Faculty of Medicine

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Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge from Centre for the Rehabilitation of the Paralysed (CRP).

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"Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge from CRP".

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

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DECLERATION

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

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Acronyms

ASIA: American Spinal Injury Association

BHPI: Bangladesh Health Professions Institute

BMRC: Bangladesh Medical and Research Council

CRP: Centre for the Rehabilitation of the Paralszed

FIM: Functional Independence Measure

IMSOP: International Medical Society of Paraplegia

PU: Pressure Ulcer

SCI: Spinal Cord Injury

SCL: Spinal Cord Lesion

SPSS: Statistical Package of Social Science

US: United States

WC: Wheel chair

WHO: World Health Organization

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Abstract

Purpose: To assess Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge from CRP. Objective: The aim of this study was to describe Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge from CRP and find out the socio-demographic characteristics of traumatic paraplegic SCI patients with pressure ulcer. Methodology: The study design was cross – sectional. The sample size were 45 and Purposive sampling technique was used for sample selection from inpatient of Centre for the Rehabilitation of the Paralyzed (CRP) in Bangladesh which is the largest spinal cord injury rehabilitation centre in South Asia. Data was collected by modified questioner and it was analyzed by SPSS software version 16.0. Results .The study population consisted of 41 males (91.1%) and 4 (8.9%) females. Their age ranged from 10 to 75 years with a mean age of the patients were 32.51 years with standard deviation (±1.0725). Most of the patients were young age. All 45 patients had spinal cord lesions with pressure ulcer. National SCI statistical centre found that males accounts for 82% of all spinal cord injuries and females for 18%. Traumatic SCI is more common in persons younger than 40 years, non-traumatic SCI is more common in persons older than 40 years. Greater mortality is reported in the older patients with SCI (Dawodu, 2007). Male was predominantly higher than female. Majority of the patient were lives in rural area same situation also seen in India (Singh et al., 2003).The people of rural area are mostly poor and they are engage in risky work that may causing SCI. Farmer was the higher for traumatic spinal cord injury. Students was the second most common occupation where spinal cord injury was seen. More than 80% of the population lives in villages and 65% of the total labor forces are employed in agriculture (Hossain, 2001). The most common37.8% (n=17) impairment grading in ASIA scale was complete-A.

Approximately 40% of patients with spinal cord injury (SCI) present with complete SCI, 40% with incomplete injury, and 20% with either no cord or only root lesions (Rizollo et al.,2000).

CHAPTER –I: INTRODUCTION

1.1 Background

A pressure ulcer is an area of localized damage to the skin, muscle and/or underlying tissue, caused by shear, friction, or unrelieved pressure, usually over bony prominences (Nursing Clinical Practice Guideline, 2001). Pressure ulcers are common problems in healthcare system and produce a significant burden on patients, relatives and caregivers (Bours et al., 2002). Pressure ulcers (PrUs) are one of the major secondary complications of SCI and are a source of suffering for the patients and their care givers. These wounds are typically non-healing, resulting in a downward spiral of chronic inflammation, which can be a source of morbidity and even mortality in immobile populations(Singh et al., 2014).

Pressure sore can be defined as "area of localized damage to the skin and underlying tissue caused by pressure, shear, friction or a combination of these" (Conva Tec Inc, 2011). Pressures sours are a very common problem for individuals with restricted mobility. Despite the current treatment and prevention attempts, Pressure ulcers remain a serious medical problem commonly found among hospitalized individuals (Luidhardt, 2011).

Despite many advances in spine surgery and rehabilitation medicine, there remain significant morbidity and mortality associated with spinal cord injury (SCI). Even the seemingly simple problem of pressure ulcers (PUs) remains a common SCI complication(Zakrasek et al., 2014).

In those individuals who develop pressure sore, approximately 60% occur in the acute care setting – usually within the first two weeks of hospitalization .With the increased acuity of those admitted to hospital, it is estimated that 15% of elderly patients will develop pressure ulcers within the first week of hospitalization .In the long term care setting, pressure ulcers are most likely to develop within the first four weeks of admission (Registered Nurses' Association Of Ontario, 2005).

A lot of researches and clinical observations have demonstrated people sufferings from pressure sore which profound negative effect on general physical health, socialization, financial status, body image etc (Henzel et al., 2011). Many cross-sectional studies of subjects with SCI showed that the prevalence of pressure sore increased as time since injury increased. Neurologically impaired skin with long-term physiological and structural changes may play an important role in the development of pressure sore among the long standing SCI (Chen et al., 2005).

Pressure ulcers affect 3 million adults in the United States(Ulcer & Strategies, 2013). They have a major impact on health status, quality of life, and health care costs. Treatment of pressure ulcers is critical to promote healing and minimize the risk for complications. Treatment interventions include management of conditions that give rise to pressure ulcers (support surfaces and nutritional support), protection and promotion of wound healing (wound dressings; topical applications; and various adjunctive therapies that are used in addition to standard pressure ulcer care, such as vacuum-assisted closure, ultrasound therapy, electrical stimulation, and hyperbaric oxygen therapy), and surgical repair of the wound(Qaseem et al., 2015)

It was shown that pressure ulcer remain major health problems affecting approximately 3 million patients. In 1993, pressure ulcer were noted in 280,000 hospital stays, and 11 years later the number of ulcers was 455,000.2 The Healthcare Cost and Utilization Project report found from 1993 to 2003 a 63% increase in pressure ulcer in American Hospitals Study (Lyder and Ayello, 2007).

Pressure ulcer treatment involves various approaches, including interventions to treat the conditions that lead to pressure ulcers (support surfaces and nutritional support), interventions to protect and promote healing of the ulcer(Ulcer & Strategies, 2013).

The purpose of the present prospective study was to evaluate the application of PRP in relation to PrUs healing on the basis of clinical, wound size measurement and histopathological features in one PrU (case) versus saline dressing on the another PrU (control) in the same patient(Singh et al., 2014).

A lot of countries have undertaken surveys to identify the numbers of patients with pressure ulcers, examples are as follows: Canada- overall prevalence rate of 26% in all healthcare institutions; 25% in acute care, 30% in long term or sub acute care and 15% in the community. Germany- point prevalence rates of 5.3-28.3% in the hospital setting, Iceland – prevalence rate 8.9%. Italy – prevalence rate of 8.3% in hospital setting in 1996, but over 30% in home care setting. Japan – prevalence rate 5.1% and incidence 4.4%. Netherlands – prevalence rate of 23.1%. Spain – overall prevalence rate – 8%, but variation between different care settings (Jahan, 2012)

Health care providers face the challenge of providing effective care for increasing numbers of patients with chronic wounds. Pressure ulcers, one type of chronic wound, are estimated to affect 1.3–3 million individuals in the United States.1 Prevalence varies among specific clinical populations, with higher percentages reported for the elderly, the acutely ill, and those who have sustained spinal cord injuries. The first comprehensive clinical practice guidelines for the treatment of patients with pressure ulcers were published by the Agency for Healthcare Research and Quality (AHRQ) in 1994. Since that time, a number of professional groups have also developed and published guidelines(Whitney et al., 1999).

The pressure sore prevalence in individual American hospitals varies widely ranging from 4.7% to 29.7%, in the UK, several large multi-centre studies show pressure sore prevalence varies from 6.6% to 18.6%. The pressure sore prevalence in Australian health care settings between 1983 and 2002, ranges from 3% to 36.7%. Small numbers of prevalence studies have been reported in South East Asia and Africa. The prevalence of pressure sore in three Singaporean hospitals caring for acute and rehabilitating patients was 9% to 14% , and in one rehabilitation hospital in Hong Kong this was stated as 21% (Prentice et al.,2003).

1.1Justification of the study

SCI is somewhat a distressing condition to make the people losing their mobility power in maximum case and make dependent on assistive device, but it depends on the extent and severity of injury. (Ema, 2013).

Spinal cord injury has been described as ―one of the greater calamities‖ that can befall a human being. Because SCI tends to occur to people in their early adulthood, in the prime of their lives, when they are attending school or developing their careers or establishing a home and starting a family. From a life course perspective, SCI derails people with disabilities leaving them off-track and off-time in regard to socially expectable normative activities and social roles (Pickett et al., 2006).

Spinal Cord injury, whether traumatic or non-traumatic, is a sudden, devastating and debilitating neurological condition addressed throughout the history. The incidence of spinal cord injury is increasing with time with an annual rate of 15-40 cases per million with male predominance and a propensity of affecting the low-socio economic group .The condition leads not only to varying degrees of physical disabilities including paralysis, sensory deficit, dysfunction of bowel and bladder but also to various crippling complications such as pressure sore, autonomic dysreflexia , deep vein thrombosis, spasticity, sexual dysfunction and pneumonia (Sang et al, 2009)

1.1 Research question

What is the Situation of pressure ulcer after complete rehabilitation of SCI patients following up one year discharge from Centre for the Rehabilitation of the Paralysed?

1.2 Objectives of study

1.4.1 General objective

To identify the Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge from CRP.

1.4.2 Specific objective

To find out the information about the socio-demography.

To calculate the number of patients with pressure sore in per hundred SCI patients.

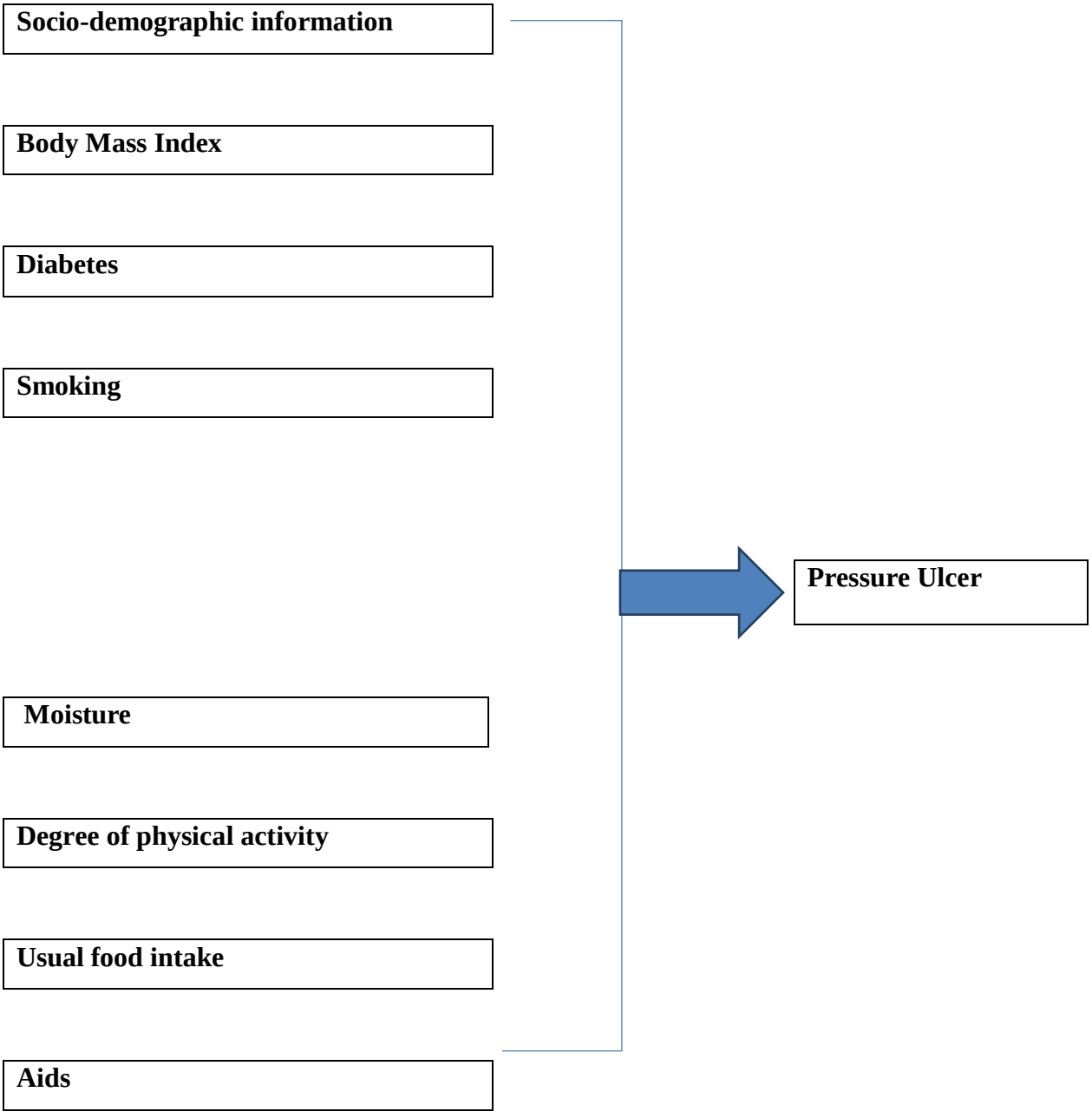
To determine the common factors that influence pressure sore

To inspect the degree of pressure sore which mostly occur at CRP.

To evaluate the frequency of pressure sore among the complete, incomplete paraplegia and tetraplegia SCI patients.

1.3List of variables

Independent variables **Dependent variable**



1.4.Operational definition

Prevalence: Prevalence is a frequently used epidemiological measure of how commonly a disease or condition occurs in a population. Prevalence measures how much of some disease or condition there is in a population at a particular point in time.

Pressure sore: A sore area of skin which develops due to cut off the blood supply to the area for more than two to three hours because of pressure and lack of movement **Neurological level:** Up to the level where both sensory and motor function is remain intact.

Incidence: Incidence measures the rate of occurrence of new cases of a disease or condition. Incidence is calculated as the number of new cases of a disease or condition in a specified time period (usually a year) divided by the size of the population under consideration who are initially disease free.

Spinal cord injury: Spinal cord injury (SCI) is damage to the spinal cord that results in a loss of function such as mobility or feeling. Spinal cord injury (SCI) is a devastating condition that produces severe functional impairment and requires intensive and specialized clinical rehabilitation (Roy, 2012)

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

Paraplegia: Paralysis of both legs and is an impairment in motor or sensory function of the lower extremities

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

Friction: The rubbing of one object or surface against another.

Muscle spasms: A sudden, violent, involuntary muscular contraction.

CHAPTER –II: LITERRATURE REVIEW

Spinal Cord injury, whether traumatic or non-traumatic, is a devastating and debilitating neurological condition and the incidence of spinal cord injury is increasing with time. It was aimed to look into the epidemiology of spinal cord injury in Bangladesh as a preliminary step towards the prevention of this condition and the related complications. (Schoonov et al., 2006).

The challenges of SCI care in developing countries have been described previously.6 That said, in light of recent publicity surrounding natural disasters such as the earthquakes in Pakistan (2005), China (2008) and Haiti (2010), there has been a resurgence of interest in improved rehabilitation medicine in the developing world. Physicians and researchers in these parts of the world are starting to document local SCI care and complications, including information about the prevalence and management of PUs. To the authors' knowledge, there are currently no literature reviews compiling these data and examining the prevalence of PUs in the developing world. This article is a compilation and analysis of these papers about SCI-related PUs in the developing world that examines the prevalence and explores the risks, costs and possible solutions to this common. (Zakrasek et al., 2014).

Bangladesh, a poor but developing country of south-Asia suffers a great deal of socio-economic problem arising from spinal cord injury and its health-related complications as evident from the yearly rate of admission at the specialized center like Centre for Rehabilitation of the Paralyzed (CRP). There is scarcity of extensive epidemiological data in Bangladesh hence this research aimed to assess the epidemiology of spinal cord injury as a preliminary step towards the prevention of this condition and the related complications. (Fehlings et al., 2011).

Pressure ulcers following spinal cord injury (SCI) are common with serious consequences .They can cause sepsis, osteomyelitis, amputation and permanent scarring .They are also associated with depression, pain and social isolation, which negatively

impact quality of life.4 They prevent people from working and therefore have large financial implications for individuals and their families. Pressure ulcers are also a major cause of mortality, particularly in low- and middle-income countries (LMICs) where there is limited access to treatment options. (Arora et al., 2017).

The Pressure ulcer is a sore area of skin that develops when the blood supply to it is cut off for more than two to three hours due to pressure on it and lack of movement (MedicineNet, 2011). It is also define as a localized injury to the skin and underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and friction (National Pressure Ulcer Advisory Panel, 2007). As the skin dies, the pressure sore develops as a red painful area, which in time turns purple. Left untreated, the skin can break open and become infected. A pressure sore can become deep and extend into the underlying muscle. Once a pressure sore develops, it is often very slow to heal. Untreated pressure sores can become gangrenous or seriously infected. (MedicineNet, 2011).

Unrelieved pressure is the most common cause of pressure sores in SCI (Spinal Cord Injury Model System, 2009). There are three processes involved in the development of pressure sore. The main one is the pressure that body weight puts on tissues as they become squeezed between bones and a surface. Friction created by the body sliding over sheets, upholstery, etc also plays a part in irritating the skin. Poor circulation of blood to the area, too much moisture, and poor skin quality can also contribute to the problem. The ulcer comes about when the pressure cuts off the blood supply to an area of tissues and (AGS Foundation for Health in Aging, 2005) leading to tissue damage, skin breakdown and a pressure sore. (Spinal Cord Injury Model System, 2009).

Pressure ulcers are a common and severe complication of spinal cord injury (SCI) (Arora et al., 2015).Warm areas, skin redness, red areas on the skin that do not go away even after the pressure is removed , Cracked, blistered, scaly, or broken skin , an open sore involving skin surface or tissue under the skin, a foul odor or yellowish stains on clothing, sheets, or chairs, painful or tender (American Physical Therapy Association,

2012) . Pressure points may present in many parts of the body such as on the back of the head, ears, back of shoulders, elbows, buttocks, hips, heels, or any place where bony part rests on the bed surface (American Cancer Society, 2011). Although pressure sore can be very painful the person who has the pressure sore might not notice any pain for loss of sensation in the site of pressure sore (American Physical Therapy Association, 2012).

A frequent occurrence of pressure ulcers (PUs) during hospitalization of patients with a spinal cord injury (SCI) has been reported in the literature, varying from 36 to 49.2% in recent publications(Van Der Wielen, Post, Lay, Gläsche, & Scheel-Sailer, 2016). Pressure sore usually occur over bony prominences. Positioning in bed or sitting in a wheelchair will focus the pressure on different parts of the body. When lying in bed on back pressure is distributed over a greater area than when sitting. However, sacrum, coccyx and heels are the most vulnerable when lying in bed (SpinalCiord Medicine, 2002).

Pressure sores may also develop on the back or sides of the head, neck, or ear rims. This may occur in a patient who is paralyzed, in a coma or has a neuromuscular disorder. The back of a patient's head may develop a pressure sore due to lying in a supine position for a prolonged period of time during and after surgery (Carol et al., 08). In very thin people, their shoulder blades also may be at risk. If lying on side hip bone is the most vulnerable. Also in the side-lying position if knees or ankles are touching they are at risk as well. When sitting in wheelchair or on any other surface ischium are at greatest risk (SpinalCiord Medicine, 2002).

There are two major factors associated with the risk of developing pressure ulcers: the amount and duration of exposure to pressure and the ability of the tissue to tolerate the pressure. The primary cause of pressure ulcer development is the exposure to pressure; without a mechanical load no pressure ulcer will develop. However, the ability of the tissue to withstand mechanical loading determines whether or not a person will develop a pressure ulcer due to a certain loading. The exposure to pressure is influenced by the mobility, activity and sensory perception of a patient and tissue tolerance for pressure is influenced by intrinsic and extrinsic factors . Intrinsic factors are related to the individual, e.g. age, smoking, incontinence, weight and body temperature. Extrinsic factors are

related to the environment, e.g. contact surface and temperature and humidity of the environment(Loerakker, 2007)

Pressure is the most important factor in pressure sore development. Tissue damage is caused by skin distortion resulting in occlusion of the blood vessels that leads to tissue necrosis and breakdown. Most pressure sore occur where the skin and tissues are directly compressed between bone and another hard surface such as floor, bed, chair, theatre table or trolley. Pressure damage can also occur when equipment is incorrectly applied as splints or bandages. There is no scientific agreement about the time and the given amount of pressure needs to be exerted before injury begins. Prolonged low pressure can be as harmful as short-term high pressure (Tissue Viability Nurse and clinical practice vacillators, 2011).

Friction- Friction occurs when two surfaces move across each other, and often results in the removal of superficial layers of skin. Friction damage often occurs as a result of poor lifting techniques. In addition, voluntary and involuntary movements by the patients can lead to friction injuries, particularly on elbows and heels (Registered Nurses' Association of Ontario, 2005).

Sensory functioning – The loss of protective response is a major factor in pressure damage (Tissue Viability Nurse and clinical practice vacillators, 2011). Patients who have experienced loss of sensation as the result of spinal cord injury or neurological disease have an increased risk of developing pressure ulcers. A person without sensory loss can feel pain and will generally feel uncomfortable after spending a lot of time in one position. When sensory loss occurs, a person may not feel uncomfortable or the need to be repositioned (Morrow, 2009).

Severity of SCI- The level and completeness of SCI may increase the risk of developing pressure ulcers. Issues such as the inability to check the skin or perform a weight shift on can increase the likelihood that will develop a pressure ulcer. However, even people with full use of their arms and hands are at risk if they do not take responsibility for doing those things that contribute to healthy skin (Mayo Clinic staff, 2011).

Skin or tissue condition – This is adversely affected by age, dehydration, malnutrition, medication such as systemic or topical steroids, hypoxia, and skin moisture and tissue oedema. Previous skin trauma such as surgical scars or previous pressure ulceration increases the risk of farther damage (Tissue Viability Nurse and clinical practice vacillators, 2011).

Urinary or fecal incontinence- Problems with bladder control can greatly increase the risk of pressure sores because the skin may frequently be moist, making it more likely to break down. Bacteria from fecal matter can cause serious local infections and lead to life-threatening infections affecting the body in general (Mayo Clinic staff, 2011).

Age- Individuals at the extremes of age are at increased risk, which increases their susceptibility to pressure ulcer formation (Tissue Viability Nurse and clinical practice vacillators, 2011). The skin of older adults is generally more fragile, thinner, less elastic and drier than the skin of younger adults. Also, new skin cells are usually generated more slowly. All of these conditions of the skin make it more vulnerable to damage.

Smoking- Smoking impairs circulation. Pressure sores are one of the health risks increased by smoking especially in people with SCI. (Mayo Clinic staff, 2011).

Loss of muscle mass- With paralysis the muscles tend to shrink, become less bulky and get smaller (atrophy). Muscle mass or bulk serves as a natural cushion over the bony areas. A decrease in muscle mass leads to less protection over bony surfaces and more pressure on the thin skin layers (Spinal Cord Injury Model System, 2009).

Muscle spasms- People who have muscle spasms or other involuntary muscle movement may have an increased risk of pressure sores from frequent friction or shearing (Mayo Clinic staff, 2011).

There are different systems to classify pressure sore. The system adopted by the European Pressure Ulcer Advisory Panel (EPUAP) consists of four grades in which each grade is defined by the anatomic limit of tissue damage, This classification system can be used to evaluate the anatomic depth of tissue destruction (Loerakker, S., 2007). The

international NPUAP- EPUAP Pressure Ulcer Classification System are staged as follows:

Stage I- Intact skin with non-balanceable erythema of a localized area usually over a bony prominence. Discoloration of the skin, warmth, edema, hardness or pain may also be present. Darkly pigmented skin may not have visible blanching. The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue. Stage I may be difficult to detect in individuals with dark skin tones. May indicate at risk persons.

Stage II- Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or ruptured serum filled. Presents as a shiny or dry shallow ulcer without slough or bruising. This stage should not be used to describe skin tears, tape burns, incontinence associated dermatitis, maceration or excoriation.

Stage III- Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscles are not exposed. Some slough may be present. May include undermining and tunneling. The depth of a Stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and Stage III ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep Stage III pressure ulcers. Bone or tendon is not visible or directly palpable.

Stage IV- Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present. Often include undermining and tunneling. The depth of a Stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and these ulcers can be shallow. Stage IV ulcers can extend into muscle and supporting structures (e.g., fascia, tendon or joint capsule) making osteomyelitis or osteitis likely to occur. Exposed bone/muscle is visible or directly palpable (EPUAP-NPUAP, 2009).

To prevent pressure sore special attention should be given to the areas where pressure sore often develop (U.S. National Library of Medicine, 2011).

Pressure relief- Have to turn every 2 hours (based on some animal and human trials), rotate by 30°. It may be difficult to maintain every 2 hour position change (disrupts sleep cycle), so patients may use low air loss mattress or bed which turns patient automatically. (Koretz and Eslami, 2011). Patients have to use the devices which totally relieve pressure on the heels as for example placing pillows under the calf to raise the heels. Pillows or foam wedges may use to keep boney prominences such as knees and ankles from direct contact with each other. Avoid positioning directly on the trochanter when using the side-lying position. Elevate the head of the bed as little (maximum 30° angle) and for as short a time as possible to minimize shear stress (Koretz and Eslami, 2011).

Skin Care - Daily inspection of the skin has to done. Incontinence have to assess and treat. When incontinence cannot be controlled, cleanse skin at time of soiling, use a topical moisture barrier, and select under pads or briefs that are absorbent and provide a quick drying surface to the skin. Have to avoid massage over the bony prominences. And also have to use proper positioning, transferring, and turning techniques to minimize skin injury due to friction and shear forces. It is necessary to identify and correct factors compromising protein or calorie intake and consider nutritional supplementation for nutritionally compromised persons (National Pressure Ulcer Advisory Panel, 1993).

Avoid Rough Materials- Avoid rough clothing that may cause constant friction against the hips, buttocks, elbows and shoulder blades the areas where the body comes into constant contact with mattresses or wheelchair materials. Avoid the use of rough wash clothes for bathing, but use a soft textured sponge instead. If any signs of a pressure sore is seen have to meet the doctor immediately for treatment (Stern et al., 2012).

Changing position-To prevent pressure sore reposition of the bed-bound patients at least every 2 hourly and chair-bound patients every hourly have to done. For this patients may use a written repositioning schedule. During positioning in chairs or wheelchairs postural alignment, distribution of weight, balance and stability, and pressure relief have to consider (National Pressure Ulcer Advisory Panel, 1993). The patients have to use the items which can help to reduce pressure as like as pillows, sheepskin, foam padding, and powders from medical supply stores. (U.S. National Library of Medicine, 2011).

Education-Implement educational programs for the prevention of pressure sores that are structured, organized, comprehensive, and directed at all levels of health care providers, patients, family, and caregivers. The information included- etiology of the risk factors for pressure sores, risk assessment tools and their application, skin assessment, selection or use of support surfaces, development or implementation of individualized programs of skin care, demonstration of positioning to decrease risk of tissue breakdown, and accurate documentation of pertinent data (National Pressure Ulcer Advisory Panel, 1993).

Pressure sore can have serious and even life-threatening complications. The most serious complication is blood poisoning or septicemia (AGS Foundation for Health in Aging, 2005). Sepsis occurs when bacteria enters to bloodstream through the broken skin and spreads throughout the body which is a rapidly progressing, life-threatening condition that can cause organ failure (Mayo Clinic staff, 2011). Other types of infections are also common, including local infections, skin infections, and bone infections. For about 25% of people with nonhealing pressure sore, the underlying bone is involved in the infection. These develop when the infection from a pressure sore burrows deep into the joints and bones. Joint infections (septic or infectious arthritis) can damage cartilage and tissue, and bone infections such as osteomyelitis, may reduce the function of the joints and limbs. Pressure sore can also serve as sources of serious infections by bacteria those are resistant to normal antibiotics (AGS Foundation for Health in Aging, 2005). Cellulitis is the another complication of pressure sore where the acute infection of the skin's connective tissue causes pain, redness and swelling, all of which can be severe. Cellulitis can also lead to meningitis which is an infection of the membrane and fluid surrounding the brain and spinal cord (Mayo Clinic staff, 2011). Other complications include pain and depression, both of which have been linked to slow wound healing. Finally, because most pressure ulcers, particularly deep ones, take a long time and a lot of care to heal, pressure ulcers can have a significant impact on the quality of life of that people who often need nursing care or may need to be in a specialized facility for treatment (AGS Foundation for Health in Aging, 2005).

Treatment focuses on preventing pressure sores from getting worse and on restoring healthy skin (Skin Problems & Treatments Health Center, 2011). Pressure sores in spinal

cord-injured patients can be treated by either conservative or surgical methods. Shortened healing period and long lasting results can be achieved by surgery (Jósvay, 2003). The best treatment outcomes will result from using a multidisciplinary team of specialists, this will ensure all problems are addressed (Kirman, 2010).

Conservative treatments Pressure reduction- The first step in healing a pressure sore is determination of the cause, ie, pressure, friction, or shear. Turning and repositioning the patient to prevention and treatment through pressure relief. Bimolecular aspects of PU development are incompletely characterized and need further research(Henzel et al, 2011). Patients who are capable of shifting their weight every 10 minutes should be encouraged to do so. Repositioning should be performed every 2 hours, even in the presence of a specialty surface or bed. Patients who are bedbound should be positioned at a 30 degree angle when lying on their side to minimize pressure over the ischial tuberosity and greater trochanter. Efforts should be made to avoid sliding the patient over a surface to prevent shear forces and friction. Patients who develop a pressure sore while sitting should be placed on bed rest with frequent repositioning (Kirman, 2010).

Pressure Sore Care -The another principle of healing is proper care of the sore. The three aspects of care are: Cleaning, Removing dead tissue or debris, dressing or bandaging the pressure sore. Pressure sores heal best when they are clean. They should be free of dead tissue, excess fluid draining from the sore, and other debris. If not, healing can be slowed, and infection can result Removing dead tissue is often painful so pain-relieving medicine have to take 30 to 60 minutes before these procedures. Choosing the right dressings is important to pressure sore care. The most common dressings are gauze, film and hydrocolloid (moisture- and oxygen-retaining) dressings. Gauze dressings must be moistened with saline and changed at least daily. If they are not kept moist, new tissue will be pulled off when the dressing is removed (Agency for Health Care Policy and Research, 1994).

Infection control- All pressure sore are colonized with bacteria. Most local infection can be managed using antimicrobial wound products and systemic antibiotics should not be used routinely for local infection. Reduce risk of infection and enhance wound healing by hand washing, wound cleansing and debridement. Protect from exogenous sources of

contamination such as faces. If purulent material or foul odors is present, more frequent cleansing and possibly debridement are required. When there are clinical signs of infection which do not respond to treatment, radiological examination should be undertaken to exclude osteomyelitis and joint infection (Tidy, 2010).

Eat a healthy diet- Good nutrition is important to both preventing and treating pressure sores. Focus on getting enough liquids, calories, protein, and vitamins, and on controlling the weight. Both increases and decreases in body weight can cause pressure sores (Skin Problems & Treatments Health Center, 2011).

Pain management- Interventions that may reduce pain include the use of nonsteroidal anti-inflammatory drugs such as ibuprofen and naproxen particularly before and after debridement procedures and dressing changes. Topical pain medications such as a combination of lidocaine and prilocaine, also may be used during debridement and dressing changes (Mayo Clinic staff, 2011).

Physiotherapy intervention Wound care has been a part of physical therapist practice from its very beginnings. Based on the results of the physical therapist's evaluation, including a review of the medical history and an examination of the wound, the therapist will select treatments, which may include caregiver training, strengthening exercises, wound care.Pressure ulcer is a significant problem; in clinical practice, repositioning is recommended. However(Moore et al., 2011)

Train repositioning- As pressure sore are usually the result of prolonged contact of a body part with a bed or chair, repositioning or moving a person is needed to help pressure sore heal. The physical therapist can train family members and caregivers to do positioning and transfers safely from one place to another place (American Physical Therapy Association, 2012).

Improve Strength- In many cases, pressure sore are the result of people being too weak to change their own position. The physical therapist will develop an exercise program so that the individual with pressure sore can perform repositioning and transfers without any help of other person (American Physical Therapy Association, 2012).

Ultrasound- Clinical trials suggest that ultrasound speeds the healing of leg ulcers and possibly also of pressure sores (Ernst, 2012).

Hydrotherapy- Whirlpool methods for wound cleansing and facilitating healing and reducing wound and infection (EPUAP-NPUAP, 2009).Hydrotherapy is one of the most frequently used procedures in the general class of treatments commonly known as physical therapy.

Monitoring healing- A physiotherapist will monitor the healing process of any pressure ulcers to gauge the effectiveness of treatment. Usually, the depth and width of the ulcers are measured. Healing progress is usually evaluated weekly. Depending on the size and severity of the ulcers healing may take from only a few days to several months. Especially severe pressure ulcers may take up to a year to heal, and unfortunately, some may never heal, especially when the person has other illnesses. There are no specific guidelines that can be used to predict whether an ulcer will be no healing. (AGS Foundation for Health in Aging, 2005).

Several other treatments are sometimes used in treating pressure sores. These are found most commonly in clinics that specialize in treating serious wounds. Researchers continue to study these and other treatments for pressure sores and other wounds. Some insurance will not cover the newer treatments without special approval (EPUAP-NPUAP, 2009).

Antibiotics- Pressure sores that are infected and don't respond to other interventions may be treated with topical or oral antibiotics (Mayo Clinic staff, 2011).

Muscle spasm relief- Muscle relaxants such as diazepam, tizanidine, dantrolene and baclofen - may inhibit muscle spasms and enable the healing of sores that may have been caused or worsened by spasm-related friction or shearing (Mayo Clinic staff, 2011).

Pressure sores that fail to heal may require surgical intervention. The goals of surgery include improving the hygiene and appearance of the sore, preventing or treating infection, reducing fluid loss through the wound and lowering the risk of cancer. The type of reconstruction that's best in any particular case depends mainly on the location of the

wound and whether there's scar tissue from a previous operation. In general, though, most pressure wounds are repaired using a pad of the person's own muscle, skin or other tissue to cover the wound and cushion the affected bone (Mayo Clinic staff, 2011).

Postoperative Care- Rehabilitation of the patient with a flap includes progressively longer periods of sitting with flap viability checked after each sitting period. Flap viability may be compromised if pallor, redness, or both at the operative site do not decrease after 10 minutes of pressure relief (U.S. National Library of Medicine, 2008). In addition, general principles of preoperative care, the following measures have to take as daily inspection of flap; proper positioning to avoid any pressure on the flap and change of posture allowed earliest by 2 weeks of the surgery or later according to the flap-healing situation (Singh, 2010). Patients are taught to shift their body weight once they are bearing weight on the flap and to inspect the skin daily using a mirror. Managing Tissue Loads, for more specific recommendations on techniques for positioning and pressure reduction when the patient is sitting or in bed (U.S. National Library of Medicine, 2008). Only when a pressure sore is completely healed can pressure be reapplied over the area. Complete healing means that the outer layer of skin (the epidermis) is unbroken and normal coloring has returned to the area. The first time pressure is applied to a newly healed area, it must be for a very short time (15 minutes at most). Then remove pressure from the area and inspect it for redness (erythema). If there is redness, observe it and time carefully how long it takes to fade to the color of the surrounding tissue or the color which was before the pressure was applied in the case of a scar. If fading occurs in 15 minutes or less, no damage has occurred. Wait at least one hour and repeat pressure application (Tidy, 2010).Give proper wheelchair or cushions or orthosis for mobilization and to avoid any pressure on flap; monthly follow up for 3 months and then at 6 months after flap

CHAPTER –III: METHODOLOGY

3.1 Study design

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

3.2 Study sites and area

The study was conducted in Spinal cord injury department of CRP, Savar Dhaka.

3.3 Study population and sampling

The study population was any set of people or events from which the sample was selected and to which the study results was generalized. In this study the study population was all the SCI patients of CRP and the samples were the SCI patients those staying in SCI unit of CRP, Savar, Dhaka. A group of people were known as sample. About 45 SCI patients were taken as sample for this study.

3.4 Sampling technique

Purposive sampling technique was selected because purposive sampling involves the deliberate selection of individuals by the researcher based on predefine criteria and getting of those samples whose criteria was concerned with the study purpose. Here another factor was resource limitation to get the sample in bigger aspect as well as the limitation of time. Participants were chosen purposively because the participants have some particular features or characteristics which were enable detailed exploration of the research objectives. This method was contained some inclusion criteria to select the participant as to find out the actual snap of the situation.

3.5 Inclusion criteria of the study

All spinal cord injury patients with pressure ulcer discharged from CRP, Savar, Dhaka.

Both sex were equal priority

The patients who had interest to participate in the interview.

Pressure ulcer patient completed rehabilitation of SCI

Wheel chair dependent patient

Age: 10-70 years

3.6 Exclusion criteria of the study

Patient who were re –admition

Patient who were walking

Arterial or venous disorder, or vasculitis as cause for ulcerated wound

Clinically significant systemic disease

Significant malnutrition

Recent use of steroidal therapy Penicillin

Patient who were discharge from CRP but more then 1 year

Patients who had lack of willingness

3.7 Sample size

It was an educational research and had the time limitation so 45 SCI patients were taken as sample.

The formula was

$$n = \left(\frac{z\left(1 - \frac{a}{2}\right)}{d} \right)^2 . pq$$

Here, $\frac{z\left(1-\frac{a}{2}\right)}{d}$ = Confidence level at 95% (standard value of 1.96).

n= required sample size

p = prevalence of pressure sore in literature

q= (1-p)

d = margin of error at 5% (standard value of 0.05)

3.8 Data collection method and tools

The face to face interview technique was used to collect data. For this the materials to successfully complete the interview session and collected the valuable data from the participants were used such as- question paper, consent form, pen, file, clip board etc. A structured questionnaire for collecting information related to the study was used.

3.9 Data analysis

Data were numerically coded using an SPSS 16.0 version software program. Data were analyzed through descriptive statistics which focused to table, pie chart and bar chart.

3.10 Inform consent

Written consent was given to all participants prior to the completion of the pre test questionnaire. It explained the participants about his or her role in this study. It received a written consent form every participants including signature. So the participant assured that they could understand about the consent form and their participation was on voluntary basis. The participants were informed clearly that their information would be kept confidential. It assured the participants that the study would not be harmful for them. It was explained that there might not a direct benefit from the study for the participants but in the future cases like them might got benefit from it. The participants have the right to withdraw consent and discontinue participation at any time without prejudice to present or future care at the SCI unit of physiotherapy of CRP.

3.11 Ethical consideration

It took approval from the ethical committee of Physiotherapy department to do the study. Then permission was taken from the In-charge of SCI unit for data collection from the patients by ensuring the safety of participants. The participant, who was interested to participate in the study, was informed verbally about the topic and purpose of study. They were informed about the number of interviews and length of interview. It was informed that there would be no risk or direct benefit to participate in the study. Each participant had the right to refuse to answer any question or withdraw them from the study. It was informed that the information given by participant will be published according to their permission and at this time their identities will be protected by using coding. Here the world Health Organization and Bangladesh Medical Research Councils rules were followed.

CHAPTER –IV: RESULTS

The aim of the study was to find out the Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge at CRP. Data were numerically coded using an SPSS 16.0 version software program. The collected data were calculated as percentages and presented by using graph and table charts. 45 participants were taken to find out Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge from CRP.

Age of the participants:

Table no-1: Age of the participants.

Mean	32.511
Std .deviation	1.0725

Among the 45 participants mean age were 32.511 with standard deviation (1.0725). (Table-1).

Association between the age of the participants and stage of pressure ulcer:

Table no-2: The age of the participants and stage of pressure ulcer.

Chi squire	**p value**
58.206	0.648

The observed chi squire was 58.206 values. It is greater than the level of significant state chi-square value. So the result was not significant that indicate there was not significant association between the age of the participants and stage of pressure ulcer.

Association between the age of the participants and site of pressure ulcer:

Table no-3: the age of the participants and site of pressure ulcer

Chi squire	p value
1.222	0.004

The observed chi squire was 1.222 values. It is less then the level of significant state chi-square value. So the result was significant that indicate there was significant association between the age of the participants and site of pressure ulcer.

Male and female ratio

Male were predominantly higher than female. Out of 45 participants 41 (91.1%) were male and 4 (8.9%) were female. The study shows the sex distribution among the participants (Figure-1).

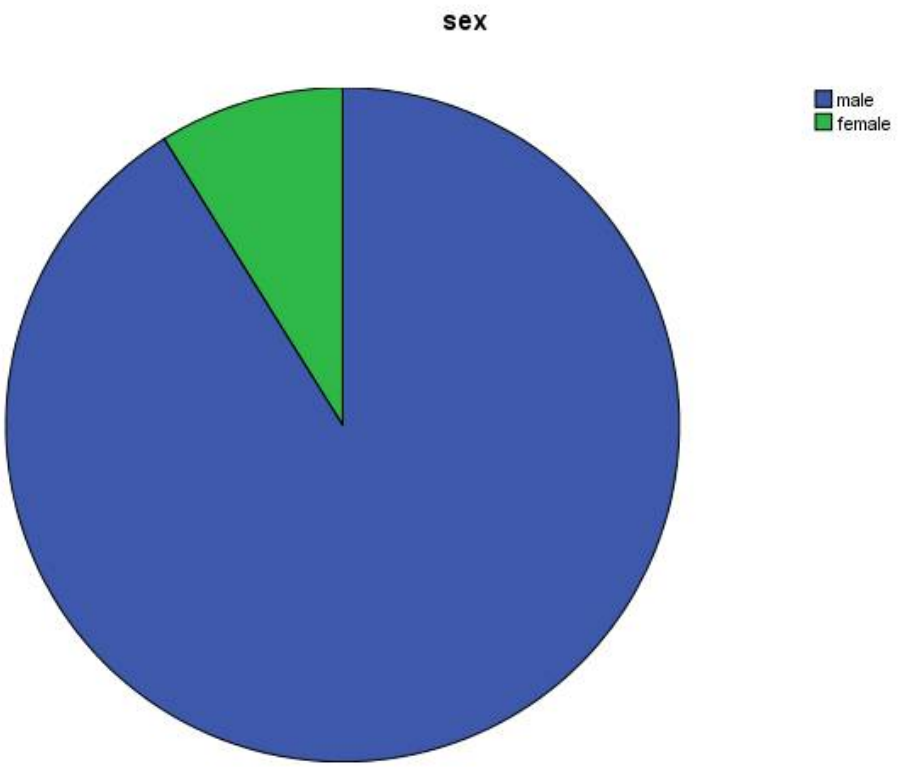


Figure no-1: Gender of the participants

Residential area

The frequency of residential area among 45 participants are 16 participants were urban and 29 participants were rural. The percentage are urban 35.6% and rural 64.4% (Figure -2).

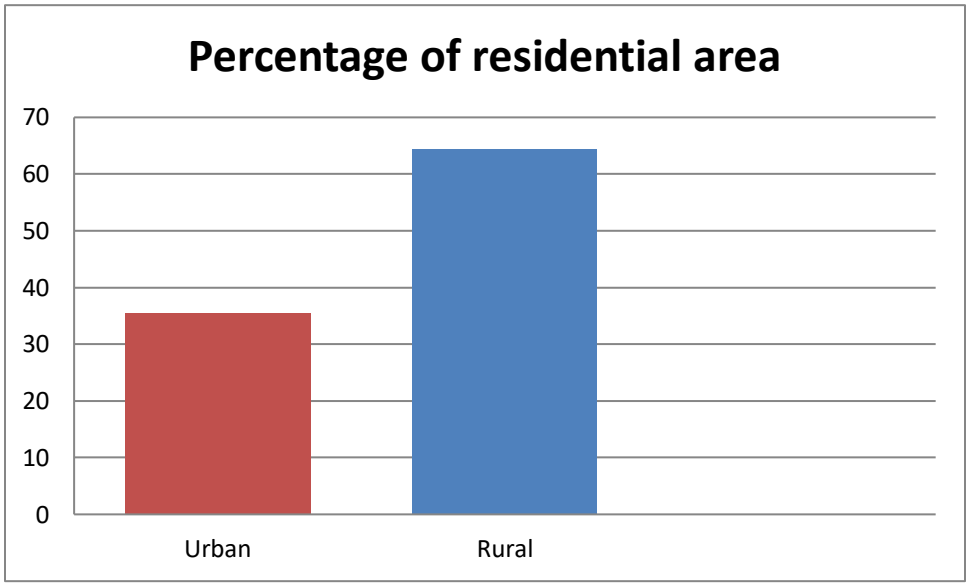


Figure no-2: The frequency of residential area

Association between residential area and pressure ulcer:

Table no -4: residential area and pressure ulcer

Chi squire	p value
1.278	0.258

This observed Chi-square value was 1.278 values .It is less than the level of significant state chi-square value. So the result was significant that indicate there was significant association between residential area and pressure ulcer.

Educational Status

Table no-5: The frequency of education status

Educational Status	Frequency	Percent
Illiteracy	26	57.8%
Primary	12	26.7%
Secondary	4	8.9%
H.S.C	3	6.7%
Total	45	100%

Among 45 participants 86% male ,14% female ,most illiteracy 57.8% ,primary 26.7%, secondary 8.9% and lowest 6.7% H.S.C .The study shows the details about the educational status of the participants (Table-5).

Distribution of respondents with sex and education:

Table no-6: Respondent with sex and education

Sex	Education					Total
	Illiteracy	primary	secondary	H.S.C	Graduate	
Male	23	8	16	6	0	41
Female	3	1	0	0	0	4

Among 45 participants 86% male ,14% female, most illiteracy 57.8% ,primary 26.7%, secondary 8.9% and lowest 6.7% H.S.C. The study shows the details about the education and sex (table-6)

Association between education and site of pressure ulcer:

Table no -7: education and site of pressure ulcer

Chi squire	P value
4.070	0.397

This observed Chi-square value was 4.070 values. it is greater than the level of significant state chi-square . So the result was not significant that indicate there was not significant association between education and site of pressure ulcer.

Occupation

Table no-8: The frequency of occupation

Occupation	Frequency	Percent
Farmer	9	20%
Housewife	2	4.4%
Students	8	17.8%
Labor	13	28.4%
Tailor	6	14%
Others	7	14.4%

Out of 45 participants, most of them were labor 28.4% (n=13). Farmer were the second most common 20% (n=9), Student were 3rd position 17.8 %(n=8),housewife were 4.4%,tailor were 14% and others were 14.4% .The study shows about the details information of the occupations of the participants (Table-8).

Frequency of monthly family income:

Among 45 participants the frequency of monthly family income were that 11.%(n=5) participants earned monthly in range 1000-5000 taka, 33.% (n=15) participants earned monthly in range 5001-10000 taka, 18% (n=8) participants earned monthly in range 10001-15000 taka ,36% (n=16) participants earned monthly 15001-20000 taka and 2%(n=1) participants earned monthly in range 20001-25001 (Figure-3).

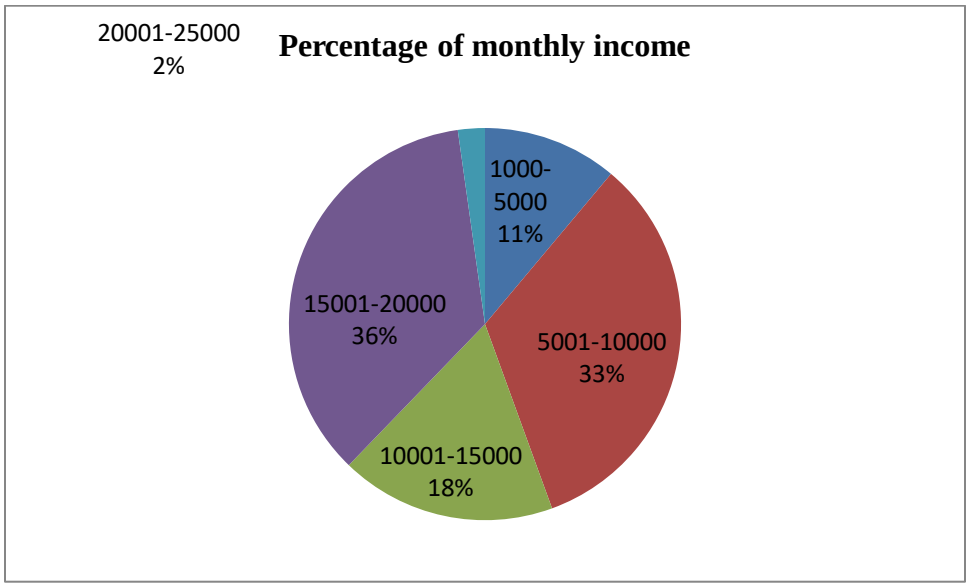


Figure no-3: The percentage of monthly income

Information about type of injury and pressure sore:

Table no-9: Percentage of type of injury and pressure sore

Having pressure sore of the participants	Type of injury				Total
	Complete paraplegia	Incomplete paraplegia	Complete tetraplegia	Incomplete tetraplegia	
Number	12	12	17	4	45
Percentage	26.7%	26.7%	37.8%	8.9%	100%

The 45 participants who suffered from pressure sore among them complete paraplegia presented in 26.7% (n=12), incomplete paraplegia presented in 26.7% (n=12), complete

tetraplegia presented in 37.8% (n=17), incomplete tetraplegia presented in 8.9% (n=4) participants (Table no-9).

Association between income and pressure ulcer:

Table no -10: income and pressure ulcer

income and pressure ulcer	Chi squire	P value
	2.076	**0.722**

This observed Chi-square value was 2.076 .It was less the level of significant state chi-square value. So the result was significant that indicate there was significant association between income and pressure ulcer .

Site of pressure sore:

Out of 45 participants, most of them were buttocks 55% (n=25). Ankles were the second most common 27% (n=12) , hips were 3rd position 9%(n=4),shoulder were 7%,mellulus were 2%. The study shows about the details information of the developed pressure ulcer of the participants (Figure-4).

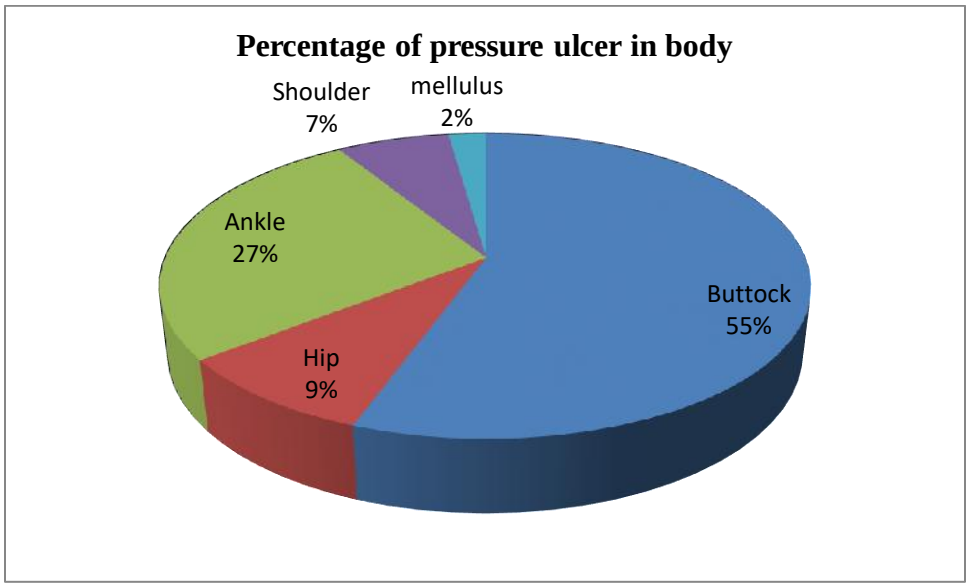


Figure no-4: Site of pressure sore:

Stage of pressure ulcer:

Out of 45 participants, most of them, stage 4 were 13% (n=4). Stage 3 were the second most common 27% (n=12) , stage-2 were 1st position 38 %(n=17) and stage -1 were 3rd position 22%(n=10) .The study shows about the details information of the stage pressure ulcer of the participants (Figure-5).

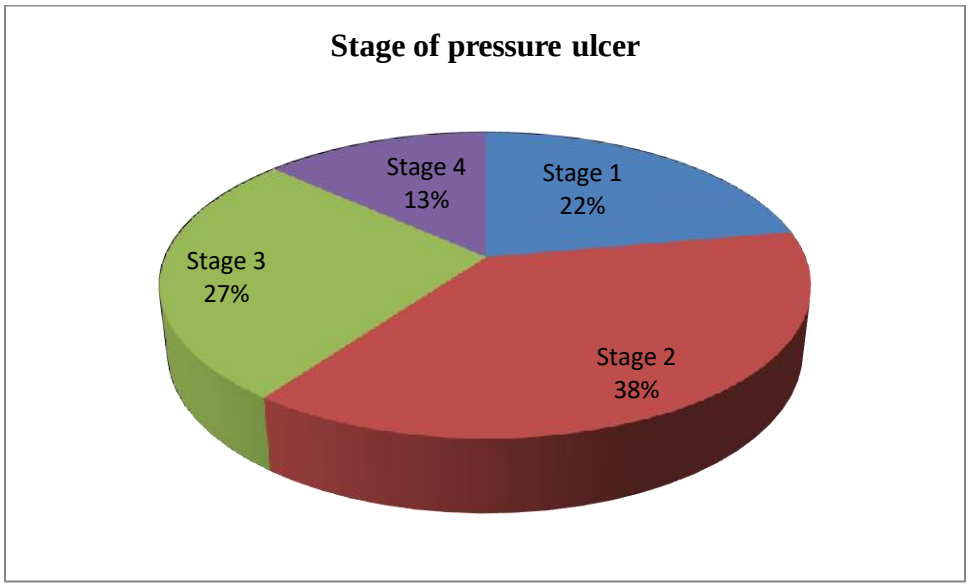


Figure no-5: Stage of pressure ulcer

Sense about bowl and bladder movements:

Out of 45 participants,the people who have sense about bowl and bladder movement 66.67%(n=30) and who have no sense about those 33.33%(n=15) The study shows about the details information of the sense about bowl and bladder movement of the participants (Figure-6)

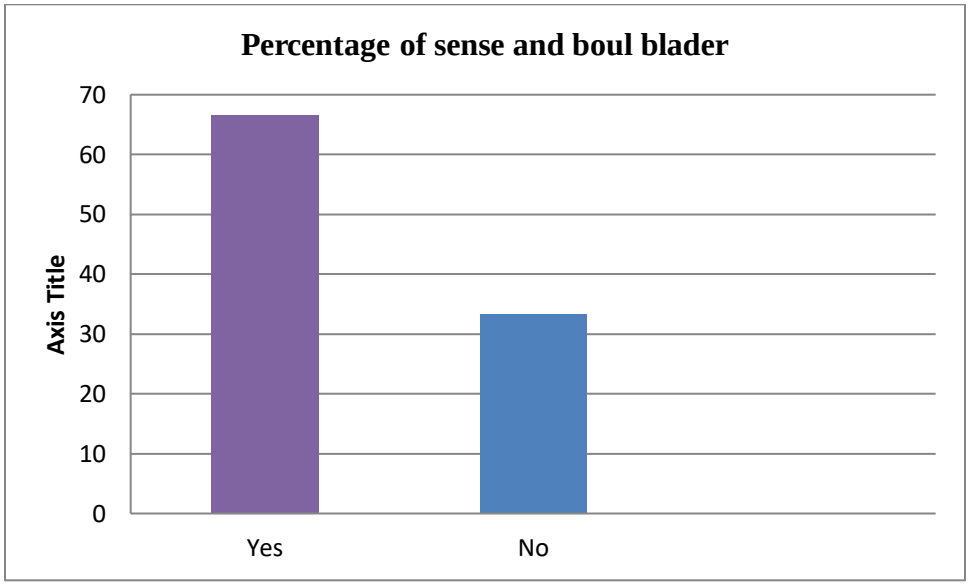


Figure no -6:Sense about bowl and bladder movements

Information about transferring technique of the participants

Table no-11: about transferring technique of the participants

Having pressure sore of the participants	Knowledge of proper transferring technique		Total
	Yes	No	
number	16	29	45
percentage	35.6%	64.4%	100%

Among 45 participants from whom data were collected 35.6% (n=16) participants were able to transfer from bed to wheel chair and wheel chair to bed and 64.4% (n= 29) participants were not able as they were bed rest patients . (Table-11)

Measure the lifting time:

Out of 45 participants, most of them cannot lifted 53%(n=24) .30 minutes can be lifted were 34%(n=15) and one hour can be lifted by 13%(n=6)people of them. The study shows about the details information of the measure the lifting participants (Figure-7).

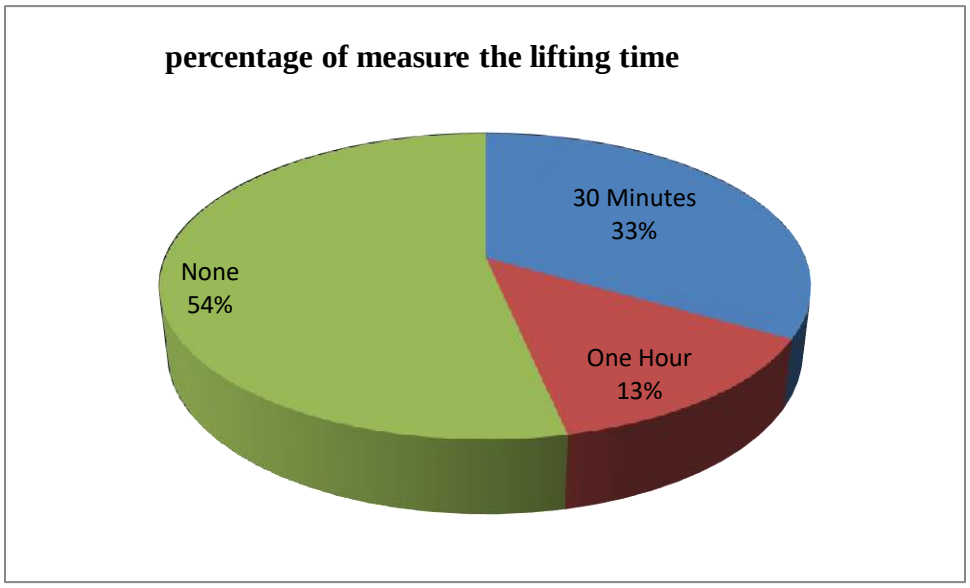


Figure no-7: Measure the lifting %

Information about friction:

Among 45 participants who got pressure sore 31.11% (n=14) participants avoid friction and 68.89% (n=31) participants do not avoid friction.

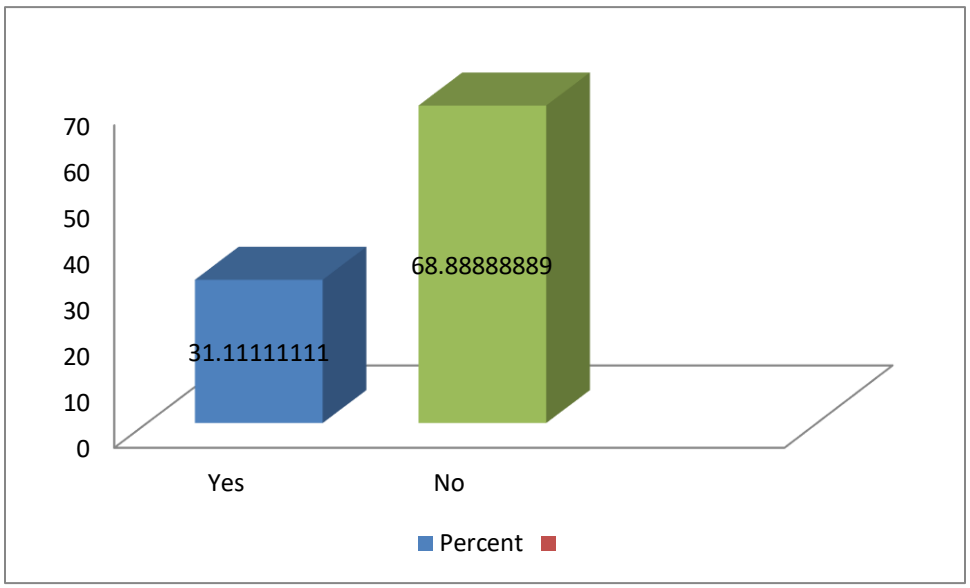


Figure 8-: avoiding friction

BMI score of them:

Out of 45 participants ,most of the BMI score under weight were 42%(n=19) . BMI 2nd Score over weight were 38%(n=17)and 3rd position of BMI score obesity were 20%(n=9). The study shows about the details information of the BMI score participants (Figure-9).

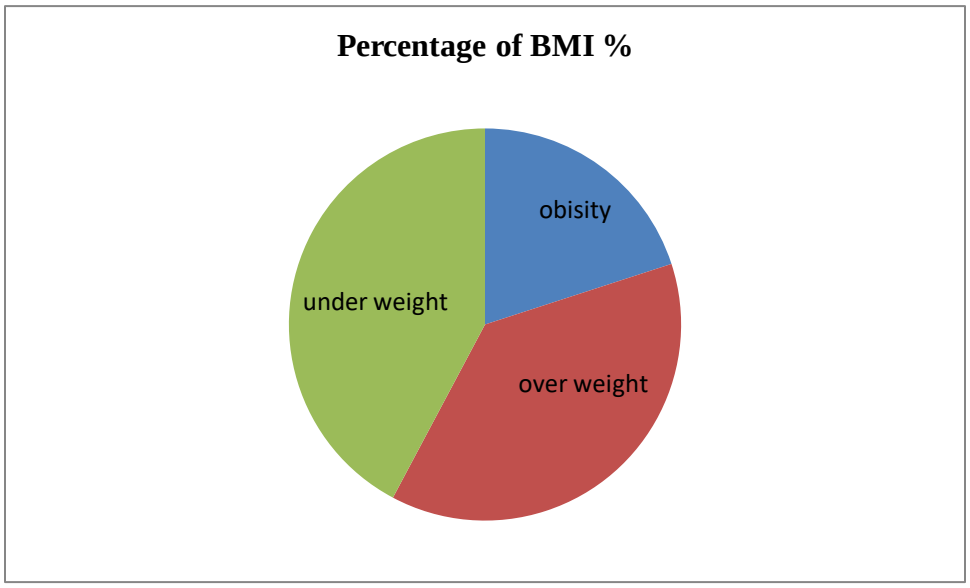


Figure no-9: body mass index score %

Suffering diabetic mellitus:

Out of 45 participants, most of them were not suffering diabetic mellitus, 91.11% (n=41) and 8.89% (n=4) people of them were suffering DM.(Figure no-10)

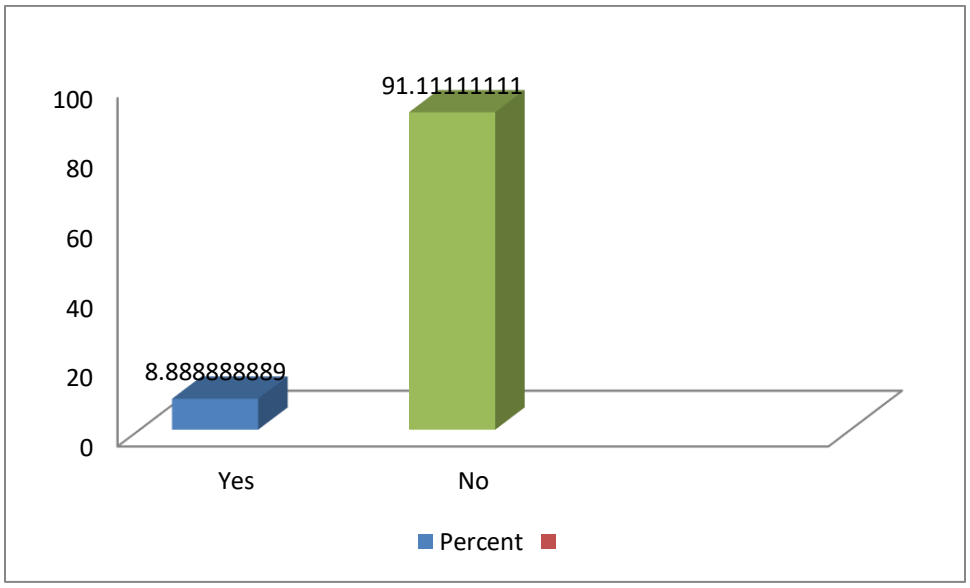


Figure no-10: Suffering diabetic mellitus

Taking smoke:

Out of 45 participants, 71%(n=32) people of them took smoke and 29%(n=13) people did not take smoke(Figure no-11).

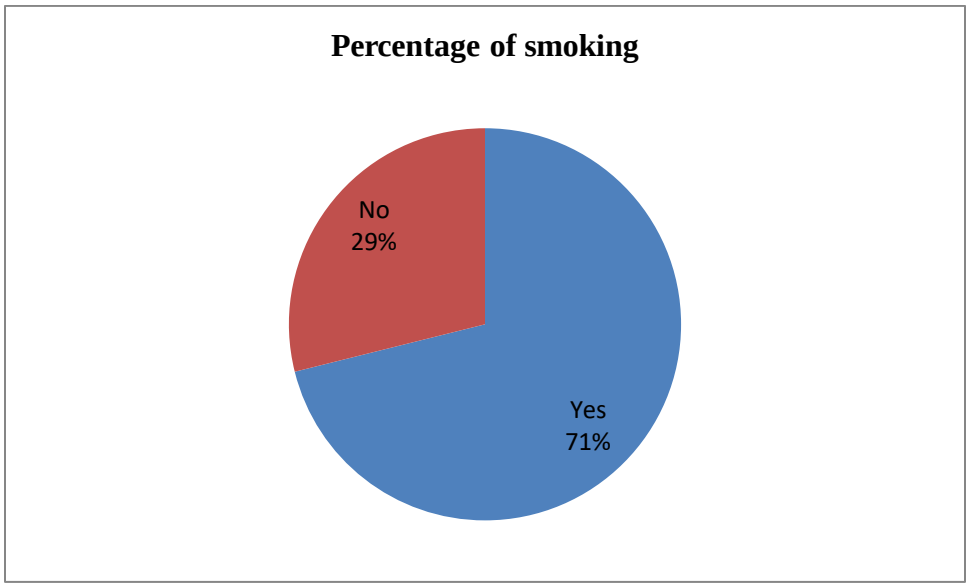


Figure no-11:percentage of taking smoke

CHAPTER –V: DISCUSSION

A cross sectional study was used to find out the Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge from CRP. The study was based on data gathered from spinal cord injury unit, rehabilitation wing unit and community in Bangladesh.

The proper management and prevention of causes can be reduced the rate of pressure ulcer. Although it was realized that the sample size was small; this study provides information about patients of spinal cord lesions with pressure ulcer in our country.

Even though most studies identifying risk factors for PU formation have originated in the developed world, the identified risk factors are undoubtedly also germane to SCI care in the developing world. Furthermore, many of these risk factors are more commonly encountered in developing countries.

Low household income in the United States is associated with increased PU risk. Although this association has many confounding variables and is difficult to extrapolate to nations where average annual income is often a small percentage of that of the United States, decreased financial resources probably increase PU risk worldwide. One could speculate, for example, that financially poor individuals would be unable to afford quality pressure relief cushions, mobility aids, caregiver support and/or proper nutrition. In addition, low household income might have a more pronounced effect on SCI complication rates in regions where healthcare expenses are predominantly paid out-of-pocket and significant medical events have catastrophic effects on family finances. Finally, there are typically fewer social welfare programs provided by the governments of these regions to assist the poor in accessing healthcare(Zakrasek et al.,2014) .

Total 45 patients were taken in this in study period. Measurement of functional outcomes is an integral part of any goal-orientated, multidisciplinary rehabilitation program and

requires suitable assessment tools. The study population consisted of 41 males (91.1%) and 4 (8.9%) females. Their age ranged from 10 to 75 years with a mean age of the patients were 32.51 years with standard deviation (±1.07). Most of the patients were young age. All 45 patients had spinal cord lesions with pressure ulcer.National SCI statistical centre found that males accounts for 82% of all spinal cord injuries and females for 18%. Traumatic SCI is more common in persons younger than 40 years, non-traumatic SCI is more common in persons older than 40 years. Greater mortality is reported in the older patients with SCI (Dawodu, 2007). Male was predominantly higher than female. The study consisted of 16 participants were urban and 29 participants were rural. The percentage are urban 35.6% and rural 64.4% . Majority of the patient were lives in rural area same situation also seen in India (Singh et al., 2003).The people of rural area are mostly poor and they are engage in risky work that may causing SCI. Farmer was the higher for traumatic spinal cord injury. Students was the second most common occupation where spinal cord injury was seen. More than 80% of the population lives in villages and 65% of the total labor forces are employed in agriculture (Hossain, 2001)...

The 45 participants who suffered from pressure sore among them complete paraplegia presented in 26.7% (n=12), incomplete paraplegia presented in 26.7% (n=12), complete tetraplegia presented in 37.8% (n=17), incomplete tetraplegia presented in 8.9% (n=4) participants. Approximately 40% of patients with spinal cord injury (SCI) present with complete SCI, 40% with incomplete injury, and 20% with either no cord or only root lesions (Rizollo et al., 2000).

This study showed that the participants who were suffering from pressure sore had a poor educational status , most illiteracy 57.8% ,primary 26.7%, secondary 8.9% and lowest 6.7% H.S.C.

In this study it was found that , stage-4 were 13% (n=4). Stage-3 were the second most common 27% (n=12) , stage-2 were 1stposition 38 %(n=17) and stage-1 were 3rd position 22%(n=10) . The prevalence and incidence studies of pressure Ulcers in Canada had shown that the incidence of pressure ulcers over a 4week follow-up ranged from 10.8%

to 13.3% for Stage II and greater ulcers, and rose to 28% when Stage I ulcers were included (Carol et al., 08).

This study showed that pressure sore was commonly seen in the participants who had no sense of bowl and bladder movements. The participants who had pressure sore among them 66.67% had the sense about bowl and bladder movements and 33.33% had no sense about bowl and bladder movements. So it was seems that incontinence is one of the risk factor of the risk factor for developing pressure sore at the CRP. The literature said that problems with bladder control can greatly increase the risk of pressure sores because the skin may frequently be moist, making it more likely to break down (Mayo Clinic staff, 2011).

Among 45 participants from whom data were collected 35.6% (n=16) participants were able to transfer from bed to wheel chair and wheel chair to bed and 64.4% (n= 29) participants were not able as they were bed rest patients. According to literature If anyone have trouble to transferring into wheelchair, have to learn proper technique from the physical therapist to prevent pressure sore (Mannheim, 2010).

Limitation of the study

- Some limitations were noted for this study. First of all, time was limited which had a great deal of impact on the study. If enough time was available knowledge on the thesis could be extended.
- On the other hand, the result of the study cannot be generalized to the whole population of SCI patients in Bangladesh as the samples were collected only from the CRP and the data were collected from very small population. The number of subjects (45) was not sufficient for the study.
- I could not able to collect samples by random selection because, there were not adequate subjects, therefore, the external validity had not achieved in this research.
- This study has provided for the first time data on the prevalence of pressure sore among the SCI patient in Bangladesh. No research has been done before on this topic. So there was little evidence to support the result of this project in the context of Bangladesh.

The researcher was a 4th year B.Sc. in physiotherapy student and this was him first research project. He had limited experience with techniques and strategies in terms of the practical aspects of research. As it was the first survey of the researcher so might be there were some mistakes that overlooked by the researcher.

CHAPTER –VI: CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Due to the effect of pressure, the ischemic degenerative changes occur at all the levels simultaneously affecting the skin, subcutaneous fat, muscle and fascia if any between the bony prominence and the pressure causing surface. If subcutaneous necrosis occurs, ulceration will be clinically seen when the necrotic skin gives way.

Hussain reported that for a specific pressure the obliteration of skin and subcutaneous vessels is more as compared to those of the underlying muscle. But the tissue damage is more in the muscle after mechanical loading than in the skin. Because of this the existing staging of pressure sores may not be justifiable. This needs to be studied further before any change in the prevailing staging is recommended. The aim of the study was to assess the Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge from CRP.

In this study among 45 participants about 91.11% were male and 8.9% were female so male was more vulnerable than female. Most of the participants came from rural areas and low educational level. From the study it can be concluded that due to SCI there have a lot of physical and mental problem such as ability to self-care, contacts with friends, family life, sexual life, partner relationship, leisure situation, financial situation, vocational situation and over all whole life. The preceding discussion supports the hypothesis that PUs are more difficult to prevent and treat in developing nations where the risk factors for PUs such as poverty, low education, limited activity level and malnutrition, are more prevalent. That said, this discussion also suggests that PU rates in the developing world can be decreased with improved acute care, adequate nursing, improved support surfaces and education.

When they getting treatment from CRP they were very delighted with the services, friendly environment was provided by the CRP staff was good. Spinal cord injury mostly devastated a life of a person. Which impact on their daily life following physical, mental,

social, economical and lots. Pressure sore add negative values on their life. In this regard, situation of pressure ulcer should be monitored carefully.

6.2 Recommendation

The aim of the study was to assess the Situation of pressure ulcer after complete rehabilitation of SCI patient following up one year discharge from CRP. There were some limitations in his study but researcher found some typical issues that might be taken for the better outcome of further research in future.

The main recommendations would be follwed:

- The random sampling technique would be convenient choice in future in order to enabling the power of generalization the results.
- The time of the study very limit so in future long time should be taken for conducting this study.
- Researcher taken only 45 participants as the sample of this study so in future the sample size should be extended.
- Here the percentage of classification the spinal cord injury patients were not equal. So regarding this. in future the percentage of the participants should be maintained for the better accomplishment of the outcome.

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Annexure

Permission letter

July 21st, 2018

Assistant Manager,

Rehabilitation Wings,

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343.

Through: Head of Physiotherapy department, BHPI.

Subject: Permission to collect data in order to conduct my research project.

Dear Sir,

With due respect and humble submission to state that I am Shahidul Islam, student of 4th professional B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI). According to the course curriculum, I have to conduct a research project for the partial fulfillment to complete of the degree of B.Sc in Physiotherapy. The title of my research project is **"Situation of pressure ulcer after complete rehabilitation of the spinal cord injury patients following up one year discharge from CRP"**. My research project will be conducted under the supervision of **Mohammad Anwar Hossain**, Associate Professor and Head of Department of Physiotherapy, CRP. I want to collect data for my research project from the community with Spinal Cord Injury Patients. So, I need permission for collecting data from the community. I would like to assure that anything of my study will not be harmful for the participants.

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

Yours sincerely,

Shahidul Islam

Shahidul Islam

4th professional B.Sc. in Physiotherapy,

Roll-03, Session: 2013-2014,

Bangladesh Health Professions Institute (BHPI)

(an academic institute of CRP)

CRP, Chapain, Savar, Dhaka-1343.

Approved 21/07/18

Mohammad Anwar Hossain
Associate Professor & Head
Physiotherapy Dept., CRP
CRP-Chapain, Savar, Dhaka-1343

Forwarded to Counselor & CBR Field officer, CRP

SALIM RAHMAN
Assistant Manager
Rehabilitation Wing
CRP, Bangladesh, Savar, Dhaka-1343

সম্মতিপত্র

আসসালামু আলাইকুম,

আমি শহিদুল ইসলাম, বাংলাদেশ হেলথ প্রফেশন্স ইনস্টিটিউট (বি.এইচ.পি.আই), সি.আর.পি এর বি.এস.সি ইন ফিজিওথেরাপী কোর্সের ৪র্থ বর্ষের শিক্ষার্থী। আমার প্রাতিষ্ঠানিক কাজের অংশ হিসেবে আমাকে একটি গবেষণা করতে হবে। আমার গবেষণার বিষয় হলো, "সিআরপি থেকে বের হওয়ার ১ বছর পর মেরুরজ্জুকে আঘাতজনিত রোগীর সম্পূর্ণ পুনর্বাসন করার পরে চাপ আলসারের অবস্থা"। এ পরীক্ষামূলক গবেষণার মাধ্যমে আমি একটি পরীক্ষা করবো যে, চাপ আলসারের রোগীদের ক্ষেত্রে যে বিষয়গুলি চাপজনিত ঘা কে প্রভাবিত করে।

গবেষণাটি সম্পাদনের জন্য, আমার তথ্য সংগ্রহ করা প্রয়োজন হবে। এজন্য, আপনি আমার গবেষণার একজন সম্মানিত অংশগ্রহনকারী হতে পারেন।

আমি আপনাকে অবগত করছি যে, এটি একটি সম্পূর্ণ প্রাতিষ্ঠানিক গবেষণা এবং এটি অন্য কোনো উদ্দেশ্যে ব্যবহৃত হবে না। আমি আপনাকে আরো নিশ্চিত করছি যে, আপনার প্রদত্ত সকল তথ্য গোপন রাখা হবে। আপনার অংশগ্রহন হবে ইচ্ছাকৃত। এই গবেষণা থেকে আপনি যে কোনো মুহূর্তে সম্মতি প্রত্যাহার করতে পারবেন।

আপনার যদি এই গবেষণা সম্পর্কে এবং অংশগ্রহণকারী হিসেবে আপনার অধিকার সম্পর্কে কোনো জিজ্ঞাসা থাকে তবে আপনি আমার সাথে অথবা আমার পর্যবেক্ষক মোহাম্মদ আনোয়ার হোসেন, সহকারী অধ্যাপক, ফিজিওথেরাপি বিভাগ, বিএইচপিআই, সিআরপি' সাথে যোগাযোগ করতে পারবেন।

উপাত্ত সংগ্রহের পূর্বে আপনার কি কোনো প্রশ্ন আছে?
আমি কি আপনার সাক্ষাৎকার গ্রহনের সম্মতি পেতে পারি?

☐ হ্যাঁ ☐ না

অংশগ্রহণকারীর স্বাক্ষর.....তারিখ.....

তথ্যসংগ্রহকারীর স্বাক্ষর.....তারিখ.....

স্বাক্ষীর স্বাক্ষর.....তারিখ.....

টপিকঃসিআরপি থেকে বের হওয়ার ১ বছর পর মেরুরজ্জুকে আঘাতজনিত রোগীর সম্পূর্ণ পুনর্বাসন করার পরে চাপ আলসারের অবস্থা।

কোড নং:

রোগীর নামঃ.....

মোবাইল নং.....

সমাজ-জনতাত্ত্বিক প্রশ্নাবলী

সিরিয়াল নং	প্রশ্ন	উত্তর
০১	আপনার বয়স কত?	.....
০২	লিঙ্গ	i. পুরুষ ii. নারী
০৩	আবাসিক এলাকা	i. শহুরে ii. গ্রামীণ
০৪	শিক্ষাগত যোগ্যতা	i. নিরক্ষরতা ii. প্রাথমিক iii. মাধ্যমিক iv. এইচএসসি v. গ্রাজুয়েট vi. মাস্টার্স
০৫	পেশা	i. কৃষক ii. দর্জি

		iii. সূত্রধর iv. গৃহিনী v. শিক্ষার্থীরা vi. অন্যরা
০৬	আপনার পরিবারের কত উপার্জনকারী সদস্য?	i. কেবল মাত্র একজন ii. দুই বা তার বেশি
০৭	আপনার পরিবারের কত আয়?	.....
০৮	আঘাতের ধরন কি?	i. সম্পূর্ণ পারাপ্লেজিয়া ii. অসম্পূর্ণ পারাপ্লেজিয়া iii. সম্পূর্ণ টেট্রাপ্লেজিয়া iv. অসম্পূর্ণ টেট্রাপ্লেজিয়া

চাপ আলসার সম্পর্কে প্রশ্নবলী		
সিরিয়াল নং	**প্রশ্ন**	**উত্তর**
০১	আপনার এখন কোন চাপজনিত ঘা আছে?	i. হ্যাঁ ii. না
০২	আপনার শরীরের মধ্যে এটি কোথায় উদ্ভূত?	i. পাছা ii. নিতম্ব iii. গোড়ালি

		iv. হাঁটু v. কনুই vi. কাঁধ vii. মেলুলাস
০৩	আপনার এখন কয়টা চাপজনিত ঘা আছে?	i. এক ii. দুই iii. দুএর বেশী iv. না
০৪	চাপজনিত ঘা কোন স্তরে আছে এখন ?	i. প্রথম স্তর ii. দ্বিতীয় স্তর iii. তৃতীয় স্তর iv. চতুর্থ স্তর
০৫	আপনার মলাশয় এবং মূত্রাশয় আন্দোলন সম্পর্কে কোন অনুভুতি আছে কি?	i. হ্যাঁ ii. না
০৬	আপনার মলাশয় এবং মূত্রাশয় আন্দোলন নিয়ন্ত্রণ করতে পারেন কি?	i. হ্যাঁ ii. না
০৭	আপনার মূত্রাশয় অসমত্ব আছে কি?	i. হ্যাঁ ii. না
০৮	কি ধরনের আপনি বিছানায় ম্যাট্রিক্স ব্যবহার?	i. শক্ত ii. নরম
০৯	আপনি সঠিকভাবে উত্তোলন করেন?	i. হ্যাঁ ii. না
১০	লিফট নিয়ে কতক্ষণ পরে?	i. 30 মিনিট ii. 1 ঘন্টা iii. না
১১	আপনি কি চাকার চেয়ার ব্যবহার করেন?	i. হ্যাঁ ii. না

১২	আপনি কি সঠিক ট্রান্সফারিং টেকনিক জানেন?	i. হ্যাঁ ii. না
১৩	আপনি স্থানান্তর এবং বিছানা গতিশীলতা সময় ঘর্ষণ এড়াতে না?	i. হ্যাঁ ii. না
১৪	আপনার বিএমআই স্কোর কত?	i. >২০ ii. ১৮.৫-২০ iii. -<১৮.৫
১৫	আপনার বহুমত্র রোগ আছে কি ?	i. হ্যাঁ ii. না
১৬	আপনি ধূমপান করেন কি ?	i. হ্যাঁ ii. না

Patients name:…….

Phone number:……..

Social demographics questionnaire

Serial No	Questions	Answers
01	Age	…….
02	Sex	i. Male ii. Female
03	Residential area	i. Urban ii. Rural
04	Education level	i. Illiteracy ii. Primary iii. Secondary iv. H.S.C v. Graduate vi. Masters
05	Occupation	i. Farmer ii. Tailor iii. Carpenter iv. House wife v. Students vi. Others
06	How many earning member in your family?	i. Only one ii. Two or more than
07	How many income in your family?	……
08	Type of injury	i. Complete paraplegia ii. Incomplete paraplegia iii. Complete tetraplegia iv. Incomplete tetraplegia

Questionnaire about pressure ulcer

Serial no	Questions	Answers
01	Have you any pressure sore now?	i. Yes ii. No
02	Where is it developed in your body?	i. Buttock ii. Hip iii. Ankle iv. Heel

		v. Elbow vi. Shoulder vii. Mellulus
03	How many pressure sore do you have?	i. One ii. Two iii. More than two iv. None
04	What is the degree of pressure sore?	i. Stage I ii. Stage II iii. Stage III iv. Stage IV
05	Do you have any sense about bowl and bladder movements?	i. Yes ii. No
06	Can you control your bowl movements?.	i. Yes ii. No
07	Do you have bladder incontinence?.	i. Yes ii. No
08	What type of matrix you use to lie on the bed?	i. Hard ii. Soft
09	Do you take lift properly?	i. Yes ii. No
10	How long after you take a lift?	i. 30 minutes ii. 1 hour iii. None
11	Do you use wheel chair?	i. Yes ii. No
12	Do you know the proper transferring technique?	i. Yes ii. No
13	Do you avoid friction during transferring and bed mobility?	i. Yes ii. No
14	BMI score:	i. Obesity ii. Over weight iii. Under weight
15	Do you have diabetic mellitus?	i. Yes ii. No
16	Do you take smoke?	i. Yes ii. No