

**KNOWLEDGE AND ATTITUDE TOWARDS COMMON  
COMPLICATION OF SPINAL CORD INJURY AMONG SCI  
PATIENTS ATTENDED AT CRP, BANGLADESH.**

By

**Sonam Prajapati**

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### Supervisor's Statement

As supervisors of Ms. Sonam Prajapati, M.Sc. Thesis work, we certify that we consider her thesis "Knowledge and Attitude towards common complication of Spinal Cord Injury among patients attending at CRP" to be suitable for examination.

  
Mohammad Anwar Hossain

Associate Professor

Department of Physiotherapy

BHPI.

(Supervisor)

Date: 08/06/18

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

“KNOWLEDGE AND ATTITUDE TOWARDS COMMON COMPLICATIONS OF SPINAL CORD INJURY AMONG SCI PATIENTS ATTENDING AT CRP, BANGLADESH”

Submitted by **Sonam Prajapati**, for the partial fulfillment of the requirements for the degree of M.Sc. in Rehabilitation Science.

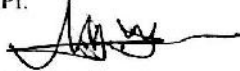


**Mohammad Anwar Hossain**

Associate Professor

Department of Physiotherapy

BHPI.



**Md. Julker Nayan**

Associate Professor

Department of Occupational therapy

BHPI.



**Md. Fazul Karim Patwary**

Professor

Institute of IT

Jahangirnagar University.



**S.J.M. Ummul Ambia**

Lecturer

Department of Rehabilitation Science

BHPI.

Date of Approval: 06/06/018

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Name: Sonam Prajapati

Date: 06/06/018

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## Acronyms

- AOR- Adjusted Odd Ratio
- BPAP- Bilevel Positive Airway Pressure (BPAP)
- CPAP- Continuous Positive Airway Pressure
- CRP- Center of Rehabilitation Paralyzed
- DVT- Deep Venous Thrombosis
- IC- Intermittent catheterization
- MIC<sub>S</sub>- Major Immobility Complications
- PU- Pressure Ulcer
- SCI- Spinal Cord Injury
- TM- Transverse myelitis
- TSCI- Traumatic Spinal Cord Injury
- UI- Urinary Incontinence
- UTI- Urinary Tract Injury
- $\chi^2$ - chi-square

## ABSTRACT

**Background:** Spinal cord injuries (SCI) are life threatening and most prevalent crises around the world thus the first aid from society population could be helpful for proper management by health care professionals.

**Objectives:**To find out the level of knowledge and attitude of SCI patients towards common complications after spinal cord injury in Centre of Rehabilitation of Paralyzed (CRP).

**Methods:** A cross sectional self administered questionnaire that was carried out in 100 SCI patients in SCI unit in CRP, Bangladesh. Data was analyzed by using SPSS and various tests such as frequency distribution, chi-square ( $\chi^2$ ) and odds ratio.

**Results:** The highest mean knowledge score of patients was in the area of Urinary problems like UTI (71%) followed by pressure sore (68%) and the least mean knowledge score was in the area of respiratory complication.

In overall, most of the respondents (69%) had good knowledge about common complication of SCI, 31% had poor knowledge and 52% had positive attitude and 48% had negative attitude. There was a significant relation between knowledge score and Attitude score. Male respondents [AOR = 4.261, 95 % CI (1.601- 11.341)] and types of injury [AOR = 4.444, 95 % CI 1.149 - 17.185] were significantly associated with knowledge. Likewise, causes of injury [AOR = .844, 95 % CI (1.197- 6.761)] and types of injury [AOR = 6.111, 95 % CI 1.406 – 26.565] were significantly associated with attitude on complication of spinal cord injury.

**Conclusion:**The study concluded that though patients had good knowledge and positive attitude. Awareness programme need to be planned and implemented regarding preventive measures.

**Key Words:** Knowledge, Attitude, Spinal Cord Injury, Complication, Pressure sore.

**1.1. Background**

Spinal Cord injury (SCI), whether traumatic or non-traumatic, is a sudden (Fyffe, Deutsch, Botticello, Kirshblum, & Ottenbacher, 2014), devastating and debilitating (Quadir et al., 2017) neurological condition addressed throughout the history. Traumatic spinal cord injury (TSCI) is one of the most devastating types of injury, and it results in varying degrees of paralysis, sensory loss, and bladder/bowel dysfunction. The effects of TSCI are not limited to an individual's health; it also creates an enormous financial burden for families and society at large (Pickelsimer, Shiroma, & Wilson, 2010).

The incidence of spinal cord injury is increasing with time with an annual rate of 15-40 cases per million (Singh, Tetreault, Kalsi-Ryan, Nouri, & Fehlings, 2014) with male predominance and affecting the low-socio economic group (Quadir et al., 2017). The global incidence of SCI every year ranges between 5.3 and 57.8 per million people, whereas the individuals between 20 and 40 years age are highest incidence of SCI. In the context of Asia, the incidence of traumatic SCI occupies from 7.8 per million to 20.5 per million, however ages ranged from 20.6 to 35.4. The majority of population with SCI is the highest in low and middle income countries. Among them the male suffers seems to be in greater extent than the female individuals (Vasiliadis, 2012). The global prevalence of SCI occupies the range of 223–755 per million. Amongst, one third SCI sufferers are tetraplegic and 50% of SCI individuals having a complete lesion with a comparison showing a significant differences between men and women as 3.8/1 (Wyndaele & Wyndaele, 2006). The condition leads not only to varying degrees of physical disabilities including paralysis, sensory deficit, dysfunction of bowel and bladder (Ning, Wu, Li, & Feng, 2012) but also to various crippling complications such as pressure sore, autonomic

dysreflexia, deep vein thrombosis, spasticity, sexual dysfunction and pneumonia (Grivna, Eid, & Abu-Zidan, 2015).

Bangladesh is a poor developing country, with a literacy rate of about 61.0% among the age of 15 years and above (Chhabra & Arora, 2012). Spinal cord injury and its health related complications are a major issue as it causes a great deal of morbidity and mortality as well as economic problems. Patients with spinal cord injury, very often develop life-threatening complications (Islam, Hafez, & Akter, 2011). These patients can, however, be assisted to regain integration within the community by appropriate treatment and specialized rehabilitation.

In Bangladesh, there is no specialized government hospital for the treatment and rehabilitation of people with SCL. The only one non-government organization is the Centre for the Rehabilitation of the Paralyzed (CRP), which has been conducting a rehabilitation program and working in this field for the last 30 years. Bangladesh, a poor but developing country of south-asia suffers a great deal of socio-economic problem arising from spinal cord injury and its health-related complications as evident from the yearly rate of admission at the specialized center like Centre for Rehabilitation of the Paralyzed (CRP) (Quadir et al., 2017). The non-governmental special organization, CRP managed the patients with multi and interdisciplinary approach which emphasizes on the development of community based rehabilitation programs. There are sufficient staffs that work there sincerely and supported by short term volunteers from home to abroad (Hoque et al., 1999)

Traumatic SCI is a sudden event that occurs unexpectedly which turns into a hazardous condition causing several consequences making the individual to suffer throughout their lifetime (Lee et al. 2014). Fall from height, road traffic accident, gunshot injury, sports

injury is so far identified to the leading cause of injury around the world (Sridharan, Uvaraj, Dhanagopal, Gopinath, & Anuswedha, 2015) and spinal tumor, tuberculosis(TB), transverse myelitis (TM) seems to be the non-traumatic cause (Ning, Wu, Li, & Feng, 2012).Epidemiology of spinal cord injury varies from that of developed to developing country(Rahimi-Movaghar et al., 2013).

Individuals with SCI report injury-related complications, including bladder problems, pressure sores, DVT, pneumonia, pain, spasticity and fatigue.(Hetz, Latimer, Arbour-Nicitopoulos, & Martin Ginis, 2011) Nearly 95% of individuals with SCI currently have at least one secondary complication, whereas the majority of these individuals (58%) have three or more complications. As consequences of SCI, there is the greatest risk of developing secondary health complications like pressure ulcers, respiratory, urinary complications, bladder dysfunction, pain, spasticity etc. These lead to morbidity and mortality of patients. So patients must have basic knowledge on SCI and SCI related complications. Patients also need information on how to avoid these SCI related complications.

Patient and caregiver education about SCI and related secondary medical complications are essential component to a successful transition to home and community. Additionally, proper education and knowledge about SCI and its associated complications will help patients and caregiver direct their care throughout their lifespan.

## **1.2. Justification of the study**

Nowadays, Spinal cord Injury is most commonly occurring disabling condition in all developing and developed countries in the world and it will increase day by day due to lack of awareness. Injuries that are affecting the spinal cord and complicated by physical damage are an important health problem in Bangladesh as they carry a high rate of morbidity and mortality. Spinal cord injury (SCI) is an important clinical condition that can lead to lifelong disability. The SCI individuals are at higher risk of developing the secondary complications which results in increased utilization of the health care system by people with SCI (Manns & May, 2007). The common complication following SCI especially long-term complications increase morbidity and decrease community participation and health-related quality of life. Improving functional level and quality of life are essential goals of rehabilitation in patients with SCI. Therefore, it is important to have knowledge regarding common complications of SCI and learn how to manage these complications for the recovery and rehabilitation process (Sezer, 2015).

In low-income and middle-income countries, people with spinal cord injury (SCI) are vulnerable to life-threatening complications. Knowledge of possible complication is important because they may be life-threatening and/or may lead to prolonged rehabilitation. Nowadays the evidence of spinal cord injury is increased in Bangladesh as increase population. Due to increasing population decreasing the working opportunities they are undertaking risky work as a result they are falling in spinal cord injuries for this increasing the chance of developing complications like pressure sores. But still now there is no evidence that research has been done on this topic so I become interested to select this topic. Most of the spinal cord injury patients of Bangladesh come at CRP for treatment so I select the patients of CRP as my sample population.

This study will find out the amounts of the patients who have complication after injury and will help to take measures about its complication among the patients. The patients may provide proper recommendation for every single risk which will be helpful for them. This study will also help to discover the lacking area of a patients, especially about their functional daily activities which are responsible for the complication. Beside this it will help to find out the reason for less survival of SCI individuals which is mandatory for current situation. This study will help to assess the knowledge and how they are dealing with their problems among the spinal cord injury patients in CRP which will pay the further attention for the treatment procedure of their complications.

In Bangladesh, there is lack of evidence on patient's knowledge and attitude regarding complication of SCI and its management. Therefore, this study set out to assess the level of patients' knowledge and attitude on management of its complication.



### **1.3. Research Question:**

What is the level of patient's knowledge and attitude regarding complication of spinal cord injury?

### **1.4. Operational definition**

#### **Spinal Cord Injury**

Spinal cord injury is damage to the spinal cord that results in a loss of function such as mobility disrupting the overall life activities of the sufferer and causing a long term effect on the individuals as well as family members, society as well as nation.

#### **Complication**

Complication is defined as an unfavorable evolution or consequence of a disease, a health condition or a therapy which can become worse in its severity or show a higher number of signs, symptoms or new pathological changes and become widespread throughout the body or affect other organ systems.

#### **Knowledge**

Knowledge is an information which is developed through the process of learning and also through understanding that results from research and experience.

#### **Attitude**

Attitude refers to tendency to act in a particular way based on experience that influences the individual's response to the objects and its relation to existing situation. Attitudes help us define how we see situations, as well as define how we behave toward the situation or object.

Traumatic spinal cord injury may cause long-lasting dysfunction in many organ systems and with permanent change of function, lead to a higher morbidity together with a lower quality of life (Barker et al., 2009). The management of SCI has changed significantly during the past decades due to increased knowledge about the pathos-physiology of SCI together with new diagnostic methods and treatment methods. The spinal cord is affected by both the immediate physical effects of trauma, and secondary pathologic processes. SCI often results in a life threatening condition that includes varying degrees of sensory loss and motor paralysis. It also includes impairment of bowel, bladder and other physiologic functions (Gassaway et al., 2009). SCI often results in significant and catastrophic dysfunction and disability of an individual. It physically and psychologically affects not only the individual, but also the family and society.

A spinal cord injury (SCI) results in a number of motor, sensory, and autonomic impairments which predisposes a person to multisystem dysfunction, leading to an increased likelihood of a range of related secondary complications (Cardenas, Hoffman, Kirshblum, & McKinley, 2004) which defined as medical consequences that can cause functional limitations. A cross-sectional study from the US Model System determined that 95.6% of patients had at least one medical complication at the time of their routine annual check-up (Munce et al., 2014). Common secondary health complications after SCI include pressure ulcers, urinary tract infections, bowel problems, fractures, chronic pain, and depressive disorders. Despite the fact that many of these complications are amenable to treatment and/or prevention, secondary complications represent a significant burden at both the health system and individual level: they are costly, in terms of limited health-care resources (Munce et al., 2013) and they intensify the experience of disability for people

with SCI by negatively impacting on long-term health, productivity/employment, dignity, mobility, and independence (Leduc & Lepage, 2015).

Lim et al., 2007 found that early rehabilitation in an organized multidisciplinary SCI care system has been shown to be beneficial, with lower mortality, decreased pressure sores, slightly greater chance of neurologic recovery, and shorter lengths of stay with lower hospital charges. Hence knowledge of possible complications during the acute phase is important because they may be life-threatening and/or may lead to prolonged rehabilitation (Hagen, 2015).

In addition to the profound direct consequences of SCI, there is a high risk of secondary health conditions, including pressure ulcers, respiratory complications and urological complications (Thietje et al., 2011). To reduce avoidable morbidity and mortality, patients must have a basic understanding of an SCI and SCI-related complications. Patients also need information on how to avoid these SCI-related risks.

Individuals with SCI report myriad injury related comorbidities and complications, including bladder problems, pressure sores, pain, spasticity, respiratory and urine leakage. Nearly 95% of individuals with SCI currently have at least one secondary complication, whereas the majority of these individuals (58%) have three or more complications (Hammell, Miller, Forwell, Forman, & Jacobsen, 2009).

Long term secondary common complications play an important role in the continuum of care for the individual with the SCI. It is important to have a better understanding of common complications that can result from SCI, as well as their risk factors. Complications are frequent cause of morbidity and mortality and lead to increased rate of re-hospitalization and cost of care along with loss of employability and decreased quality of life (McKinley, Jackson, Cardenas, & DeVivo, 2009).

Some studies which investigated that better knowledge leads to less SCI-related complications and, vice versa, less knowledge leads to more SCI-related complications (Thietje et al., 2011).

Family caregivers are fundamental partners in the delivery of multifaceted health care services. Unlike professional caregivers such as physicians and nurses, informal caregivers, usually family members or friends, provide care to individuals with a variety of conditions. Involvement of family caregivers is essential for optimal treatment of patients in ensuring treatment compliance, continuity of care and social support. It is necessary to understand that caregivers play an important role in providing care to their patients and they should be aware about the complications and their preventive measures. Glajchen, (2004) reported that involvement of family caregivers is essential for optimal treatment of patients in ensuring treatment compliance, continuity of care and social support. (Alhosis, Qalawa, S., & Abd El-Moneem, 2012) It is necessary to understand that caregivers play an important role in providing care to their patients and they should be aware about the complications and their preventive measures. Acquisition of knowledge is required during rehabilitation to learn self-care which is essential to long term survival following SCI.

### **Pressure Sores**

Pressure ulcers are an important and potentially life threatening common complication of SCI. Pressure ulcers are serious, lifelong secondary complication of spinal cord injury (SCI) that have the potential to interfere with physical, psychological and social well being and to impact overall quality of life (Hsieh et al., 2014). They can lead to further functional disability and fatal infections and surgical interventions can be required (Regan et al., 2009). Pressure ulcer is defined as a localized injury to the skin and underlying tissue usually over a bony prominence, as a result of pressure or pressure in combination

with shear. The primary cause is felt to be externally applied pressure for a prolonged period over bony prominences, such as the sacrum and ischial tuberosity. This leads to ischemia of overlying soft tissues, which ultimately can lead to necrosis.

The incidence of PUs has become a universally known quality indicator in the hospital settings that the patients' quality of life, increases hospital expenses and has an adverse effect on achieving goals of care so much so that their occurrence reflects the quality of care (Gupta, Loong, & Leong, 2012). Thus, the treatment and prevention of ulcers should be considered as a priority, especially where patients are at high risk; such as patients in rehabilitation centers.

Lack of knowledge and skills in PUs prevention contributes substantially to the occurrence or deterioration of PUs. Although evidence-based guidelines for the prevention of PUs have been developed extensively and have been supported globally, the problem is still widely spread in health care facilities around the world.

According to Shahin et al., 2008 pressure ulcers have been described as one of the most costly and physically debilitating complications since the 20th century. On the other hand, pressure ulcers cause pain and discomfort, prolongs illness, delay rehabilitation and discharge, and may contribute to disability and death. Health care costs raise dramatically, the need for supplies, nursing hours, and community resources increase, it is estimated that a pressure ulcer can increase the cost by 50 % (Catania, 2003). Although the etiology of pressure ulcers is not fully understood, it is very important to identify the groups at high-risk for pressure ulcers (Kim, Lee, Lee, & Eom, 2009). The risk factors for it include age, moisture, nutritional deficit. Moreover, pressure ulcer occurs exclusively in people with limited mobility, so it is a challenge to prevent the occurrence of pressure ulcer (Joyce, 2005). The review by Gelis et al. discusses the pressure ulcer risk factors in persons with spinal cord injury during the chronic stage. Behavioural risk factors (relieving the

pressure, careful skin monitoring and smoking) are probably the ones for which a preventive strategy can be established. The most common places for pressure ulcers are over bony prominences (bones close to the skin) like the elbow, heels, hips, ankles, shoulders, back, and back of the head (Bathell, 2003 & Kuffler, 2010).

McKinley et al reported that the most common locations for pressure ulcers after SCI are the ischium (31%), trochanters (26%), sacrum (18%), heel (5%), malleolus (4%) and feet (2%). Hoff et al also reported that risk factors for pressure ulcers are immobility, reduced activity, lack of sensibility, moisture due to urinary and fecal incontinence, muscle atrophy, prolonged time since injury, depression, smoking and poor nutrition. (Kohta, Kameda, & Morita, 2017) PU can lead to several complications: the most serious is localized infection and invasion of the contiguous soft tissue, expressed as cellulitis, osteomyelitis and sepsis. These complications interfere within the healing process, and increase mortality. Good prevention requires identifying the individuals at risk for developing pressure ulcers (Gélis et al., 2009). Pressure ulcer management includes daily inspection of skin, keeping skin clean and dry, avoidance of excessive pressure or shearing, proper pressure relief techniques, individually prescribed equipment (e.g. wheelchair cushions), well balanced nutrition, early recognition and treatment (Cardenas, Hoffman, Kirshblum, & McKinley, 2004).

In the home setting, Fujita et al recently evaluated a questionnaire survey on pressure injury prevention among caregivers at home care and clarified that the levels of knowledge and practice among them were relatively low. According to literature, it has been identified that Nurse's knowledge of the prevention of pressure ulcers is poor, which is reflected in their practice as they do not comply with best practice guidelines. Study conducted in Sweden on nurse's knowledge and practice of existing guidelines on prevention of pressure ulcer found that, majority of them had inadequate knowledge and

practice to implement guidelines. Poor knowledge and practice of nurses have its own significant contribution for higher prevalence of pressure ulcers (Nuru, Zewdu, Amsalu, & Mehretie, 2015).

### **Respiratory complication**

After SCI, respiratory complications are the most important cause of morbidity and mortality in both acute and chronic stages (Garshick, E, Kelley, A, 2005). Patients are most vulnerable to respiratory illness in the first year after injury but continue to suffer from respiratory complications throughout life. The number of respiratory complications suffered during initial admission is more important than level of injury in determining length of stay and hospital costs (Berlowitz, Wadsworth, & Ross, 2016). As seen through the literature, SCI often leads to respiratory dysfunction, including insufficiency of respiratory muscles, ineffective cough etc (Brown, DiMarco, Hoit, Garshick, & DiMarco, 2006). Due to these problems, atelectasis, pneumonia and respiratory failure are the most common respiratory complications in patients with SCI (Christopher & Julia).

All patients with a spinal cord injury above L<sub>1</sub> will have some form of lung dysfunction. The higher the level of injury the more severe the lung dysfunction will be. Respiratory complications are the leading cause of death in patients with SCI (37% in the first year; 21% after) (Braddom, 2006). 50% of patients with complete cervical SCI will develop pneumonia in first month post injury. Up to 40% of patients with SCI will have sleep apnea. Pneumonia is the 1<sup>st</sup> most common cause of death in the first year following SCI.

In the acute phase following a spinal cord injury, up to 80% of patients are affected by respiratory complications. Long term follow-up reveals that respiratory complications are the most frequent cause of death among SCI patients. The most common complications are atelectasis, pneumonia and respiratory failure. Prevention of respiratory complications

must start immediately, irrespective of the level of the spinal cord injury. It is essential to determine the need for mechanical ventilation both in the acute phase and during long term follow up, as well as good secretion mobilization methods. SCI patients have an over prevalence of sleep related respiratory disorders, particularly obstructive sleep apnoea syndrome, which can adversely affect quality of life and rehabilitation.

Patients with cervical and high thoracic SCI are at higher risk for respiratory complications due to paralysis of the respiratory muscles below the level of injury, which results in a weak cough mechanism and difficulty in mobilizing lung secretions (Schottler, Vogel, Hafetz, & Mulcahey, 2010). As a result, patients are at higher risk for developing atelectasis and pneumonia. (Kirshblum, Groah, McKinley, Gittler, & Stiens, 2002) Some studies have found that 67% of acute SCI patients experience severe respiratory complications within the first days after the injury; atelectasis (36.4%), pneumonia (31.4%), and respiratory failure (22.6%). Respiratory failure occurs most frequently in the acute period. Atelectasis and pneumonia are mainly seen in the acute stage of SCI but they also can appear as an important chronic respiratory problem in SCI. Chen et.al. reported that individuals with complete tetraplegia are clearly at greatest risk for the development of atelectasis/pneumonia. In the acute phase 84% of patients with injuries above C<sub>4</sub> and 60% of patients with injuries from C<sub>5</sub> to C<sub>8</sub>, will experience respiratory problems, and 75%-80% of tetraplegia above C<sub>4</sub> and 60% of tetraplegia caudal to C<sub>4</sub> will need invasive mechanical ventilation (Berlowitz, Wadsworth, & Ross, 2016).

Atelectasis needs to be recognized and treated to avoid further complications such as pneumonia, pleural effusion, and empyema. Atelectasis is most commonly found in the left lower lobe so auscultation should be done either sitting up or lying on right side. Monitoring vital capacity is one of the best ways to detect early problems. Treatment includes both lung expansion and mobilization and clearing for secretions.



This can be accomplished using different methods:

- Assisted coughing (using abdominal thrust or compression)
- Use of insufflators/exsufflator (device that delivers a deep breath then sucks the air out-video)
- Chest physiotherapy
- Placing patient in supine position (increases FEV<sub>1</sub> and vital capacity)
- Bronchodilator (patients with SCI often have hyperactive airway due to unopposed cholinergic tone) evidence icon,
- Abdominal binder (helps reduce residual lung volume in sitting position)
- Continuous Positive Airway Pressure (CPAP) or Bilevel Positive Airway Pressure (BPAP).
- Suctioning
- Increasing tidal volume on ventilator

Any signs or symptoms of pneumonia should be evaluated promptly with a chest x-ray and treated with assisted coughing, physiotherapy, and antibiotics.

The risk of respiratory failure is directly associated with injury level. Patients may lose up to one AIS level within the first few days of injury as a result of cord swelling or bleeding, making this an especially high risk period (Como et al., 2005). A patient with a complete injury above C<sub>5</sub> will typically have impaired diaphragm function and is likely to require a period of endotracheal intubation and mechanical ventilation. A C<sub>5</sub> injury level may also involve diaphragm weakness but is more likely to be associated with the ability to breathe independently. Impaired inspiration, lack of cough strength, and no movement of the hands, trunk and lower limbs are seen.

In the literature, various recommendations were reported about the management of respiratory complications associated with SCI. They include positioning and postural changes, breathing techniques, spontaneous cough and cough assistance, suctioning, respiratory muscle training, ventilation techniques and education, vaccination agents for influenza and pneumococcal infections and pharmacological interventions. Furthermore, the modifiable risk factors (obesity, smoking, etc.) must be addressed, particularly in patients with tetraplegia and of older age (Stepp et al., 2009).

### **Urinary and Bowel Complication**

One of the most important complications following SCI is the loss of genitourinary and gastrointestinal function. Bladder and bowel dysfunctions which affect the physical and psychological health of patients and severely decrease the quality of life are also prevalent in patients with traumatic SCI. Urological complications of neurogenic bladder caused by traumatic SCI consist of inability to empty the bladder, urinary tract infections (UTIs), incontinence, and upper urinary tract deterioration (Al Taweel & Alkhayal, 2011). A distended bladder may also cause pressure effects on adjacent structures including the left common iliac vein in the pelvis leading to adverse events of other organs (Vaidyanathan et al., 2001). SCI interrupts control of the bladder and bowel. After SCI, the bladder and sphincter are frequently hypotonic. In the chronic phase the bladder dysfunction is classified as either an upper or lower motor neuron syndrome.

Weld and Dmochowski reported clean intermittent catheterization (CIC) as the safest bladder emptying method for SCI patients in terms of urological complications. It was also shown to be the optimal method for assisted bladder voiding after SCI by Shen et al. CIC requires education and support, particularly during the initial stages and follow-up. Patients with sufficient hand function using CIC are able to empty the bladder regularly,

with a lower UTI rate and good continence between catheterization (Ku, 2006). The risk of urinary tract infection increases with the increasing duration of catheterization (Gastmeier, 2001). Long-term indwelling catheterization may be used for tetraplegic patients who do not have adequate upper limb function and assistance of a caregiver. Regular monitoring and suitable management for bladder dysfunction are important to prevent long term complications (e.g. infections, vesicourethral reflux, renal failure, renal calculi, bladder cancer) and provide a better quality of life in patients with SCI.

Between 27% and 62% of patients with SCI report having problems with their bowel, the most frequent symptoms are constipation, distention and abdominal pain (Ebert, Robert, & Johnson, 2012). Other symptoms are rectal bleeding, hemorrhoids, incontinence and autonomic dysreflexia. Spinal shock leads to loss of all activities, under the level of injury, including autonomic function and reflexes. During the first four weeks, 4.7% of patients experienced acute abdominal symptoms, while 4.2% reported acute gastro duodenal ulceration and hemorrhage (Ebert, Robert, & Johnson, 2012). Common bowel dysfunctions in patients with SCI may include poorly localized abdominal pain, difficulty with bowel evacuation, hemorrhoids, abdominal distention, and autonomic hyper-reflexia arising from the gastrointestinal tract.

The ultimate goals of bladder management after SCI are to preserve upper tract function with low intravesical pressure through adequate bladder drainage and to maintain urinary continence. In patients with SCI, it is generally agreed that urodynamic evaluation is essential to provide a precise diagnosis and treatment options for bladder dysfunction (Ku, 2006). The urodynamic evaluation is also strongly recommended according to the Autonomic Standards Assessment Form (Alexander et al., 2009).

Many different bladder management methods are now in use in SCI patients; the most common among them are intermittent catheterization by a trained staff or self, suprapubic

cystostomy, indwelling catheterization, condom drainage and Crede maneuver. Each of these methods has certain advantages and disadvantages in terms of convenience, expense, and differential risk of a variety of secondary complications such as urinary tract infection, epididymitis and fistula, penile pressure ulcers, and bladder and renal calculi. The optimal bladder management method should preserve renal function, minimize urinary tract complications and the risk of urothelial neoplasm (Singh et al., 2011). In addition, patient comfort, convenience, and quality of life are important factors in bladder management decisions.

In patients with SCI, treatments for bladder dysfunctions may involve conservative treatments (drug treatments, catheterization, assisted bladder emptying, rehabilitation, and external appliances), minimally invasive treatments and surgical treatments (Stöhrer et al., 2009); treatments for bowel dysfunctions may include nonpharmacological therapies (suppositories, reflex stimulation, abdominal massage, assistive devices, and others), pharmacological agents, and surgical interventions (Krassioukov, Eng, Claxton, Sakakibara, & Shum, 2010). Furthermore, treatments like catheterization, sacral anterior root stimulation, colostomy, and enema will likely cause additional pain and other side effects to patients. Therefore, an effective and safe treatment with few side-effects is warranted for the treatment of bladder and bowel dysfunction in patients with traumatic SCI.

Patients should be educated about bladder management immediately after SCI to avoid complications. However, less than 50% of SCI patients have good knowledge about bladder management and pressure ulcers after being discharged (Thietje et al., 2011). Education of community health professionals about the delayed complications of SCI and good communication between doctors, patients, caregivers, and community health

professionals are likely to improve the care of SCI patients following discharge from SCI centers (Vaidyanathan et al., 2004).

### **Urinary Tract Infection**

People with SCI have an increased risk of developing urinary tract infection (UTI). At present, UTIs represent a major cause of morbidity and mortality in patients with SCI, although, with improved management, mortality from urinary sepsis has fallen to 10–15% (García Leoni & De Ruz, 2003). Urinary tract infection is the most common urological complication for the SCI patient. Sepsis, frequently caused by UTIs, is a leading cause of mortality among patients with SCI. Urinary tract infections increase the number of hospital admissions and length of a hospital stay and lead to loss of therapy time. The SCI related factors that contribute to UTI risk in persons with SCI include (1) incomplete bladder emptying, (2) low bladder wall compliance, and (3) insertion of an indwelling catheter.

The overall incidence of UTI in SCI is 2.5 cases per year (Gould, Umscheid, Agarwal, Kuntz, & Pegues, 2017). Frequently, it occurs as a result of neurogenic bladder and the need for catheterization.

Typical manifestations of symptomatic UTI are usually absent in SCI patients with neurogenic bladder dysfunction and impaired sensation. The diagnosis of UTI in SCI patients may be delayed or missed, because symptoms are often subtle. Signs and symptoms of UTI in SCI patients include fever, discomfort or pain over the kidney or bladder, urinary incontinence, increased spasticity, autonomic hyperreflexia, cloudy urine with increased odor, malaise, lethargy, or sense of unease (García Leoni & De Ruz, 2003).

Patients with SCI have a limited set of options available to them with regard to long term urinary tract management. The choices that are made will depend on a number of different

factors including personal acceptability, convenience, risks of short and long term complications and the advice of medical staff, family and peers. It is interesting to note that different management approaches do not necessarily produce significant differences in general quality of life (Harrison, 2010).

It is immediately apparent that the natural pattern of lower urinary tract dysfunction that an individual with SCI may exhibit will preclude some forms of management unless urological interventions are used to alter lower urinary tract behavior. It is therefore the urologist's role to widen the range of options open to patients. The available choices are:

- Clean intermittent (self) catheterization using the urethral route or a continent catheterizable abdominal conduit.
- Contained urinary incontinence using a penile sheath system or pads.
- Indwelling catheterization by the suprapubic or urethral route and using a catheter valve in some cases.
- Voiding with an element of voluntary control which includes patient-induced or triggered reflex voiding, micturition by straining and, in some patients with incomplete injuries, true voluntary voiding.
- Sacral root stimulation using the Finetech-Brindley system in patients with complete supraconal injuries.
- Urinary diversion by ileal conduit or continent urinary diversion.

Complication is the leading cause of mortality and complications hampers the process of active rehabilitation. A recent study report that, occurrence of complication was high both during and after inpatient rehabilitation (Haisma et al., 2007). Complications were common among tetraplegic than paraplegic. But urinary tract infection and incontinence are more common in paraplegic patients than tetraplegic patients (Nair et al., 2005).

Almost 74.7% of patients with SCI, commit pain, spasticity, contractures and heterotrophic ossifications (Nair et al., 2005). In the developed country, DVT and pulmonary embolism shows higher rate, whereas pressure ulcer and UTI are the most common among the developing country (Rathore, 2010). Pressure sore and urinary infection is more in America. In an Indian study reports, 90.62% patients report at least one complication and among them average 50% patients suffer with UTI (Gupta et al., 2009) and another study highlights on the prevalence of complication, in these report confirm that 70% patients suffer with neurogenic bladder dysfunction, 60% report spasticity, 45% with pain, 25% Pressure ulcer, 20% heterotrophic ossification, 10% UTI, 10% for autonomic dysreflexia, 10% edema and 10% report disability (Vijayakumar and Resident 2004). In Bangladesh, 62% report UTI and 38% for PU (Hoque et al., 1999).

A study in Pakistan shows 86% patients report regular or occasional urinary incontinence (Burns & O'Connell, 2012). Among the SCI patients, almost 50% patients (mainly male) point out urinary complication during admission and mainly highlights that, pathological organisms are responsible for urinary infection (Penders et al., 2003). From a study of Netherland, found that 49% SCI patients complain UTI (Haisma et al., 2007). A study on UK, reported that almost 52.3% patients with SCI suffer with urinary complications. Among them 20% traumatic SCI patients report urinary tract infection and 5.9% patients with non traumatic SCI report UTI (Ruffion et al., 2013).

According to Nigerian study 60% patients suffer pressure sore during admission (Burns & Connell, 2012). Although 39.7% SCI patients complain pressure sore (Rathore, Hanif, Farooq, Ahmad, & Mansoor, 2008) or 31.3% (New et al., 2004) during admission but only 2.4% patients suffer with pressure sore during stay of hospital (Rathore et al., 2008). A

study in Pakistan reports, almost 39.7% patients were suffered with pressure sore during admission in rehabilitation centre (Burns & O'Connell, 2012).

Knowledge, attitudes and skills are necessary to provide effective health care. Literature about the knowledge of health care providers towards PUs prevention is inconsistent. Some studies reveal that the overall knowledge is appropriate while others show that the knowledge about PUs is adequate (Kaddourah, Abu-Shaheen, & Al-Tannir, 2016). Also, despite the positive attitude towards PUs prevention, various studies have revealed a gap between theory and practice. Within Saudi healthcare professionals, there is a scarcity of information regarding PUs. Considering the fact that better knowledge and attitudes result in better health care, the entire concerned disciplines should be aware, well informed and proficient at the clinical practice guidelines in order to reduce PUs.

Patients play a vital role in preventing complications of spinal cord injury. "Many of these complications are preventable, and early recognition can improve outcomes". Good bladder care and avoiding pressure sores but not sitting too long in one position are examples of ways that people with spinal cord injury can help take care of their health. CISC is considered preferable to other forms of bladder voiding in neuropathic patients as it has less complications and a better outcome. Several studies compared urological outcome in SCI patients and found that those with indwelling catheter, suprapubic cystostomy, reflex (tapping) voiding or Credéor abdominal straining, and incontinence pad had worse outcomes compared to those on CIC or CISC. UTIs are the most frequent complication in patients performing CISC; their prevalence varies widely in the literature (from 12 to 88%). Evidence supports increased bladder PVR as a risk factor, and patients on CISC had fewer UTIs than those with indwelling catheters and reflex or abdominal voiding.



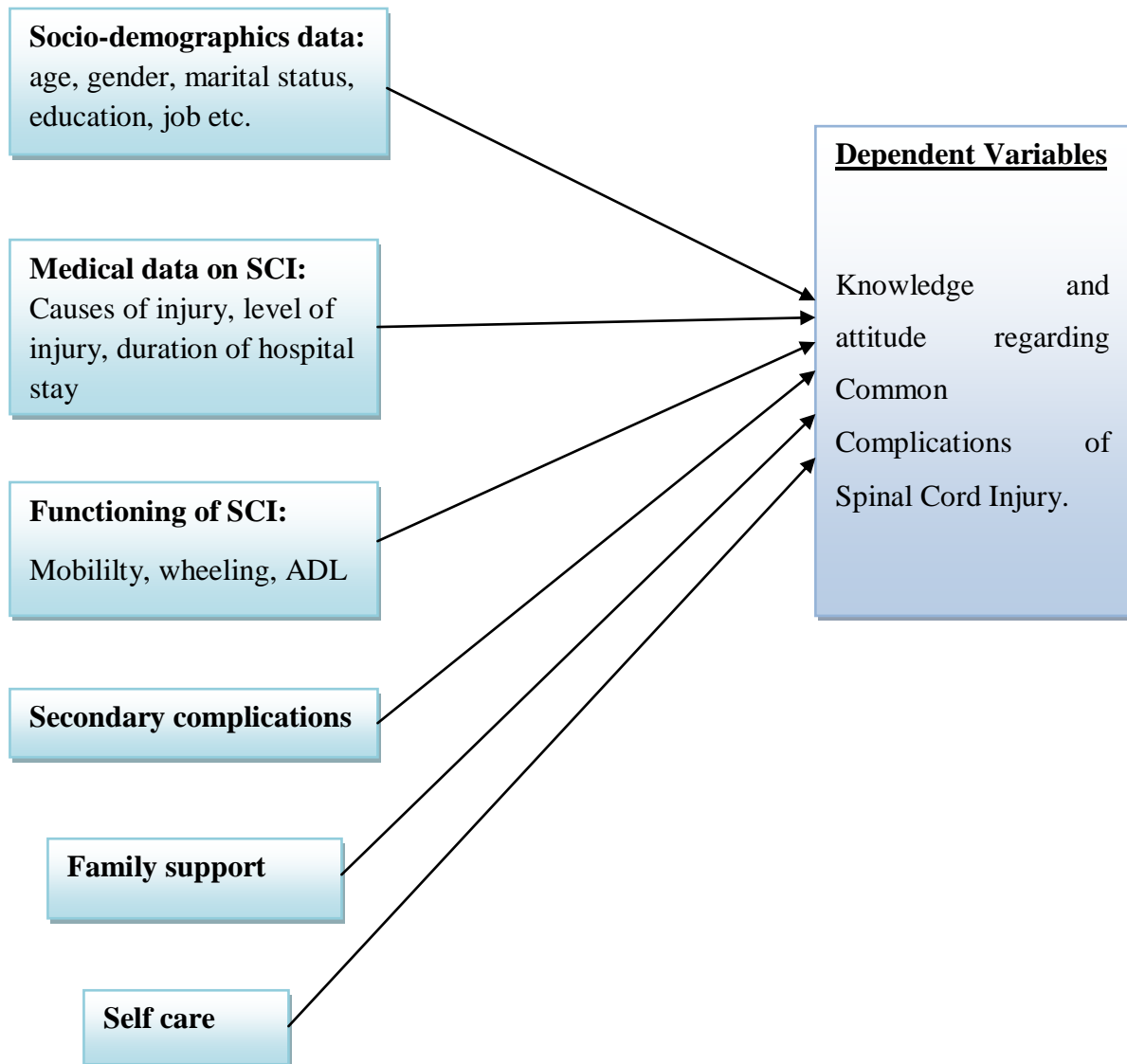
## **Preventable Complications**

There are many steps that doctors and people with spinal cord injury can take to prevent these complications, including the following:

- Use of early range of motion and rehabilitation.
- Splinting and using braces and other devices.
- Bowel regimen and bladder program to help patients use the bathroom.
- Clearance of lung secretions.
- Use of mechanical ventilator support.
- Eating a healthy diet.
- Prevent pressure ulcers by moving position ever two hours, use of air mattresses, and periodic weight shifting while sitting

3.1. Conceptual framework

Independent Variables



### **3.2. Objectives of the study**

#### **3.2.1. General Objectives**

- To assess knowledge and attitude towards Common Complications of SCI among Spinal cord injury patients.

#### **3.2.2. Specific Objectives**

- To assess the knowledge regarding common complication of SCI among patients.
- To assess the level of attitude regarding common complication of SCI among patients.
- To determine the relation between knowledge and attitudes of patients regarding complication of SCI.
- To find out the association between knowledge and attitude towards common complication of SCI among patients with selected demographic variables.

### **3.3. Study design**

The study had conducted by using quantitative method to assess the knowledge and attitude among SCI patients attended at the CRP, Bangladesh. A cross sectional study was chosen to conduct the study. It is the simplest variety of descriptive or observational study and also known as surveys are a useful way to gather information on important health-related aspects of people's knowledge and attitudes.

Cross sectional design was used to find out the quantitative information of different variable of this study. The study conducted can help to reveal the association of different related variables. Therefore, cross sectional study provide a snapshot of the frequency of related variables.

### **3.4. Study Population**

In this study, the study population had included only SCI patients who were attended at the CRP, Bangladesh.

### **3.5. Study area/site**

The study had conducted at Spinal Cord Injury department of CRP, Savar, and Dhaka. Centre for the Rehabilitation of the Paralyzed (CRP) is one of the largest rehabilitation centers for the spinal cord injury in Bangladesh. The patient information was collected from CRP as it is one of the main centers for SCI in Bangladesh.

### **3.6. Study Period**

The study was conducted from November, 2017 to May, 2018.

### **3.7. Sample size**

Sample size was determined according to following criteria: 50% prevalence of patient with Spinal Cord Injury because researcher has not accurate data about the prevalence of Spinal Cord Injury in Bangladesh. The confidence interval was 95% and 5% error level.

The formulation of sample size determination:

$$n = (z^2 \times p \times q) / r^2.$$

Here,  $z = 1.96$  (confidence interval 95%)

$r = 0.05$  (error level 5%)

$p = 0.50$  (50% prevalence)

$q = (1 - 0.50) = 0.5$

$(1.96)^2 \times 0.5 \times 0.5 \div (0.05)^2$

$n = 384$

The total sample required 384 to conduct study. But researcher selected limited patient to conduct the study due to limited time for this study patient availability. The participants selected based on inclusion and exclusion criteria.

### **3.8. Inclusion and exclusion criteria**

#### **Inclusion Criteria:**

- Both sexes are equally prioritized.
- Age ranges from 18-67 years old.
- Patients who have attended at CRP.
- Patients with both paraplegic and tetraplegic and with AISA A,B, C or D lesions.

#### **Exclusion Criteria:**

- Patients who have mental disorders.
- Patients with neurologic diseases (e.g. MS, ALS).
- Those who are in 24 hrs mechanical ventilation dependency.

### **3.9. Sampling Technique**

The researcher had used convenience sampling method which is a type of non probability sampling. It is the simplest which occupies low cost and the researcher has a freedom to use whomever they find. The researcher had selected this technique as it is the easiest and quickest method of sample selection.

### **3.10. Data collection tools/ materials**

The data were collected by using survey questionnaire. Each participant took part in interview for lasting approximately 10-15 minutes and some more than 20 minutes. All the information required for the study were obtained by face to face interaction with patient with the help of secondary information sources i.e. patient demographic data, hospital record, inquiry etc. The survey questionnaires were developed through literature review on knowledge and attitude on complication of SCI. A well structured questionnaire with simple understandable language was provided to the concerned person. Generally closed ended questions were conducted with the lists of multiple responses from which the respondent had to select only one response. Multiple choice items are the most popular type of survey questions because they are generally the easiest for a respondent to answer and the easiest to analyze.

The questionnaire had contained three parts.

- First part of questionnaire had contained demographic detailed of the respondent.
- Second and third part had contained the structure questionnaire with choices where respondent will be asked to select the appropriate answer on knowledge and attitude.

The details of each section will be explained as follows:

#### **Section 1: Demographic Questionnaire**

This questionnaire consisted of 9 items to assess the subjects' demographic data including age, gender, marital status, basic education, job, causes of injury, level of injury and types of injury (Appendix B).

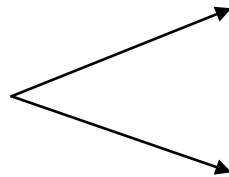
## **Section 2: Knowledge related Questionnaires**

This questionnaire was designed to assess the level of patients' knowledge regarding common complications based on the domains. It was composed of 27-item multiple choice questions which had been modified (Appendix). The subjects were asked to rate the 5 level of knowledge ranged from 1 to 5; 5 = strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, and 1 = strongly disagree. The higher score indicated the greater level of knowledge. To improve power, we collapsed the Likert scale responses into two variables namely agree and disagree: combination of ("strongly agree" and "agree") and combination of ("neutral", "disagree" and "strongly disagree"). The overall score is obtained by calculating the arithmetic mean of the 27 items, and the score for each domain is obtained through the arithmetic average of the values of each item comprising that domain. The level of knowledge was categorized into two groups:

**Poor Knowledge**

**Level of Knowledge**

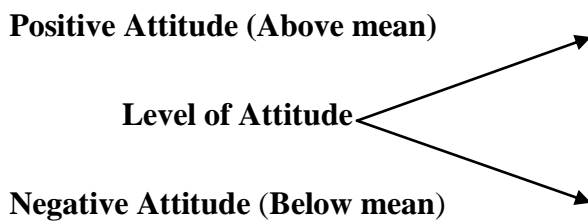
**Good Knowledge**



## **Section 3: Attitude related questionnaire**

A 14-item structured questionnaire was developed based on thinking, behavior and thoughts of domain (Appendix). Attitude components included factors related to pressure ulcer development, risk assessment, skin care, nutrition to maintain healthy skin, preventive measures etc. The subjects were asked to rate the 4 level of attitude ranged from 0 to 3; 3 = always, 2 = often, 1 = sometimes, and 0 = never. The questionnaire included positive and negative item questions. The scores of negative items were reversed.

The possible total score ranged from 15-37. The higher scores indicated the positive attitude. Total scores of attitudes were categorized into two levels based on mean.



Regarding to the reliability, the study used Cronbach's coefficient alpha to measure consistency, complementarily and correlation coefficient. To generate the Cronbach's alpha results, validation of the instrument was conducted through a pilot study and the results obtained had an overall Cronbach's alpha of  $(r) = 0.76$ .

### **3.11. Data management and analysis**

Data collection and analysis were carried out in an iterative manner. Descriptive statistics were used to analyze the data. The demographic data like age, gender, education along with different variables were entered into the SPSS and was re-coded as required. For example, the age was re-coded as age groups as 18-27 as 1 and 28-37 as 2 and so on. For all the demographic data, the frequency table and percentage distribution were calculated. The mean age of all the participants were calculated along with percentage distribution. Standard deviation was calculated for the age and percentage differences were calculated for the genders and shown through pie chart.

All the data were put in Statistical Package for Social Science (SPSS) and Microsoft excel through different variables. For analysis, descriptive measures such as mean, median, standard deviation, and as well as the Cronbach's  $\alpha$  coefficient (internal consistency) was used. The data were analyzed through chi-square test ( $\chi^2$ ) to see the association between two different variables. The statistical technique was used to determine the degree to



which two variables are related. This measure had helped to see the linear association between two variables and with this measure we can find that whether there is any strong or weak influence of dependent variables to independent variables.

A  $p$  value of  $<0.05$  was considered as significant. Equation of chi-square test:

$$\chi^2 = \frac{\sum (O - E)^2}{E}$$

Here, O= Observed frequency

E= Expected frequency

Those variables which were significant, were subjected to binary logistic regression analysis. In all the analysis, ( $p < .05$ ) was taken as statistically significant value. Binary logistic regression were computed to assess statistical association between the outcome variable and independent variables using Odds Ratio; significance of statistical association was assured or tested using 95% confidence interval (CI) and  $p$  value ( $<0.05$ ). Odds ratios and their 95% confidence intervals were determined for each level of the independent variables in those models that were significant. Odds ratios in this context describe the particular behavior. One level of each characteristic is used as the reference group against which the odds of demonstrating the behavior at all other levels of the variable are measured. The reference group is usually chosen by the researcher when initiating the analysis to allow the most salient interpretation of results. Confidence intervals provide information about the precision of the estimated odds ratio. Confidence intervals including 1.0 are, by definition, not statistically significant. Binary logistic regression analysis, adjusting for gender and types of injury was performed to predict factors associated with knowledge of complication and causes of injury and types of injury was performed to predict factors associated with attitude.

### **3.12. Quality control and assurance**

Questionnaire was to assess the patient's knowledge and attitude regarding common complication after SCI. To ensure and improve the quality of the study, first questionnaire was translated in the national language that is Bangla language following the standard procedure of linguistic validation.

For translation, two individual who were fluent in both languages were assigned for forward translation. They both prepare two versions of questionnaires then they both sat together and discussed and come up with one first version of translated questionnaire. Then this translated version was provided to another person who was fluent in both languages and who have not seen the original copy of questionnaire for backward translation. Then all three translators sat together and consensus was drawn with final version of translated questionnaires in Bangla language.

Then the pilot study had been conducted for the questionnaire to ensure the validity of the questionnaire. With the help of this survey, the unmet and required changes can be made and rearrange the questionnaire to make it easiest, understandable, and clear to the participants. The questionnaires filled by all those participants were kept safely in other to maintain confidentiality of participants. The data collected had been reviewed several times before entering into the SPSS program to reduce the errors that are likely to occur while entering and analysis of the collected data. The data were being re-coded in the required variables. Analysis of the data was done from the computer to minimize the errors.

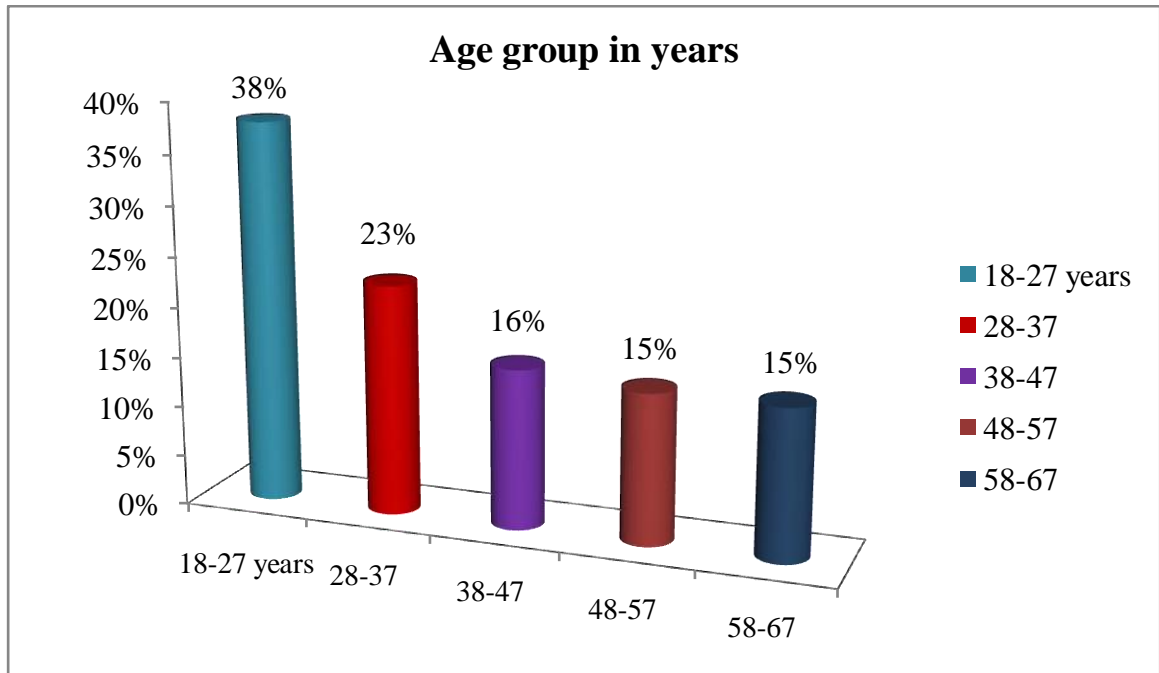
### **3.13.Ethical Consideration**

Study was conducted following the standard guidelines for ethical consideration. First, prepared research proposal was submitted to the concerning authority after getting approval from course coordinator of Department of Masters in Rehabilitation Science and supervisor. The ethical approval had been taken from the Institutional Review Board (IRB) of Bangladesh Health Professions Institution (BHPI) for the conduction of the study. The researcher obtained permission from the Ethical Committee of BHPI. The researcher obtained permission from the Head of Spinal Cord Injury Department.

The respondents from the study was told clearly about their right to leave or not forced to participant if he/she was not willing to participate in the study. The researcher had taken appropriate informed consent from the participants who were interested to participate in the study and then informed verbally about the study and its purpose. Confidentiality of the information provided by the participants will not be revealed directly. They were being informed that there will not be any harm and direct benefit to participate in the study.

#### 4.1.Socio-Demographics

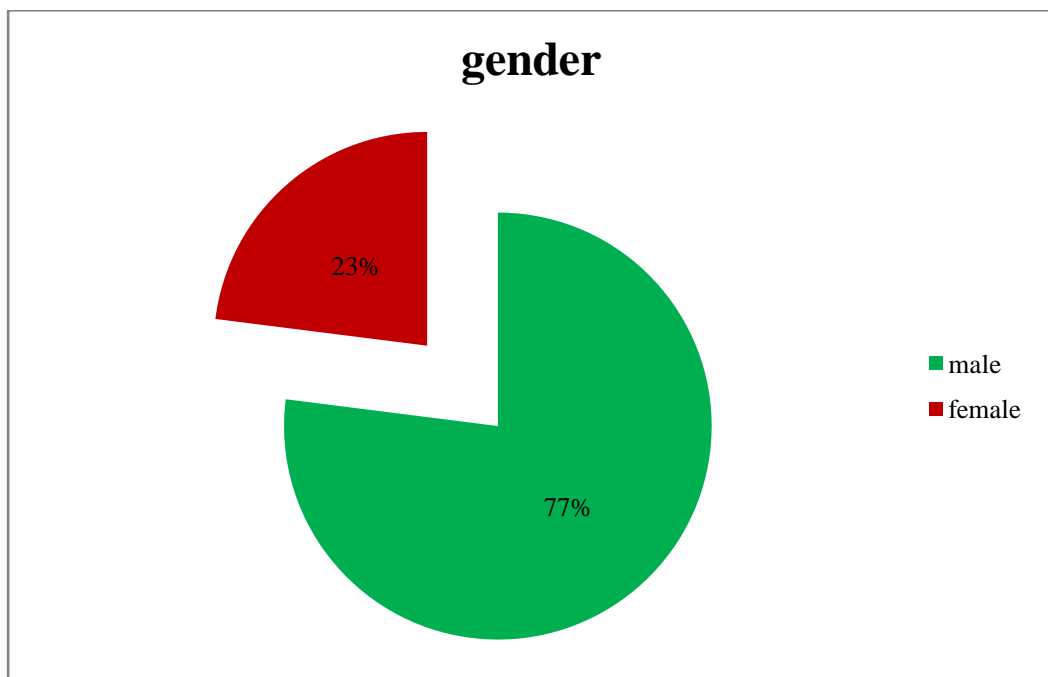
#### 4.2. Age of the participants



**Fig I: Age of participants**

The mean age of the participants was  $35.14 \pm 13.85$  years and median was 32 years. Most of the respondents were aged 18-27 years 38% ( $n= 38$ ) and aged between 58-67 year only 8% ( $n=8$ ). Other respondent was aged between 28-37 years 23% ( $n= 23$ ). And those aged between 38-47 years 16% ( $n= 16$ ) and 48-57 years aged were 15% ( $n=15$ ).

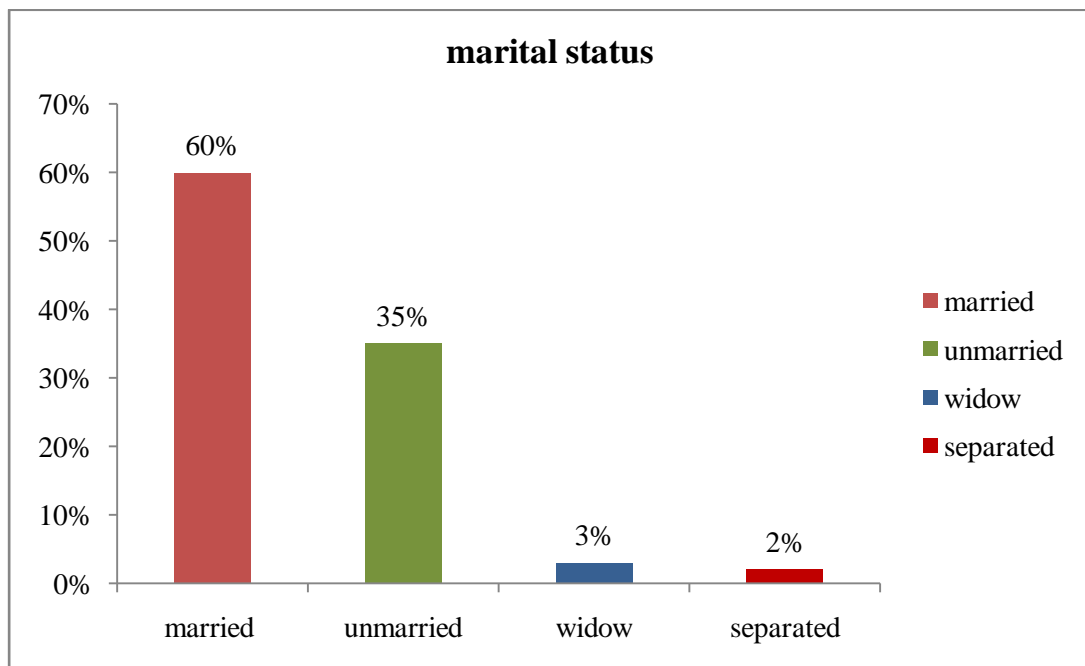
### 4.3. Gender of the Participants



**Fig II: Gender of the participants**

In this study, majority of respondents 77% (n=77) were male and 23% (n=23) were females among 100 participants.

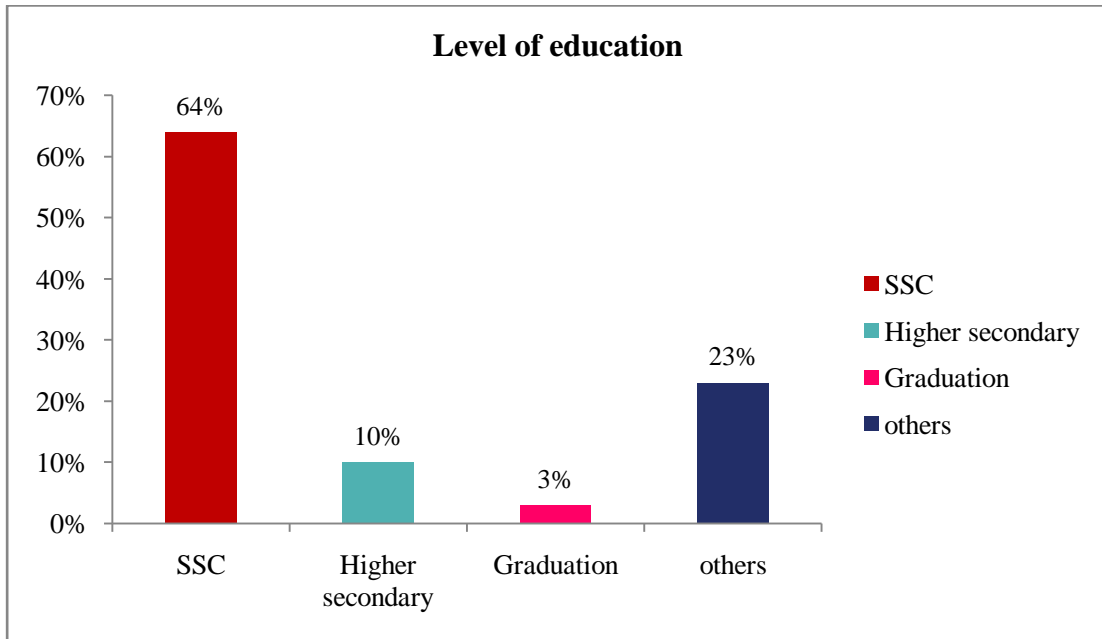
#### 4.4. Marital Status



**Fig III: Marital status of participants**

Most of the participants was married 60% (n=60) and 35% (n=35) was unmarried. Widow group was 3% and separate living was 2% in the study.

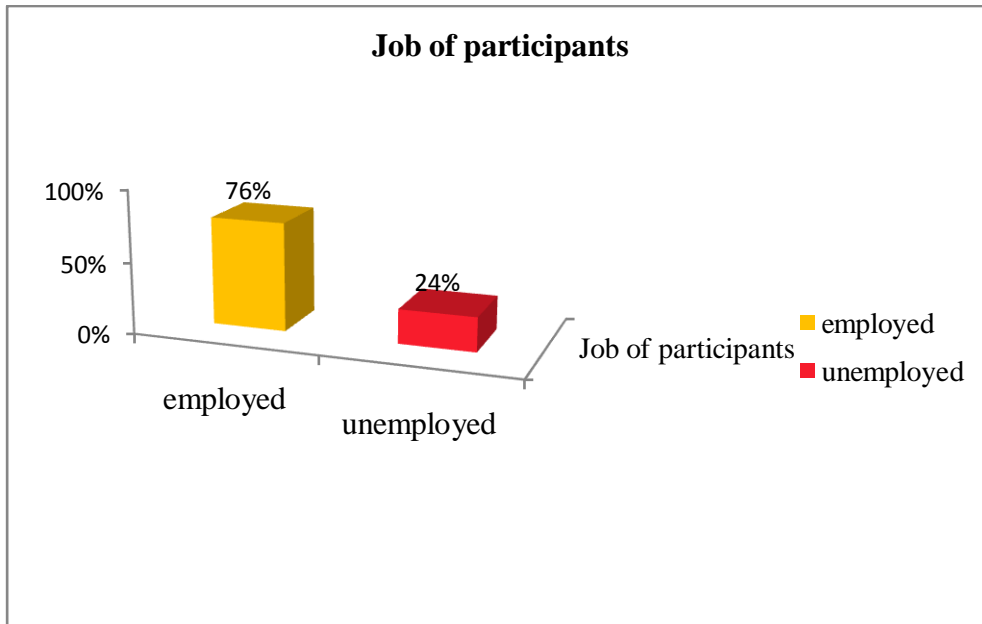
#### 4.5. Level of education



**Fig IV: Level of education**

Most of the participant had completed SSC 64% (n=64) and only 3% (n=3) had completed graduation. 10% (n=10) had completed higher secondary education and about 23% (n=23) were illiterate.

#### 4.6. Job of Participants

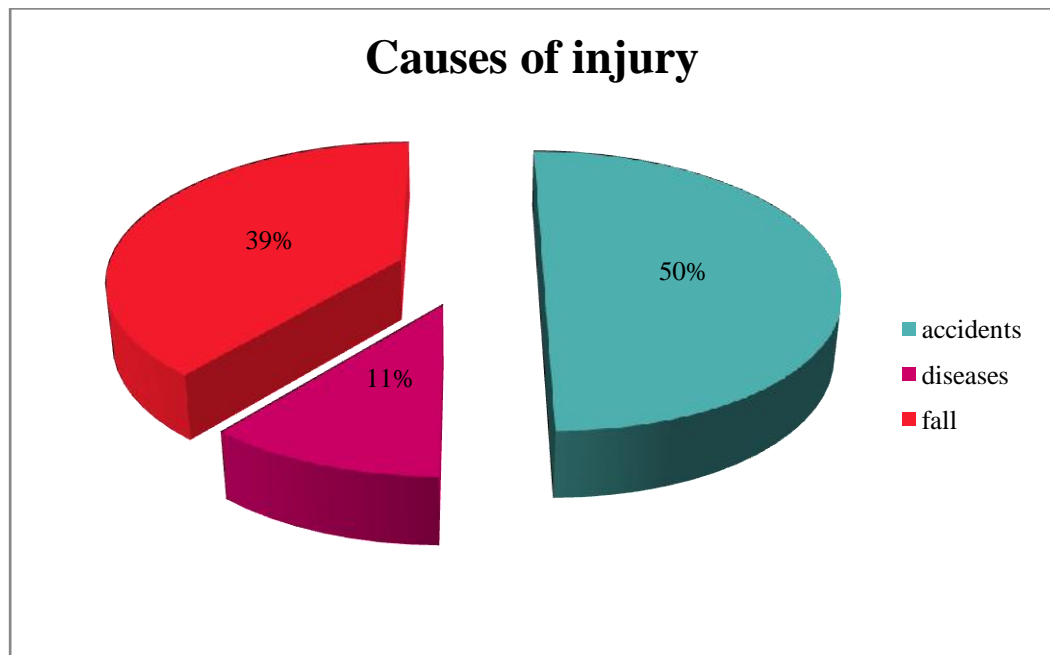


**Fig V: Job of Participants**

Fig V demonstrates that most of the participants were employed 76% (n=76) and 24% (n=24) were unemployed.



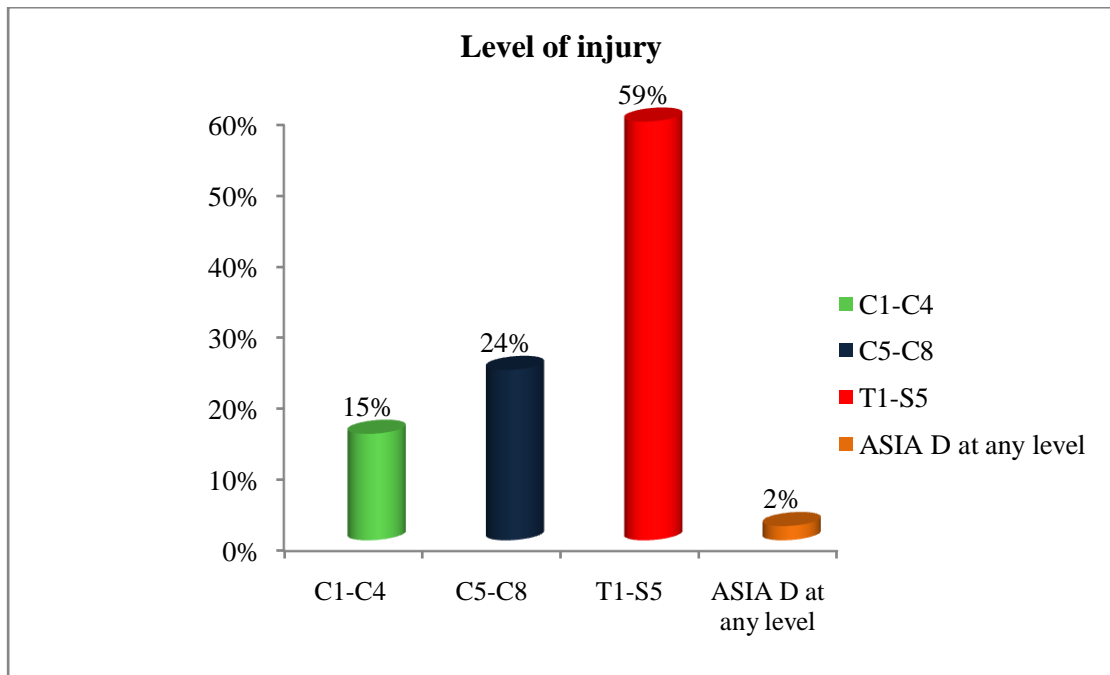
#### 4.7. Causes of injury



**Fig VI:Causes of Injury**

In this study, most of the participants 50% (n=50) had injury due to accidents. 39% (n=39) had injury due to fall whereas 11% (n=11) had injury due to diseases.

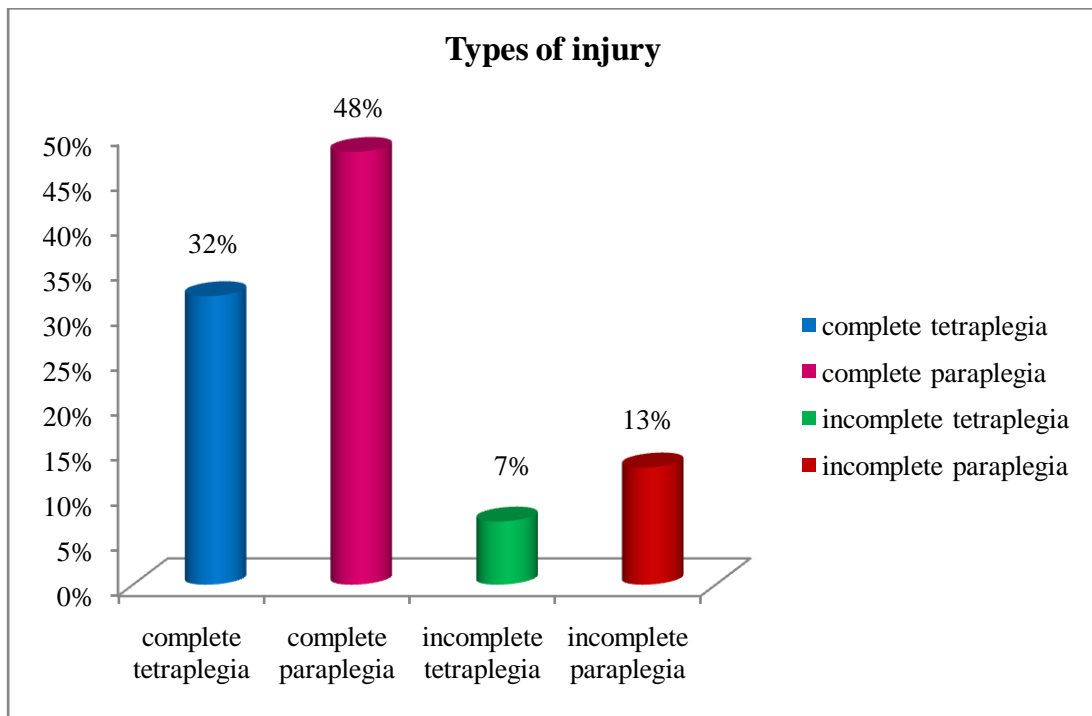
#### 4.8. Level of injury



**Fig VII:Level of Injury**

Most of the participants 59% (n=59) had thoracic injury T1-S5, ASIA A, B, C and only 2% had ASIA D at any level whereas 24% (n=24) had cervical injury at C5-C8 ASIA A, B, C and 15% (n=15) had cervical at C1-C4 ASIA A, B, C in this present study.

#### 4.9. Types of injury



**Fig VIII: Types of Injury**

In this study, 48% (n=48) participants had complete paraplegia injury and 32% (n=32) participants had complete tetraplegia whereas 13% (n=13) participants had incomplete paraplegia and 7% (n=7) had incomplete tetraplegia.

#### 4.10. Frequency distribution of age and gender

**Table I: Distribution of age and gender**

| Gender of participant | Age of participants (in years) |       |       |       |       | Total |
|-----------------------|--------------------------------|-------|-------|-------|-------|-------|
|                       | 18-27                          | 28-37 | 38-47 | 48-57 | 58-67 |       |
| <b>Male (N)</b>       | 24                             | 20    | 13    | 14    | 6     | 77    |
| <b>%</b>              | 31.2                           | 26.0  | 16.9  | 18.2  | 7.8   | 100   |
| <b>Female (N)</b>     | 14                             | 3     | 3     | 1     | 2     | 23    |
| <b>%</b>              | 60.9                           | 13.0  | 13.0  | 4.3   | 8.7   | 100   |
| <b>Total (N)</b>      | 38                             | 23    | 16    | 15    | 8     | 100   |
| <b>%</b>              | 38.0                           | 23.0  | 16.0  | 15.0  | 8.0   | 100   |

Among 77 male respondents, 31.2% were male in age group of 18-27 years, 26% male in 28-37 years age group, 16.9% in 38-47 age group, 18.2% in 48-52 age group and 7.8% in 58-67 age group. Among 23 female respondents, 60.9% were female in 18-27 age group, 13% female in 28-37 age group & 38-47 age group, 4.3% female in 48-57 age group and 8.7% female in 58-67 age group.

**Table II: Distribution of causes of injury and level of injury**

| Causes of injury  | Level of injury                |                                |                                |        | Total |
|-------------------|--------------------------------|--------------------------------|--------------------------------|--------|-------|
|                   | C <sub>1</sub> -C <sub>4</sub> | C <sub>5</sub> -C <sub>8</sub> | T <sub>1</sub> -S <sub>5</sub> | ASIA D |       |
| <b>Accident N</b> | 10                             | 13                             | 26                             | 1      | 50    |
| <b>%</b>          | 20.0                           | 26.0                           | 52.0                           | 2.0    | 100.0 |
| <b>Diseases N</b> | 0                              | 2                              | 9                              | 0      | 11    |
| <b>%</b>          | 0                              | 18.2                           | 81.8                           | 0      | 100.0 |
| <b>Fall (N)</b>   | 5                              | 9                              | 24                             | 1      | 39    |
| <b>%</b>          | 12.8                           | 23.1                           | 61.5                           | 2.6    | 100.0 |

Among 50 accidental respondents, majority of respondents 52% had injury at T<sub>1</sub>-S<sub>5</sub>level ASIA A, B, C. 26% of respondents had injury at C<sub>5</sub>-C<sub>8</sub>level and only 2% had ASIA D level. Among 11 diseased respondents, most of the respondents 81.8% had injury at T<sub>1</sub>-S<sub>5</sub>level and 18.2% had injury at C<sub>5</sub>-C<sub>8</sub>level. No-one had injury at C<sub>1</sub>-C<sub>4</sub> level. Among 39 fall respondents, almost 61.5% of respondents had injury at T<sub>1</sub>-S<sub>5</sub>level, 23.1% of respondents had injury at C<sub>5</sub>-C<sub>8</sub>level and 12.8% had injury at C<sub>1</sub>-C<sub>4</sub> level. Only 2.6% had ASIA D level.

**Table III: Distribution of marital status and types of injury**

| Marital status     | Types of injury |           |              |             | Total |
|--------------------|-----------------|-----------|--------------|-------------|-------|
|                    | Com. Tetra      | Com. Para | Incom. Tetra | Incom. Para |       |
| <b>Married (N)</b> | 23              | 26        | 5            | 6           | 60    |
| <b>%</b>           | 38.3            | 43.3      | 8.3          | 10.0        | 100.0 |
| <b>Unmarried N</b> | 10              | 18        | 2            | 5           | 35    |
| <b>%</b>           | 28.6            | 51.4      | 5.7          | 14.3        | 100.0 |
| <b>Widow (N)</b>   | 1               | 1         | 0            | 1           | 3     |
| <b>%</b>           | 33.3            | 33.3      | 0            | 33.3        | 100.0 |
| <b>Separated N</b> | 0               | 1         | 0            | 1           | 2     |
| <b>%</b>           | 0               | 50.0      | 0            | 50          | 100.0 |

Among 60 married respondents, 43.3% and 23% of respondents were complete paraplegia and complete tetraplegia whereas 8.3% and 10% of respondents were incomplete paraplegia and tetraplegia. Among 35 unmarried respondents, 51.4% and 28.6% of respondents were complete paraplegia and complete tetraplegia. Likewise, 14.3% and 5.7% were incomplete paraplegia and tetraplegia. Among 3 widow respondents, 33.3% was complete tetraplegia and paraplegia and incomplete paraplegia. Among 2 separated respondents, 50% was complete paraplegia and 50% was incomplete paraplegia.

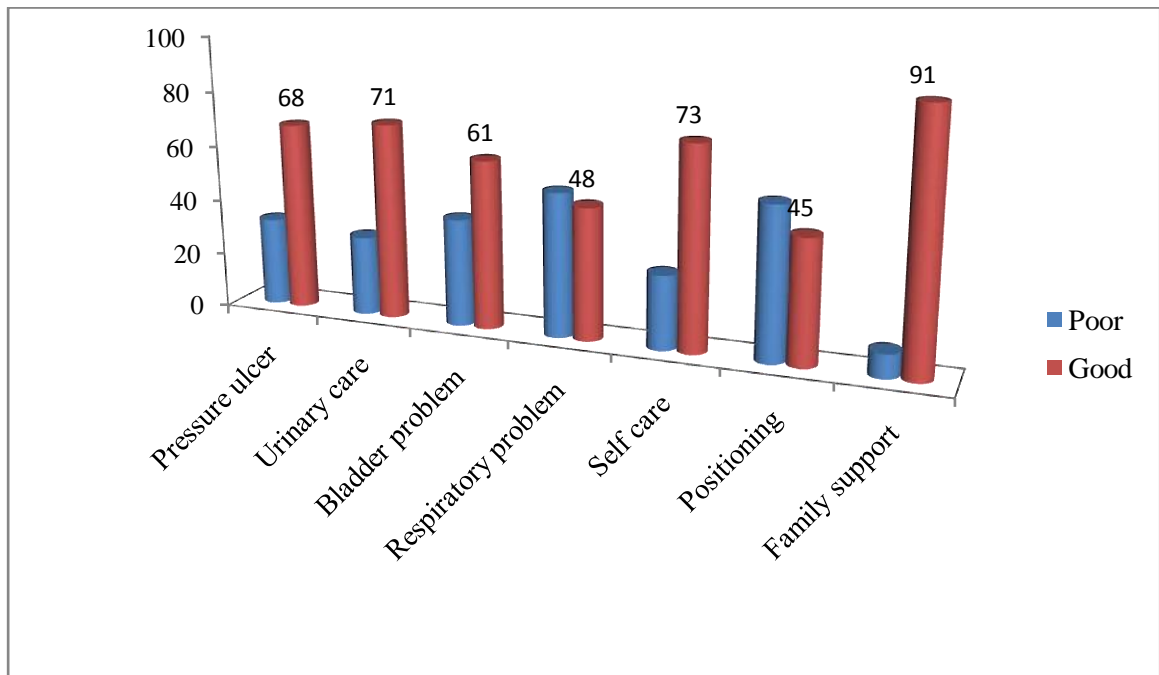
**Table IV: Respondent’s score of knowledge on domain of complication of spinal cord injury**

| <b>Variables</b>                          | <b>Poor %</b> | <b>Good %</b> | <b>Mean Score ± S.D.</b> |
|---|---------------|---------------|--------------------------|
| Knowledge on Pressure ulcer               | 32%           | 68%           | 6.72 ± 0.944             |
| Knowledge on Urinary care                 | 29%           | 71%           | 6.68 ± 1.136             |
| Knowledge on bladder and bowel Management | 39%           | 61%           | 10.65± .940              |
| Knowledge on respiratory Complication     | 52%           | 48%           | 6.16 ± 1.170             |
| Knowledge on self care                    | 27%           | 73%           | 8.95 ± 1.077             |
| Knowledge on Positioning                  | 55%           | 45%           | 6.50 ± .010              |
| Knowledge on importance of family support | 9%            | 91%           | 5.6 ± 0.711              |

Table IV depicts that more than half 91% and 9% of respondents were having good and poor knowledge on importance of family support whereas 71% and 29% were having good and poor knowledge on Urinary care. Good knowledge on pressure sores were 68% and 32% were having poor knowledge on the same domain.

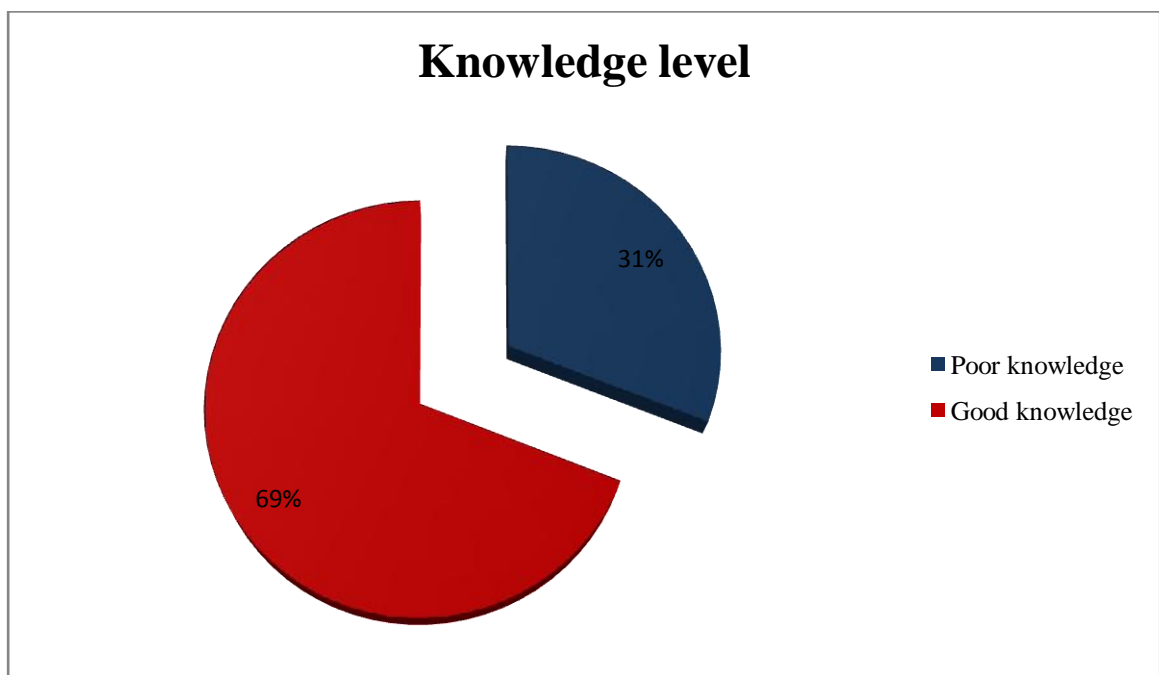
Considering each domain of knowledge regarding complication, all the respondents were having good level of knowledge in all domains except respiratory and positioning domains. In which only 48% of respondents were having good knowledge on respiratory and 52% were having poor knowledge whereas 45% were having good knowledge and 55% were having poor knowledge regarding positioning as shown in fig (IX).

#### 4.11. Percentage distribution of domains of knowledge score



**Fig:IX: Percentage distribution of domains of knowledge score on complications**

#### 4.12. Distribution of Overall Knowledge level on Common Complications related to SCI among patients



**Fig X: Distribution of Overall Knowledge level**

Participants were asked 27 item questions to assess their knowledge on complication. These items were first tested for its reliability using SPSS scale reliability test and it was found that Cronbach's Alpha reliability for this scale was 0.757 which is equal to the standard Cronbach's alpha which is 0.7. It means that these items are homogenous and a reliable scale to measure the knowledge of respondents.

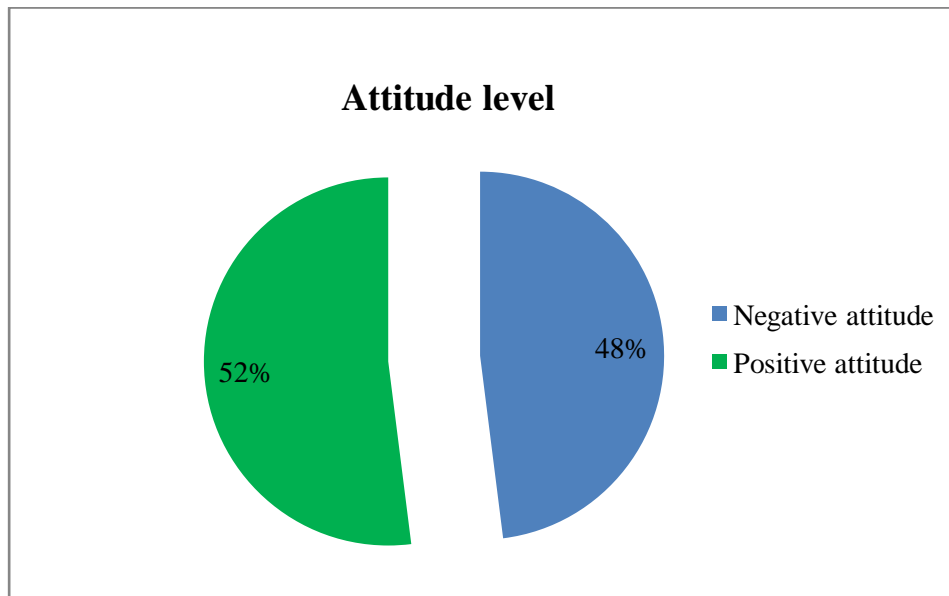
Knowledge score were categorized into two groups based on their score in relation to the mean. Those respondents, who score more than mean score is **Good knowledge** and those who score less than mean score is **Poor knowledge**. The overall mean score on knowledge was 45.83 (SD = 4.415). Fig X shows the percentages of respondents who were in each category of knowledge level. More than half (69 %) of the respondents were found to have good knowledge, while (31%) of the respondents were not (fig X). From the seven dimensions of knowledge regarding complications of spinal cord injury, the respondents had good knowledge on pressure ulcer, urinary care, bladder management, self care but had poor knowledge on respiratory complication and positioning.



**Table V: Distribution of studied group according to their Attitudes (Means)**

|   | Never<br>% | Sometimes<br>% | Often<br>% | Always<br>% | Mean<br>(S.D.)    |
|---|------------|----------------|------------|-------------|-------------------|
| <b>i. Are you interested to take care of pressure ulcer?</b>                                      | 5          | 3              | 7          | 85          | 2.72<br>0.75      |
| <b>ii. Do you feel tired to turn every 2 hours?</b>   | 36         | 51             | 4          | 9           | 0.86<br>0.85      |
| <b>iii. Are you interested in other types of care?</b>  | 4          | 15             | 8          | 73          | 2.50<br>0.89      |
| <b>iv. Do you feel ashamed because of urine leakage?</b>  | 47         | 25             | 14         | 14          | 1.95<br>0.9       |
| <b>v. I do some type of pressure relief technique at every 30 minutes.</b>                        | 18         | 9              | 14         | 59          | 2.14<br>1.18      |
| <b>vi. I am careful about my legs, feet or buttocks when doing transfers.</b>                     | 2          | 9              | 5          | 84          | 2.71<br>0.71      |
| <b>vii. In case of incontinence, I would have care to have my skin dried as soon as possible.</b> | 21         | 16             | 15         | 48          | 1.90<br>1.21      |
| <b>viii. I am careful to keep my joints flexible.</b>   | 8          | 21             | 24         | 47          | 2.10<br>1.0       |
| <b>ix. If my urine smells, I would have it examined.</b>  | 34         | 29             | 5          | 32          | 1.35<br>1.2       |
| <b>x. I use pillow under leg to prevent heel ulcer.</b>   | 13         | 22             | 5          | 60          | 2.12<br>1.15      |
| <b>xi. Do you feel difficulty in managing pressure sores?</b>                                     | 36         | 10             | 10         | 44          | 1.62<br>1.36      |
| <b>xii. Do you think it is important to manage breathing problems?</b>                            | 7          | 6              | 6          | 81          | 2.61<br>0.89      |
| <b>xiii. Do you think it will take you depression?</b>  | 9          | 39             | 15         | 37          | 1.80<br>1.04      |
| <b>xiv. Do you think caregiver participation is needed to take care of bowel &amp; bladder?</b>   | 1          | 10             | 6          | 83          | 2.71<br>0.69      |
| <b>Overall Mean (S.D.)</b>  |            |                |            |             | <b>2.07(0.75)</b> |

#### 4.13. Distribution of Overall Attitude level on Common Complications related to SCI among patients



**Fig XI: Attitude level of respondents**

Attitude towards common complication of SCI were assessed by respondents indicating their level of agreement to some statements on a 4-point Likert scale (0= never, 1= sometimes, 2= often and 3=always) to questions. Lower scores reflected more negative attitudes, and higher scores reflected more positive attitudes. The questionnaire includes both positive and negative items questions. Scores for each attitude related question were summarized in Table (V) and total scores of attitudes were collapsed and categorized into two levels, namely, positive attitude and negative attitude on the basis of median. Those respondents who score above the median were considered as **Positive Attitude** and those who score less than median score were considered as **Negative Attitude**.

The Cronbach's Alpha reliability for this scale was 0.30. Table (V) indicates the percentage of responses in each category, and the mean rating for each category. The overall mean score was 28.09 (S.D=4.531) and median score was 29. Finding presented in

fig XI shows that 52% of the respondents were positive and 48% of respondents were negative towards attitude regarding complications.

**Table VI: Relationship between knowledge level and attitude level**

| Attitude level   | Knowledge level |      |      |      | Total |      | Df | $(\chi^2)$<br><i>p</i> |
|------------------|-----------------|------|------|------|-------|------|----|------------------------|
|                  | Poor            |      | Good |      | N     | %    |    |                        |
|                  | N               | %    | N    | %    |       |      |    |                        |
| <b>Negative</b>  | 21              | 67.7 | 27   | 39.1 | 48    | 48.0 |    |                        |
| <b>Positive</b>  | 10              | 32.3 | 42   | 60.9 | 52    | 52.0 | 1  | 7.015<br>.008*         |
| <b>Total (N)</b> | 31              | 100  | 69   | 100  | 100   | 100  |    |                        |

Above table illustrates that among 69 good knowledgeable respondents, 42 respondents have positive attitude and 27 respondents have negative attitude whereas out of 31 poor knowledgeable respondents, 10 respondents have positive attitude and 21 have negative attitude.

This Table VI shows that the relation between Knowledge score and Attitude score by using chi-square ( $\chi^2$ ) test. The 5% level of significance at 1 df, the standard table value is 3.84. The observed value or chi-square ( $\chi^2$ ) value is 7.015 which is greater than the standard table value which means that there is association between knowledge and attitude score. Since *p* value was .008 which is less than ( $p < .05$ ) so there is strong significant relation between the knowledge score and the attitude score, the good knowledge show a positive attitude.

**Table VII: Association between knowledge level and demographic data**

| Variables          | level  | Knowledge level |                        |        |
|--------------------|--|-----------------|------------------------|--------|
|                    |  | df              | Chi-square( $\chi^2$ ) | pvalue |
| Age group          | 18-27<br>28-37<br>38-47<br>48-57<br>> 57   | 4               | 0.462                  | .977   |
| Gender             | Male<br>Female   | 1               | 9.096                  | .003*  |
| Marital status     | Married<br>Unmarried<br>Widow<br>Separated   | 3               | 4.662                  | .198   |
| Level of education | SSC<br>Higher Sec<br>Graduation<br>Other   | 3               | 0.970                  | .808   |
| Job                | Employed<br>Unemployed   | 1               | 3.248                  | .071   |
| Causes of injury   | Accidents<br>Diseases<br>fall  | 2               | 3.204                  | .202   |
| Level of injury    | C1-C4 ASIA A, B, C<br>C5-C8 ASIA A, B, C<br>T1-S5, ASIA A, B, C<br>ASIA D at any level | 3               | 7.042                  | .071   |
| Types of injury    | Complete tetraplegia<br>Complete paraplegia<br>Incomplete                              | 3               | 9.146                  | .027*  |

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tetraplegia  
Incomplete  
paraplegia

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**Significance level  $p < 0.05$ ,  $\chi^2$  is computed for p-value**

Table (VII) represents Knowledge regarding common complication of spinal cord injury is statistically not significant with age group ( $p=0.977$ ), marital status ( $p=0.198$ ) level of education ( $p=0.808$ ), job ( $p=0.071$ ) & causes of injury ( $p=0.202$ ). The respondent knowledge regarding common complication of spinal cord injury is statistically significant with gender ( $p=0.003$ ) and types of injury ( $p=0.027$ ).

#### **Age group and Knowledge score**

The 5% level of significant at 4 degree of freedom (df), the standard table value was 9.49. The observed value or chi-squared ( $\chi^2$ ) value was 0.462 which was less than the standard table value which means that there was no association between age group and knowledge score. Since  $p$  value was 0.977 which was greater than 0.05 so there was no statistically significant relation between age group and knowledge score.

#### **Gender and Knowledge score**

The 5% level of significant at 1 degree of freedom (df), the standard table value was 3.84. The observed value was 9.096 which was greater than the standard table value which means that there was association between gender group and knowledge score. Since  $p$  value was 0.003 which was less than 0.05 so there was statistically significant relation between gender group and knowledge score.

#### **Level of education and Knowledge score**

The 5% level of significant at 3 degree of freedom (df), the standard table value was 7.81. The observed value or chi-squared ( $\chi^2$ ) value was 0.970 which was less than the standard table value which means that there was no association between level of education and knowledge score. Since  $p$  value was 0.808 which was greater than 0.05 so there was no statistically significant relation between level of education and knowledge score.

### **Job of participants and Knowledge score**

The 5% level of significant at 1 degree of freedom (df), the standard table value was 3.84. The observed value or chi-squared ( $\chi^2$ ) value was 3.248 which was less than the standard table value which means that there was no association between job and knowledge score. Since  $p$  value was 0.071 which was greater than 0.05 so there was no statistically significant relation between job of participants and knowledge score.

### **Causes of injury and Knowledge score**

The 5% level of significant at 2 degree of freedom (df), the standard table value was 5.99. The observed value or chi-squared ( $\chi^2$ ) value was 3.204 which was less than the standard table value which means that there was no association between causes of injury and knowledge score. Since  $p$  value was 0.202 which was greater than 0.05 so there was no statistically significant relation between causes of injury and knowledge score.

### **Types of injury and Knowledge score**

The 5% level of significant at 2 degree of freedom (df), the standard table value was 7.81. The observed value or chi-squared ( $\chi^2$ ) value was 9.146 which were greater than the standard table value which means that there was association between types of injury and knowledge score. Since  $p$  value was 0.027 which was less than 0.05 so there was statistically significant relation between types of injury and knowledge score.

**Table VIII: Association between Attitude level and Demographic data**

| Variables          | level   | Attitude level |                        |        |
|--------------------|---|----------------|------------------------|--------|
|                    |   | df             | Chi-square<br>$\chi^2$ | pvalue |
| Age group          | 18-27<br>28-37<br>38-47<br>48-57<br>> 57  | 4              | 1.558                  | 0.816  |
| Gender             | Male<br>Female  | 1              | 1.982                  | 0.159  |
| Marital status     | Married<br>Unmarried<br>Widow<br>Separated  | 3              | 2.806                  | 0.422  |
| Level of education | SSC<br>Higher Sec<br>Graduation<br>Other  | 3              | 2.927                  | 0.403  |
| Job                | Employed<br>Unemployed  | 1              | 2.660                  | 0.103  |
| Causes of injury   | Accidents<br>Diseases<br>fall   | 2              | 5.937                  | 0.051* |
| Level of injury    | C1-C4 ASIA A, B,<br>C<br>C5-C8 ASIA A, B,<br>C<br>T1-S5, ASIA A, B,<br>C<br>ASIA D at any level         | 3              | 2.730                  | 0.435  |
| Types of injury    | Complete<br>tetraplegia<br>Complete paraplegia<br>Incomplete<br>tetraplegia<br>Incomplete<br>paraplegia | 3              | 8.197                  | 0.042* |

Significance level  $p < 0.05$ ,  $\chi^2$  is computed for p-value



Attitude regarding common complication of spinal cord injury is statistically not significant with age group ( $p=.816$ ), gender ( $p=.159$ ), marital status ( $p=.422$ ), level of education ( $p=.403$ ) and job ( $p=.103$ ). The respondent attitude regarding common complication of spinal cord injury is statistically significant with causes of injury ( $p=.051$ ) and types of injury ( $p=.042$ ).

#### **Age group and Attitude score**

The 5% level of significant at 4 degree of freedom (df), the standard table value was 9.49. The observed value or chi-squared ( $\chi^2$ ) value was 1.558 which was less than the standard table value which means that there was no association between age group and attitude score. Since  $p$  value was 0.816 which was greater than 0.05 so there was no statistically significant relation between age group and attitude score.

#### **Gender and Attitude score**

The 5% level of significant at 1 degree of freedom (df), the standard table value was 3.84. The observed value was 1.982 which was less than the standard table value which means that there was no association between gender group and attitude score. Since  $p$  value was 0.159 which was greater than 0.05 so there was no statistically significant relation between gender group and attitude score.

#### **Level of education and Attitude score**

The 5% level of significant at 3 degree of freedom (df), the standard table value was 7.81. The observed value or chi-squared ( $\chi^2$ ) value was 2.927 which was less than the standard table value which means that there was no association between level of education and attitude score. Since  $p$  value was 0.403 which was greater than 0.05 so there was no statistically significant relation between level of education and attitude score.

### **Job of participants and Attitude score**

The 5% level of significant at 1 degree of freedom (df), the standard table value was 3.84. The observed value or chi-squared ( $\chi^2$ ) value was 2.660 which was less than the standard table value which means that there was no association between job and attitude score. Since  $p$  value was 0.103 which was greater than 0.05 so there was no statistically significant relation between job of participants and attitude score.

### **Causes of injury and Attitude score**

The 5% level of significant at 2 degree of freedom (df), the standard table value was 5.99. The observed value or chi-squared ( $\chi^2$ ) value was 5.937 which was greater than the standard table value which means that there was association between causes of injury and attitude score. Since  $p$  value was 0.051 which was equal to or greater than 0.05 so there was marginally statistically significant relation between causes of injury and attitude score.

### **Types of injury and Attitude score**

The 5% level of significant at 2 degree of freedom (df), the standard table value was 7.81. The observed value or chi-squared ( $\chi^2$ ) value was 8.197 which were greater than the standard table value which means that there was association between types of injury and attitude score. Since  $p$  value was 0.042 which was less than 0.05 so there was statistically significant relation between types of injury and attitude score.

**Table IX: Binary Logistic regression of level of Knowledge with selected characteristics of SCI respondents**

| Variable        | Level              | d.f | Sig. | Odd Ratio | 95% C.I.  |        |
|-----------------|--------------------|-----|------|-----------|-----------|--------|
|                 |                    |     |      |           | Lower     | Upper  |
| Gender          | Male               | 1   | .04  | 4.261     | 1.601     | 11.341 |
|                 | Female             |     |      | Reference |           |        |
| Types of injury | Com. Tetraplegia   | 3   | .031 | 4.444     | 1.149     | 17.185 |
|                 | Com. Paraplegia    |     | .047 | 3.657     | 1.015     | 13.177 |
|                 | Incom. Tetraplegia |     | .999 | 2.58      | 0.000     |        |
|                 | Incom. Paraplegia  |     |      |           | Reference |        |

**Table X: Binary Logistic regression of Attitude with selected characteristics of SCI respondents**

| Variable         | Level                | d.f | Sig. | Odd Ratio | 95% C.I.  |        |
|------------------|----------------------|-----|------|-----------|-----------|--------|
|                  |                      |     |      |           | Lower     | Upper  |
| Causes of injury | Accidents            | 2   | .018 | 2.844     | 1.197     | 6.761  |
|                  | Diseases             |     | .676 | 1.333     | 0.345     | 5.147  |
|                  | Fall                 |     |      |           | Reference |        |
| Types of Injury  | Complete tetraplegia | 3   | .016 | 6.111     | 1.406     | 26.565 |
|                  | Com. Paraplegia      |     | .056 | 3.968     | 0.964     | 16.329 |
|                  | Incom. Tetraplegia   |     | .787 | 1.333     | 0.165     | 10.743 |
|                  | Incom. Paraplegia    |     |      |           | Reference |        |

(Tables IX and X) represent binary logistic regression of knowledge and attitude with selected characteristics of individuals with SCI. A binary logistic regression was done to examine the relationship of knowledge and attitude with gender, causes of injury and types of injury as predictors. This table shows the results of this analysis. All the variables are entered into the logistic regression model one by one to determine the significant individual contribution. Gender, causes of injury and types of injury was found to be statistically significant with  $p$  value. Male respondents have 4.261 ( $p$  value = .04, 95% CI: 1.601- 11.341) times more likely to have good knowledge as compare to female respondents. Likewise, respondents with complete tetraplegia were found 4.444 ( $p$  value = .031, 95% CI: 1.149 - 17.185) and complete paraplegia were found 3.657 ( $p$  value = .47, 95% CI: 3.657-1.015) times more likely to have good knowledge as compare to incomplete paraplegic respondents. Since ( $p$  value = .999  $>$   $p$  = .05) in incomplete tetraplegia which is not statistically significant so there is no relation of knowledge between incomplete tetraplegic and incomplete paraplegic.

In addition, respondents who had injury due to accidents have 2.844 ( $p$  = .018, 95% CI: 1.197- 6.761) times more likely to have positive attitude as compare to respondents who had injury due to fall. And respondents who had injury due to diseases have ( $p$  = .676  $>$   $p$  = .05) which is not statistically significant so, there is no relation between respondents who had injury due to diseases and respondents who had injury due to fall.

Similarly, complete tetraplegic respondents were found 6.111 ( $p$  = .016, 95% CI: 1.406 – 26.565) and complete paraplegic respondents were found 3.968 ( $p$  = .056, 95% CI: 0.964- 16.329) times more likely to have positive attitude as compare to incomplete paraplegic respondents. Incomplete tetraplegic respondents had ( $p$  = .787  $>$   $p$  = .05) which was not significant so, there was no significant relation of attitude between incomplete tetraplegic respondents and incomplete paraplegic respondents.

Adequate knowledge about complication is crucial for patients, caregivers and health care staff. Such knowledge will help frame the decision of whether or not the patient is at higher risk and need prevention. It will also assist in knowing what type of prevention should be used, and how should it be practiced. Although scientific advances in health care guidelines and recommendations are available, the problem is still widespread in health care facilities around the world. The purpose of this study is to find out knowledge and attitude regarding common complication of spinal cord injury and to examine the relationship among those variables. The findings revealed that respondent had a good level of knowledge and positive attitude regarding common complication after spinal cord injury. There was a significant relationship between respondents' knowledge and attitude. The findings are discussed in 4 parts: 1) Socio demographics; 2) level of knowledge; 3) level of attitude; and 4) relationships among knowledge and attitude.

Socio-demographic findings of this study revealed that majority of respondents 38% were between age group 18-27 years but in other study the least group 15.2% were in this age group while the least group of respondent 8% fall between the age range of 58-67 years in this study. Most of these injuries are caused to young healthy adults, so the injury is the most prevalent among 15-37 year old men. Finding from the other study revealed that, majority of the participants were within the age group of 38 and 47 years (Gimba & Sinegugu, 2015). But in this study only 16% fall between age group 38-47 years. Very few of participants were in more than 57 age group in this present study.

In this study, majority of the respondents were male 77% and 23% were female. But in other study majority of respondents 56.4% were female and only 43.6% were male (Poudyal & Neupane, 2014). As regards to marital status of respondents, majority of respondents 60% were married and 35% were unmarried. Very few of respondents 3%

were widow and 2% were separated. This finding is comparable with the study carried out by Kurian in which majority of sample were married 72.5% (Alhosis, Qalawa, S., & Abd El-Moneem, 2012). More than half of the respondents 77% were literate and about 23% were illiterate and findings from another study that majority of respondents 92% had PCL in nursing and only 8% had bachelor in nursing. This limited formal educational qualification and training is a strong factor related to nurses' low level of knowledge (Shrestha & Shrestha, 2016). In this study only 3% were graduated.

In relation to the causes that led to the injury, we observed a higher frequency of motor vehicle accidents, followed by injury with a fall. These results, as well as other studies, confirm that urban violence, traffic accidents and work have contributed to the high rate of people with physical disabilities in Brazil, especially in cities of medium and large size.

The findings showed that the respondents who participated in this study had a good level of overall knowledge regarding the complications like pressure ulcer, UTI, pneumonia etc.. In present study, the overall mean knowledge score of the respondents is 48.53 with 4.415 SD. This finding is consistent with the study done by Tiwari, on "knowledge & practice of family members towards pressure sore prevention to their immobilized patient" in western regional hospital Pokhara, which showed that the mean knowledge score was 78.22 percent and standard deviation, was 1.44.

Regarding the knowledge on pressure ulcer, the mean percent knowledge score was 14.66% where 68% of respondents had good knowledge regarding pressure ulcer and its management. 76% of respondents had good knowledge regarding frequent change of position and 80% of respondents had knowledge to relieve continue pressure from developing bedsores. But this finding is comparable with the study carried out by (Poudel, 2014) that only 10.9% of the respondents had knowledge that use of pillow/rolled

blanket/air mattress to relieve continue pressure from developing bedsore. Similar finding was reported by Kwiczala-Szydłowska, Skalska & Grodzicki that most of caregivers did not know basic principles of prevention including devices useful in pressure ulcer prevention, did not know about pressure reducing mattresses and the study concluded that families and caregivers of bed-ridden patients have insufficient knowledge of pressure ulcer prevention.

73% of respondents had good knowledge about the development of pressure ulcer in bony prominence like sacrum, elbow, olecranon etc. Similarly the majority, 88.8% of the participants were aware that pressure ulcer commonly occurred around bony prominences in the study done by Dilie & Mengistu, 2015. This may be due to lack of knowledge and lack of proper guidances. In another study, about 45% respondents always avoid massage over bony prominence while only 36% respondents sometimes pay more attention to pressure points.

In this study, the overall mean percent of knowledge regarding urinary care was 12.37%. The study done by (Khanal, 2014), it was found that only 2.2% of caretakers knew that urinary catheter should be changed once a week but no one changed the catheter once a week. People with indwelling catheter must know about the definition, risk factors, signs & symptoms and preventive measures of urinary tract infection. If people with indwelling catheter have adequate knowledge, then only they can use their knowledge to prevent catheter related urinary tract infection. 83% of respondents had good knowledge about prolonged indwelling catheters lead to urinary tract infection (UTI).

A study was conducted by Wilde, in the community with the people having indwelling catheter and found that almost all of them were unaware about risk factors, symptoms and preventive measures of UTI. The respondents scored knowledge by 12.37% as a whole on

urinary care, risk factor and complication of UTI, in contrast to other study carried by Narbada, 2016 found that caretakers scored knowledge by 39.74% as a whole on definition, risk factors, contributing factors, signs & symptoms, complications and preventive measures of UTI before receiving educational intervention and score was increased by 90.64% after receiving educational intervention.

From the collected data, it was found that 61% of respondents had good knowledge regarding bowel and bladder management after SCI like CIC, bowels motions make skin red sore very quickly. The result of the current study disagrees with a study conducted by Thietje et al. that reported less than 50% of SCI patients had good knowledge about bladder management after being discharged. Due to bladder dysfunction, there is an increased risk of retention or incontinence of urine which may lead to Urinary Tract Infection (UTI). UTI constitutes an additional health burden for patients with SCI.

In this present study, it was found that majority of respondents 52% had poor knowledge regarding respiratory complication like pneumonia. Looking at the other complication it was found that respondents had poor knowledge related respiratory complication as compared to other complications. Regarding self care and good personal hygiene, 73% of respondents had good knowledge and 27% had poor knowledge on skin care and own hygiene. Family caregivers play a central role in managing all aspects of the patient's care (Turkoglu and Kılıc, 2012). They are the one who will be with the patient every time than physicians and nurses. Hence the caregivers and patients' knowledge regarding general measures such as positioning, exercise, skin care, nutrition and support will enhance the quality of outcome and prevent complications. Glajchen, (2004) reported that involvement of family caregivers is essential for optimal treatment of patients in ensuring treatment compliance, continuity of care and social support. It is necessary to understand



that caregivers play an important role in providing care to their patients and they should be aware about the complications and their preventive measures.

Attitude is considered an essential individual characteristic as it determines individual expectations. (Ajzen and Fishbein, 2005) stated in their study that an individual's likelihood of carrying out a positive behavior is influenced by a positive attitude. Since the respondents in this current study demonstrated good levels of knowledge, this would cause a positive level of attitude of complications.

In this study, the respondents demonstrated positive attitude regarding complication of SCI with mean attitude score of  $28.09 \pm S.D = 4.531$ . In another study carried out by (Kaddourah, Abu-Shaheen, & Al-Tannir, 2016), the participants demonstrated unsatisfactory attitudes with a mean attitude score of 30.5 (56.5 %). But in another study, general, nurses' attitudes towards the management of MICs were positive. This is consistent with other studies on pressure ulcers (Almeida Tavares, Silva, Sa-Couto, Boltz, & Capezuti, 2015; Demarre et al., 2012), DVT (Jin et al., 2014) and UTIs (Jain et al., 2015).

In present study, 52% of respondents show positive attitude toward the complication whereas 48% demonstrates negative attitude. In another study, only 68.4% of the participants had favorable attitude toward pressure ulcer prevention practice. In present study, 85% of respondents were always interested to take care of pressure ulcers. 36% of respondents felt never tired to turn in every 2 hours whereas 9% of respondents always tired. 47% of respondents never felt ashamed because of urine leakage and 14% always felt ashamed. 60% of respondents always used pillow under heel to prevent heel ulcer where 13% of respondents never used pillow under heel. 44% of respondents always felt difficulty in managing pressure sores and 36% never felt difficulty. 81% of respondents

always thought about importance of managing breathing problems and 7% never thought about it. 37% of respondents were always depressed, 39% were sometimes and 9% were never depressed because of injury.

However, there was significant relation between knowledge and attitude. This finding was similar to another study in which there was significant difference in knowledge and attitudes regarding MICs by nurse and ward characteristic. This is consistent with findings among other population groups related to pressure ulcers (Nuru, Zewdu, Amsalu, & Mehretie, 2015) and pneumonia (Cui, 2015).

According to the KAP model, one factor that affects attitudes is a knowledge-base in a specific area. Therefore, the findings of this study support the KAP model. No significant association was noticed in this study between the levels of knowledge with all the parts of socio-demographic characteristics except for gender and types of injury. Younger age group participants significantly have higher mean of knowledge scores than older age group. Male respondents have 4.261 ( $p$  value = .04, 95% CI: 1.601- 11.341) times more likely to have good knowledge as compare to female respondents. In contrast, El-Daharja, 2009 reported that there was a relation between a caregiver's gender and acquisition of program knowledge as the female caregivers were positively affected and fostered the education program and the result of the program than men. However, no significant relationship between participants' mean of knowledge scores and their education level was found. The findings are comparable to Pieper and Mott who did not find any association between educational level and knowledge.

There was no significant relation between attitude and socio-demographics data but there were significant between causes of injury and types of injury (Table X). Respondents who had injury due to accidents have 2.844 ( $p$  value = .018, 95% CI: 1.197- 6.761) and

respondents who had injury due to diseases have 1.333 ( $p$  value= 0.676, 95% CI: 0.345-5.147) times more likely to have positive attitude as compare to respondents who had injury due to fall. Similarly, complete tetraplegic respondents were found 6.111 ( $p$  value= .016, 95% CI: 1.406 – 26.565), complete paraplegics respondents were found 3.968 ( $p$  value= 0.056, 95% CI: 0.964-16.329) times more likely to have positive attitude as compare to incomplete paraplegic respondents.

In this regard, respondents need further continuing education and training programs regarding prevention of complication that could influence positive attitude; ultimately, leading to effective practice.

## **5.2. Limitation**

The major limitations of this study include the following:

- The fact that no study was conducted so far in Bangladesh on this topic; no enough literature was available to discuss in national context.
- The study may be subjected to response set bias from the respondents.
- The study was cross sectional; therefore, it was difficult to know which occurred first the exposure or the outcome.
- The sample selection being limited to CRP only.
- Use of a self-administered questionnaire and data was collected in Bangla language and researcher was not full known of Bangla language.
- Sample size the study was done in small size. The total population of study was 385 out of which 100 participants were interview

Patients' knowledge regarding common complication of spinal cord injury was found to be good and their positive attitudes. According to Anderson et.al (2005), an effective education can bring change in human behavior especially regarding positive attitudes. Patients need to enhance their attitude and knowledge on complications in order to further improve practice in this area. Those respondents, who had better knowledge, should also teach their respective colleagues who had deficits for the betterment of care. Based on study findings, it is concluded that knowledge on complication among patients is good in several domain; self care, positioning, family support, pressure ulcer etc. Patients should have provided the health education on complications, risk factors to improve knowledge which helps to prevent and manage the complications.

Finding demonstrates that patients do not have enough knowledge regarding respiratory complications. This supports the need to implement an educational program for patients and caregiver in healthcare settings to improve patients' outcomes. Prevention and management of complication of spinal cord injury is of great importance. The level of overall knowledge is good. The level of overall knowledge is statistically significant with gender of the respondents and types of injury. Similarly, the overall attitude is statistically significant with causes and types of injury. These data will be helpful for developing a system of care for patients with SCI. All spinal cord injured patients had a good level of knowledge about complications, but they needed to identify effective strategies for translating knowledge to practice activity. The patient can be educated and continuous feedback monitoring, supervision of practice should be needed on prevention of complications.

## **Recommendation**

Further research on its prevention and its practice in healthcare settings is needed. Educational programs should be planned and offered on instructed basic knowledge to all caregivers and patients to minimize incidence of pressure ulcers. Further research studies should be undertaken on the prevention of complications in many geographical areas to investigate the confounding factors that hinder the form of development of complications. Further researches can be done in the area of health education for prevention aspects concerning caregivers and patients as a target such as prevention of pressure ulcers, chest infection, pneumonia etc. Hospital Administrators needed to support caregivers and patients education and research to ensure establish preventive measures for SCI survivors. Training and educational program to enhance knowledge and practice of caregivers regarding care of immobilized patient is highly needed. Medical professionals should be aware that caregiver education is an integral part of care for immobilized patients.

## References

- Ajzen, I., & attitudes, M. F. (2005). The influence of attitudes on behavior. *The Handbook of Attitudes*, 173(221), 31. Retrieved from [https://www.researchgate.net/profile/Icek\\_Ajzen/publication/264000974\\_The\\_Influence\\_of\\_Attitudes\\_on\\_Behavior/links/00b7d53c7dea81c846000000.pdf](https://www.researchgate.net/profile/Icek_Ajzen/publication/264000974_The_Influence_of_Attitudes_on_Behavior/links/00b7d53c7dea81c846000000.pdf)
- Al Taweel, W., & Alkhayal, A. (2011). Neurogenic bladder evaluation and management after spinal cord injury: Current practice among urologists working in Saudi Arabia. *Urology annals*, 3(1), 24.
- Alexander, M. S., Biering-Sorensen, F., Bodner, D., Brackett, N. L., Cardenas, D., Charlifue, S., ... Wyndaele, J. J. (2009). International standards to document remaining autonomic function after spinal cord injury. *Spinal Cord*, 47(1), 36–43. <https://doi.org/10.1038/sc.2008.121>
- Alhosis, K., Qalawa, S., & Abd El-Moneem, D. (2012). Effect of Designed Pressure Ulcer Prevention Program on Caregivers' Knowledge of Immobilized Patients. *Journal of American Science*, 8(12), 939–948.
- Barker, R. N., Kendall, M. D., Amsters, D. I., Pershouse, K. J., Haines, T. P., & Kuipers, P. (2009). The relationship between quality of life and disability across the lifespan for people with spinal cord injury. *Spinal Cord*, 47(2), 149–155. <https://doi.org/10.1038/sc.2008.82>
- Berlowitz, D. J., Wadsworth, B., & Ross, J. (2016). Respiratory problems and management in people with spinal cord injury. *Breathe*, 12(4), 328–340. <https://doi.org/10.1183/20734735.012616>

- Bethell, E. (2003): Controversies in classifying and assessing grade 1 Pressure ulcers. *Nurse Times Journal*, 99 (3): p.73
- Bluestein, D., & Javaheri, A. (2008). Pressure ulcers: Prevention, evaluation, and management. *American Family Physician*, 78(10).
- Braddom, R.L. (2006). *Physical medicine and rehabilitation* (3rd ed.). Philadelphia: Saunders
- Brown, R., DiMarco, A. F., Hoit, J. D., Garshick, E., & DiMarco, A. (2006). Respiratory Dysfunction and Management in Spinal Cord Injury. *Respir Care*, 51(8), 853–870. <https://doi.org/10.1016/j.surg.2006.10.010>.
- Burns, A. S., & O’Connell, C. (2012). The challenge of spinal cord injury care in the developing world. *The Journal of Spinal Cord Medicine*, 35(1), 3–8. <https://doi.org/10.1179/2045772311Y.00000000043>
- Cardenas, D. D., Hoffman, J. M., Kirshblum, S., & McKinley, W. (2004). Etiology and incidence of rehospitalization after traumatic spinal cord injury: A multicenter analysis. *Archives of Physical Medicine and Rehabilitation*, 85(11), 1757–1763. <https://doi.org/10.1016/j.apmr.2004.03.016>
- Centre for Rehabilitation of the Paralyzed (2010) Annual Report: 2012-2013, Ability not Disability CRP Printing Press: Bangladesh
- Chhabra, H. S., & Arora, M. (2012). Demographic profile of traumatic spinal cord injuries admitted at Indian spinal injuries Centre with special emphasis on mode of injury: A retrospective study. *Spinal Cord*, 50(10), 745–754. <https://doi.org/10.1038/sc.2012.45>



- Dahm, K. T. (2017). 2017 Eff ekt av lungefunksjonstrening i akuttfasen for pasienter med traumatisk , høy ryggmargsskade En systematisk oversikt.
- Dilie, A., & Mengistu, D. (2015). Assessment of Nurses ' Knowledge , Attitude , and Perceived Barriers to Expressed Pressure Ulcer Prevention Practice in Addis Ababa Government Hospitals , Addis Ababa , Ethiopia , 2015. *Advances in Nursing*, 2015, 1–11. <https://doi.org/10.1155/2015/796927>
- Ebert, E., Robert, U.-, & Johnson, W. (2012). Gastrointestinal Involvement in Spinal Cord Injury: a Clinical Perspective. *J Gastrointestin Liver Dis*, 21(1), 75–82.
- Fyffe, D. C., Deutsch, A., Botticello, A. L., Kirshblum, S., & Ottenbacher, K. J. (2014). Racial and ethnic disparities in functioning at discharge and follow-up among patients with motor complete spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, 95(11), 2140–2151. <https://doi.org/10.1016/j.apmr.2014.07.398>
- Galeiras Vázquez, R., Rascado Sedes, P., Mourelo Fariña, M., Montoto Marqués, A., & Ferreiro Velasco, M. E. (2013). Respiratory management in the patient with spinal cord injury. *BioMed Research International*, 2013. <https://doi.org/10.1155/2013/168757>
- García Leoni, M. E., & De Ruz, A. E. (2003). Management of urinary tract infection in patients with spinal cord injuries. *Clinical Microbiology and Infection*, 9(8), 780–785. <https://doi.org/10.1046/j.1469-0691.2003.00643.x>
- Garshick, E., Kelley, A. (2005). A prospective assessment of mortality in chronic spinal cord injury. *Spinal Cord*, 43(June 2003), 408–416. <https://doi.org/10.1038/sj.sc.3101729.A>

- Gastmeier, P. (2001). Nosocomial urinary tract infections: Many unresolved questions. *Clinical Microbiology and Infection*, 7(10), 521–522. <https://doi.org/10.1046/j.1469-0691.2001.00353.x>
- Gélis, A., Dupeyron, A., Legros, P., Benaïm, C., Pelissier, J., & Fattal, C. (2009). Pressure ulcer risk factors in persons with SCI: Part I: Acute and rehabilitation stages. *Spinal Cord*, 47(2), 99–107. <https://doi.org/10.1038/sc.2008.107>
- Gimba, S. M., & Sinegugu, D. (2015). Dearth of literature on barriers to provision of psychiatric nursing care in Nigeria: Findings from a literature review. *International Journal of Nursing and Midwifery*, 7(2), 16–20. <https://doi.org/10.5897/IJNM2014>.
- Gould, C. V, Umscheid, C. A., Agarwal, R. K., Kuntz, G., & Pegues, D. A. (2017). Guideline for Prevention of Catheter - Associated Urinary Tract Infections 2009. *Healthcare Infection Control Practices Advisory Committee*, (2009), 1–61. <https://doi.org/10.1086/651091>
- Grivna, M., Eid, H. O., & Abu-Zidan, F. M. (2016). Epidemiology of spinal injuries in the United Arab Emirates. *World Journal of Emergency Surgery*, 10(20).<https://doi.org/10.1186/s13017-015-0015-8>
- Gupta, N., Loong, B., & Leong, G. (2012). Comparing and contrasting knowledge of pressure ulcer assessment, prevention and management in people with spinal cord injury among nursing staff working in two metropolitan spinal units and rehabilitation medicine training specialists in a three-way comparison. *Spinal Cord*, 50(2), 159–164. <https://doi.org/10.1038/sc.2011.88>
- Hagen, E. M. (2015). Acute complications of spinal cord injuries. *World Journal of Orthopedics*, 6(1), 17. <https://doi.org/10.5312/wjo.v6.i1.17>

- Haisma, J. A., van der Woude, L. H., Stam, H. J., Bergen, M. P., Sluis, T. A., Post, M. W., & Bussmann, J. B. (2007). Complications following spinal cord injury: Occurrence and risk factors in a longitudinal study during and after inpatient rehabilitation. *Journal of Rehabilitation Medicine, 39*(5), 393–398.
- Hammell, K. W., Miller, W. C., Forwell, S. J., Forman, B. E., & Jacobsen, B. A. (2009). Fatigue and spinal cord injury: A qualitative analysis. *Spinal Cord, 47*(1), 44–49.
- Harrison, S. C. W. (2010). Managing the urinary tract in spinal cord injury. *Indian Journal of Urology : IJU : Journal of the Urological Society of India, 26*(2), 245–252.
- Hetz, S. P., Latimer, A. E., Arbour-Nicitopoulos, K. P., & Martin Ginis, K. A. (2011). Secondary complications and subjective well-being in individuals with chronic spinal cord injury: Associations with self-reported adiposity. *Spinal Cord, 49*(2), 266–272.
- Hopkins, A., Dealey, C., Bale, S., Defloor, T. and Worboys, F. (2006), Patient stories of living with a pressure ulcer. *Journal of Advanced Nursing, 56*: 345–353.
- Hoque, F., Grangeon, C., and Reed, K., (1999). Spinal cord lesions in Bangladesh: an epidemiological study 1994-1995. *Spinal Cord, 37*:858- 861
- Hossain, M. S., Harvey, L. A., Rahman, M. A., Muldoon, S., Bowden, J. L., Islam, M. S., ... Herbert, R. D. (2016). Community-based Interventions to prevent serious Complications (CIVIC) following spinal cord injury in Bangladesh: Protocol of a randomised controlled trial. *BMJ Open, 6*(1).

- Hsieh, J., McIntyre, A., Wolfe, D., Lala, D., Titus, L., Campbell, K., & Teasell, R. (2014). Pressure ulcers following spinal cord injury. *Spinal Cord Injury Rehabilitation Evidence*, (December 2014), 1–90. Retrieved from <http://www.scireproject.com/rehabilitation-evidence/pressure-ulcers/introduction>
- Islam, M. S., Hafez, M. A., & Akter, M. (2011). Characterization of spinal cord lesion in patients attending a specialized rehabilitation center in Bangladesh. *Spinal Cord*, 49(7), 783–786. <https://doi.org/10.1038/sc.2011.36>
- Jaul, E., & Menzel, J. (2014). Pressure Ulcers in the Elderly, as a Public Health Problem. *Journal of General Practice* 2014 2:5, 2(5), 4–7. <https://doi.org/10.4172/2329-9126.1000174>
- Kaddourah, B., Abu-Shaheen, A. K., & Al-Tannir, M. (2016). Knowledge and attitudes of health professionals towards pressure ulcers at a rehabilitation hospital: A cross-sectional study. *BMC Nursing*, 15(1), 1–6. <https://doi.org/10.1186/s12912-016-0138-6>
- Kirshblum, S. C., Groah, S. L., McKinley, W. O., Gittler, M. S., & Stiens, S. a. (2002). Spinal cord injury medicine. 1. *Etiology, classification, and acute medical management*. *Archives of Physical Medicine and Rehabilitation*, 83(3), S50–S57, S90–S98. <https://doi.org/10.1053/apmr.2002.32156>
- Kohta, M., Kameda, Y., & Morita, S. (2017). Knowledge and practice for pressure injury prevention among care managers in a home care setting: a cross-sectional study. *Chronic Wound Care Management and Research*, Volume 4, 99–105.

- Krassioukov, A., Eng, J. J., Claxton, G., Sakakibara, B. M., & Shum, S. (2010). Neurogenic bowel management after spinal cord injury: A systematic review of the evidence. *Spinal Cord*, 48(10), 718–733. <https://doi.org/10.1038/sc.2010.14>
- Ku, J. H. (2006). The management of neurogenic bladder and quality of life in spinal cord injury. *BJU International*, 98(4), 739–745. <https://doi.org/10.1111/j.1464-410X.2006.06395.x>
- Kuffler, D. (2010): Techniques for WoundHealing with a Focus on Pressure Ulcers Elimination. *The Open Circulation and Vascular Journal*, 3 (8) : P . 74
- Leduc, B. E., & Lepage, Y. (2015). Health-related quality of life after spinal cord injury. *Disability and Rehabilitation*, 24(4), 196–202. <https://doi.org/10.1080/09638280110067603>
- Lee, B.B., Cripps, A.R., Fitzharris, M. &Wing, C.P. (2014). The global map for traumatic spinal cord injury epidemiology: update 2011, global incidence rate. *Spinal Cord*, 52:110–116.
- Li, J., ... Wu, X. (2018). Nurses' knowledge and attitudes regarding major immobility complications among bedridden patients: a prospective multicentre study. *Journal of Clinical Nursing*. <https://doi.org/10.1111/jocn.14339>
- Linsenmeyer, T. A., Bodner, D. R., Creasey, G. H., Green, B. G., Groah, S. L., Joseph, A., ... Wheeler, J. S. (2006). Bladder management for adults with spinal cord injury: a clinical practice guideline for health-care providers. *The journal of spinal cord medicine (Vol. 29)*.

- Lowthian, P. (2005): The classification and grading of pressure ulcers. *Tissue Viability Journal*, 3 (15) : Pp. 15-18
- Ma, H. P., Lu, H. J., Xiong, X. Y., Yao, J. Y., & Yang, Z. (2014). The investigation of care burden and coping style in caregivers of spinal cord injury patients. *International Journal of Nursing Sciences*, 1(2), 185–190.
- Manns, P.J. & May, L.A. (2007). Perceptions of issues associated with the maintenance and improvement of long-term health in people with SCI. *Spinal Cord*, 45:411–419.
- McKinley, W. O., Gittler, M. S., Kirshblum, S. C., Stiens, S. A., & Groah, S. L. (2002). 2. Medical complications after spinal cord injury: Identification and management. *Archives of Physical Medicine and Rehabilitation*, 83(3), S58–S64.
- Middleton JW, Leong G, Mann L. Management of spinal cord injury in general practice - part 1 (2008). *Aust Fam Physician*, 37(5), 229–233.
- Muhammad, D., Ahmad, I. W., Khan, M. N., Ali, F., & Muhammad, G. (2017). Knowledge , Attitude and Practices of Nurses Regarding Pressure Ulcers Prevention At a Tertiary Care Hospital of Peshawar , Khyber Pakhtunkhwa, 7(2).
- Munce, S. E. P., Webster, F., Fehlings, M. G., Straus, S. E., Jang, E., & Jaglal, S. B. (2014). Perceived Facilitators and Barriers to Self-management in Individuals with Traumatic Spinal Cord Injury: A Qualitative Descriptive Study. *BMC Neurology*, 14(1), 48.
- Nair, K. P. S., Taly, A. B., Maheshwarappa, B. M., Kumar, J., Murali, T., & Rao, S. (2005). Nontraumatic spinal cord lesions: a prospective study of medical complications during in-patient rehabilitation. *Spinal Cord*, 43(9), 558–564.

- Narbada, K. (2016). Change in Knowledge and Practices Regarding Preventive Measures of Urinary Tract Infection after Education, *6*(January), 327–333.
- Ning, G.-Z., Wu, Q., Li, Y.-L., & Feng, S.-Q. (2012). Epidemiology of traumatic spinal cord injury in Asia: A systematic review. *The Journal of Spinal Cord Medicine*, *35*(4), 229–239.
- Nuru, N., Zewdu, F., Amsalu, S., & Mehretie, Y. (2015). Knowledge and practice of nurses towards prevention of pressure ulcer and associated factors in Gondar University Hospital, Northwest Ethiopia. *BMC Nursing*, *14*(1), 1–8.
- P.J. Potter, D.L. Wolfe, J.A. Burkell, and K.C. Hayes (2004) Challenges in Educating Individuals with SCI to Reduce Secondary Conditions. *Spinal Cord Injury Rehabilitation*, *1*(10), 30-40.
- Poudyal, M., & Neupane, M. L. (2014). Knowledge on Prevention of Complications Related To Immobility Among Caregivers of Orthopedic Patients At Selected Hospitals of. *Journal of Chitwan Medical College 2014; 4*(9): 9-12, (2004), 9–12.
- Qaddumi, J., & Khawaldeh, A. (2014). Pressure ulcer prevention knowledge among jordanian nurses: A cross- sectional study. *BMC Nursing*, *13*(1), 1–8.
- Quadir, M. M., Sen, K., Sultana, M. R., Ahmed, M. S., Taoheed, F., Andalib, A., ... Arafat, S. M. Y. (2017). Demography, Diagnosis and Complications of Spinal Cord Injury Patients in a Rehabilitation Center of Bangladesh. *International Journal of Neurorehabilitation*, *4*(1), e244.

- Rahimi-Movaghar, V., Sayyah, M. K., Akbari, H., Khorramirouz, R., Rasouli, M. R., Moradi-Lakeh, M., ... Vaccaro, A. R. (2013). Epidemiology of traumatic spinal cord injury in developing countries: A systematic review. *Neuroepidemiology*, *41*(2), 65–85.
- Rathore, M. F. A., Hanif, S., Farooq, F., Ahmad, N., & Mansoor, S. N. (2008). Traumatic spinal cord injuries at a tertiary care rehabilitation institute in Pakistan. *Journal of the Pakistan Medical Association*, *58*(2), 53–57.
- Regan, M. A., Teasell, R. W., Wolfe, D. L., Keast, D., Mortenson, W. B., Aubut, J. L., & Cord, S. (2009). A Systematic Review of Therapeutic Interventions for Pressure Ulcers After Spinal Cord Injury. *YAPMR*, *90*(2), 213–231.
- Schottler, J., Vogel, L., Hafetz, R. S., & Mulcahey, M. J. (2010). Patient and caregiver knowledge of severity of injury among youth with spinal cord injury. *Spinal Cord*, *48*(1).
- Sezer, N. (2015). Chronic complications of spinal cord injury. *World Journal of Orthopedics*, *6*(1), 24. <https://doi.org/10.5312/wjo.v6.i1.24>
- Shrestha, N., & Shrestha, P. (2016). Knowledge of Pressure Ulcer Management among Nurses, *9*(2), 47–51.
- Singh, R., Rohilla, R. K., Sangwan, K., Siwach, R., Magu, N. K., & Sangwan, S. S. (2011). Bladder management methods and urological complications in spinal cord injury patients. *Indian Journal of Orthopaedics*, *45*(2), 141–147. <http://doi.org/10.4103/0019-5413.77134>



- Stöhrer, M., Blok, B., Castro-Diaz, D., Chartier-Kastler, E., Del Popolo, G., Kramer, G., ... Wyndaele, J. J. (2009). EAU Guidelines on Neurogenic Lower Urinary Tract Dysfunction. *European Urology*, *56*(1), 81–88.
- Strand, T., & Lindgren, M. (2010). Knowledge, attitudes and barriers towards prevention of pressure ulcers in intensive care units: *A descriptive cross-sectional study*. *Intensive and Critical Care Nursing*, *26*(6), 335–342. <https://doi.org/10.1016/j.iccn.2010.08.006>
- Thietje, R., Giese, R., Pouw, M., Kaphengst, C., Hosman, A., Kienast, B., ... Hirschfeld, S. (2011). How does knowledge about spinal cord injury-related complications develop in subjects with spinal cord injury A descriptive analysis in 214 patients. *Spinal Cord*, *49*(1), 43–48. <https://doi.org/10.1038/sc.2010.96>
- van Silfhout, L., Peters, A. E. J., Berlowitz, D. J., Schembri, R., Thijssen, D., & Graco, M. (2016). Long-term change in respiratory function following spinal cord injury. *Spinal Cord*, *Nov 2015*(November 2015), 1–6.
- Wyndaele, M. & Wyndaele, J-J. (2006). Incidence, prevalence and epidemiology of spinal cord injury: what learns a worldwide literature survey? *Spinal Cord*, *44*:523–529.
- Zakrasek, E. C., Creasey, G., & Crew, J. D. (2015). Pressure ulcers in people with spinal cord injury in developing nations. *Spinal Cord*, *53*(1), 7–13.
- Zimmer, M. B., Nantwi, K., & Goshgarian, H. G. (2007). Effect of spinal cord injury on the respiratory system: basic research and current clinical treatment options. *The Journal of Spinal Cord Medicine*, *30*(4), 319–30.

## Appendixes

### Appendix-A: Consent form

#### I. Consent form (In Bangla)

#### তথ্যপত্র ও সম্মতি পত্র

**শিরোনাম: Knowledge and Attitude Regarding Common Complications of Spinal Cord Injury (SCI) among SCI patients attended at CRP, Bangladesh.**

আসসালামু আলাইকুম/নমস্কার,

আমি সোনাম প্রজাপতি এম.এস.সি. রিহাবিলিটেশন সায়েন্স, বাংলাদেশ হেলথ প্রফেশন্স ইন্সটিটিউট ( বিএইচপিআই ), ঢাকা বিশ্ববিদ্যালয়ের একজন ছাত্রী। স্নাতকোত্তর ডিগ্রী প্রাপ্তির জন্য আমার একটি গবেষণামূলক প্রকল্প পরিচালনা করা প্রয়োজন এবং আমার গবেষণা প্রকল্পটি হচ্ছে যেটি আমি করছি জনাব মোহাম্মদ আনোয়ার হোসেনের তত্ত্বাবধানে।এর জন্য আমি একটি জরিপ সঞ্চালন করছি সি আর পি তে মেরুরজ্জুতে আঘাত প্রাপ্ত রোগীদের উপরে।তথ্য পাওয়ার জন্য আমার আপনাকে কিছু প্রশ্ন জিজ্ঞাসা করতে হবে। আপনার সরবরাহকৃত যাবতীয় তথ্য গোপন রাখা হবে এমনকি প্রতিবেদন এবং প্রকাশনের সময়েও। আপনার সাহায্য যথাযথ ভাবে সমাদৃত হবে; আমি আপনাকে সত্য তথ্য দিতে অনুরোধ করবো। আপনার যদি কোন অনুসন্ধান থাকে তাহলে কোন সংকোচ ছাড়াই জিজ্ঞাসা করতে পারেন। এই অধ্যয়নে আপনার অংশগ্রহণ স্বৈচ্ছাকৃত এবং যে কোন নেতিবাচক প্রভাবে আপনি এই অধ্যয়ন থেকে নিজেকে প্রত্যাহার করে নিতে পারবেন। সাক্ষাতকার নিতে ২০ মিনিট লাগবে। আপনি প্রত্যাহার করতে পারবেন এবং পছন্দ অনুযায়ী প্রশ্নের উত্তর নাও দিতে পারবেন।

অংশগ্রহনকারীর নামঃ.....

অংশগ্রহনকারীর স্বাক্ষর.....

তারিখঃ.....

## **II: Information Sheet & Consent Form (English)**

Title: Knowledge and Attitude Regarding Common Complications of Spinal Cord Injury (SCI) among SCI patients attended at CRP, Bangladesh.

Dear participant

Namaste,

I Sonam Prajapati, a student of Dhaka University, currently pursuing Masters degree in Rehabilitation Science under the supervision of Mr. Mohammad Anwar Hossain at Bangladesh Health Professional Institute. I would like to request you to participate in the research study to find out about the knowledge and Attitude regarding Common Complication of Spinal Cord Injury among SCI patients attended at CRP. Your participation in this study is voluntary. If you do not agree to participate at all you can withdraw your support to the study anytime you want. Your answer will be recorded in this questionnaire which will take approximately 20 minutes and will be kept highly confidential and private. This study will not cause any risk or harm to you. Please try to give truthful answers as much as possible. If you have any questions regarding the survey and questionnaire you may ask the researcher.

I have read or have been explained to me the information. I have got opportunity to ask any query and discuss about the study with the data collector, I have been answered to my satisfaction. I have informed about the risk and benefit of the research. I have understood that I am free to withdraw from the study at any time, without having any reason and without affecting present and future medical care. I am informed that all my answer will remain highly confidential.

I agree to take part in this study.

Name of Participant \_\_\_\_\_

Signature of Participant \_\_\_\_\_

Date \_\_\_\_\_

## Appendix- B Questionnaires (Bangla and English)

রোগীদের মধ্যে এসসিআই এর সাধারণ প্রচলন সম্পর্কে জ্ঞান ও মনোভাব মূল্যায়ন মূলক প্রশ্ন ১) যথাযথ উত্তরের বাম পাশে টিক চিহ্ন দিন অথবা দয়া করে লিখুন।

খন্ড একঃ আর্থজনমিতিঃ

|                            |   |
|----------------------------|---|
| ১. অংশগ্রহনকারীর আইডি নং   |   |
| ২. বয়স(বছর অনুযায়ী)      |   |
| ৩. লিঙ্গ                   | <input type="radio"/> ক পুরুষ .<br><input type="radio"/> খনারী .  |
| ৪. বৈবাহিক অবস্থা          | <input type="radio"/> কবিবাহিত .<br><input type="radio"/> খঅবিবাহিত .<br><input type="radio"/> গবিপত্নীক/বিধবা .<br><input type="radio"/> ঘবিভক্ত .   |
| ৫. আনুষ্ঠানিক শিক্ষার স্তর | <input type="radio"/> কমাধ্যমিক .<br><input type="radio"/> খউচ্চ মাধ্যমিক .<br><input type="radio"/> গস্নাতকোত্তর .<br><input type="radio"/> ঘঅন্যান্য .  |
| ৬. পেশাগত অবস্থা           | <input type="radio"/> কচাকরিত .<br><input type="radio"/> খবেকার .<br><input type="radio"/> গঅবসরপ্রাপ্ত .   |
| ৭. আহত হওয়ার কারণ সমূহ    | <input type="radio"/> কদুর্ঘটনা .<br><input type="radio"/> খরোগ .<br><input type="radio"/> গপড়ে যাওয়া .<br><input type="radio"/> ঘ অন্যান্য .   |
| ৮. আঘাতের তীব্রতার স্তর    | <input type="radio"/> ক. C1-C4 ASIA A, B, C<br><input type="radio"/> খ. C5-C8 ASIA A, B, C<br><input type="radio"/> গ. T1-S5, ASIA A, B, C<br><input type="radio"/> ঘ .ASIA D যেকোন উচ্চতায়                      |
| ৯. আঘাতের ধরন              | <input type="radio"/> ক সম্পূর্ণ টেট্রাপ্লেজিয়া<br><input type="radio"/> খ .সম্পূর্ণ প্যারাপ্লেজিয়া<br><input type="radio"/> গঅ .সম্পূর্ণ টেট্রাপ্লেজিয়া<br><input type="radio"/> ঘ .অসম্পূর্ণ প্যারাপ্লেজিয়া |

খন্ড ২: এসসিআই এর সাধারণ অনুপাত সম্পর্কিত জ্ঞান

(দৃঢ়ভাবে অসম্মত=১, অসম্মত=২, নিরপেক্ষ=৩, সম্মত=৪, দৃঢ়ভাবে সম্মত=৫)

তুমি কি একমত?

| ক্ষত চাপ   | দৃঢ়ভাবে<br>অসম্মত | অসম্মত | 'নির<br>পেক্ষ | সম্মত | দৃঢ়ভাবে<br>সম্মত |
|--|--------------------|--------|---------------|-------|-------------------|
| ১০. আমার ঘা হবার ঝুঁকি রয়েছে।                               |                    |        |               |       |                   |
| ১১. আমি ঘা সম্পর্কে সতর্ক, তাই আমি প্রতিদিন এটি পরীক্ষা করি। |                    |        |               |       |                   |
| ১২. আমি ঘা থেকে উপশম পেতে নিজেকে উত্তোলন করি।                |                    |        |               |       |                   |
| ১৩. হাড় উঁচু স্থানগুলোতে ঘা হয়ে থাকে                       |                    |        |               |       |                   |

| মূত্রাধারের যত্ন   | দৃঢ়ভাবে<br>অসম্মত | অসম্মত | 'নিরপেক্ষ | সম্মত | দৃঢ়ভাবে<br>সম্মত |
|--|--------------------|--------|-----------|-------|-------------------|
| ১৪. প্রস্রাব, কাশি বা হাঁটতে প্রায়ই মূত্র নির্গত হয়।                           |                    |        |           |       |                   |
| ১৫. প্রস্রাব অসামঞ্জস্যতা পরিচালনা করতে ক্যাথেটার ব্যবহৃত হয়।                   |                    |        |           |       |                   |
| ১৬. দীর্ঘস্থায়ী সময় ধরে জন্যে ক্যাথেটার ব্যবহারে মূত্রনালিতে সংক্রমণ হতে পারে। |                    |        |           |       |                   |
| ১৭. সপ্তাহে একবার মূত্রনালীর ক্যাথেটার পরিবর্তন করা উচিত                         |                    |        |           |       |                   |

| মূত্রথলির ব্যবস্থাপনা   | দৃঢ়ভাবে<br>অসম্মত | অসম্মত | নিরপেক্ষ | সম্মত | দৃঢ়ভাবে<br>সম্মত |
|---|--------------------|--------|----------|-------|-------------------|
| ১৮. একটি মূত্রাশয় সংক্রমণের কারণে ইউরিনারি ইনকন্টিন্যান্স হতে পারে।                                  |                    |        |          |       |                   |
| ১৯.এসসিআই রোগীদের মূত্রাশয় খালি করার জন্যে Clean intermittent catheterization (CIC)একটি উত্তম পন্থা। |                    |        |          |       |                   |
| ২০. পায়খানার চলাচল খুব দ্রুত তুককে লাল এবং কালশিটে তৈরি করে।   |                    |        |          |       |                   |

| শ্বাসযন্ত্রের যত্ন   | দৃঢ়ভাবে<br>অসম্মত | অসম্মত | নিরপেক্ষ | সম্মত | দৃঢ়ভাবে<br>সম্মত |
|--|--------------------|--------|----------|-------|-------------------|
| ২১. আঘাতের পরঘাড়ে আঘাতের জন্যে শ্বাসযন্ত্রের অবনতি বেশি দেখা যায়।  |                    |        |          |       |                   |
| ২২. ইহারজন্যে ডিসপোনিয়া , শ্বাসযন্ত্র বিকল,এটিলেকটেসিস,নিউমোনিয়া, শ্বাসজনিত সমস্যার জন্যে ঘুম ভাঙ্গা এরকম সমস্যা হতে পারে।   |                    |        |          |       |                   |
| ২৩. আমি গভীরভাবে শ্বাস প্রশ্বাস নিতে অক্ষম এবং জোর করে কাশতে হয় ।   |                    |        |          |       |                   |
| ২৪. প্রতিরক্ষামূলক ব্যবস্থাগুলি হচ্ছে অবস্থানগত এবং শরীরের অবস্থান পরিবর্তন, শ্বাসের কৌশল , স্বতঃস্ফূর্ত কাশি এবং কাশি সহায়তা ,চোষা, শ্বাসের অনুশীলন সম্পর্কে শিক্ষা। |                    |        |          |       |                   |



| নিজের যত্ন:   | দৃঢ়ভাবে<br>অসম্মত | অসম্মত | নির |
|---|--------------------|--------|-----|
| ২৫. প্রতিদিনই আমি আমার ত্বককে আয়নায় পরীক্ষা করে দেখি।                                       |                    |        |     |
| ২৬. আমি আমার ঘাড়ে গরম জিনিস রাখি না  |                    |        |     |
| ২৭. আমি ক্যাথিটার লাগানোর আগে এবং পরে আমার হাত ধোঁত করি।                                      |                    |        |     |
| ২৮. আমি পর্যাপ্ত পরিমাণ পানি পান করি  |                    |        |     |
| ২৯.<br>ভাল স্বাস্থ্যবিধি এবং মূত্র সংক্রান্ত সঠিক যত্ন মূত্রনালীর সংক্রমণ প্রতিরোধ করতে পারে। |                    |        |     |

| অবস্থান নির্ণয়  | দৃঢ়ভাবে<br>অসম্মত | অসম্মত | নিরপেক্ষ | সম্মত | দৃঢ়ভাবে<br>সম্মত |
|--|--------------------|--------|----------|-------|-------------------|
| ৩০. প্রতি ২০ মিনিটের মধ্যে বসার স্থান পরিবর্তন করা উচিত।                   |                    |        |          |       |                   |
| ৩১. শোয়ার অবস্থান প্রতি দুই ঘণ্টায় পরিবর্তন করা উচিত।                    |                    |        |          |       |                   |
| ৩২. দাঁড়ানোর ফ্রেম শক্ত হয়ে যাওয়া কমাতে ব্যবহার করা হয়।                |                    |        |          |       |                   |
| ৩৩. শক্ত হয়ে যাওয়া ও ঘা কমাতে অবস্থান ঠিকভাবে রাখা সবচেয়ে গুরুত্বপূর্ণ। |                    |        |          |       |                   |



| পারিবারিক সমর্থন  | দৃঢ়ভাবে<br>অসম্মত | অসম্মত | নিরপেক্ষ | সম্মত | দৃঢ়ভাবে<br>সম্মত |
|---|--------------------|--------|----------|-------|-------------------|
| ৩৪. এককী এসসিআই এর জটিলতার<br>যত্ন নেওয়া কঠিন                          |                    |        |          |       |                   |
| ৩৫. পরিবার থেকে আসা<br>পরিচর্যাকারীঅন্যদের চেয়ে রোগীর<br>ভাল যত্ন নেয় |                    |        |          |       |                   |
| ৩৬. ভালভাবে রোগী যত্ন জন্য<br>পারিবারিক সমর্থন গুরুত্বপূর্ণ।            |                    |        |          |       |                   |

খন্ড ৩: এসসিআই এর জটিলতার ক্ষেত্রে সাধারণ মনোভাব

(কখনো না= ০, মাঝে মাঝে= ১, প্রায়ই = ২এবং সবসময়=৩)

| ক্ষেত্র: অনুভূতি  | কখনো<br>না | মাঝে মাঝে | প্রায়ই | সবসময় |
|---|------------|-----------|---------|--------|
| ৩৭. আপনি কি ঘা এর যত্ন নিতে<br>আগ্রহী?  |            |           |         |        |
| ৩৮. আপনি প্রতি দুই ঘন্টা পরপর<br>ঘুরতে ক্লান্ত বোধ করেন?  |            |           |         |        |
| ৩৯. আপনি কি অন্যান্য ধরনের যত্ন<br>(যেমন খাওয়ানো, ড্রেসিং,<br>পরিষ্কার, পয়ঃনিষ্কাশন)ইত্যাদিতে আগ্রহী? |            |           |         |        |
| ৪০. আপনি প্রস্রাব নির্গত হওয়ার কারণে<br>লজ্জা বোধ করবেন?   |            |           |         |        |

| ক্ষেত্র: আচরণ   | কখনো<br>না | মাঝে<br>মাঝে | প্রায়ই | সবসময় |
|---|------------|--------------|---------|--------|
| ৪১. আমি প্রতি ৩০ মিনিটের মধ্যে কিছু ধরনের চাপমুক্তের কৌশল ব্যবহার করি।                            |            |              |         |        |
| ৪২. স্থান পরিবর্তন করার সময় আমি আমার পা, পায়ের পাতা, বা নিতম্ব সম্পর্কে সতর্ক থাকি।             |            |              |         |        |
| ৪৩. অধারাবাহিকতার ক্ষেত্রে, যত তাড়াতাড়ি সম্ভব আমি আমার ত্বক শুকিয়ে নেয়ার চেষ্টা করি।          |            |              |         |        |
| ৪৪. আমি আমার অস্থিসন্ধি নমনীয় রাখতে সতর্কতা অবলম্বন করি ( ) আমি নিয়মিত গতিপাল্লার ব্যায়াম করি। |            |              |         |        |
| ৪৫. যদি আমার প্রস্রাব গন্ধ হয়, তবে আমার এটি পরীক্ষা করানো উচিত হবে।                              |            |              |         |        |
| ৪৬. আমি গোড়ালি আলসার/ক্ষত প্রতিরোধ করতে পায়ের নিচে বালিশ ব্যবহার করি।                           |            |              |         |        |

| ক্ষেত্র: চিন্তা   | কখনো<br>না | মাঝে<br>মাঝে | প্রায়ই | সবসময় |
|---|------------|--------------|---------|--------|
| ৪৭. আপনি কি ঘা পরিচালনা করতে অসুবিধা বোধ করেন?  |            |              |         |        |
| ৪৮. আপনি কি মনে করেন শ্বাসের সমস্যাগুলি পরিচালনা করা গুরুত্বপূর্ণ?                        |            |              |         |        |
| ৪৯. আপনি কি মনে করেন এটি আপনাকে বিষণ্ণতায় ঠেলে দিবে?                                     |            |              |         |        |
| ৫০. আপনি কি মনে করেন যে অল্পে ও মলাশয়ের যত্ন নেওয়ার জন্য যত্নদাতার অংশগ্রহণের প্রয়োজন? |            |              |         |        |

**Questionnaire to assess Knowledge and attitude regarding Common Complication of SCI among Patients.**

(Please write or put tick marks at left of the appropriate answer)

**PART ONE: SOCIO-DEMOGRAPHICS**

|                              |  |
|------------------------------|--|
| 1. Participant ID No         |  |
| 2. Age (in years)            |  |
| 3. Sex                       | <input type="checkbox"/> a. Male<br><input type="checkbox"/> b. Female   |
| 4. Marital status            | <input type="checkbox"/> a. Married<br><input type="checkbox"/> b. Unmarried<br><input type="checkbox"/> c. Widow/widower<br><input type="checkbox"/> d. Separated   |
| 5. Level of formal education | <input type="checkbox"/> a. SLC<br><input type="checkbox"/> b. Higher Secondary<br><input type="checkbox"/> c. Graduation<br><input type="checkbox"/> d. other   |
| 6. Employment                | <input type="checkbox"/> a. Employed                      d. student<br><input type="checkbox"/> b. Unemployed<br><input type="checkbox"/> c. Retired  |
| 7. Causes of injury          | <input type="checkbox"/> a. Accidents<br><input type="checkbox"/> b. Diseases<br><input type="checkbox"/> c. Fall  |
| 8. Level of injury severity  | <input type="checkbox"/> a. C1-C4 ASIA A, B, C<br><input type="checkbox"/> b. C5-C8 ASIA A, B, C<br><input type="checkbox"/> c. T1-S5, ASIA A, B, C<br><input type="checkbox"/> d. ASIA D at any level         |
| 9. Type of injury            | <input type="checkbox"/> a. Complete Tetraplegia<br><input type="checkbox"/> b. Complete Paraplegia<br><input type="checkbox"/> c. Incomplete Tetraplegia<br><input type="checkbox"/> d. Incomplete paraplegia |

**PART TWO: KNOWLEDGE RELATED TO COMMON COMPLICATION OF SCI**

(Strongly disagree=1, Disagree=2, neutral=3, agree=4 & strongly agree=5)

**Do you agree?**

| <b>Pressure sores</b>  | <b>Strongly disagree</b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly agree</b> |
|--|--------------------------|-----------------|----------------|--------------|-----------------------|
| 10. I am susceptible to develop pressure sore.                   |                          |                 |                |              |                       |
| 11. I am careful about pressure ulcer so I checked it every day. |                          |                 |                |              |                       |
| 12. I lift myself to relieve pressure sore.                      |                          |                 |                |              |                       |
| 13. Pressure ulcer occurs in bony prominences.                   |                          |                 |                |              |                       |

| <b>Urinary care</b>  | <b>Strongly disagree</b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly agree</b> |
|--|--------------------------|-----------------|----------------|--------------|-----------------------|
| 14. Urine leakage can occur more often in sneezing, coughing or walking. |                          |                 |                |              |                       |
| 15. Catheters are used to manage urinary incontinence.                   |                          |                 |                |              |                       |
| 16. Prolonged indwelling catheters lead to urinary tract infection.      |                          |                 |                |              |                       |
| 17. Urinary catheter should bechanged once a month.                      |                          |                 |                |              |                       |

| <b>Bladder management</b>  | <b>Strongly disagree</b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly agree</b> |
|--|--------------------------|-----------------|----------------|--------------|-----------------------|
| 18. A bladder infection can cause urinary incontinence.  |                          |                 |                |              |                       |
| 19. Clean intermittent catheterization (CIC) is one of the safest bladders emptying method for SCI patients. |                          |                 |                |              |                       |
| 20. Bowel motions make skin red and sore very quickly.   |                          |                 |                |              |                       |

| <b>Respiratory care</b>  | <b>Strongly disagree</b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly agree</b> |
|--|--------------------------|-----------------|----------------|--------------|-----------------------|
| 21. After injury, respiratory impairment is more severe in high cervical injuries.   |                          |                 |                |              |                       |
| 22. It can cause dyspnea, respiratory failure, atelectasis, pneumonia, sleep disordered breathing.   |                          |                 |                |              |                       |
| 23. I am unable to breathe deeply and cough forcefully.  |                          |                 |                |              |                       |
| 24. Preventive measures are positioning and postural changes, breathing techniques, spontaneous cough and cough assistance, suctioning, education about breathing exercises. |                          |                 |                |              |                       |

**Self care**

|   | <b>Strongly disagree</b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly agree</b> |
|---|--------------------------|-----------------|----------------|--------------|-----------------------|
| 25. I check my skin with mirror every day.  |                          |                 |                |              |                       |
| 26. I do not keep hot things in my lap.   |                          |                 |                |              |                       |
| 27. I do wash my hands before and after catheterization.                            |                          |                 |                |              |                       |
| 28. I drink plenty of water.  |                          |                 |                |              |                       |
| 29. Good hygiene and proper handling of urinary care can prevent urinary infection. |                          |                 |                |              |                       |

**Positioning**

|   | <b>Strongly disagree</b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly agree</b> |
|---|--------------------------|-----------------|----------------|--------------|-----------------------|
| 30. Sitting position should be changed in every 20 mins.                  |                          |                 |                |              |                       |
| 31. Lying position in bed should be changed in every 2 hours.             |                          |                 |                |              |                       |
| 32. Standing frames are used to reduce tightness.                         |                          |                 |                |              |                       |
| 33. Positioning is most important to reduce tightness and pressure sores. |                          |                 |                |              |                       |

**Family Support**

|   | <b>Strongly disagree</b> | <b>Disagree</b> | <b>Neutral</b> | <b>Agree</b> | <b>Strongly agree</b> |
|---|--------------------------|-----------------|----------------|--------------|-----------------------|
| 34. It's difficult to take care of complication of SCI alone.     |                          |                 |                |              |                       |
| 35. Caregiver from family takes good care to patient than others. |                          |                 |                |              |                       |
| 36. Family support is important for good patient care.            |                          |                 |                |              |                       |

**PART THREE: ATTITUDE TOWARD COMMON COMPLICATION OF SCI**

(Never = 0, sometimes=1, Often=2 and always=3)

| <b>Domain : Feeling</b>  | <b>Never</b> | <b>Sometimes</b> | <b>Often</b> | <b>Always</b> |
|--|--------------|------------------|--------------|---------------|
| 37. Are you interested to take care of pressure ulcer?                                       |              |                  |              |               |
| 38. Do you feel tired to turn every two hours?   |              |                  |              |               |
| 39. Are you interested in other types of care (like feeding, dressing, cleaning, toileting)? |              |                  |              |               |
| 40. Do you feel ashamed because of urine leakage?  |              |                  |              |               |

| <b>Domain : Behaviour</b>   | <b>Never</b> | <b>Sometimes</b> | <b>Often</b> | <b>Always</b> |
|---|--------------|------------------|--------------|---------------|
| 41. I do some type of pressure relief technique at every 30 minutes.                      |              |                  |              |               |
| 42. I am careful about my legs, feet, or buttocks when doing transfers.                   |              |                  |              |               |
| 43. In case of incontinence, I would take care to have my skin dried as soon as possible. |              |                  |              |               |
| 44. I am careful to keep my joints flexible (I regularly do range of motion exercises).   |              |                  |              |               |
| 45. If my urine smells, I would have it examined.   |              |                  |              |               |
| 46. I use pillow under my leg to prevent heel ulcer.                                      |              |                  |              |               |

| <b>Domain : Thought</b>   | <b>Never</b> | <b>Sometimes</b> | <b>Often</b> | <b>Always</b> |
|---|--------------|------------------|--------------|---------------|
| 47. Do you feel difficulty in managing pressure sores?                                |              |                  |              |               |
| 48. Do you think it is important to manage breathing problems?                        |              |                  |              |               |
| 49. Do you think it will take you depression?   |              |                  |              |               |
| 50. Do you think caregiver participation is needed to take care of bowel and bladder? |              |                  |              |               |



Appendix- C: Approval of thesis proposal



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

Ref.

CRP-BHPI/IRB/01/18/186

Date: 04/01/2018

To  
Sonam Prajapati  
Part II, M.Sc. in Rehabilitation Science  
Session: 2016-17, Student ID: 181160072  
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

**Subject: Approval of the thesis proposal- "Knowledge and attitude regarding Common Complication of Spinal Cord Injury among Spinal cord injury patients attended at CRP, Bangladesh."**

Dear Sonam Prajapati,

Congratulations.

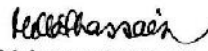
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above mentioned dissertation, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

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

Since the study involves answering a questionnaire that take about 20-30 minutes, have no likelihood of any harm to the participants, the members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 9.00 AM on 6<sup>th</sup> May, 2017 at BHPI.

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

Best regards,

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

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

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

## Appendix-D: Permission Letter for Data Collection

### Permission Letter

#### Permission Letter

Date: 04/01/2018

To

The Head of department,  
Department of Spinal Cord Injury  
CRP, Chapain, Savar, Dhaka-1343

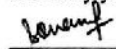
Subject: Application for permission of data collection for master's thesis

Dear Sir,

With due respect, I am Sonam Prajapati, student of part-II M.Sc in Rehabilitation Science at Bangladesh Health Professional Institute (BHPI). As per course curriculum, I need to complete a thesis for completion of my Masters program. Hence, I have to conduct a thesis entitled, **“Knowledge and Attitude regarding Common Complications of spinal cord injury (SCI) among SCI patients attended at CRP”** under honorable supervisor **Mohammad Anwar Hossain**. As my research includes spinal cord injury patients, I would like you to grant me the permission to use the information among patients. The purpose of the study is to assess the knowledge and attitude regarding complication of spinal cord injury among patients attended at CRP. Related information will be collected from the patients attending in CRP.

Data collection will require the patients and a small space of CRP. Data will be collected for 4 weeks from January, 2018. Data collectors will receive informed consents from all participants. Ethical approval is received from the Institutional Review Board (IRB) of Bangladesh Health Profession's Institute (BHPI).

Sincerely yours,



Yours sincerely

Sonam Prajapati  
Part-II, M.Sc in Rehabilitation Program  
BHPI, CRP, Savar, Dhaka

*Allow for data collection  
from SCI patients at  
SCU unit. Anwar  
Muzaffor Hossain  
Senior PT & Incharge SCI Unit  
Physiotherapy Department  
CRP Savar Dhaka-1343*