KNOWLEDGE, ATTITUDE AND PRACTICE (KAP) AMONG CAREGIVERS TOWARDS PRESSURE ULCER IN SPINAL CORD INJURY PATIENTS AT REHABILITATION CENTER IN BANGLADESH.

By

Niraj Singh Tharu

Submitted in Partial Fulfillment of the Requirements for the Degree of

MSc in Rehabilitation Science

May 2018

Bangladesh Health Professions Institute (BHPI)

Faculty of Medicine

University of Dhaka

DECLARATION

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

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

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

  A Bibliography is appended.

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

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

Signature:

Name: Niraj Singh Tharu

Date:

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, ATTIUDE AND PRACTICE (KAP) AMONG CAREGIVERS TOWARDS PRESSURE ULCER IN SPINAL CORD INJURY PATIENTS AT REHABILITATION CENTER IN BANGLADESH"

Submitted by **Niraj Singh Tharu**, for the partial fulfillment of the requirements for the degree of M. Sc.In Rehabilitation Science.

Prof. Dr. Mohammad Alamgir Kabir

Professor, Department of Statistics

Jahangirnagar University

Md. Habibur Rahman

Associate Professor, BHPI

Department of Physiotherapy

Dr. Kamal Ahmed

Associate Professor, IHT

Mohakhali, Dhaka

Muhammad Millat Hossain

Assistant Professor

Rehabilitation Science

Date of approval: 06/06/2018

ACKNOWLEDGEMENT

I would like to pay my gratitude to Almighty God who gave me the passion to complete this study. I want to acknowledge my family members who had always inspired me and provide me all necessary supports.

I am immensely grateful to my supervisor, supervisor, Professor Dr. Mohammad Alamgir Kabir, Jahangirnagar University for his valuable supervision, guidance and feedback during study period.

I would like to express my deepest gratitude to the Bangladesh Health Professions Institute (BHPI), to give me the opportunity to perform this study.

I would also like to thank Mr. Muzaffor Hossain, Senior PT & Incharge SCI Unit, Physiotherapy Department, CRP, Savar, Dhaka for providing all the necessary help, from giving information of the patients and caregivers and also in the process of data collection in different wards of SCI Unit.

In addition, I am thankful to all of my honorable teachers specially Muhammad Millat Hossain, Assistant Professor and Course coordinator, Department of Rehabilitation Science and Nasirul Islam, Associate Professor & Principal (Acting), BHPI, CRP for their valuable suggestions.

Specially, I would like to thank my friends for their tremendous support and guideline from the very beginning of my study.

I would like to express my gratitude to the care givers and SCI patients who gave their valuable time and provided the information, related to my study and helped me to make my work successful.

Thank you and God bless you all abundantly.

TABLE OF CONTENTS

LIST OF FIGURES AND LIST OF TABLES

List of abbreviations

SCI - Spinal Cord Injury

PUs - Pressure Ulcers

TSCI - Traumatic Spinal Cord Injury

NTSCI- Non-Traumatic Spinal Cord Injury

NPUAP - National Pressure Ulcer Advisory Panel

EPUAP - European Pressure Ulcer Advisory Panel

PPPIA - Pan Pacific Pressure Injury Alliance

LMICs - Low- and middle-income countries

CRP - Centre for the Rehabilitation of the Paralysed

ERB - Ethical Review Board

PUAQ - Pressure Ulcer Attitude Questionnaire

BHPI – Bangladesh Health Professions Institute

Abstract

***Background*:** The life expectancy of persons with SCI in Bangladesh who were discharged after rehabilitation, 56.4% of them died within 5 years whereas only 16.4% survived beyond 10 years. The People with SCI are at higher risk of PU throughout their lifetime due to their immobility that hinders the rehabilitation and community integration also, results in increased utilization of the health care system by people with SCI.

Objective: The objective of the study was to determine the knowledge, attitude and practice among caregivers regarding prevention and care of pressure ulcer in SCI patients.

***Method*:** The study design was cross-sectional and the participants were the caregivers of SCI patients at CRP, Savar, Dhaka. The study sample selected by convenient sampling procedure. The researcher used modified semi-structured questionnaire for data collection with face to face interview.

***Result*:** The study showed that caregivers had a moderate level of knowledge (M = 73.68%, SD = 6.43), neutral level of attitude (M = 70.32%, SD = 6.89), and moderate level of practice (M = 74.77%, SD = 9.08). There was a positive significant relationship between caregivers' knowledge and attitude ($r = 0.30$, $p < 0.01$), and between knowledge and practice ($r = 0.37$, $p < 0.01$). However, no correlation existed between caregivers attitude and practice ($r = 0.12$, $p > 0.10$) regarding prevention and care of pressure ulcer.

***Conclusion*:** The caregivers had insufficient information and were unaware about prevention and care of pressure ulcer. Having higher qualifications showed more positive attitude compared to lower qualifications or having no formal education. Mostly, the wife or mother of the patients were caregivers, and majority of them showed neutral attitude. These findings suggest that caregivers need to develop positive attitude and increase their knowledge of prevention and care of pressure ulcer in order to improve practice.

Key words: Pressure ulcer, caregiver, spinal cord injury, knowledge, attitude, practice

CHAPTER I INTRODUCTION

1.1 Introduction

Spinal cord injury (SCI) refers to the temporary or permanent loss of motor, sensory, or autonomic functions below the level of damage resulting in a permanent neurologic deficit and disability in majority of the patients. The most common reasons in traumatic spinal cord injuries were falls from height, road traffic accidents, injuries or accidents in sports, etc. (Nulle et al., 2017). Spinal cord injuries are highly disabling and deadly injuries. In a SCI, the structures and functions of the spinal cord are damaged by trauma, inflammation, tumors or other causes resulting in dysfunction of motor, sensory and autonomic nerves below the damaged level. Based on their etiology, SCIs can be divided into two different groups: traumatic spinal cord injuries (TSCI) and non-traumatic spinal cord injuries (NTSCI) (Yang et al., 2014). Traumatic SCI is a sudden event that occurs unexpectedly which turns into hazardous condition causing several consequences making the individual to suffer throughout their lifetime (Lee et al. 2014). According to the National Pressure Ulcer Advisory Panel (NPUAP) and European Pressure Ulcer Advisory Panel (EPUAP), pressure ulcer (PU) is defined as "localized injury to the skin and/or underlying tissue usually over a bony prominence as a result of pressure, or pressure in combination with shear and/or friction" (Dilie & Mengistu, 2015).

SCI has a serious impact mainly on the life of a young individual affecting their productive life resulting in physical, psychological and economic consequences. The SCI individuals suffer from various complications even after discharge from the rehabilitation and pressure ulcer seems to be one of commonest (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). Caregiver refers to an individual who provides care to the patient and assistance to manage patient's desires of daily living from simple care of feeding to dressing by preventing the development of complications. Caregivers are also responsible for patient's recovery and rehabilitation (Mersal, 2014).

1.2 Background

Spinal cord injury is a traumatic event that results in disturbances to normal sensory, motor, or autonomic function and ultimately impacts a patient's physical, psychological, and social well-being and places substantial financial burden on health care systems (Singh et al., 2014). SCI has a devastating effect in the life of sufferer because it creates disturbances in a person`s physical, mental, familial as well as social life. The incidence of SCI is increasing rapidly worldwide with a yearly incidence of 15 to 40 per million and seen most commonly in the low socio-economic society (Quadir et al., 2017). The individuals with SCI have a yearly incidence of pressure ulcers (PUs) from 23% to 30%. However, approximately 85% of SCI sufferers develop pressure ulcers at some moment during their lifetime. Moreover, 70% of SCI individuals having pressure ulcers suffer multiple ulcers. Among the SCI individuals, between 7% and 8% deaths occurs due to its complications (Byrne & Salzberg, 1996). The common risk factors for pressure ulcers among SCI sufferers are decreased level of activity, immobility, completeness of the SCI, urine incontinence/moisture, autonomic dysreflexia/severe spasticity, etc. (Byrne & Salzberg, 1996).

The SCI has serious consequences on family members and caregivers because they had to take the responsibilities of overall activities of the sufferer that leads to stressful condition. The dependency of SCI individuals brings the emotional changes even in the life of caregivers to deal with due to the time and effort they spend for them (Otaghsara et al., 2014). PUs are injury to the skin that is located in a small area of the body which disrupts the tissue along with the skin and occurs commonly over the bony prominences mainly due to the continuous and prolong pressure on the body parts accompanied by the rashes or cut. PUs are the serious and painful condition that affects the elderly and the individual with physical impairment that bounds the individual in limited mobility disturbing the well-being of the patient and the family (Uba et al., 2015). PUs are very popular among the hospitalized patients causing a significant burden on patients, their relatives and caregivers. In recent days, PUs are known worldwide to be amongst top five most common cause for the patient's complications and affecting their health safety. The estimation shows that the cost for treating pressure ulcer is almost 2.5 times greater than that of its prevention (Nuru et al., 2015).

SCI develops stress on the injured individuals as well as on their families. Not only the patients are at risk of developing major depression, but also their caregivers, who may also reveal levels of disturbed emotional status. The immobility of the SCI patient makes them dependent on their caregivers and as a result, this creates significant changes in the caregivers' life due to the time and effort that they must dedicate (Otaghsara et al., 2014). Pressure ulcers are one of the most costly and physically devastating complications from the 20th century causing pain and discomfort to the sufferer that prolongs the illness, rehabilitation, time of discharge, and also leading to disability and death (Nuru et al., 2015). PU are serious and costly complication for the individuals with reduced mobility and sensation therefore, the individuals with SCI were at higher risk throughout their lifetimes (Henzel et al. 2011). PU are very familiar among the immobile and the hospitalized patients causing a burden on the patients and their caregivers. Approximately, every year 1.7 million patients suffer from pressure ulcer.

The estimated incidence of PU in the developed and developing countries ranges from 8.3 % to 25.1% in developed countries, and 2.1 % to 31.3 % in developing countries (Kaddourah et al., 2016). According to "The National Pressure Ulcer Advisory Panel; the Agency for Health Care Policy and Research, 2004" PU develop among the neurologically impaired patients with an yearly incidence of 5-8%, where the estimated lifetime risk to be 25-85%. Moreover, 95% of PU develop on the lower part of the body, 36% on the lower back (sacrum) and 30% on the heel. PU are reported to be the main cause of death in 7-8% of all paraplegics (El-Daharja, 2009). Caregivers play an important role for preventing PUs for bed ridden patients at their homes. The study showed that providing educational-training program to caregivers in managing and preventing pressure ulcers for bedridden patients is very effective and helps to reduce the impact of PU (Eljedi, 2015). Caregivers of the SCI individuals have greater contribution to maintain the physical and emotional well-being of the sufferer. It is reported that the caregivers are the primary source of help for the individuals overall daily life activities also have important role in reducing the secondary complications and improving quality of life for individuals with SCI (Munce et al., 2014). Caregivers have a tremendous role in meeting the physical needs as well as the emotional needs of the patient. To provide such care they requires a high level of knowledge and positive attitude. If the caregiver does not have proper knowledge regarding the provision of care, it may hamper the health of the patient instead of speedy recovery (Mersal, 2014).

1.2.1 In context of developed countries

The study shows in the United States of America (USA), the total estimated cost for the treatment of pressure ulcers is between 2 and 5 million dollars every year. Also there are around 60,000 deaths every year due to pressure ulcer in the USA (Byrne & Salzberg, 1996). The prevalence of PUs was approximately, 10.2% in the United Kingdom where 59% of these developed from hospital setting. In contrast, it is reported to be 38% in hospital based, in the United States. Simultaneously, the information presented by the Agency for Healthcare Research and Quality indicated that pressure ulcers are increasing rapidly at the rate of 80% from 2006 to 2014 (Eljedi, 2015). Otaghsara et al., (2014) reported that 21% of spinal cord injured patients' caregivers experience depression in the USA. Also, the caregivers of individuals with SCI have a lower quality of life and experience greater psychological stress. A community survey in Canada found that 15 % of people with SCI experience two or more pressure ulcers within a year. PUs are one of the most common secondary complications for people with SCI. It also states that PUs occur in 30–85 % of patients during the first month of injury and 85 % of individuals with SCI are likely to experience a pressure ulcer during their lifetime (Baron et al., 2016). Another study estimated that in the United States between 50% and 80% of persons with SCI developed a pressure ulcer at least once in their lives. The majority of the ulcers occurred in the first 2 years after injury, but even after 3 to 4 years, there was a reported incidence of 30% (Caliri, 2005). Moore (2004), stated that pressure ulcers affects the quality of life of the individual, and creates financial burden on the families in terms of rehabilitation and delayed discharge. This study conducted in Ireland had demonstrated the importance of education very well. Education increases awareness of the problem and provides the information needed to carry out prevention effectively.

1.2.2 In context of developing countries

The studies conducted in low- and middle-income countries (LMICs), (Zimbabwe, Nepal and Bangladesh) presents the rate of survival of SCI individuals that ranges from 30 to 75% between 1 and 5 years after discharge (Hossain et al., 2016). In the context of Asia, the incidence of traumatic SCI occupies form 7.8 per million to 20.5 per million, however ages ranged from 20.6 to 35.4. The majority of population with SCI are youngest and highest in low and middle income countries. Among them the male suffers seems to be in greater extent than the female individuals (Vasiliadis, 2012).

Another study conducted in Nepal showed that caregivers had poor knowledge regarding prevention of complications related to immobility. However, 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 having an appropriate knowledge, positive attitude and appropriate practice towards the complications (Poudyal et al., 2014). The study conducted in India reported that family members were the key caregivers in majority of the cases and they were engaged in the formal trainings provided for the role of a caregiver (Sharma et al., 2013). The study in Iran stated that caregivers of patients with an injury at cervical level experienced more severe episodes of depression. Caregivers of individuals with SCI have a lower quality of life and experience greater psychological stress (Otaghsara et al., 2014).

1.2.3 In context of Bangladesh

Bangladesh is a developing country which presents the literacy rate of about 61% among the age of 15 years and above. The complications due to SCI has a major impact on the life of individuals causing a large number of morbidity and mortality. The people with spinal cord injury remain at the high risk throughout their lifetimes because of decreased mobility and lack of sensation coupled with other physiological changes (Bates-Jensen et al., 2009). In Bangladesh, the incidence and prevalence of PU does not exists at current scenario. However, study conducted in 1999 demonstrated 38% of PU that creates adverse effects on the life of sufferers such as increased risk of infection, delayed wound healing, increased mortality, increased patient care costs, increased patients' length of hospital stay, pain and suffering, and lower quality of life (Islam, 2010). In Bangladesh, the study about life expectancy of persons with SCI demonstrated that the patients who were discharged after rehabilitation, 56.4% of them died within 5 years whereas only 16.4% survived beyond 10 years. The surprising fact is that, every four out of five affected persons died at home. This shows the inaccessibility of healthcare among the people in the community and lack of knowledge and improper practice after the community reintegration of the SCI patients. Men in their most active and productive period of life (20-40 years) were the ones affected by SCI. The high number of younger SCI victims results in serious economic loss to the family, as well as to the community and country (Razzak et al., 2011).

1.3 Justification of the Study

Spinal cord injury affects the overall environment of an individual that may be in the form of physical, psychological and social well-being leading a financial burden on patient's, their families and the community which needs a long term care with significant health care resources (Singh et al. 2014). 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. Approximately 10% of hospitalized and 5% of community-living patients are affected by pressure sore. Patients reported PUs as inconvenience and troublesome that interferes their usual schedule, restrict their social life, interaction with family and friends affecting their personal relationship (Gorecki et al., 2009). 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 greater proportion of PU sufferers belongs to the age group older than 65 years with an approximation of 70% also the younger patients with neurologic impairments and severe illness are risk of developing PU (Uba et al., 2015).

The study about the Two-year survival following discharge from hospital after spinal cord injury in Bangladesh conducted at Centre for the Rehabilitation of the Paralysed (CRP) demonstrated that individuals with SCI who are wheelchair dependent, approximately one in five people die within two years of discharge from hospital. Approximately, 56% of individuals developed pressure ulcer where 90% of sufferers are male, also indicates that in Bangladesh men are the one to experience SCI than the women. Every year around 390 patients with SCI are admitted to CRP. The common cause of death is due to pressure ulcers which is preventable (Hossain et al., 2016).

Another study conducted in Bangladesh at CRP about prevalence of Pressure sore among the SCI patients demonstrated that 28% of patients with SCI developed pressure sore where majority of them were paraplegic having no sensation about bowl and bladder movements. However, the sufferers had the poor socioeconomic status and low literacy rate with large number of people having insufficient and inappropriate knowledge about PU. The People with SCI are at risk of PU throughout their lifetime due to their immobility that hinders the rehabilitation and community integration (Jahan, 2006).

Although the development of new technologies with advancement in spinal surgery and rehabilitation, there seems to be no change in mortality and morbidity associated with SCI. Even though pressure ulcers become a serious complication leading to deaths. The treatment and prevention of pressure ulcers seems to be more challenging in the context of developing nations where the risk factors for PU such as poverty, low education, limited activity level and malnutrition, are more widespread (Zakrasek et al. 2015). Globally, in every health care setting PU seems to be one of the commonest and serious complication or health care problem to deal with instead of various technological equipment's development and advances in medicine, the rate of developing PU is not decreasing (Zeb et al., 2015). Caregivers who had been involved in patient care for a longer duration of time developed negative attitude towards the disability. There is a close relationship between the caregiver and the disability, therefore numerous researches had been conducted regarding the attitude of caregivers towards the disability because the caregivers had to cope with the problems occurring to the persons with disability (Zheng et al., 2016).

In Nepal, the follow-up study of SCI patients within 1-2 years of discharge reported that 35% of mortality rate among the wheel chair users where pressure ulcer was one of the main cause of the death. The average survival rate of SCI patients within 2 years of discharge had been noticed 21% in Nepal. This is very higher mortality in comparison to western countries where 1 year survival rate is almost 90-99%. Therefore, both the caregivers and health team need to be concentrated towards this enormous challenge (Scovil et al., 2012). Another study conducted in Bangladesh showed that 19% of the wheel chair dependent patients discharged from a large SCI unit in Bangladesh die within 2 years of discharge due to pressure ulcer (Hossain et al., 2018).

Prevention of PUs is an indicator of quality of care. Caregivers has an important role on prevention and care of PU developed in spinal cord injury patients, because SCI individuals are at higher risk of pressure ulcer development due to the life-long disability. According to Mersal (2014), 12% of the caregivers had no ideas as to how a patient on bed for long time should be dealt with when caregivers' bedsore practices were assessed. They left their patients lying in uncomfortable positions that lead to worsening of bedsore status. Another study showed the relatively high prevalence of depression in Colombian caregivers of patients with SCI was 43% (Otaghsara et al., 2014).

The SCI patients loss their sensation and have chance to develop pressure ulcer due to excessive pressure being applied to the tissues over an excessive duration. Even they can get pressure sore from wet bed and cloth if they have no bladder control. Now a days the rate of spinal cord injury is increased in Bangladesh. Due to increasing population and 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 pressure sore. This study will find out the knowledge and attitude among caregivers of the patients with SCI and will help to take measure and about pressure sore among the patients. This study will also help to discover the lacking area of a patients, especially about their functional daily activities which are responsible for pressure sore. Beside this it will help to find out the reason for less survival of SCI individuals which is mandatory for current situation.

1.4 Research question

- What is the level of caregivers' knowledge, attitude and practice regarding prevention and care of pressure ulcer in Spinal cord injury patients?

1.5 Operational definition

Spinal cord injury

Spinal cord injury is a 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.

Pressure ulcer

A pressure ulcer is defined as any lesion caused by continuous pressure mainly over the bony prominence due to reduction in blood supply to that area that results in damage to the skin and underlying tissue.

Caregivers

Caregiver refers to an individual who provides care to the patient and assistance to manage patient's desires of daily living from simple care of feeding to dressing by preventing the development of complications.

Knowledge

It refers to the caregivers' ability to understand and answer the questions properly regarding prevention and care of pressure ulcer in SCI patients.

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.

Practice

It refers to care given to meet the activities of daily living.

1.6 Outline of thesis

The rest of the thesis is outlined as follows. **Chapter 2** reviews the current and past literature, mostly on the knowledge, attitude and practice among caregivers towards the pressure ulcer in spinal cord injury patients. The review includes theories related to SCI and PU with their impacts in the life of individual and the family in context of developed countries, developing countries and Bangladesh. This chapter also reviews the literature on prevalence and incidence of PU among SCI in Bangladesh and other countries. **Chapter 3** provides an overview of different sets of procedures used in this study, and the variables used along with their sampling procedures. This chapter also provides the conceptual framework with the brief explanation of the variables. **Chapter 4** reports the findings of KAP among caregivers. This chapter also presents their relationship among different variables. **Chapter 5** provides the empirical findings between KAP and with the socio-demographic variables. **Chapter 6** provides an overall conclusion, recommendations, strengths and limitations of the study. In addition, this chapter also includes suggestions for future research.

CHAPTER II LITERATURE REVIEW

2.1 Introduction

Literature review refers to the review of information found in various literatures related to the selected area of study. This review describes, summarizes and evaluate the literatures selected in the current study. **Section 2. 2** describes the overview of PUs among SCI in variety of patients with PU in both the community and home settings. **Section 2.3** reviews the literatures of developed countries presenting their prevalence of PU and role of caregivers, while **section 2.4** gives a brief explanation of caregivers' knowledge towards PU complications and the preventive strategies in developing countries. **Section 2.5** explains the scenario of PU in Bangladesh with the life expectancy and survival rate after discharge from the rehabilitation center.

2.2 Overview

Pressure ulcer is a common health problem for persons with SCI and it is ignored therefore, its prevention is underestimated and given a low priority. PUs management occupies one- fourth of the total expenses spent for taking care of SCI patients. Instead, its prevention would cost less than one- tenth the sum used for treatment. Therefore, more priority must be given to the prevention rather than treatment (Byrne & Salzberg, 1996). It is believed that the patients with PUs have feeling of burden on others resulting in anxiety and stress. And they predict that PUs have occurred because of the lack of knowledge about PUs and insufficient health care (Gorecki et al., 2009). PU has become a challenge to everyone those who are dealing with its management and prevention because it is common in every health care setting such as hospitals, nursing homes, rehabilitation centers and even at homes. The application of educational-training program to caregivers in managing and preventing pressure ulcers reduces the burden on the families and the health care system (Eljedi, 2015). The reduction of pressure ulcers depends on finding the risk factors and prevention on contribution of caregivers including their knowledge and attitude about the pressure ulcer. Education and awareness are important factor for preventing pressure ulcers, which may be given to the individuals with SCI, their families and caregivers (Henzel et al. 2011).

The occurrence of PU with leading to worsen the condition depends on the knowledge and skills of the caregivers. Therefore knowledge and skills are essential component to provide effective care. The study shows that around 95.1% of PUs could be avoided with having a knowledge on its prevention (Kaddourah et al. 2016). Spinal cord injury patients have the problem of mobility who are unable to change positions independently and need the assistance. Mobility is a cause for developing of PU among SCI patients. It is easier to prevent the complications than to treat or cure them. Caregivers play an important role to prevent complications that develop due to mobility problems. Providing knowledge and preventive measures about the changes of mobility to the caregivers prevents the patients from risk and discomfort (Mersal, 2014). The individuals with SCI are more susceptible to secondary complications causing an extra burden of health care needing hospitalization, acute care, home-based services which requires a higher budget for its treatment and prevention. The span of time for individuals with SCI regarding the survival and life expectancy is increasing nowadays (Wyndaele & Wyndaele, 2006).

Care giving is a difficult job and many care givers show psychological stress and develop physical and mental health problems, especially if care giving condition continues more than one year. If adequate knowledge is provided to care givers, then it will assist them to cope with the stress and enhance the quality of life of themselves and their patients (Saini et al., 2017).

The study conducted on caregiver's knowledge about caring of stroke patients showed that one third of the caregiver's have insufficient and inappropriate knowledge about how to take proper care of stroke patient's (Lee et al., 2015). Elliott & Berry (2009), reported that caregivers have more stress than those not involved in caregiver roles however, these caregivers presented poor quality of life after the onset of SCI. As caregiver burden increases over time, those who cannot manage well and lack effective skills experience dissatisfaction in their personal relationships with the SCI partners. The occurrence of SCI to an individual alters the family attitudes and roles over time. After the SCI to an individual, family caregivers have to adopt various changes in their lifestyles with a huge stress and depression disturbing their own-shelf life style. The education should be given to the patient and also information regarding the care to caregivers for people with SCI would help to maintain the long term health (Manns & May, 2007).

It has been observed that although the nurses and health professionals instead of having knowledge about PU and its prevention but still they are struggling to prevent or reduce the rate of developing PU. Therefore, it is difficult for the caregivers to prevent PU in home setting without appropriate knowledge on it (Zeb et al., 2015). It is an innovative idea to share caregivers as a part of health care system to play a major role in patients' care such as preventing pressure ulcer. Caregivers play an important role in managing all aspects of the patient's care. They are the one who will be with the patient every time than medical professionals. Hence the caregivers' knowledge regarding general measures such as positioning, exercise, skin care, nutrition and support will enhance the quality of care and prevent complications (Mersal, 2014). The caregivers of the patients with the injury at the cervical level presented with higher rate of depression. This indicates that higher patient's dependency on their caregivers makes them more susceptible for developing emotional changes. This will lead to the change of caregivers' attitude towards the patient that leads to decreased in the quality of the care (Otaghsara et al., 2014).

The impact of SCI is on the entire family while one of its members, who takes the responsibility for the care of the suffered individual and his needs is known as caregiver. In this way, the caregiver divides his/her time, attention, activities, professional, family, social and marital roles, etc. between the new demands of the affected individual (Nogueira et al., 2013). Lala et al., (2014) reported that the individuals with traumatic SCI in the community, 33.5% of individuals experienced a pressure ulcer in the within a year. It was also found that approximately 65% of individuals with pressure ulcers were limited in their ability to participate in their main activity such as daily activities and participation in community. The care giver plays a vital role to attain patient's fast recovery and to prevent complications. They play an important role in providing care to their patients. They are the one who will be with the patients every time than physicians and nurses. Hence, the care givers knowledge regarding general measures such as positioning, exercise, skin care, nutrition and support enhances the quality of outcome and prevent complication (Saini et al., 2017).

Caliri (2005), revealed that PU occurs commonly, which increase the expenses and also a life threatening condition that results in long hospitalization and interferes with rehabilitation and community reintegration. For both the individual and the caregiver, pressure ulcers can result in disruption of work, delayed community reintegration, reduced quality of life, and loss of self-esteem. Therefore all individuals with SCI should be considered at high risk for pressure ulcers in all settings and effective preventive strategies should be taught to both the caregiver and the individual. According to Hopkins (2006), pressure ulcer restricted the patients' activities and developed unnecessary burden on their families and caregivers. In addition, those restrictions delayed their rehabilitation. The impact of pressure ulcer was on their families and caregivers which worries the patients affected and due to the change in their attitude. The education given to caregivers related to secondary complications after SCI is an effective way of successful transfer to home and community. Additionally, proper education and knowledge about SCI and associated complications will help caregivers direct their care throughout their lifespan (Schottle et al., 2009).

Moore (2004), stated that pressure ulcers affects the quality of life of the individual, and creates financial burden on the families in terms of rehabilitation and delayed discharge. This study conducted in Ireland had demonstrated the importance of education very well. Education increases awareness of the problem and provides the information needed to carry out prevention effectively. According to Saini et al., (2017) family care givers knowledge and practice regarding management of immobilized patient enhance the quality of life of patient. Therefore, individualized teaching programme was effective to improving the practices of caregivers regarding care of pressure point in immobilized patients. It was reported that life expectancy for individuals with SCI in low income countries is shorter with respect to individuals with SCI in high income countries. Because of that individuals with spinal cord injury (SCI) in low income countries face serious challenges in their daily lives (Derud, 2014).

2.3 In context of developed countries

The study conducted in Canada on the SCI individuals about the economic impact of SCI during their lifetime showed that the predicted lifetime expenses for a person with incomplete paraplegia ranges from CAD$1.47 million to $3.03 million for one with complete tetraplegia. These predictions covers the complications from surgical period to emergency readmissions along with the long-term complications including pressure ulcers, bladder and bowel

dysfunction, and respiratory problems (Singh et al. 2014). Mersal (2014) reported that while assessing the knowledge and practice of caregivers of immobilized patients regarding prevention of complications related to immobilization in Egypt, it was found that caregivers explained caregiving is a difficult job and suffered psychological stress as physically and mentally especially when care giving is continuous for more than a year. Every year 60,000 peoples die in the USA as a result of the complications of pressure ulcer (Islam et al., 2010).

In Canada, there was seen a prevalence of pressure ulcer approximately 30% among individuals with SCI, in the community setting. PUs have a major impact on the daily life of individuals with SCI. PUs are one of the most common complications that may arise after SCI (Lala et al., 2014).

One study conducted in Brazil reported that, 34% of the SCI individuals developed at least one pressure ulcer during acute care or rehabilitation within 24 hours while, In the United Kingdom, 32% of patients visited at a spinal cord injury unit with pressure ulcers, whereas a total of 56% experienced an ulcer at some stage between injury and discharge (Caliri, 2005). The study about Knowledge, attitudes and practice among nursing staff concerning pressure ulcer prevention and treatment – a survey in a Swedish healthcare setting showed that the incidence of pressure ulcer varies between 12% and 55% in Sweden (Kallman & Suserud, 2009). In France, 52% were found to be tetraplegic, and 48% paraplegic. In England and Wales, more than half of all deaths (58.3%) occurred in hospital (Razzak et al., 2011).

2.4 In context of developing countries

PU are quite common in bed ridden patients where caregivers plays an important role in management of such problems. The study conducted in North India on caregiver's knowledge regarding home based bedsore care demonstrated poor quality of care to the bed ridden patient's. It showed the need for formal training to the caregivers in various aspects of pressure ulcer as they were untrained and lack of adequate knowledge about PU. It is estimated that the incidence of PU among bedridden patients is more than 50% whereas 17% of PU develops in the home care settings (Sharma et al., 2013). The study conducted in Iran about the emotional status of caregivers of SCI individuals showed that majority of caregivers developed depression due to long term dependency of the patient that created emotional disturbances in their life (Otaghsara et al., 2014).

Sharma et al., (2013) demonstrates a study in North India revealed that when caregivers do not have adequate knowledge or proper training in the care of bed ridden patients, caregivers try a variety of things which leads to low quality of care and high rate of complications in bed ridden cases. The study conducted on effectiveness of educational training program in Palestine about preventing pressure ulcer for bedridden patients by caregivers at their homes was very helpful. Therefore, to improve the quality of care such type of preventive programs should be extended to the community settings also for the caregivers of SCI patients (Eljedi et al., 2015). A study conducted in India on knowledge and practice of immobilized orthopedic patients and their care givers regarding prevention of complications showed that knowledge and practice of patient and caregivers were inadequate to prevent complications of immobilization (Poudyal et al., 2014).

2.5 In context of Bangladesh

The study conducted in Bangladesh demonstrated that SCI and its complications create a serious consequence on life of individuals leading to a large number of morbidity and mortality with economic problems. In context of Bangladesh, young age males are at higher risk of SCI where majority of cases are paraplegic and buttock seems to be the most risky area for developing pressure ulcer (Quadir et al., 2017). Razzak et al., (2011) reported that majority of patients affected with SCI are men rather than women in Bangladesh. This difference is due to the fact that men are mostly exposed to the work or activities that make them vulnerable to SCI, while women generally do not go out for work and remain indoors.

Limited records have been available about pressure ulcer prevalence and incidence in the hospitals of Bangladesh. One of the study in Bangladesh stated that 38% had developed pressure ulcer among paralyzed patients in Bangladesh (Islam et al., 2010). In the context of low-income and middle-income countries people with SCI are susceptible to life threatening complications after discharged from the hospital. A study conducted in Bangladesh showed that 19% of the wheel chair dependent patients discharged from a large SCI unit in Bangladesh die within 2 years of discharge due to pressure ulcer (Hossain et al., 2018).

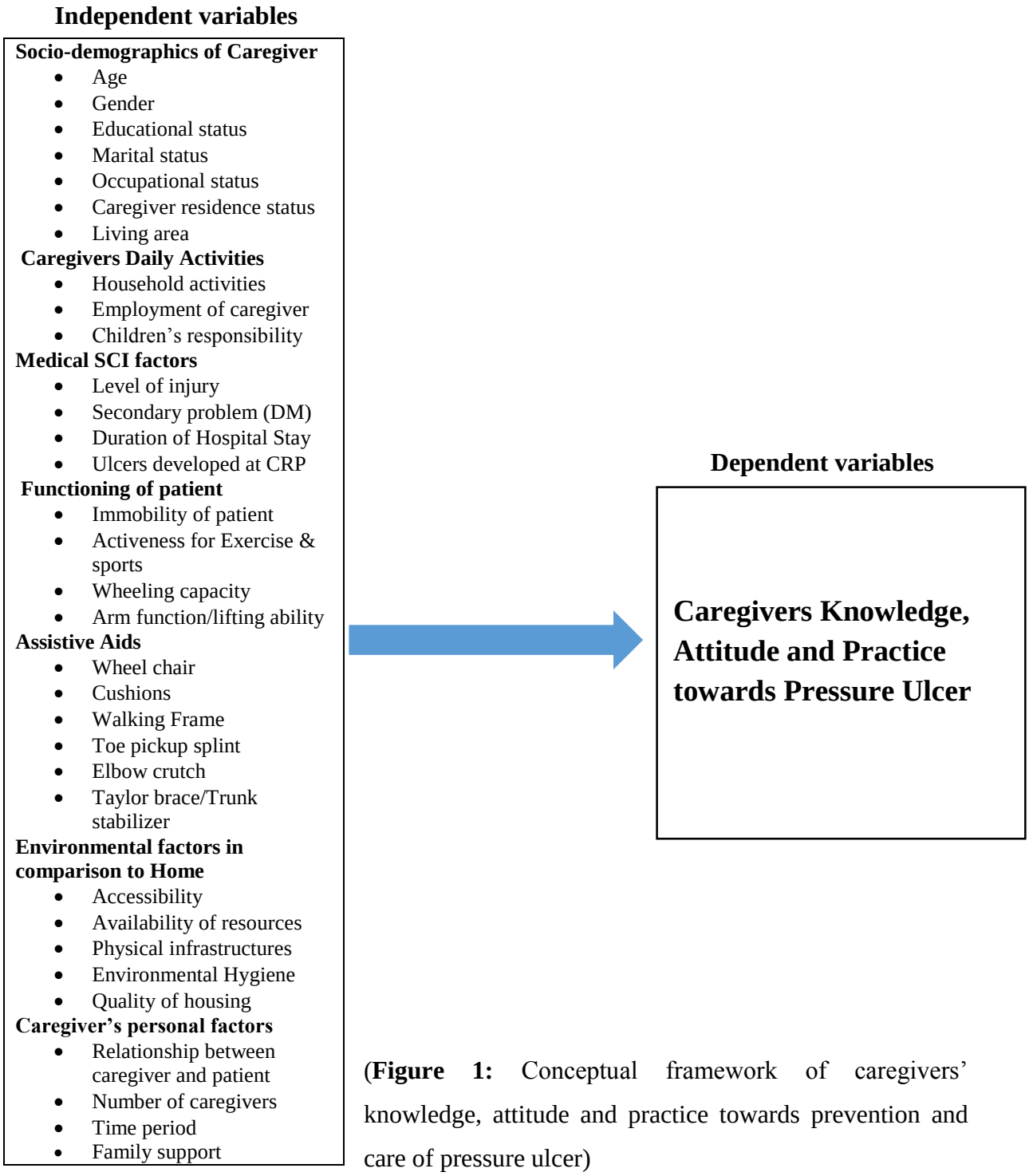
In Bangladesh, it was found that 79.75% were paraplegic rather than tetraplegic 20.25% which is different from findings in other country studies whereas in Pakistan it showed that 47.2% were tetraplegic and 52.8% paraplegic. In Bangladesh, many people with SCI are house-bound, unemployed, living in poverty and have pressure ulcers. They experience moderate rates of depression and report limited quality of life. Also living with a SCI in LMICs is challenging (Hossain et al., 2016). The study showed that more than 80% of the persons with SCI had died at home. It was found that only 16.4% of the study population survived for 10 years, which was much lower than figures for various developed countries where a 10 year survival rate was observed in around 80% of affected persons in France. The higher number of deaths of persons with SCI at home in the present study may indicate the negative social acceptance of such people, lack of proper reintegration in society (Razzak et al., 2011).

CHAPTER III RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a systematic way to solve a problem. It shows how research is to be carried out and aims to give the work plan of research. This chapter describes the overall procedures for conducting this study. **Section 3.2** describes the conceptual framework along with the variables used. **Section 3.3** explains the objectives of this study. **Section 3.4** gives a brief explanation on study design and study population, while **section 3.5** provides a brief explanation on study area and study period. **Section 3.6** defines the sample size and sampling technique. The convenience sampling has been used for this study. **Section 3.7** explains the inclusion and exclusion criteria of this study. Data collection tools and data management and analysis are explained in **section 3.8** and **section 3.9**, respectively. **Section 3.10** provides the quality control and quality assurance information. **Section 3.11** described the process of ethical consideration used in this thesis.

3.2 Conceptual framework



(**Figure 1:** Conceptual framework of caregivers' knowledge, attitude and practice towards prevention and care of pressure ulcer)

3.3 Study objectives:

3.3.1 General objective

- To determine the knowledge, attitude and practice among caregivers regarding prevention and care of pressure ulcer in SCI patients.

3.3.2 Specific objectives:

- To identify socio-demographic characteristics of the caregiver that affect prevention and care of pressure ulcer.
- To analyze if the quality of pressure ulcer care depends on the relationship between caregiver and SCI patient.
- To discuss the relationships among the level of caregivers knowledge and attitude, knowledge and practice, attitude and practice regarding prevention and care of pressure ulcer.

3.4 Study design and study population

The quantitative cross-sectional survey was used to conduct this study. The descriptive correlational design was used to explore the caregivers' knowledge, attitude, and practice regarding prevention and care of pressure ulcer of the spinal cord injury patients admitted for rehabilitation at Centre for Rehabilitation of Paralysed (CRP) in Bangladesh. In addition, the relationships among caregivers' knowledge, attitudes, and practices were examined.

The study was conducted on all the caregivers of SCI patients admitted to the CRP with a recent spinal cord injury. Most patients were admitted within a few days of their spinal cord injury, but some were admitted to other hospitals and later transferred to the CRP. The study included all the caregivers of paraplegic and tetraplegic patients with spinal cord injury staying at CRP. The caregivers of tetraplegic patients were interviewed from all the phases of rehabilitation whereas, the caregivers of paraplegic patients were included during their discharge from the halfway hostel. The patients with pressure ulcer or without pressure ulcer were not differentiated, both their caregivers were included in the study.

3.5 Study area and study period

The study was conducted at Centre for the Rehabilitation of the Paralysed (CRP) in Bangladesh. It is 115 - bed rehabilitation center for SCI patients including other neurological departments located in Savar, the capital city of Bangladesh. It is one of the biggest rehabilitation center for spinal cord injury patients in Bangladesh. The study was conducted in the SCI department after the approval from the Ethical Review Board (ERB) and permission from the head of the respected department. The duration of study was six months.

3.6 Sample size and sampling technique

Sample size was estimated according to following formula with the assumption of 50% prevalence, 95% confidence level, 5% margin of error and a total population of 390.

The formulation of sample size determination: $$n = \frac{NZ^2P(1-P)}{d^2(N-1)+Z^2P(1-P)}$$

The study conducted at CRP by Hossain et al., (2016) shows that the CRP admits approximately 390 patients a year with recent spinal cord injury. This makes the CRP one of the largest acute spinal cord injury units in Bangladesh. It receives referrals from all over Bangladesh including referrals from other hospitals. Therefore, total population of 390 was considered for this study. The calculated sample size for this study was 194. The data was collected from December 2017 to April 2018. Therefore, all the patients with recent spinal cord injury admitted to CRP during this period were included in this study based on the inclusion and exclusion criteria. The total collected data was 127. Meanwhile, this is an academic research and had time limitations so that, it was not possible to collect the total sample size.

A convenience sampling has been used for this study. Researcher acknowledge that this type of sampling method occupies low cost and researcher has a freedom to choose whomever they find. Researcher selected this technique as it is easiest and quicker method of sample selection.

3.7 Inclusion and exclusion criteria

Inclusion criteria

- Caregivers who had primary responsibility for the patient's care.
- Having caregivers' age minimum of 18 years.
- At least one month of stay as a caregiver for tetraplegic patients and two weeks of stay in halfway hostel for caregivers of paraplegic patients.

Exclusion criteria

- Caregivers of the patients who were admitted to the CRP more than 1 year after spinal cord injury.

3.8 Data collection tools

For data collection a structured interview questionnaire was used. The questionnaire developed by the researcher was divided into 4 sections:

3.8.1 Socio-demographic questionnaire,

3.8.2 Caregivers knowledge regarding prevention and care of pressure ulcer questionnaire,

3.8.3 Caregivers attitude regarding prevention and care of pressure ulcer questionnaire, and

3.8.4 Caregivers practice regarding prevention and care of pressure ulcer questionnaire.

The details of each section will be explained as follows:

3.8.1 Socio-demographic questionnaire

This questionnaire consisted of 8 items to assess the respondents' socio-demographic data including age, gender, educational status, marital status, occupational status, residence status, living area and relationship between caregiver and patient.

3.8.2 Caregivers knowledge of prevention and care of pressure ulcer questionnaire

This questionnaire was designed to assess the level of caregivers' knowledge regarding prevention and care of pressure ulcer in SCI patients. The questions were adopted from National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance based on Prevention and Treatment of Pressure Ulcers, published in 2014. (NPUAP/EPUAP/PPPIA, 2014). The 18-item structured questionnaire was modified and developed by the researcher based on perspectives of SCI in Bangladesh. The respondents were asked to answer the questions based on knowledge as correct, partially correct and incorrect. Score "3" was given for correct answer, "2" for partially correct answer and "1" for incorrect answer. The questionnaire included positive and negative item questions. Items number 2.3, 2.6, 2.9, 2.12, 2.15 and 2.18 were negative questions and the rest of them were positive questions. The scores of negative items were reversed. The possible total score ranged from 18 to 54 and it was then converted into percentage. The higher scores indicated the higher level of knowledge.

McDonald's standard of learning outcome measured criteria was used to categorize caregivers' level of knowledge regarding prevention and care of pressure ulcer. This set of criteria was developed in order to measure the actual performance of students' learning in the educational institution. So, in this study, McDonald's composite percent scores were used for measuring accurate learning outcomes of the caregivers' knowledge and their practice regarding prevention and care of pressure ulcer. The criterion was categorized into five groups (Uba et al., 2015):

Level of Knowledge/Practice	Composite percent of scores
Very low	< 60%
Low	60% - 69.99%
Moderate	70% - 79.99%
High	80% - 89.99%
Very high	90% - 100%

3.8.3 Caregivers attitude of prevention and care of pressure ulcer questionnaire

This questionnaire was designed to assess the level of caregivers' attitude regarding prevention and care of pressure ulcer in SCI patients. The questions were adopted from Pressure Ulcer Attitude Questionnaire (PUAQ) (Moore & Price, 2004). The 12-item structured questionnaire was modified and developed by the researcher based on the caregivers' perspective in Bangladesh.

The respondents were asked to rate the 5 level of attitude ranged from 1 to 5; 5 = strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, and 1 = strongly disagree. The questionnaire included positive and negative item questions. Items number 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.10, 3.11 and 3.12 were negative questions and the rest of them were positive questions. The scores of negative items were reversed. The possible total score ranged from 12 to 60 and it was then converted into percentage. The higher scores indicated the positive attitude. Total scores of attitudes were categorized into three levels based on mean percentage and standard deviation: negative attitude below (mean ±1 SD), neutral level (mean ± 1 SD), and positive attitude above (mean ± 1 SD).

The scores of each level were as followed:

Level of attitude	Score
Negative	< 63.43%
Neutral	63.43% - 77.21%
Positive	> 77.21%

3.8.4 Caregivers practice of prevention and care of pressure ulcer questionnaire

This questionnaire was designed to assess the level of caregivers' practice regarding prevention and care of pressure ulcer in SCI patients. The questions were adopted from National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance based on Prevention and Treatment of Pressure Ulcers, published in 2014. (NPUAP/EPUAP/PPPIA, 2014). The 16-item structured questionnaire was modified and developed by the researcher based on perspectives of SCI in Bangladesh. The respondents were asked to indicate the frequency of their practice of prevention and care of pressure ulcer. Score "3" was given for Always practice, "2" for Sometimes practice and "1" for Never practice. The possible scores ranged from 16 – 48. These score were then converted into percentage. The higher scores indicated the higher level of practice. The total score was categorized into five groups as indicated in section 2.

3.9 Data management and analysis

Data were analyzed using descriptive and inferential statistics. Descriptive statistics were used for presenting demographic characteristics. Knowledge, attitude, and practice level were described in terms of frequency, percentage, mean, standard deviation, and range. The Pearson product-moment correlation coefficient (r) was used to examine the relationships among the level of caregivers' knowledge, attitude, and practice. A *p*- value of 0.05 or less was considered as statistically significant. Relationship of caregivers' knowledge, attitude and practice with socio-demographic variables was tested using Chi-square test.

3.10 Quality control and quality assurance

The questionnaire has been carefully designed and English-Bengali version was used for data collection to maintain the quality of the data. Before actual data collection time, the questionnaire (tool) was checked for clarity, comprehensiveness, and content validity by an expert and pretested for reliability through pilot study on 10 caregivers in different units of SCI department at CRP. Then, based on the findings of the pretest, the questions were modified for wording and clarity. Data were collected carefully and confidentiality of recipient information was maintained during whole period of research. Researcher accepted the answers of participant whether they are right or wrong without researcher influence. The researcher checked all data several times to maintain accuracy. The collected data were then reviewed and checked for completeness and consistency by the principal investigator on a regular basis.

3.11 Ethical consideration

Approval from ethical review board of Bangladesh Health Professions Institute (BHPI) and hospital administration was obtained from intended hospital (CRP) as well as department, patients and caregivers. At first, written consent of the caregivers was obtained prior to the administration of the questionnaire. The patients and caregivers were informed of the purpose of the study that they had the right to refuse and to participate. Furthermore, the patients and caregivers were told that they can refrain from answering any questions and they can terminate at any time. Confidentiality of the patients and caregivers was maintained all times.

CHAPTER IV RESULTS

The results section state the findings of the research arranged in a logical sequence or interpretation. The results of the current study are presented based upon the methodology. **Section 4.1** describes the respondents' socio-demographic characteristics. **Section 4.2** explains the level of caregivers' knowledge, attitude and practice regarding prevention and care of PU in SCI patients, while **section 4.3** gives a brief explanation on relationship between caregivers' knowledge and attitude, attitude and practice, and knowledge and practice regarding prevention and care of PU in SCI patients. **Section 4.4** defines the relationship between caregivers' knowledge, attitude and practice (KAP) with respondents' socio-demographic characteristics.

4.1 Respondents' socio-demographic characteristics

The participants in this study involved all the caregivers of paraplegic and tetraplegic patients with spinal cord injury at Centre for the Rehabilitation of the Paralysed (CRP). It is biggest rehabilitation center in Bangladesh. One hundred and twenty seven (127) respondents were interviewed which was 65.46 % of the total study population.

Table 4.1: Socio-demographic characteristics of the respondents (N=127)

Variables	n	(%)	Variables	n	(%)
Age (years) (M=38.21, SD=11.95, Min=18, Max=72)			**Occupational status**		
18 – 27	31	(24.4)	Housewife	88	(69.3)
28 – 37	30	(23.6)	Agriculture	13	(10.2)
38 – 47	37	(29.1)	Service	8	(6.3)
48 – 57	23	(18.1)	Business	2	(1.6)
57 years and Above	6	(4.7)	Student	8	(6.3)
Gender			Factory worker	4	(3.1)
Male	30	(23.6)	Others	4	(3.1)
Female	97	(76.4)	**Living area**		
Educational status			Rural	104	(81.9)
No formal education	47	(37.0)	Semi-urban	2	(1.6)
Primary education	32	(25.2)	Urban	21	(16.5)
Secondary education	24	(18.9)	**Relationship between caregiver and patient**		
Higher secondary education	17	(13.4)	Mother	25	(19.7)
Graduate and Above	7	(5.5)	Father	7	(5.5)
Marital status			Wife	52	(40.9)
Unmarried	15	(11.8)	Husband	2	(1.6)
Married	110	(86.6)	Sister	8	(6.3)
Widowed	2	(1.6)	Brother	15	(11.8)
Separated	0	(0.0)	Others	18	(14.2)
Caregiver residence status					
Lives together with patient	105	(82.7)			
Lives separately from patient	22	(17.3)			

(n = No. of respondents)

As shown in (Table 4.1), the mean age of the caregivers was 38.21 years (SD = 11.95) with a minimum and maximum age of 18 and 72 years. The majority of the caregivers (29.1%) were at the age range of 38 to 47 years. Simultaneously, an age range of 18 to 27 years and 28 to 37 years were (24.4%) and (23.6%) respectively while the least group of the caregivers (4.7%) fall in the age range of 57 years and above. A majority of them were female (76.4%). The caregivers with no formal education occupied the highest proportion (37.0%) who were engaged in taking care of the patients while the caregivers with higher educational status as graduates and above were (5.5%). Most of the caregivers were married (86.6%) whereas (11.8%) of them were unmarried. Regarding occupational status it showed that near to two third of the caregivers were housewife (69.3%). About (6.3%) each belonged to service and educational background and (10.2%) were engaged in agriculture. The caregivers residence status showed that (17.3%) of the caregivers lived separately or far from the patient who did not shared a common house with the patient in their residence. Most of the caregivers were from the rural area (81.9%). Regarding relationship between caregiver and patient, it is found that the highest percentage of the caregivers were the wife and mother of the patients occupying (40.9%) and (19.7%) respectively.

4.2 Caregiver's knowledge level regarding prevention and care of pressure ulcer

Table 4.2: Frequency and percentage of caregivers in each category of knowledge level of prevention and care of pressure ulcer (N=127)

Knowledge Level	n	%
Very low (<60%)	3	2.4
Low (60 - 69.99%)	31	24.4
Moderate (70 – 79.99%)	69	54.3
High (80 – 89.99%)	24	18.9
Very high (90 – 100%)	0	0.0
M = 73.68%, SD = 6.43, Min = 55.56, Max = 87.04	127	100.0

(n = No. of respondents)

Overall, the caregivers knowledge regarding prevention and care of pressure ulcer was at a moderate level (M = 73.68%, SD = 6.43) with minimum and maximum scores of 55.56% and 87.04%, respectively. Table 4.2, illustrates the number and frequency of caregivers who were in each category of knowledge level. It was found that 26.8% of caregivers possessed very low (2.4%) to low (24.4%) level of knowledge. Majority of caregivers (54.3%) had a moderate level of knowledge whereas (18.9%) scored a high level of knowledge and no caregivers had a very high level of knowledge regarding prevention and care of pressure ulcer.

4.3 Caregiver's attitude level regarding prevention and care of pressure ulcer

Table 4.3: Frequency and percentage of caregivers in each category of attitude level of prevention and care of pressure ulcer (N=127)

Caregivers Attitude	**n**	**%**
Negative (<63.43%)	19	15.0
Neutral (63.43% - 77.21%)	88	69.3
Positive (>77.21%)	20	15.7
M = 70.32%, SD = 6.89, Min = 51.67, Max = 93.33	127	100.0

(n = No. of respondents)

The table above shows the caregivers attitude regarding prevention and care of pressure ulcer was at neutral level (M = 70.32%, SD = 6.89) with minimum and maximum scores of 51.67% and 93.33%, respectively. Most of the caregivers (69.3%) achieved neutral level of overall attitude towards prevention and care of pressure ulcer. 15.0% of the caregivers showed negative attitudes. Simultaneously, (15.7%) of the caregivers had an overall positive attitudes towards prevention and care of pressure ulcer.

4.4 Caregiver's practice level regarding prevention and care of pressure ulcer

Table 4.4: Frequency and percentage of caregivers in each category of practice level of prevention and care of pressure ulcer (N=127)

Caregivers Practices	n	%
Very low (<60%)	9	7.1
Low (60 - 69.99%)	28	22.0
Moderate (70 – 79.99%)	58	45.7
High (80 – 89.99%)	24	18.9
Very high (90 – 100%)	8	6.3
M = 74.77%, SD = 9.08, Min = 54.17, Max = 93.75	127	100.0

(n = No. of respondents)

Overall caregivers practice regarding prevention and care of pressure ulcer was at a moderate level (M = 74.77%, SD = 9.08) with minimum and maximum scores of 54.17% and 93.75%, respectively. As table 4.4, shows, it was found that less than half (45.7%) of the caregivers scored at moderate levels and (18.9%) of the caregivers had high levels practice regarding prevention and care of pressure ulcer. However, it was observed that 29.1% of caregivers possessed very low (7.1%) to low (22.0%) level of knowledge.

4.5 Relationship between caregivers' knowledge and attitude, attitude and practice, and knowledge and practice regarding prevention and care of pressure ulcer

Table 4.5: Pearson correlation coefficients between caregivers knowledge, attitude, and practice regarding prevention and care of pressure ulcer (N = 127)

	Knowledge	**Attitude**	**Practice**
Knowledge	1.00		
Attitude	0.30**	1.00	
Practice	0.37**	0.12	1.00

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Correlational analysis revealed that there was a moderately positive significant relationship between caregivers knowledge and attitude ($r = 0.30$, $p < 0.01$), and between knowledge and practice ($r= 0.37$, $p < 0.01$). There was a little and non-significant relationship between attitude and practice ($r= 0.12$, $p > 0.10$) regarding prevention and care of pressure ulcer.

Table 4.6: Relation between knowledge score and socio-demographic data

	Knowledge score								Total		χ^2 *p*
	Very low		Low		Moderate		High				
	n	%	n	%	n	%	n	%	n	%	
Age group											
18 – 27	0	0.0	5	16.1	17	24.6	9	37.5	31	24.4	
28 – 37	0	0.0	5	16.1	15	21.7	10	41.7	30	23.6	43.607***
38 – 47	0	0.0	11	35.5	24	34.8	2	8.3	37	29.1	
48 – 57	1	33.3	7	22.6	12	17.4	3	12.5	23	18.1	
57	2	66.7	3	9.7	1	1.4	0	0.0	6	4.7	
Gender											
Male	0	0.0	5	16.1	18	26.1	7	29.2	30	23.6	2.534
Female	3	2.4	26	83.9	51	73.9	17	70.8	97	76.4	
Educational status											
No formal education	3	100.0	16	51.6	28	40.6	0	0.0	47	37.0	
Primary	0	0.0	8	25.8	13	18.8	11	45.8	32	25.2	51.316***
Secondary	0	0.0	1	3.2	20	29.0	3	12.5	24	18.9	
Higher secondary	0	0.0	6	19.4	7	10.1	4	16.7	17	13.4	
Graduate +	0	0.0	0	0.0	1	1.4	6	25.0	7	5.5	
Occupational status											
Housewife	3	100.0	24	77.4	46	66.7	15	62.5	88	69.3	
Agriculture	0	0.0	3	9.7	8	11.6	2	8.3	13	10.2	
Service	0	0.0	0	0.0	6	8.7	2	8.3	8	6.3	15.021
Business	0	0.0	0	0.0	2	2.9	0	0.0	2	1.6	
Student	0	0.0	2	6.5	2	2.9	4	16.7	8	6.3	
Factory worker	0	0.0	2	6.5	2	2.9	0	0.0	4	3.1	
Others	0	0.0	0	0.0	3	4.3	1	4.2	4	3.1	
Relationship between caregiver and patient											
Mother	1	33.3	12	38.7	10	14.5	2	8.3	25	19.7	
Father	0	0.0	1	3.2	6	8.7	0	0.0	7	5.5	
Wife	2	66.7	9	29.0	32	46.4	9	37.5	52	40.9	32.543**
Husband	0	0.0	0	0.0	2	2.9	0	0.0	2	1.6	
Sister	0	0.0	2	6.5	5	7.2	1	4.2	8	6.3	
Brother	0	0.0	4	12.9	9	13.0	2	8.3	15	11.8	
Others	0	0.0	3	9.7	5	7.2	10	41.7	18	14.2	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (n = No. of respondents)

4.6 Relationship between knowledge score and socio-demographic data

The relation between knowledge score and socio-demographic data, demonstrated in table 4.6. It was observed that the age group showed a significant effect on knowledge score, (28-37) years exhibited high knowledge. Also, relationship between caregiver and patient shows significant relation with knowledge score. Moreover, there was a relation between educational status and level of knowledge, the caregivers with no formal education and primary education displayed the majority of low and high knowledge.

Table 4.7: Relation between attitude score and socio-demographic data

	Attitude score						Total		χ^2 *p*
	Negative		Neutral		Positive				
	n	%	n	%	n	%	n	%	
Age group									
18 – 27	2	10.5	18	20.5	11	55.0	31	24.4	
28 – 37	6	31.6	20	22.7	4	20.0	30	23.6	17.615*
38 – 47	4	21.1	31	35.2	2	10.0	37	29.1	
48 – 57	5	26.3	15	17.0	3	15.0	23	18.1	
57 +	2	10.5	4	4.5	0	0.0	6	4.7	
Gender									
Male	7	36.8	16	18.2	7	35.0	30	23.6	4.719
Female	12	63.2	72	81.8	13	65.0	97	76.4	
Educational status									
No formal education	12	63.2	35	39.8	0	0.0	47	37.0	
Primary	5	26.3	26	29.5	1	5.0	32	25.2	40.511***
Secondary	1	5.3	14	15.9	9	45.0	24	18.9	
Higher secondary	0	0.0	11	12.5	6	30.0	17	13.4	
Graduate +	1	5.3	2	2.3	4	20.0	7	5.5	
Occupational status									
Housewife	8	42.1	68	77.3	12	60.0	88	69.3	
Agriculture	6	31.6	5	5.7	2	10.0	13	10.2	
Service	1	5.3	5	5.7	2	10.0	8	6.3	27.061**
Business	1	5.3	0	0.0	1	5.0	2	1.6	
Student	0	0.0	5	5.7	3	15.0	8	6.3	
Factory worker	1	5.3	3	3.4	0	0.0	4	3.1	
Others	2	10.5	2	2.3	0	0.0	4	3.1	
Relationship between caregiver and patient									
Mother	4	21.1	19	21.6	2	10.0	25	19.7	
Father	2	10.5	5	5.7	0	0.0	7	5.5	
Wife	6	31.6	41	46.6	5	25.0	52	40.9	24.538
Husband	0	0.0	2	2.3	0	0.0	2	1.6	
Sister	1	5.3	6	6.8	1	5.0	8	6.3	
Brother	4	21.1	8	9.1	3	15.0	15	11.8	
Others	2	10.5	7	8.0	9	45.0	18	14.2	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (n = No. of respondents)

4.7 Relation between attitude score and socio-demographic data

It was found that the age group showed significant effect on attitude score, (18-27) years presented more positive attitude than other age groups. Also, there was a relation between educational status and level of attitude, the caregivers with secondary education showed more positive attitude than caregivers with other qualifications. Moreover, it was observed that occupational status showed significant effect with attitude level. The caregivers who were house wife had maximum positive attitude than caregivers with other occupation. Regarding relationship between caregiver and patient in table 4.7, it showed relation with attitude score, the wife of the patients had greater positive attitude regarding prevention and care of pressure ulcer than others.

4.8 Relation between practice score and socio-demographic data

The gender showed significant effect on practice score while, the females show very high practice more than the males. Also, there was a relation between education and level of practice, the caregivers with graduate degrees demonstrated very high practice than with other qualifications revealed in table 4.8. Again, relationship between caregiver and patient shows significant relation with practice score.

Table 4.8: Relation between practice score and socio-demographic data

	Practice score										Total		χ^2 *p*
	Very low		Low		Moderate		High		Very high				
	n	%	n	%	n	%	n	%	n	%	n	%	
Age group													
18 – 27	1	11.1	6	21.4	15	25.9	8	33.3	1	12.5	31	24.4	
28 – 37	1	11.1	6	21.4	13	22.4	7	29.2	3	37.5	30	23.6	9.726
38 – 47	4	44.4	10	35.7	15	25.9	5	20.8	3	37.5	37	29.1	
48 – 57	2	22.2	6	21.4	11	19.0	3	12.5	1	12.5	23	18.1	
57 +	1	11.1	0	0.0	4	6.9	1	4.2	0	0.0	6	4.7	
Gender													
Male	0	0.0	2	7.1	17	29.3	8	33.3	3	37.5	30	23.6	10.147*
Female	9	100.0	26	92.9	41	70.7	16	66.7	5	62.5	97	76.4	
Educational status													
No formal education	7	77.8	12	42.9	25	43.1	3	12.5	0	0.0	47	37.0	
Primary	2	22.2	5	17.9	23	39.7	1	4.2	1	12.5	32	25.2	78.355***
Secondary	0	0.0	6	21.4	7	12.1	10	41.7	1	12.5	24	18.9	
Higher secondary	0	0.0	5	17.9	2	3.4	8	33.3	2	25.0	17	13.4	
Graduate +	0	0.0	0	0.0	1	1.7	2	8.3	4	50.0	7	5.5	
Occupational status													
Housewife	9	100.0	22	78.6	39	67.2	14	58.3	4	50.0	88	69.3	
Agriculture	0	0.0	2	7.1	9	15.5	2	8.3	0	0.0	13	10.2	
Service	0	0.0	2	7.1	2	3.4	3	12.5	1	12.5	8	6.3	22.838
Business	0	0.0	0	0.0	1	1.7	1	4.2	0	0.0	2	1.6	
Student	0	0.0	2	7.1	2	3.4	3	12.5	1	12.5	8	6.3	
Factory worker	0	0.0	0	0.0	2	3.4	1	4.2	1	12.5	4	3.1	
Others	0	0.0	0	0.0	3	5.2	0	0.0	1	12.5	4	3.1	
Relationship between caregiver and patient													
Mother	4	44.4	8	28.6	10	17.2	3	12.5	0	0.0	25	19.7	
Father	0	0.0	1	3.6	3	5.2	3	12.5	0	0.0	7	5.5	
Wife	4	44.4	11	39.3	24	41.4	9	37.5	4	50.0	52	40.9	35.888*
Husband	0	0.0	0	0.0	1	1.7	0	0.0	1	12.5	2	1.6	
Sister	1	11.1	4	14.3	1	1.7	1	4.2	1	12.5	8	6.3	
Brother	0	0.0	1	3.6	12	20.7	1	4.2	1	12.5	15	11.8	
Others	0	0.0	3	10.7	7	12.1	7	29.2	1	12.5	18	14.2	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (n = No. of respondents)

Table 4.9: Caregiver's knowledge regarding prevention and care of pressure ulcer (n= no. of respondents)

Variables	Correct n (%)	Partially-correct n (%)	Incorrect n (%)
The patient on a wheel chair should shift their weight approximately every 15 minutes while sitting in a wheelchair	127 (100.0)	0 (0.0)	0 (0.0)
Turn or reposition patients in bed at least every 2 hours.	104 (81.9)	22 (17.3)	1 (0.8)
Repositioning is not necessary to be performed on a bed ridden patient when a special mattress is applied.	14 (11.0)	26 (20.5)	87 (68.5)
When you are assisting a patient with changing position, move the patient carefully so you do not create friction of the skin.	113 (89.0)	11 (8.7)	3 (2.4)
Use of proper transfer techniques can reduce friction of the skin while transferring.	27 (21.3)	91 (71.7)	9 (7.1)
To prevent pressure ulcer, a bedridden patient should be dragged slowly for changing the position.	0 (0.0)	13 (10.2)	114 (89.8)
The patient should ensure maximum mobility according to their capabilities.	74 (58.3)	51 (40.2)	2 (1.6)
Avoid applying any lotion to bony prominences or reddened areas, as this may soften or irritate the skin increasing breakdown.	25 (19.7)	35 (27.6)	67 (52.8)
While dressing the wound of the patient, hand washing is not necessary if the gloves are worn.	75 (59.1)	21 (16.5)	31 (24.4)
The most risky areas to pressure ulcer development such as upper back, elbows, buttocks, heels, etc. should be checked every day.	32 (25.2)	92 (72.4)	3 (2.4)
Avoid overstretching of skin while the patient are repositioned or transferred.	123 (96.9)	4 (3.1)	0 (0.0)
Massage is recommended for reddened body areas in bed ridden patients.	96 (75.6)	23 (18.1)	8 (6.3)
Use pillow or cushions to keep bony prominences such as knees and ankles, from direct contact with each other	4 (3.1)	122 (96.1)	1 (0.8)
Assess weight changes of the patient over time.	3 (2.4)	9 (7.1)	115 (90.6)
The patient on wheel chair have lesser chance of developing pressure ulcer.	68 (53.5)	37 (29.1)	22 (17.3)
Ensure that the patient is well-nourished.	121 (95.3)	6 (4.7)	0 (0.0)
Usually drinking 8 glasses of water everyday will be sufficient.	19 (15.0)	105 (82.7)	3 (2.4)
The overweight patients should not be given proper balanced diet as it will increase their weight.	101 (79.5)	21 (16.5)	5 (3.9)

4.9 Caregiver's knowledge regarding prevention and care of pressure ulcer

The caregiver's knowledge regarding prevention and care of pressure ulcer demonstrated that all the caregivers were completely aware about the weight shifting on a wheel chair in a continuous specific interval of time. 126 caregivers believed repositioning is necessary for prevention and care of pressure ulcer. 22 of them were partially correct that repositioning can play a vital role in prevention and care of pressure ulcer. When asked that repositioning is not necessary if special mattress is applied, 26 were partially correct in telling so. Again, 113 of them knew that to prevent from friction of skin the patient should be moved slowly during assistance, whereas 11 were partially correct about technique of assistance in changing position. Only 27 knew that proper transfer technique can reduce friction. Moreover, none of them knew that to prevent pressure ulcer, bedridden patients should be dragged slowly for changing the position while, 13 were somewhat aware about changing position. Again, 70 knew that applying lotion to bony or red areas may increase the risk of pressure ulcer. Among them 35 were partially correct about using lotion could be harmful in the prominent areas. Seventy five of them believed that while dressing the wound of the patient, hand washing is not necessary if the gloves are worn. 31 caregivers considered it is important to do so. There was misconception among many regarding massage in bed ridden patients. Eight caregivers believed that giving massage to the reddened body areas is contradictory. When asked about assessing weight of the patients over time, only 12 caregivers agreed about this but almost none of them had measured their weight after the injury or majority (115) of them felt it is not necessary. Sixty eight caregivers agreed to the fact that overweight patients have greater chances of developing pressure ulcer whereas, 22 of them believed opposite of that. Majority of them (121) knew the right kind of diet could prevent the risk of pressure ulcer. Again, 122 caregivers agreed to the fact that giving proper balanced diet to the overweight patients will result in weight gain, therefore they should be deprived of proper diet. While, only 5 caregivers supported that all the patients should be provided with proper diet.

Table 4.10: Caregiver's attitude regarding prevention and care of pressure ulcer

Variables	Agreed (Positive)		Disagreed (Negative)	
	n	(%)	n	(%)
Aware about awful consequences of pressure ulcer.	117	(92.1)	10	(7.9)
All patients are at risk for developing pressure ulcer.	81	(63.8)	46	(36.2)
If patient have pressure ulcer it lacks your interest in patient care.	29	(22.8)	98	(77.2)
Pressure ulcer care does not need extra attention if patient is in hospital or rehabilitation center.	44	(34.6)	83	(65.4)
Feel tired and irritated to change the patient's position every two hours.	52	(40.9)	75	(59.1)
Long term care to the patient is difficult.	52	(40.9)	75	(59.1)
Patient care interrupts your personal, social and job life.	64	(50.4)	63	(49.6)
In comparison with other areas of patient care, pressure ulcer care is a low priority for you.	41	(32.3)	86	(67.7)
It's your responsibility to take care of patient on your own.	93	(73.2)	34	(26.8)
Patient care, children responsibility, job and household work all together are not possible for you.	55	(43.3)	72	(56.7)
Pressure ulcer prevention is time consuming for you to carry out.	71	(55.9)	56	(44.1)
Less interested in pressure ulcer care than other aspects of patient care.	38	(29.9)	89	(70.1)

n = No. of respondents

4.10 Caregiver's attitude regarding prevention and care of pressure ulcer

The caregiver's attitude regarding prevention and care of pressure ulcer illustrates that 117 caregivers were aware about the consequences of pressure ulcer whereas 10 of them did not have much idea about the consequences. 81 caregivers agreed about the fact that all the patients are at risk for developing pressure ulcer while 46 of them were opposite to that. Majority of the caregivers (98) responded that there will be no change in the pressure ulcer care if the patient had pressure ulcer but 29 said that it might change their interest of patient care.

Again, 83 of them believed that pressure ulcer care does not need extra attention if the patient is in hospital or rehabilitation center. Only 44 of them believed that pressure ulcer can occur anywhere and needs proper attention everywhere. Moreover, 75 caregivers showed positive attitude towards changing patient position every two hours and providing long term care to the patient. Sixty four caregivers agreed that patient care interrupts their personal and social life and 63 of them disagreed to this statement. Majority (93) of the caregivers accept pressure ulcer care as their responsibility whereas 34 of them think it's not their responsibility to take care of pressure ulcer. 55 of them felt it is not possible to manage house hold chores along with the patient care. When asked about their interest in pressure ulcer care than other aspects of care, 38 of them showed their interest in other aspects of care while 89 caregivers were interested to give overall care to the patient.

Table 4.11: Caregiver's practice regarding prevention and care of pressure ulcer

Variables	Always n (%)	Sometimes n (%)	Never n (%)
Encourage and assist the patient to eat well, drink sufficient fluid, and exercise several times daily.	92 (72.4)	31 (24.4)	4 (3.1)
Use pillows and cushions to reduce pressure on existing pressure ulcers or risky skin areas.	37 (29.1)	74 (58.3)	12 (12.6)
Check for incontinence a minimum of every two hours.	84 (66.1)	41 (32.3)	2 (1.6)
Do not massage or forcefully rub skin that is at risk of pressure ulcers.	7 (5.5)	11 (8.7)	109 (85.8)
Clean the skin immediately after toileting.	112 (88.2)	12 (9.4)	3 (2.4)
Use skin moisturizers daily on dry skin.	3 (2.4)	118 (92.9)	6 (4.7)
Consulting a therapist or a doctor noticing any changes on the skin.	82 (64.6)	4 (35.4)	0 (0.0)
Keep the patient bed free form crumbles and wrinkles, both of which can irritate the skin.	107 (84.3)	20 (15.7)	0 (0.0)
Encourage patient involvement in activities.	51 (40.2)	68 (53.5)	8 (6.3)
Provide clothes made of cotton that is light and soft in texture.	30 (23.6)	88 (69.3)	9 (7.1)
Use proper transfer technique to move the patient without sliding across bed or chair surfaces.	107 (84.3)	19 (15.0)	1 (0.8)
Relieve pressure from the heels, when the patient is in bed by positioning pillows or cushions.	44 (34.6)	22 (17.3)	61 (48.0)
Consider wiping the patient skin sites by using a towel, without rubbing the skin.	108 (85.0)	18 (14.2)	1 (0.8)
Use a pressure redistributing chair cushion for patients sitting in wheelchair.	35 (27.6)	9 (7.1)	83 (65.4)
Do not massage bony prominences or reddened areas of skin.	1 (0.8)	8 (6.3)	118 (92.9)
Inspect the skin at least daily for signs of pressure ulcer.	27 (21.3)	88 (69.3)	12 (9.4)

n = No. of respondents

4.11 Caregiver's practice regarding prevention and care of pressure ulcer

The caregiver's practice regarding prevention and care of pressure ulcer reveals that 92 caregivers always assist and encourage the patients for food and exercise whereas, 31 of them do not frequently encourage the patient for these activities. Again, 12 of them have never used pillows and cushions over risky skin areas as a preventive method for pressure ulcer. Majority of caregivers (84) check for incontinence at regular interval of two hours. While, 41 of them does not give priority of every 2 hours. Seven caregivers always gave massage without concerning about the risk of pressure ulcer. Moreover, 112 of them always maintained the cleanliness of the skin immediately after the faeces. Only 3 caregivers always used the skin moisturizers for dry skin whereas, 118 of them used it sometimes only. Most of them (82) were aware about to report a doctor or therapist noticing any changes on the skin. Maximum (107) caregivers knew that even bed making plays an important role in prevention and care of pressure ulcer. None of them ignored about cleanliness and hygiene on bed making and consulting a doctor noticing any changes on the skin. Thirty caregivers always provided cotton clothes to the patients that is light and soft in texture while, 88 of them provided sometimes if needed or told to do so. Again, 107 of them used proper transfer technique to move the patient from bed to chair or vice-versa. Only 35 caregivers used pressure redistributing chair cushion for patients sitting in wheel chair where 83 of them have never used it. Twenty seven caregivers always checked the skin on a daily basis for signs of pressure ulcer whereas, 88 of them performed this inspection sometimes in a week.

CHAPTER V DISCUSSION

5.1 Introduction

The discussion section presents the overall findings and results of the current study and compares the following results with other previous similar studies conducted in many countries. The study aimed at exploring the level of caregivers' knowledge, attitudes and practice regarding the prevention and care of PU and to examine the relationships among those variables. The findings revealed the caregivers had a moderate level of knowledge, neutral level of attitudes, and a moderate level of practice regarding prevention and care of PU. Findings from the study revealed that there was a moderately positive significant relationship between caregivers' knowledge and attitude, and between knowledge and practice. However, a little and non-significant relationship was found between attitude and practice. **Section 5.2** describes the socio-demographic characteristics, while **section 5.3** explains on level of knowledge among caregivers towards PU in SCI patients. **Section 5.4** gives a brief explanation on level of attitude. **Section 5.5** defines the level of practice regarding prevention and care of PU. **Section 5.6** describes the relationships among knowledge, attitude, and practice.

5.2 Socio-demographic characteristics

Findings from the study indicated that majority of the caregivers (29.1%) were at the age range of 38 to 47 years while, the least group of the caregivers (4.7%) fall in the age range of 57 years and above. This shows that the majority of the caregivers were at their middle age whereas, the senior members of the family were rarely involved as a caregiver. A study in Brazil reported that care of the person with disabilities is usually assigned to women as a result of their traditional role as caretaker for the home and family (Nogueira et al., 2013).

This study presents similar results. The greater percentage of caregivers (76.4%) were the females. This indicates that the females are mostly in priority for the caretaking of anyone in the family in developing country like Bangladesh. The caregivers educational status shows that the higher proportion of the caregivers (37.0%) were with no formal education. Simultaneously, the caregivers with primary education occupies the second place with (25.2%) and the proportion of other higher qualifications descends as their educational status increases. This is a clear indication that the caregivers who are educated are not interested for the role of caregiver.

Regarding occupational status, it is found that most of the caregivers are housewife (69.3%). Men are mostly exposed to the work or activities that make them vulnerable to SCI, while women

generally do not go out to work and remain indoors (Razzak et al., 2011). There is interconnection with educational status and gender. As majority of the caregivers are females and house wife, it is found that majority of the females are with no formal education. The caregivers residence status showed that (17.3%) of the caregivers lived separately or far from the patient who did not shared a common house with the patient in their residence. It shows that those caregivers were not from the family members. They were either relatives and kins or cousins. It was observed that maximum number of caregivers were from rural area (81.9%). It shows that the patients are from the villages and remote areas. Relationship between caregiver and patient shows that majority of the caregivers were wife of the patients (40.9%). It reveals that the wife of the male patients and mothers of female patients are mostly involved in caretaking amongst a family member, if the patient were married.

5.3 Level of knowledge

The findings showed that the caregivers who participated in this study had a moderate level of overall knowledge regarding the prevention and care of pressure ulcers. This indicates that the caregivers had neither high nor low knowledge regarding prevention and care of pressure ulcer. It means that caregivers had insufficient information on prevention and care of pressure ulcer. In India, it had been reported that the knowledge of caregivers regarding bedsore care was inadequate where majority of the participants' beliefs and practices were found to be incorrect (Sharma et al., 2013). This study presents a similar scenario. There are possible reasons to explain the moderate level of overall knowledge of this group of respondents.

It is assumed that age group and educational background may be a factor related to this moderate level of knowledge. Item analysis supports this explanation. There was significant correlation between age and knowledge in the current study. It has been proposed that knowledge and level of education had a highly significant relation. Caregivers having higher school education, had higher knowledge than those having other levels of education (Mersal, 2014). This study reveals comparable results. More than three quarter of the respondents are in age group (18-27) and (28-37) of the total respondents. This is the age of education and learning and also the active phase of the life. This might be the reason for the moderate level of knowledge.

There was a relation between knowledge score and demographic data. One of the study showed that the age had a significant effect on knowledge score, the old age exhibited an excellent knowledge. Also there was a relation between occupation and level of knowledge, the house wife and student displayed the majority of fair and poor knowledge (Al-Othman et al., 2018). The current study supports this statement. Again, most of the caregivers (37.0%) had no formal education followed by primary education with (25.2%) which is very minimum level of education. Only both of these compromise more than the half of the total respondents. This reveals that when the caregivers are asked the questions on negative aspects of knowledge. Majority of them were either incorrect or partially correct.

Furthermore it could be hypothesized that occupational status is related to an individual's knowledge. Majority of the caregivers are housewife (69.3%). Therefore, they had knowledge on overall care of the patient except on transfer and positioning of the patient. Because most of them were partially correct about the knowledge on transfer and positioning. It seems they had more information on other aspects of care rather than pressure ulcer care. Additional analysis did not support this expectation. One of the study reported similar significant relation between level of knowledge, age, sex, marital status and kin relationship respectively (Mersal, 2014).

Regarding relationship between caregiver and patient, it is predicted that if the patient were married, wife and mothers were the primary caregiver and other family members were rarely involved in the caretaking. Previous study showed related results where level of knowledge is statistically significant with area of residence, marital status and educational status of respondents (Poudyal et al., 2014). Because SCI is a life-long disability, they will only be the caregivers after the patient is discharged for community reintegration. Therefore, they might had put interest and learned very well when taught by the therapists during rehabilitation phases and halfway hostel phase about the knowledge on prevention and care of pressure ulcer.

5.4 Level of attitude

Results indicated that the majority of caregivers showed a neutral level of attitude regarding the prevention and care of pressure ulcers. The finding indicates that caregivers neither care nor were indifferent about the prevention and care of pressure ulcer. It means that caregivers were unaware of pressure ulcer prevention care, or they had no idea about preventing pressure ulcer development. It is assumed that age would be related to attitude. In contrast, additional analysis supported this expectation.

There was significant correlation between age and attitude in the current study. The similar relationship was demonstrated between attitude score and demographic data, it was found that the female showed more positive attitude than male, while the house wife had positive attitude more than the other occupation (Al-Othman et al., 2018).

It was observed that majority of the caregivers were of age group (38-47) years, because they were of middle age so that they understood the fact about the disability and were ready to compromise with the situation. Therefore, they might had showed neutral attitude towards prevention and care of pressure ulcer. Again, the educational status was a related factor to this neutral level of attitude. In this study approximately (95.0%) of the caregivers with higher qualifications showed more positive attitude compared to lower qualifications or having no formal education.

Regarding relationship between caregiver and patient, it also showed relation with attitude score. The wife of the patients had greater neutral attitude (46.6%) regarding prevention and care of pressure ulcer than others. This might be due to their relationship. As it was observed that wife and mother of the married patients are in priority of caregiving if the patient were married. This may be reason that they showed neutral attitude rather than negative or positive attitude. It was also found that, there was a significant relation between occupational status with level of attitude. Majority of the house wife (77.3%) showed neutral attitude towards prevention and care of pressure ulcer compared to other occupations. The possible reason behind that may be they did not had several responsibilities rather than as a caregiver such as office work and family responsibilities. And being a house wife they are performing a daily tasks in their houses which are also quite similar to the activities as a caregiver.

5.5 Level of practice

It was found that the caregivers' practice regarding prevention and care of pressure ulcer was at a moderate level. The level of knowledge was equivalent with the level of their practice. In this study, caregivers' practice was reflected by their knowledge. It is assumed that age would be related to practice. However, additional analysis did not support this expectation. There was no significant correlation between age and practice in the current study. Furthermore, it could be hypothesized that gender is not related to an individual's practice. However, item analysis does not support this explanation.

There was a significant relation between gender with the level of practice. A possible reason for explaining this moderate level of practice among gender may be because the females are mostly engaged in household chores as it was found that majority of the caregivers were housewife. This helps them to give moderate level of practice to the patients than the male caregivers. Educational status is a related factor for the moderate level of practice. It was observed that the caregivers with higher level of education showed higher practice. Very high practice (50.0%) was presented by the caregivers with graduate and above degrees and high practice (25.0%) showed by the caregivers with higher secondary level of education. Therefore both age and educational status influence the neutral level of practice in this current study.

Also, one of the study reported a similar significant relation between level of practice, age, sex, marital status and kin relationship respectively (Mersal, 2014). A relation had been shown between level of practice with level of education and type of job of caregivers. Caregivers having higher school education, have higher level of practice than those having other levels of education.

5.6 Relationships among knowledge, attitude, and practice

There was moderately positive significant relationship between knowledge and attitude regarding prevention and care of pressure ulcer. According to the KAP model, one factor that affects attitudes is a knowledge-base in a specific area. Subsequently, the findings of this study support the KAP model. This may be because caregivers' attitudes were influenced by age group, educational status and relationship between caregiver and patient. A similar study in Pakistan, demonstrated that poor or appropriate knowledge was significantly associated with development of pressure ulcer where level of knowledge was based on the training and occupation of the participants. Meanwhile, attitude and practice were also significantly associated with the increased level of knowledge (Zeb et al., 2015).

It showed that the caregivers who were wife of the patient and in the active phase of life and with higher education demonstrated positive attitude. Therefore, knowledge in itself is related to caregivers' development of attitudes. According to the KAP model, changes in the knowledge and attitude of individuals can affect practice. In this regard, caregivers need further continuing education and training programs regarding prevention and care of pressure ulcer that could influence positive attitude; ultimately, leading to effective practice towards prevention and care of pressure ulcer.

Previous study showed the relationship was demonstrated between knowledge and Attitude but not with the practice. The high level of knowledge show a positive attitude, while there was no relation between the knowledge and practice score (Al-Othman et al., 2018). There was a moderate, significant positive correlation between knowledge and practice regarding prevention and care of pressure ulcer among the caregivers. These findings supports the KAP model in which practice is influenced by knowledge. One of the possible reason for this, because the caregivers practice were influenced by gender and educational status. Very high practice (62.5%) was demonstrated by the females while, (70.8%) of the female caregivers were having high knowledge. It was also found that caregivers with higher qualifications showed very high level of practice. Therefore, practice also depends on the level of knowledge. One of the study also revealed that caregivers had unsatisfactory knowledge and inadequate performance where training and educational program enhances knowledge and practice of caregivers (Mersal, 2014). However, there was a little and non-significant relationship between attitude and practice regarding prevention and care of pressure ulcer. This relationship was in contrast with the KAP model. The KAP model suggests that if attitudes developed, they would reflect on practice. Hence, in this study, caregivers' practice was not reflected by their attitude.

CHAPTER 6 CONCLUSION

6.1 Introduction

Conclusion refers to a judgment or result that is formed after the completion of research. This chapter concludes the current study findings. **Section 6.2** gives a brief explanation on the results and analysis of the current study**. Section 6.3** provides a recommendation to improve the knowledge, attitude and practice of caregivers towards PU in SCI patients, while **section 6.4** describes the strengths and limitations of this study. **Section 6.5** provide suggestions for conducting the future research.

6.2 Conclusion

The level of caregivers' knowledge was at moderate level regarding prevention and care of pressure ulcer, the level of caregivers' attitude was at a neutral level, and the level of caregivers' practice was at a moderate level. Thus, it is concluded that caregivers have lack of sufficient knowledge and are compelled for patient care against their interest also their practice was not very satisfactory. There was a positive significant relationship between caregivers knowledge and attitude ($r = 0.30$, $p < 0.01$), and between knowledge and practice ($r= 0.37$, $p < 0.01$) regarding prevention and care of pressure ulcer. In contrast, no correlation existed between caregivers attitude and practice ($r= 0.12$, $p > 0.10$) regarding prevention and care of pressure ulcer. Also, the relationship of KAP with socio-demographic data demonstrated that educational status and relationship between caregiver and patient showed significant relationship with KAP whereas, age group had significant effect on knowledge and attitude level. Simultaneously, gender revealed relation with the practice level. Therefore, it is concluded that the quality of pressure ulcer care depends on the relationship between caregiver and SCI patient.

6.3 Recommendation

It is recommended that caregivers need up-dated knowledge and information about prevention and care of pressure ulcer in order to improve their practice. Although the attitude level was neutral and the practice level was moderate, the knowledge level was also moderate. These findings indicated that attitudes are important factors in relation to practice on pressure ulcer prevention. Following recommendations are put forward to improve caregivers' knowledge, attitude, and practice regarding the prevention and care of pressure ulcers:

- To improve the knowledge, attitude and practices towards prevention and care of pressure ulcer, the caring behaviors among family caregivers of the patients with bedsores should be improved. It is necessary to strengthen their perception of the severity and susceptibility of pressure ulcer and thereby improve their caring behaviors and promote patients recovery.
- Caregiving is a difficult job especially for a long term and caregivers start feeling psychological stress. Therefore, if adequate knowledge is provided to care givers it will assist them to cope with the stress and enhance the quality of their life and their patients.
- Promoting a positive attitude and addressing personal and behavioral factors are therefore important for proper care of the individual.
- If adequate knowledge is provided to care givers, then it will assist them to cope with the stress and develop positive attitude towards pressure ulcer care which enhance the quality of life of themselves and their patients.
- Special attention needs to be paid to improving the support systems for persons with SCI in the acute rehabilitation and reintegration phases of care in Bangladesh.

6.4 Strengths and Limitations of the Study

Strengths of the Study

- The major strength of this research lies in the fact that it has attempted to assess caregivers' knowledge, attitude, and practice at CRP, in Bangladesh. Thus, it can be first in the country.
- This exploration of the current situation of caregivers' knowledge, attitude, and practice for prevention and care of pressure ulcer could provide baseline data for the further improvement of pressure ulcer care in Bangladesh.

Limitations of the Study

- The main limitation was absence of a standard questionnaire to examine caregiver's knowledge, attitude and practice.
- Another limitation was the generalizability of the findings because this study was conducted in one rehabilitation center. The findings may not be generalized to other rehabilitation centers.
- No enough literature was available to discuss in national context due to lack of researches in this area in Bangladesh.

6.5 Suggestions for future research

This study presents the findings of knowledge, attitude and practice of caregivers towards prevention and care of pressure ulcer in a rehabilitation setting. However, the survival rate of patients with SCI after discharge from the center seen to be less than the western countries. In community settings, the knowledge, attitude and practice of the caregivers towards pressure ulcer may be different. Therefore, I suggest to conduct the study of KAP among caregivers towards prevention and care of pressure ulcer in spinal cord injury patients, in the community to reveal the findings related to the prevention and care of pressure ulcer at both levels.

REFERENCES

Al-othman, A. M., Alatawi, F. H., & Alshaikhi, O. M. (2018). Assessment of Knowledge , Attitude and Practice towards Cervical-Spinal Injury Among Adults in Dammam City , 2017, *70*(January), 918–923. https://doi.org/10.12816/0044331.

Baron, J., Swaine, J., Presseau, J., Aspinall, A., Jaglal, S., White, B., … Grimshaw, J. (2016). Self-management interventions to improve skin care for pressure ulcer prevention in people with spinal cord injuries: A systematic review protocol. *Systematic Reviews*, *5*(1), 1–8. https://doi.org/10.1186/s13643-016-0323-4.

Bates-Jensen, M.B., Guihan, M., Garber, L.S., Chin, S.A. & Burns, P.S. (2008). Characteristics of Recurrent Pressure Ulcers in Veterans With Spinal Cord Injury. *The Journal of Spinal Cord* Medicine, 32(1):34–42.

Byrne, W.D. & Salzberg, A.C. (1996). Major risk factors for pressure ulcers in the spinal cord disabled: a literature review. *Spinal Cord*, 34, 255-263. Retrieved from: https://www.researchgate.net/publication/14243740.

Caliri, M. H. L. (2005). Spinal cord injury and pressure ulcers. *Nursing Clinics of North America*, *40*(2), 337–347. https://doi.org/10.1016/j.cnur.2004.09.009.

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.

Elliott, R.T. & Berry, W.J. (2009). Brief Problem-Solving Training for Family Caregivers of Persons With Recent-Onset Spinal Cord Injuries: A Randomized Controlled Trial. *JOURNAL OF CLINICAL PSYCHOLOGY*, Vol. 65(4): 406-422. Retrieved from http://dx.doi.org/ 10.1002/jclp.20527.

Eljedi, A., El-Daharja, T. & Dukhan, N. (2015). Effect of an educational program on a family caregiver's prevention and management of pressure ulcers in bedridden patients after discharge from hospitals in Palestine. *International Journal of Medical Science and Public Health.* Vol. 4(5). Retrieved from http://dx.doi.org/10.5455/ijmsph.2015.20012015120.

El-Daharja, M.T. (2009). Effectiveness of Family Training on Prevention of Pressure Ulcers among Bed-Ridden Patients after Discharge from EL-Wafa Medical Rehabilitation Hospital. The Islamic University – Gaza, Deanery of Higher Studies, Faculty of Education.

Gorecki, C., Brown, M.J., Nelson, A.E., Briggs, M., Schoonhoven, L., Dealey, C., … Nixon, J. (2009). Impact of Pressure Ulcers on Quality of Life in Older Patients: A Systematic Review. *The American Geriatrics Society,* 57:1175–118. Retrieved from http://dx.doi.org/ 10.1111/j.1532-5415.2009.02307.x.

Henzel, K.M., Bogie, M.K., Guihan, M. & Chester, H. (2011). Pressure ulcer management and research priorities for patients with spinal cord injury: Consensus opinion from SCI QUERI Expert Panel on Pressure Ulcer Research Implementation. *JRRD,* Vol. 48(3). Retrieved from http://dx.doi.org/10.1682/JRRD.2011.01.0011.

Hopkins, A., Dealey, C., Bale, S., Defloor, T., & Worboys, F. (2006). Patient stories of living with a pressure ulcer. *Journal of Advanced Nursing*, *56*(4), 345–353. https://doi.org/10.1111/j.1365-2648.2006.04007.x

Hossain, S.M., Rahman, A.M., Herbert, D.R., Quadir, M.M., Bowden. L.J. & Harvey, A.L. (2016). Two-year survival following discharge from hospital after spinal cord injury in Bangladesh, 54:132-136. Retrieved from http://dx.doi.org/:10.1038/sc.2015.92.

Hossain, M. S., Rahman, M. A., Bowden, J. L., Quadir, M. M., Herbert, R. D., & Harvey, L. A. (2016). Psychological and socioeconomic status, complications and quality of life in people with spinal cord injuries after discharge from hospital in Bangladesh: A cohort study. *Spinal Cord*, *54*(6), 483–489. https://doi.org/10.1038/sc.2015.179.

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). https://doi.org/10.1136/bmjopen-2015-010350.

Islam, S.M. (2010). Nurses' Knowledge, Attitude, and Practice Regarding Pressure Ulcer Prevention for Hospitalized Patients at Rajshahi Medical College Hospital in Bangladesh. Prince of Songkla University.

Islam, S., Sae-Sia, W., & Khupantavee, N. (2010). Knowledge, attitude and practice on pressure ulcer prevention among nurses in Bangladesh. *2nd International Conference on Humanities and Social Sciences,* 1–10.

Jahan. S. (2006). Prevalence of pressure sore among the spinal cord injury patients at CRP. Faculty of Medicine, University of Dhaka.

Kaddourah, B., Abu-Shaheen, K.A. & Al-Tannir, M. (2016). Knowledge and attitudes of health professionals towards pressure ulcers at a rehabilitation hospital: a cross-sectional study. *BMC Nursing*, 15:17. Retrieved from http://dx.doi.org/ 10.1186/s12912-016-0138-6.

Källman, U., & Suserud, B.-O. (2009). Knowledge, attitudes and practice among nursing staff concerning pressure ulcer prevention and treatment - a survey in a Swedish healthcare setting. *Scandinavian Journal of Caring Sciences*, *23*(2), 334–341. https://doi.org/10.1111/j.1471-6712.2008.00627.x

Kashif, M. (2015). Knowledge and Attitudes on Pressure Ulcer Prevention Among Nurses Working in Neurological ... the Effectiveness of Structured Aerobic Exercises for Glycaemic Control in Patients With Knowledge and Attitudes on Pressure Ulcer Prevention Among Nurses Workin, (August 2016).

Lala, D., Dumont, F. S., Leblond, J., Houghton, P. E., & Noreau, L. (2014). Impact of pressure ulcers on individuals living with a spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, *95*(12), 2312–2319. https://doi.org/10.1016/j.apmr.2014.08.003.

Lee, W.K., Choi, J.S., Kim, B.S., Lee, H.J. & Lee, J.S. (2015). A Survey of Caregivers' Knowledge About Caring for Stroke Patients. *Annals of Rehabilitation Medicine,* 39(5):800-*815.* Retrieved from http://dx.doi.org/ 10.5535/arm.2015.39.5.800.

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. Retrieved from http://dx.doi.org/10.1038/sc.2012.158.

Manns, PJ. & May, LA. (2007). Perceptions of issues associated with the maintenance and improvement of long-term health in people with SCI. *Spinal Cord*, 45:411–419. Retrieved from http://dx.doi.org/10.1038/sj.sc.3101973.

Mersal, A.F. (2014). Caregivers' Knowledge and Practice Regarding Prevention of Immobilization Complications in El-demerdash Hospital Cairo Egypt. *American Journal of Research Communication*, Vol. 2(3). Retrieved from: https://www.usa-journals.com.

Moore, Z. (2004). Pressure ulcer prevention: nurses' knowledge, attitudes and behaviour. *Journal of Wound Care*, *13*(8), 330–334. https://doi.org/10.12968/jowc.2004.13.8.26655.

Moore, Z., & Price, P. (2004). Nurses' attitudes, behaviors, and perceived barriers towards pressure ulcer prevention. *J Clin Nurs* ;13:942-52.

Munce, EP.S., Webster, F., Fehlings, G.M., Straus, E.S., Jang, E. & Jaglal, B.S. (2014). Perceived facilitators and barriers to self-management in individuals with traumatic spinal cord injury: a qualitative descriptive study. *BMC Neurology*, 14:48. Retrieved from: http://www.biomedcentral.com/1471-2377/14/48.

National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Quick Reference Guide. Emily Haesler (Ed.). Cambridge Media: Perth, Australia; 2014.

Nogueira, P. C., Rabeh, S. A. N., Caliri, M. H. L., & Haas, V. J. (2013). Cuidadores de indivíduos com lesão medular: sobrecarga do cuidado. *Revista Da Escola de Enfermagem Da USP*, *47*(3), 607–614. https://doi.org/10.1590/S0080-623420130000300012.

Nulle, A., Tjurina, U., Erts, R., & Vetra, A. (2017). A profile of traumatic spinal cord injury and medical complications in Latvia. *Spinal Cord Series and Cases*, *3*(1), 17088. https://doi.org/10.1038/s41394-017-0002-2.

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*, 14:34. Retrieved from http://dx.doi.org/10.1186/s12912-015-0076-8.

Oderud, T. (2014). Surviving spinal cord injury in low income countries. *African Journal of Disability*, *3*(2), 1–9. https://doi.org/10.4102/ajod.v3i2.80.

Otaghsara, S. M. T., Matin, M., Latifi, S., Javidan, A. N., & Koushki, D. (2014). Depressive Disorders and Emotional Status in Caregivers of Spinal Cord Injured Individuals: A Referral Center Report. *Archives of Neuroscience*, *1*(3), 1–8. https://doi.org/10.5812/archneurosci.16246.

Park-lee, E. & Caffrey, C. (2004). Pressure Ulcers Among Nursing Home Residents: United States. National nursing home survey, (PHS) 2009–1209. Retrieved from: http://www.cdc.gov/nchs.

Poudyal, S. & Neupane, M. L. (2014). Original Research Article 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.

Quadir, M.M., Sen, K., Sultana, R.M., Ahmed, S.M., Taoheed, F., Andalib, A., … Arafat, Y. SM. (2017). Demography, Diagnosis and Complications of Spinal Cord Injury Patients in a Rehabilitation Center of Bangladesh. *International Journal of Neurorehabilitation*, 4:1. Retrieved from http://dx.doi.org/ 10.4172/2376-0281.1000244.

Razzak, A., Helal, S. U., & Nuri, R. P. (2011). Life Expectancy After Spinal Cord Injury In a Developing Country-A Retrospective Study At CRP, Bangladesh. *Disability, CBR & Inclusive Development*, *22*(2), 114–123. https://doi.org/10.5463/dcid.v22i2.34.

Saini, P., Sharma, M., & Kaur, G. (2017). A study to assess the effectiveness of individualized teaching programme on practices of caregivers regarding care of pressure points in immobilized patients admitted in selected hospital, *3*(4), 457–461.

Schottler, J., Vogel, L., Chafetz, R., & Mulcahey, M. J. (2009). Patient and caregiver knowledge of autonomic dysreflexia among youth with spinal cord injury. *Spinal Cord*, *47*(9), 681–686. https://doi.org/10.1038/sc.2009.12.

Scovil, C. Y., Ranabhat, M. K., Craighead, I. B., & Wee, J. (2012). Follow-up study of spinal cord injured patients after discharge from inpatient rehabilitation in Nepal in 2007. *Spinal Cord*, *50*(3), 232–237. https://doi.org/10.1038/sc.2011.119.

Sharma, U., Kaur, S. & Singh, A. (2013). Knowledge, Beliefs and Practices of Caregivers Regarding Home Based Bedsore Care in Chandigarh, North India. *JPostgrad Med Edu Res,* 47(3):138-143. Retrieved from http://dx.doi.org/10.5005/jp-journals-10028-1071.

Sharma, U., Kaur, S., & Singh, A. (2011). Knowledge , Beliefs and Practices of Caregivers Regarding Home Based Bedsore Care in Chandigarh , North India, (November), 138–143. https://doi.org/10.5005/jp-journals-10028-1071.

Singh, A., Tetreault, L., Kalsi-Ryan, S., Nouri, A. & Fehlings, G.M. (2014). Global prevalence and incidence of traumatic spinal cord injury. *Clinical Epidemiology*,6:309–331. . Retrieved from http://dx.doi.org/10.2147/CLEP.S68889.

Uba, M.N., Alih, F.I., Kever, R.T. & Lola, N. (2015). Knowledge, attitude and practice of nurses toward pressure ulcer prevention in University of Maiduguri Teaching Hospital, Borno State, North-Eastern, Nigeria. *International Journal of Nursing and Midwifery*, Vol.7(4),54-60. Retrieved from http://dx.doi.org/10.5897/IJNM2014.0155.

Vasiliadis, V.A. (2012). Epidemiology map of traumatic spinal cord injuries: A global overview, *International Journal of Caring Sciences*, Vol. 5(3). Retrieved from: www.inernationaljournalofcaringsciences.org.

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. Retrieved from http://dx.doi.org/ 10.1038/sj.sc.3101893.

Yang, R., Guo, L., Wang, P., Huang, L., Tang, Y., Wang, W., … Shen, H. (2014). Epidemiology of spinal cord injuries and risk factors for complete injuries in Guangdong, China: A retrospective study. *PLoS ONE*, *9*(1), 1–10. https://doi.org/10.1371/journal.pone.0084733.

Zakrasek, C.E., Creasey, G. & Crew, D.J. (2015). Pressure ulcers in people with spinal cord injury in developing nations. *Spinal Cord*, 53:7–13. Retrieved from http://dx.doi.org/10.1038/sc.2014.179.

Zeb, A., Ilyas, M.S., Kashif, M., KompaL, R., Darain, H. & Bahadar, S. (2015). Knowledge and attitudes on pressure ulcer prevention among nurses working in neurological departments in tertiary care hospitals of Peshawar: a multicentre study. *Ann Allied Health Sci.,* 1(2):63-67. Retrieved from: https://www.researchgate.net/publication/307145138.

Zheng, Q., Tian, Q., Hao, C., Gu, J., Tao, J., Liang, Z., Chen, X., Fang, J., Ruan, J., Ai, Q. & Hao, Y. (2016). Comparison of attitudes toward disability and people with disability among caregivers, the public, and people with disability: findings from a cross-sectional survey. *BMC Public Health,* 16:1024. Retrieved from http://dx.doi.org/10.1186/s12889-016-3670-0.

ANNEX I: Informed consent (English)

Information Sheet & Consent Form

Title: Knowledge, Attitude and Practice (KAP) among Caregivers towards Pressure Ulcer in Spinal Cord Injury patients at Rehabilitation center in Bangladesh.

Dear Participant

Greetings,

I Niraj Singh Tharu a student of Dhaka University, currently pursuing Master degree in Rehabilitation Science at Bangladesh Health Professional Institute and conducting a master thesis under the supervision of Professor Dr. Mohammad Alamgir Kabir, at Centre for the Rehabilitation of the Paralysed (CRP). I would like to request you to participate in the research study to find out about the Knowledge, Attitude and Practice among Caregivers towards Pressure Ulcer in Spinal Cord Injury patients at Rehabilitation center in Bangladesh. If you participate in the research study you will be asked to fill in the Questionnaire that consists of several questions. The research will be directly beneficial for the spinal cord injury patients to prevent them from pressure ulcer and increase their survival rate and also improvement of rehabilitation services delivered through CRP. 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.

Agreeing to this study gives researcher permission to use the information given by you and it is mandatory for the research. The information will be used but the information that can identify you will not be disclosed or published. Participating in the study is completely voluntary and you may chose not to participate as well.

I have read the above information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

(Thumb print for illiterate participant)

Name of Participant_____

Date of Interview_____

Signature of Participant _____

Right Thumb	Left Thumb

ANNEX II: Informed consent (Bengali)

সম্মতি পত্র

আসসালামু আলাইকুম/নমস্কার,

আমি নিরাজ সিং থারু এম.এস.সি. রিহ্যাবিলিটেশন সায়েন্স, বাংলাদেশ হেলথ প্রফেশন্স ইন্সটিটিউট (বি.এইচপিআই), ঢাকা বিশ্ববিদ্যালয়ের একজন ছাত্র। স্নাতকোত্তর ডিগ্রী প্রাপ্তির জন্য আমার একটি গবেষণামূলক প্রকল্প পরিচালনা করা প্রয়োজন এবং আমার গবেষণা প্রকল্পটি হচ্ছে **"Knowledge, Attitude and Practice (KAP) among Caregivers towards Pressure Ulcer in Spinal Cord Injury patients at Rehabilitation center in Bangladesh."** যেটি আমি করছি জনাব আলমগীর কবিরের তত্ত্বাবধানে।এর জন্য আমি একটি জরিপ সঞ্চালন করছি সি আর পি তে মেরুরজ্জুতে আঘাতপ্রাপ্ত রোগীদের ঘা এর চিকিৎসা নিতে আসা রোগীদের উপরে। এই গবেষণা প্রকল্পটি প্রধানত মেরুরজ্জুতে আঘাতপ্রাপ্ত রোগীদের ঘা প্রতিরোধ ও ঘা এর যত্ন এর প্রতি জ্ঞান,মনোভাব, এবং অনুশীলন পরিচর্যাকারী/শুশ্রুষাকারীদের মাঝে।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 অনুরধ করবো। আপনার যদি কোন অনুসন্ধান থাকে তাহলে কোন সংকোচ ছাড়াই জিজ্ঞাসা করতে পারেন। এই অধ্যয়নে আপনার অংশগ্রহণ স্বেচ্ছাকৃত এবং যে কোন নেতিবাচক প্রভাবে আপনি এই অধ্যয়ন থেকে নিজেকে প্রত্যাহার করে নিতে পারবেন। সাক্ষাতকার নিতে ৩০-৪০ মিনিট লাগবে। আপনি প্রত্যাহার করতে পারবেন এবং পছন্দ অনুযায়ী প্রশ্নের উত্তর নাও দিতে পারবেন।

অংশগ্রণকারীর নাম.....

সাক্ষাতকারের তারিখ .....

অংশগ্রণকারীর স্বাক্ষর .....

নিরক্ষর অংশগ্রণকারীদের জন্য বৃদ্ধাঙ্গুলির ছাপ

ডান	বাম

ANNEX III: (English)

Questionnaire

Name of participant: Date:

Cell phone no:

Section 1: Socio-Demographic Data of caregiver

S.N.	Question	Coding Category	Code
1.1	Age	…….years	
1.2	Gender	1=Male 2=Female	☐
1.3	Educational status	1=No formal education 2=Primary education 3=Secondary education 4=Higher secondary education 5=Graduate & above	☐
1.4	Marital Status	1=Unmarried 2=Married 3=Widowed 4=Separated	☐
1.5	Occupational status	1=Housewife 2=Agriculture 3=Service 4=Business 5=Student 6=Factory worker 7=Others (Specify)……..	☐
1.6	Caregiver residence status	1=Lives Together with patient 2=Lives separately from patient	☐
1.7	Living area	1= Rural 2= Semi-urban 3= Urban	☐
1.8	Relationship between caregiver and patient	1=Mother 2=Father 3=Wife 4=Husband 5=Sister 6=Brother 7=Others (Specify)…….	☐

Section 2: Questionnaire for knowledge

S.N.	Question	Coding Category	Code
2.1	The patient on a wheel chair should shift their weight approximately every 15 minutes while sitting in a wheelchair.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.2	Turn or reposition patients in bed at least every 2 hours.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.3	Repositioning is not necessary to be performed on a bed ridden patient when a special mattress is applied.	1=Correct 2=Partially Correct 3=Incorrect	☐
2.4	When you are assisting a patient with changing position, move the patient carefully so you do not create friction of the skin.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.5	Use of proper transfer techniques can reduce friction of the skin while transferring.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.6	To prevent pressure ulcer, a bedridden patient should be dragged slowly for changing the position.	1=Correct 2=Partially Correct 3=Incorrect	☐
2.7	The patient should ensure maximum mobility according to their capabilities.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.8	Avoid applying any lotion to bony prominences or reddened areas, as this may soften or irritate the skin increasing breakdown.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.9	While dressing the wound of the patient, hand washing is not necessary if the gloves are worn.	1=Correct 2=Partially Correct 3=Incorrect	☐
2.10	The most risky areas to pressure ulcer development such as upper back, elbows, buttocks, heels, etc. should be checked every day.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.11	Avoid overstretching of skin while the patient are repositioned or transferred.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.12	Massage is recommended for reddened body areas in bed ridden patients.	1=Correct 2=Partially Correct 3=Incorrect	☐
2.13	Use pillow or cushions to keep bony prominences such as knees and ankles, from direct contact with each other.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.14	Assess weight changes of the patient over time.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.15	The patient on wheel chair have lesser chance of developing pressure ulcer.	1=Correct 2=Partially Correct 3=Incorrect	☐

2.16	Ensure that the patient is well-nourished.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.17	Usually drinking 8 glasses of water everyday will be sufficient.	3=Correct 2=Partially Correct 1=Incorrect	☐
2.18	The overweight patients should not be given proper balanced diet as it will increase their weight.	1=Correct 2=Partially Correct 3=Incorrect	☐

Section 3: Questionnaire for attitude

S.N.	Question	Coding Category	Code
3.1	Aware about awful consequences of pressure ulcer.	5= Strongly agree 4= Agree 3= Neither Agree nor Disagree 2= Disagree 1= Strongly Disagree	☐
3.2	All patients are at risk for developing pressure ulcer.	5= Strongly agree 4= Agree 3= Neither Agree nor Disagree 2= Disagree 1= Strongly Disagree	☐
3.3	If patient have pressure ulcer it lacks your interest in patient care.	1= Strongly agree 2= Agree 3= Neither Agree nor Disagree 4= Disagree 5= Strongly Disagree	☐
3.4	Pressure ulcer care does not need extra attention if patient is in hospital or rehabilitation center.	1= Strongly agree 2= Agree 3= Neither Agree nor Disagree 4= Disagree 5= Strongly Disagree	☐
3.5	Feel tired and irritated to change the patient's position every two hours.	1= Strongly agree 2= Agree 3= Neither Agree nor Disagree 4= Disagree 5= Strongly Disagree	☐
3.6	Long term care to the patient is difficult.	1= Strongly agree 2= Agree 3= Neither Agree nor Disagree 4= Disagree 5= Strongly Disagree	☐
3.7	Patient care interrupts your personal, social and job life.	1= Strongly agree 2= Agree 3= Neither Agree nor Disagree 4= Disagree 5= Strongly Disagree	☐

3.8	In comparison with other areas of patient care, pressure ulcer care is a low priority for you.	1= Strongly agree 2= Agree 3= Neither Agree nor Disagree 4= Disagree 5= Strongly Disagree	☐
3.9	It's your responsibility to take care of patient on your own.	5= Strongly agree 4= Agree 3= Neither Agree nor Disagree 2= Disagree 1= Strongly Disagree	☐
3.10	Patient care, children responsibility, job and household work all together are not possible for you.	1= Strongly agree 2= Agree 3= Neither Agree nor Disagree 4= Disagree 5= Strongly Disagree	☐
3.11	Pressure ulcer prevention is time consuming for you to carry out.	1= Strongly agree 2= Agree 3= Neither Agree nor Disagree 4= Disagree 5= Strongly Disagree	☐
3.12	Less interested in pressure ulcer care than other aspects of patient care.	1= Strongly agree 2= Agree 3= Neither Agree nor Disagree 4= Disagree 5= Strongly Disagree	☐

Section 4: Questionnaire for practice

S.N.	Question	Coding Category	Code
4.1	Encourage and assist the patient to eat well, drink sufficient fluid, and exercise several times daily.	3=Always 2=Sometimes 1=Never	☐
4.2	Use pillows and cushions to reduce pressure on existing pressure ulcers or risky skin areas.	3=Always 2=Sometimes 1=Never	☐
4.3	Check for incontinence a minimum of every two hours.	3=Always 2=Sometimes 1=Never	☐
4.4	Do not massage or forcefully rub skin that is at risk of pressure ulcers.	3=Always 2=Sometimes 1=Never	☐
4.5	Clean the skin immediately after toileting.	3=Always 2=Sometimes 1=Never	☐
4.6	Use skin moisturizers daily on dry skin.	3=Always 2=Sometimes 1=Never	☐
4.7	Consulting a therapist or a doctor noticing any changes on the skin.	3=Always 2=Sometimes 1=Never	☐

4.8	Keep the patient bed free form crumbles and wrinkles, both of which can irritate the skin.	3=Always 2=Sometimes 1=Never	☐
4.9	Encourage patient involvement in activities.	3=Always 2=Sometimes 1=Never	☐
4.10	Provide clothes made of cotton that is light and soft in texture.	3=Always 2=Sometimes 1=Never	☐
4.11	Use proper transfer technique to move the patient without sliding across bed or chair surfaces.	3=Always 2=Sometimes 1=Never	☐
4.12	Relieve pressure from the heels, when the patient is in bed by positioning pillows or cushions.	3=Always 2=Sometimes 1=Never	☐
4.13	Consider wiping the patient skin sites by using a towel, without rubbing the skin.	3=Always 2=Sometimes 1=Never	☐
1.14	Use a pressure redistributing chair cushion for patients sitting in wheelchair.	3=Always 2=Sometimes 1=Never	☐
4.15	Do not massage bony prominences or reddened areas of skin.	3=Always 2=Sometimes 1=Never	☐
4.16	Inspect the skin at least daily for signs of pressure ulcer.	3=Always 2=Sometimes 1=Never	☐

ANNEX IV: (English & Bengali)

Questionnaire (প্রশ্নপত্র)

Name of participant (অংশগ্রহনকারীর নাম): Date (তারিখ):

Cell phone no. (মোবাইল নাম্বার):

Section 1(ভাগ ১)**: Socio-Demographic Data of Caregiver** (পরিচর্যাকারীর আর্থজনতাত্ত্বিক তথ্য)

S.N.	Question(প্রশ্ন)	Coding Category(সারসংক্ষেপের বিভাগ)	Code(কোড)
1.1	Age(বয়স)	…….years(বছর)	
1.2	Gender(লিংগ)	1=Male(পুরুষ) 2=Female(মহিলা)	☐
1.3	Educational status(শিক্ষাগত যোগ্যতা)	1=No formal education(কোন প্রাতিষ্ঠানিক শিক্ষা নেই) 2=Primary education(প্রাথমিক) 3=Secondary education (মাধ্যমিক) 4=Higher secondary education (উচ্চমাধ্যমিক) 5=Graduate & above (স্নাতক অথবা এর উপরে)	☐
1.4	Marital Status(বৈবাহিক অবস্থা)	1=Unmarried(অবিবাহিত) 2=Married(বিবাহিত) 3=Widowed(বিধবা) 4=Separated (আলাদা)	☐
1.5	Occupational status(কাজের ধরন)	1=Housewife(গৃহিনী) 2=Agriculture(কৃষিকাজ) 3=Service(চাকুরী) 4=Business(ব্যবসা) 5=Student(ছাত্র) 6=Factory worker(কারখানার শ্রমিক) 7=Others (Specify) অন্যান্য (উল্লেখ করুন)……..	☐
1.6	Caregiver residence status (পরিচর্যাকারীর বাসস্থানের অবস্থা)	1=Lives Together with patient(রোগীর সাথে থাকা হয়) 2=Lives separately from patient(রোগীর থেকে আলাদা থাকা হয়)	☐
1.7	Living area(থাকার জায়গা)	1= Rural(গ্রাম) 2= Semi-urban(আধা শহর) 3= Urban(শহর)	☐

1.8	Relationship between caregiver and patient (রোগী ও পরিচর্যাকারীর মাঝে সম্পর্ক)	1=Mother (মা) 2=Father (বাবা) 3=Wife (স্ত্রী) 4=Husband (স্বামী) 5=Sister (বোন) 6=Brother (ভাই) 7=Others (Specify) অন্যান্য (উল্লেখ করুন)…….	☐

Section 2(ভাগ ২)**: Questionnaire for Knowledge** (জ্ঞানের জন্য প্রশ্নপত্র)

S.N.	Question(প্রশ্ন)	Coding Category (সারসংক্ষেপের বিভাগ)	Code(কোড)
2.1	The patient on a wheel chair should shift their weight approximately every 15 minutes while sitting in a wheelchair. (হুইলচেয়ার ব্যবহার করা রোগীকে আনুমানিক ১৫মিনিট পরপর হুইলচেয়ার থেকে ওজন তোলা উচিৎ)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.2	Turn or reposition patients in bed at least every 2 hours. **(**অন্ততপক্ষে ২ ঘন্টা পরপর ঘোরা অথবা স্থানান্তরিত করা উচিৎ)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.3	Repositioning is not necessary to be performed on a bed ridden patient when a special mattress is applied.(বিছানায় বিশেষ তোষক ব্যবহার করলে স্থানান্তর করার প্রয়োজন নেই)	1=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 3=Incorrect(সত্য নয়)	☐
2.4	When you are assisting a patient with changing position, move the patient carefully so you do not create friction of the skin.**(**যখন আপনি রোগীকে স্থানান্তরে সাহায্য করছেন,সাবধানে স্থানান্তর করে থাকেন যেন আপনি রোগীর ত্বকে ঘর্ষন সৃষ্টি না করেন)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.5	Use of proper transfer techniques can reduce friction of the skin while transferring. (যথাযথভাবে স্থানান্তরের প্রণালি ত্বকে ঘর্ষন কমাতে পারে)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.6	To prevent pressure ulcer, a bedridden patient should be dragged slowly for changing the position.(ঘা প্রতিরোধের জন্য শয্যাশায়ী রোগীকে ধীরে ধীরে টানতে হয় স্থান পরিবর্তনের জন্য)	1=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 3=Incorrect(সত্য নয়)	☐
2.7	The patient should ensure maximum mobility according to their capabilities.(রোগীকে তার সক্ষমতার অনুযায়ী সর্বোচ্চ নড়াচড়া করা উচিৎ)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐

2.8	Avoid applying any lotion to bony prominences or reddened areas, as this may soften or irritate the skin increasing breakdown. (হাড় উঁচু অথবা লাল হয়ে যাওয়া অংশগুলোতে যেকোন প্রকারের লোশন দেয়া থেকে বিরত থাকুন,যেহেতু এটা ত্বক নরম করে দিতে পারে অথবা ত্বকের যন্ত্রনা বাড়াতে পারে)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.9	While dressing the wound of the patient, hand washing is not necessary if the gloves are worn. (রোগীর ক্ষত ড্রেসিং করার সময় হাতের গ্লাভস পড়া থাকলে হ্যান্ড ওয়াশের প্রয়োজন নেই)	1=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 3=Incorrect(সত্য নয়)	☐
2.10	The most risky areas to pressure ulcer development such as upper back, elbows, buttocks, heels, etc. should be checked every day.(ঘা হবার জন্য ঝুকিপূর্ণ জায়গাগুলো যেমন পিঠ,কনুই,নিতম্ব,গোড়ালি ইত্যাদি নিয়মিত পরীক্ষা করা উচিৎ)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.11	Avoid overstretching of skin while the patient are repositioned or transferred.(রোগী স্থানান্তরের সময় রোগীর ত্বক অতিরিক্ত টানটান পরিহার করা হয়)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.12	Massage is recommended for reddened body areas in bed ridden patients.(শয্যাশায়ী রোগীর শরীরের লাল হয়ে যাওয়া অংশে মাসাজ পরামর্শ দেওয়া হয়েছে।)	1=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 3=Incorrect(সত্য নয়)	☐
2.13	Use pillow or cushions to keep bony prominences such as knees and ankles, from direct contact with each other.(বালিশ অথবা গদি ব্যবহার করুন হাড় উঁচু জায়গা যেমন হাটু এবং গোড়ালির সরাসরি সংস্পর্শ দূরে রাখতে)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.14	Assess weight changes of the patient over time. (রোগীর ওজন পরিবর্তন সময়ে সময়ে পরিমাপ করে থাকেন)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.15	The patient on wheel chair have lesser chance of developing pressure ulcer. (হুইলচেয়ার ব্যবহার করা রোগীদের ঘা হবার ঝুকি কম)	1=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 3=Incorrect(সত্য নয়)	☐
2.16	Ensure that the patient is well-nourished.(রোগী যথাযথ পুষ্টি পায় এই ব্যাপারে নিশ্চিত)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐
2.17	Usually drinking 8 glasses of water everyday will be sufficient.(নিয়মিত ৮গ্লাস পানি খাওয়া যথেষ্ট)	3=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 1=Incorrect(সত্য নয়)	☐

2.18	The overweight patients should not be given proper balanced diet as it will increase their weight.(ওজন বেশী থাকা রোগীদের সুষম খাদ্য দেওয়া উচিৎ নয় কারণ এটা ওজন বৃদ্ধি করে)	1=Correct(সত্য) 2=Partially Correct(আংশিক সত্য) 3=Incorrect(সত্য নয়)	☐

Section 3(ভাগ ৩)**: Questionnaire for Attitude** (মনোভাবের জন্য প্রশ্ন)

S.N.	Question(প্রশ্ন)	Coding Category(সারসংক্ষেপের বিভাগ)	Code(কোড)
3.1	Aware about awful consequences of pressure ulcer.(ঘা এর ভয়ংকর পরিণতি সম্পর্কে সচেতন)	5= Strongly Agree (অবশ্যই রাজি) 4= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 2= Disagree (রাজি না) 1= Strongly Disagree (একদমই রাজি না)	☐
3.2	All patients are at risk for developing pressure ulcer.(সকল রোগীই ঘা হবার ঝুকিতে রয়েছে)	5= Strongly Agree (অবশ্যই রাজি) 4= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 2= Disagree (রাজি না) 1= Strongly Disagree (একদমই রাজি না)	☐
3.3	If patient have pressure ulcer it lacks your interest in patient care.(যদি রোগীর ঘা হয় এটা রোগীর যত্ন নেবার আগ্রহ কমিয়ে দিবে)	1= Strongly Agree (অবশ্যই রাজি) 2= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 4= Disagree (রাজি না) 5= Strongly Disagree (একদমই রাজি না)	☐
3.4	Pressure ulcer care does not need extra attention if patient is in hospital or rehabilitation center.(যদি রোগী হাসপাতালে বা পুনর্বাসন কেন্দ্রে থাকে তাহলে রোগীর প্রতি অতিরিক্ত মনোযোগের প্রয়োজন নেই)	1= Strongly Agree (অবশ্যই রাজি) 2= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 4= Disagree (রাজি না) 5= Strongly Disagree (একদমই রাজি না)	☐
3.5	Feel tired and irritated to change the patient's position every two hours. (২ঘন্টা পর পর রোগীর অবয়াস্থান পরিবর্তন বিরক্তিকর ও কষ্টসাধ্য ব্যাপার)	1= Strongly Agree (অবশ্যই রাজি) 2= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 4= Disagree (রাজি না) 5= Strongly Disagree (একদমই রাজি না)	☐
3.6	Long term care to the patient is difficult. (দীর্ঘ সময় ধরে রোগীর সেবা করা কষ্টকর ব্যাপার)	1= Strongly Agree (অবশ্যই রাজি) 2= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 4= Disagree (রাজি না) 5= Strongly Disagree (একদমই রাজি না)	☐

3.7	Patient care interrupts your personal, social and job life.(রোগীর যত্ন নেওয়া আপনার ব্যক্তিগত,সামাজিক এবং চাকুরীর জীবন বাধাগ্রস্থ করে)	1= Strongly Agree (অবশ্যই রাজি) 2= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 4= Disagree (রাজি না) 5= Strongly Disagree (একদমই রাজি না)	☐
3.8	In comparison with other areas of patient care, pressure ulcer care is a low priority for you.**(**রোগীর অন্যান্য দিকের যত্নের তুলনায় ঘা এর যত্ন নেয়ার গুরুত্ব আপনার কাছে কম)	1= Strongly Agree (অবশ্যই রাজি) 2= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 4= Disagree (রাজি না) 5= Strongly Disagree (একদমই রাজি না)	☐
3.9	It's your responsibility to take care of patient on your own.(রোগীর যত্ন নেয়াটা আপনার নিজের দায়িত্ত)	5= Strongly Agree (অবশ্যই রাজি) 4= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 2= Disagree (রাজি না) 1= Strongly Disagree (একদমই রাজি না)	☐
3.10	Patient care, children responsibility, job and household work all together are not possible for you.(রোগীর পরিচর্যা,বাচ্চার দায়িত্ত,চাকুরী এবং বাসার কাজ সবকিছু আমার পক্ষে করা সম্ভব নয়)	1= Strongly Agree (অবশ্যই রাজি) 2= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 4= Disagree (রাজি না) 5= Strongly Disagree (একদমই রাজি না)	☐
3.11	Pressure ulcer prevention is time consuming for you to carry out.(ঘা প্রতি রোধের প্রক্রিয়া চাকিয়ে নেয়ে যাওয়া আপনার পক্ষে সময় ক্ষেপন কারী)	1= Strongly Agree (অবশ্যই রাজি) 2= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 4= Disagree (রাজি না) 5= Strongly Disagree (একদমই রাজি না)	☐
3.12	Less interested in pressure ulcer care than other aspects of patient care.(রোগীর অন্যান্য যত্নের তুলনায় রোগীর ঘা এর প্রতি কম আগ্রহী)	1= Strongly Agree (অবশ্যই রাজি) 2= Agree (রাজি) 3= Neither Agree nor Disagree (হ্যাঁ বা না কোনটাই না) 4= Disagree (রাজি না) 5= Strongly Disagree (একদমই রাজি না)	☐

Section 4(ভাগ ৪)**: Questionnaire for Practice** (অনুশীলনের জন্য প্রশ্ন)

S.N.	Question(প্রশ্ন)	Coding Category (সারসংক্ষেপের বিভাগ)	Code(কোড)
4.1	Encourage and assist the patient to eat well, drink sufficient fluid, and exercise several times daily. (রোগীকে উতসাহিত করি এবং সাহায্য করি ঠিকভাবে খেতে,পর্যাপ্ত পরিমানে পানি পান করতে এবং নির্দিষ্ট সময়ে ব্যায়াম করতে)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.2	Use pillows and cushions to reduce pressure on existing pressure ulcers or risky skin areas.(বালিশ এবং গদি ব্যবহার ঘা এর উপরে অথবা ঝুকিপূর্ণ স্থানে চাপ কমাতে)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.3	Check for incontinence a minimum of every two hours. (২ঘন্টা পরপর মূত্রের অনিয়ন্ত্রিয়নতা দেখা হয়)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.4	Do not massage or forcefully rub skin that is at risk of pressure ulcers.(ঘা হবার ঝুকিপূর্ণ ত্বকে মাসাজ অথবা জোরপূর্বক ঘষা হয় না)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.5	Clean the skin immediately after toileting.(পায়খানার পর দ্রুত ত্বক পরিষ্কার করুন)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.6	Use skin moisturizers daily on dry skin.(শুষ্ক ত্বক আদ্র রাখার ক্রিম ব্যবহার করা)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.7	Consulting a therapist or a doctor noticing any changes on the skin.(ত্বকে কোন পরিবর্তন দেখার সাথে সাথে ডাক্তার অথবা চিকিৎসকের সাথে যোগাযোগ করা)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.8	Keep the patient bed free form crumbles and wrinkles, both of which can irritate the skin.**(**রোগীর বিছানা ভেংগে যাওয়া অথবা কুচকে যাওয়া থেকে দূরে রাখুন কারণ উভয়ই ত্বকে জ্বালাতন করতে পারে)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.9	Encourage patient involvement in activities.(কাজে যুক্ত হতে রোগীকে উৎসাহিত করা)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.10	Provide clothes made of cotton that is light and soft in texture.(সুতি কাপড় সরবরাহ করুন যেটা গঠন বিন্যাসে হালকা এবং নরম)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.11	Use proper transfer technique to move the patient without sliding across bed or chair surfaces. (স্থানান্তরের প্রণালি যথাযথ ভাবে ব্যাবহার করুন বিছানা অথবা চেয়ারে গড়ানো পরিহার করতে)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐

4.12	Relieve pressure from the heels, when the patient is in bed by positioning pillows or cushions.**(**রোগী বিছানায় থাকার সময় বালিশের অথবা গদির অবস্থানের মাধ্যমে চাপ কমান)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.13	Consider wiping the patient skin sites by using a towel, without rubbing the skin.(রোগীর ত্বকে না ঘষে ত্বকের জায়গা গুলোতে আলতো ভাবে পরিষ্কার করতে বিবেচনা করুন)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
1.14	Use a pressure redistributing chair cushion for patients sitting in wheelchair.(হুইলচেয়ারে বসার জন্য চাপ বন্টনকারী গদি ব্যবহার করুন)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.15	Do not massage bony prominences or reddened areas of skin.(হাড় উঁচু জায়গা অথবা লাল হয়ে যাওয়া ত্বকে ম্যাসাজ করবেন না)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐
4.16	Inspect the skin at least daily for signs of pressure ulcer. (প্রতিদিন অন্তত পক্ষে ত্বক পরীক্ষা করুন ঘা এর লক্ষন দেখার জন্য)	3=Always (সবসময়) 2=Sometimes (মাঝে মাঝে) 1=Never (কখনোই নাই)	☐

ANNEX V: Permission letter

Permission Letter

Date: 04/01/2018

To

The Head of Department

Spinal Cord Injury Unit

Centre for the Rehabilitation of the Paralysed

Savar, Dhaka.

Subject: Permission for data collection from the caregivers of Spinal cord injury patients for a master thesis.

Dear Sir,

With due respect, I am Niraj Singh Tharu, 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 Master program. Hence, I have chosen a topic "Knowledge, Attitude and Practice (KAP) among Caregivers towards Pressure Ulcer in Spinal Cord Injury patients at Rehabilitation center in Bangladesh" for my research. As my research includes caregivers of spinal cord injury patients, I would like you to grant me the permission to collect data from the respective participants. Hereby I have enclosed the Institutional Review Board (IRB) clearance letter from the faculty of Rehabilitation Science.

May I therefore, hope that you would be kind enough to give me permission and oblige thereby.

Sincerely yours

Niraj Singh Tharu
M.Sc in Rehabilitation Science
BHPI, CRP, Savar, Dhaka

Allow for data collection at SCI unit.
04/01/2018
Muzaffor Hossain
Senior PT & Incharge SCI Unit
Physiotherapy Department
CRP, Savar, Dhaka-1343

Forwarded & Recommended for permission
04/01/2018
Muhammad Millat Hossain
Assistant Professor
Project & Course Coordinator
Dept. of Rehabilitation Science
BHPI CRP Savar, Dhaka-1343, Bangladesh

ANNEX VI: Approval letter

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

Ref. CRP-BHPI/IRB/12/17/182

Date: 20/12/2017

To
Niraj Singh Tharu
Part II, M.Sc. in Rehabilitation Science
Session: 2016-17, Student ID: 181160062
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal- "Knowledge, Attitude and Practice (KAP) among Caregivers towards Pressure Ulcer in Spinal Cord Injury patients at Rehabilitation center in Bangladesh" by ethics committee.

Dear Niraj Singh Tharu,

Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on 30/04/2017 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 and Bengali version)
3	Information sheet & consent form.

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

Millat Hossain

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