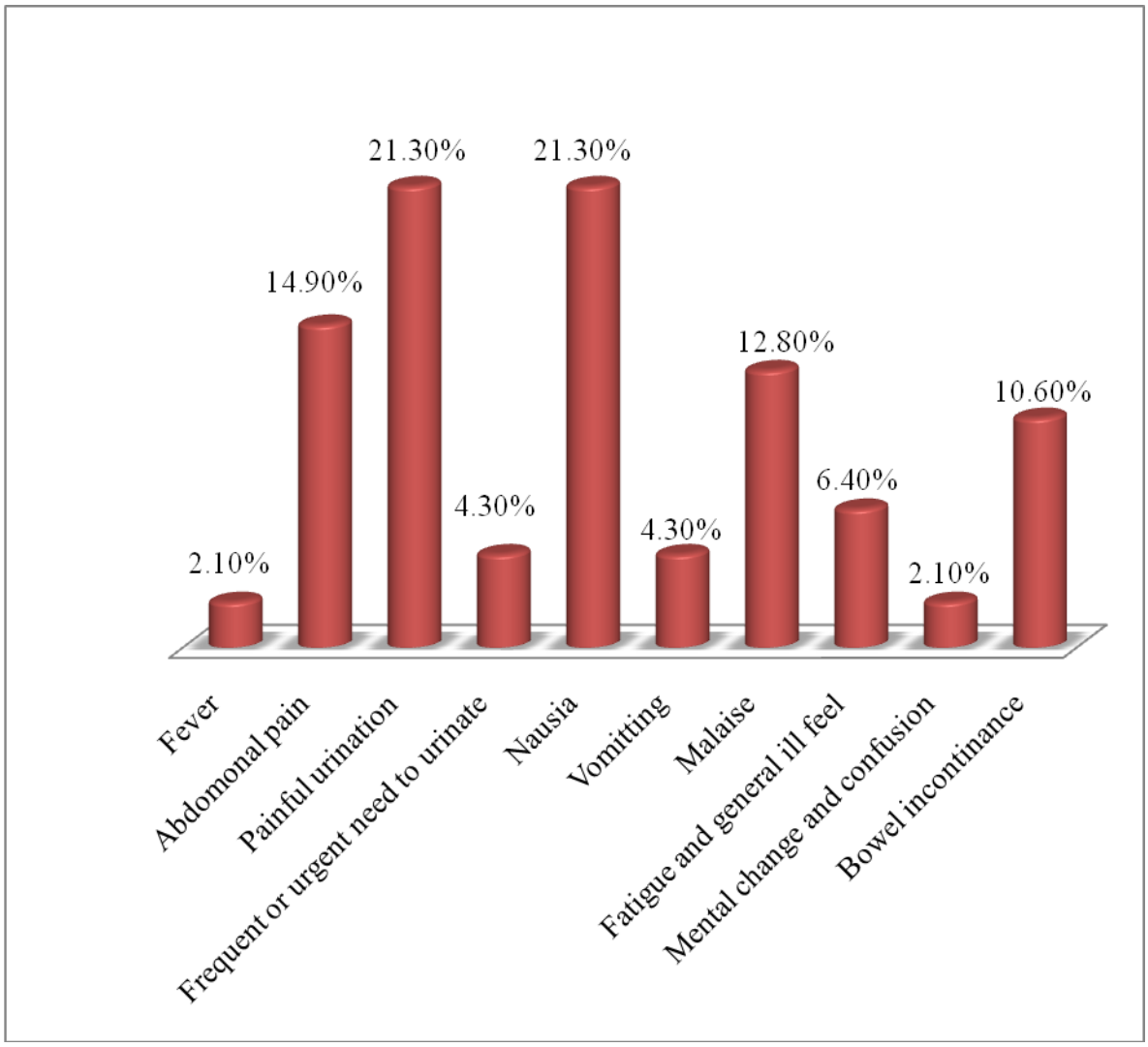


Figure-11: Symptoms of participants

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-5). This table show male count total 44, and female count total 3 and summation of male and female is 47.

Sex of the participants	Infectious disease of bladder of participants		**Total**
	Yes	No	
Male	7	37	44
Female	3	0	3
Total	**10**	**37**	**47**

Table-5: Crosstab between sex and infectious disease of bladder

4.14 Cross Tabulation between marital status and infectious diseases of participants

In this study cross tabulation between marital status and infectious diseases of participant among male and female is given in (Table-6). This table show married 38, Unmarried 9. Infectious disease of married person is 9 and Unmarried is 1. Total infectious diseases of married and unmarried are 10. Summation of male and female marital status cross tab are 47.

Marital status	Infectious disease of bladder of participants		**Total**
	Yes	No	
Married	9	29	**38**
Unmarried	1	8	**9**
Total	**10**	**37**	**47**

Table-6: Crosstab between marital status and infectious diseases

4.15 Cross Tabulation between religion and infectious diseases of participants

In this study cross tabulation between religion and infectious diseases of participant among Islam and Hinduism is given in (Table-7). Infectious disease of Islam is 9 and Hinduism is 1. Total infectious diseases of Islam and Hinduism are 10. Summation of Islam is 45 and summation of Hinduism is 2.

	Infectious disease of bladder of participants		**Total**
Religion	Yes	No	
Islam	9	36	**45**
Hinduism	1	1	**2**
Total	**10**	**37**	**47**

Table-7: Crosstab between religion and infectious diseases

4.16 Cross Tabulation between Catheterization and infectious diseases of participants

In this study cross tabulation between Catheterization and infectious diseases of participant is given in (Table-8). The numbers of user of catheter are 46 and non user of catheter is 1.

	Infectious disease of bladder of participants		**Total**
Catheterization	Yes	No	
Yes	10	36	**46**
No	0	1	**1**
Total	**10**	**37**	**47**

Table-8: Crosstab between Catheterization and infectious diseases

4.17 Association between infectious disease and sex, marital status, religion of the participants

	P- value	Remark
Marital status of participants	0.407	Not Significant
Sex of the participants	0.001	Significant
Religion of participants	0.310	Not Significant

Table-9: Association between infectious disease and sex, marital status, religion of the participants

CHAPTER-V: DISCUSSION

The aim of the study was to find out the characteristics of urinary tract infection among spinal cord injured patients at CRP, Shavar, 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 47 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 53months. 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 (Wyndael, 2002).

In this study, found that in the mean was 1.06 with standard deviation (0.247), median was 1.00 and mode was 1 of 47 participants who were affected in UTI. Male were predominantly higher than female within 47 participants which conduct in this study Here 93.6% were male and 6.4% were female. The study shows the sex distribution among the participants.

Many researchers found in this study age of <30years 13.6% involvement of UTI, 31-50 years 33.6%, 51-70 years 36.4% and >70 years 16.4% (Billote-Domingo et al.,1999). A total of 3036 catheterizations were performed on the 27 males, during which time a total of 16 episodes of significant bacteriuria occurred. The mean incidence of significant bacteriuria in males was I per 190 catheterizations, i.e. on average 0'5 per cent. Of catheterizations resulted in an episode of significant Bacteriuria (Pearman, 1968). Another study of USA the mean age of the 29 evaluable patients was 45 years, with a median of 38 years and a range of 28 to 61 years (Joshi et al., 1996).

In this research Among 47 participants who were affected in UTI and their mean age were 36.96 with standard deviation (12.485). Median was 35.00 and mode was 35. Among the age of the participants, 16-30 years were 31.91%, 32-37 years were 31.91% and 42-60 years were 36.17%. Among the 47 participants age, most frequent age group is 42-60 years. In an epidemiological study it has been found that 84.5% of spinal cord injury patients were male where 15.5% patients were female (Karamehmetog et al., 1997). 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).

In an epidemiological study it has been found, out of 64 patients there was 59 patients male and 5 patients were female. Male ratio is higher than female (Waites 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). 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 an epidemiological study it was shown that 48.7% patients were complete SCI, 39.4% patients were incomplete SCI and 11.9% patients were either no cord lesion or root lesion (Asbeck et al., 2000). 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).

Among this 47 spinal cord injury patients, researcher found that 51.10% were paraplegic spinal cord injured and 48.90% tetraplegia spinal cord injured patients. In this study, it is shown that incomplete spinal cord injuries are lower than complete spinal cord injury. Where mean 1.49, mode 1, median 1.00, SD 0.505 and range 1
The ratio of paraplegic and tetraplegic patients is given in.

In a research of 64 patients was found 32 patients who use catheter and 34 patients who did not use catheter. Non user of catheter was higher than user of catheter. And UTI is most frequent in catheter user (Cook & Smith, 1992). From the data of the present study, the researcher was found that about 97.90% spinal cord injury patient performed catheterization and 2.10% patient were did not perform catheterization. In this study researcher found that mean is 1.02, median 1.00, mode 1, SD is 0.146.

In this study the researcher has found several symptoms of 47 UTI affected patients. Among them 2.1% face fever, 14.9% have abdominal pain, 21.3% suffer from painful urination, 4.3% patient's symptom is frequent or urgent need to urinate, 21.3% face nausea, 4.3% have vomiting, 12.8% suffer from malaise, 6.4% feel fatigue and general ill feel, 2.1% face mental change and confusion and 10.6% suffer from bowel incontinence. Among those symptoms most frequent symptoms are painful urination and nausea. All physical symptoms were not found in another literature. This is very important criteria for this study.

CHAPTER-VI: CONCLUTION AND RECOMMENDATIONS

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 characteristics 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 47 data from the samples through a standard questionnaire from the Spinal Cord Injury unit of CRP. From the data base, it was found that the age range between 42-60 years is more vulnerable in urinary tract infection among SCI patients. 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 characteristics of urinary tract infection among spinal cord injured patient at CRP in Bangladesh. Researcher found from the study has fulfilled the aim of the study. The researcher recommended the following things:

- Investigator use only 47 participants as the sample of this study, in future the sample size would be more.
- In this study, the investigator took the participants only from the one selected area of Bangladesh as a sample for the study. So for further study investigator strongly recommended to include the spinal cord injured patient from all over the Bangladesh to ensure the generalizability of this study.
- The researcher took very small sample size from female participant, so further study strongly recommended to include large sample size of female participant.
- Should take more samples for pilot study to establish the accuracy of the questionnaire.

As an undergraduate study it was very limited for much information and further study at graduate level in same title will give more accurate output. It was some limitation of the study mentioned at relevant section. It is recommended by researcher to overcome those limitations during further study.

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APPENDIX

Permission letter

Date: March 15, 2013
To
Head of the Department,
Department of the physiotherapy,
Center for the Rehabilitation of the paralyzed (CRP),
Savar, Dhaka-1343

Subject: Application for permission to collect data to conduct a research study.

Sir,
I respectfully state that I am Mst. Sanzida Akter student of fourth year B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI). In fourth year course curriculum, we have to do a research project. I have chosen a research title that "Characteristics of urinary tract infection among spinal cord injured patient at CRP." And my superviser is Md. Shofiqul Islam Lecturer of Physiotherapy department. For this reason, I need to permission for collect data from the inpatient of Spinal Cord injury unit, CRP at Savar, Dhaka.

Therefore, I pray and hope that you would be kind enough to grant my application and give me the permission for collect data from Spinal Cord injury unit.

Yours faithfully
Sanzida Akter 15.03.13

Mst. Sanzida Akter
4th year B.Sc. in physiotherapy
Session: 2007-2008
BHPI, CRP, Savar, Dhaka-1343

Allow to collect
18.3.13

Incharge SCI PT / Allowed for undertaking the study.
18.03.13
Head PT

VERBAL CONSENT FORM

(Please read out to the participants)

Assalamualaikum/Namasker, my name is Mst. Sanzida Akter; I am conducting this study for a B.Sc. in Physiotherapy project study dissertation titled **"Characteristics of Urinary tract infection among SCI patient at CRP**" under Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related information regarding Urinary tract infection of SCI patient. You have to answer some questions which are mention in the attached form. This will take approximately 15 minutes.

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

If you have any query about the study or your right as a participant, you may contact with me, and/or Md. Shofiqul Islam, Assistant Professor, department of physiotherapy, BHPI, CRP, Savar, Dhaka.

Do you have any questions before I start?

So, may I have your consent to proceed with the interview or work?

Yes ☐ No ☐

Signature of the Participant/career with date _____

Signature of the Interviewer with date _____

Questionnaires

Part I: Patient's Identification (to be provided by patient or attendant):

Patient name:

Age:

Sex:

Identification number: Date:

Address:

Contact number:

Part II: Patient's Socio-demographic Information (To be collected from Record/ Care provider)

QN Questions and filters

1 Marital status:

1= Married

2= Unmarried

3= Divorced

4= Separated

5= Widow

6= Others

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 Religion

1. Islam

2. Hinduism

3. Christianity

4. Buddhist

5. Other (Specify)

5 Educational status:

1 = Illiterate

2= Literate

3= Primary school certificate (PSC)

4= junior school certificate (JSC)

5= Secondary school certificate (SSC)

6= Higher secondary certificate (HSC)

7= Bachelor or above

8= Masters or above

9= Other (Specify):

6 Occupations:

1= Rickshaw puller

2= Agriculture

3= Factory/garments worker

4= Driver

5= Businessman

6= Day laborer

7= Unemployed

8= Housewife

9= Student

10= Teacher

11= Other (Specify):

7 Average monthly family income: _____ (Taka)

8 Earning member: |__|__

1= Himself

2= others (specify)

9 Residential Area:

1= Rural

2= Semirural

3= Urban

Part III: Physiotherapy related Information

(To be collected from Record/ Care provider/clinical examination)

1 History of injury (HI)

2 Date of injury:

3 Date of admission:

4 Type of injury:

A. Traumatic

B. Non traumatic

If answer is traumatic please answer 5 otherwise go to 6

5 Causes of injury (traumatic):

a. Motor Vehicle Injury

b. Fall from Height

c. Fall while carrying heavy Load

d. Sport-related

e. Other (Please Specify):_____

6 Non traumatic injury:

a. Potts diseases

b. Spinal tumor

c. Transverse myelitis

d. Intervartebral disc prolapsed

e. Cervical spondylosis

f. Other (specify)

g. Undiagnosed

7 Skeletal level of injury:

a. Cervical __ __

b. Thoracic __ __

c. Lumber __ __

d. Sacral __ __

Length of time between date of accident/ onset and admission to first point of contact for treatment

8 Physical status 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 =

9 Confirmed type of Paralysis

1. Paraplegia =
2. Tetraplegia =

10 Initial Neurological condition according to ASIA Scale:

Complete A = 1

Incomplete B = 2

Incomplete C = 3

Incomplete D = 4

Normal E = 5

11 Initial Neurological level:

1. C __ __ T __ __
2. L __ __ S __ __

12 Diagnosis (During admission):

1= T/P 2= T/T

13 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?

  _ times

- Have you any medical report?

  1=yes 2=no

- What type of treatment you taken?

1. medication 2.no treatment

- What type of symptoms are you facing?

1= fever.

2= abdominal pain.

3= painful urination.

4= pressure or cramping in lower abdomen or back.

5= frequent or urgent need to urinate.

6= nausea.

7= vomiting.

8= malaise.

9=burning sensation during urination.

10= fatigue and general ill feeling.

11= flushed, warm, or reddened skin.

12= mental change and confusion (in elderly age).

13= back and groin pain.

14= bowel incontinence.

- Are you following intermittent catheterization?

  1= yes

  2= no

- Have you any pressure ulcer?

  1=yes

  2= no

- Have you suffer from any infectious disease of bladder?

  1= yes

  2= no.