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PREVALENCE OF COMMON MUSCULOSKELETAL DISORDERS AMONG PARAPLEGIC WHEELCHAIR USERS IN CRP

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PREVALANCE OF COMMON MUSCULOSKELETAL DISORDERS AMONG PARAPLEGIC WHEELCHAIR USERS IN CRP.

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

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Declaration

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

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Abbreviations

ASIA:	American Spinal Injury Association
BHPI:	Bangladesh Heath Professions Institute
BPKS:	Bangladesh Protibandhi Kallayan Somiti
CRP:	Centre for the Rehabilitation of the Paralysed
CSF:	Cerebrospinal Fluid
IFB:	Impact Foundation Bangladesh
ROM:	Range of Motion
SSI:	Sight Savers International
SARVE:	Social Assistance and Rehabilitation for the Vulnerable
SCI:	Spinal Cord Injury
SPSS:	Statistical Package of Social Science
WC:	Wheelchair

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Abstract

Purpose: To find out the prevalence of common musculoskeletal disorders among paraplegic wheelchair users. **Objectives:**The study was conductedto demonstrate the socio-demography among the paraplegic wheelchair users, to find out the problems while using manual wheelchair, to establish different body parts involved with musculoskeletal disorders, to define secondary mobility related complication after SCI, to bring out perception about user friendly wheelchair among participants. About 50 patients were selected through simple random sampling technique from inpatient of Spinal Cord Injury (SCI) unit, Department of Physiotherapy, Center for the Rehabilitation of the Paralyzed (CRP), Savar,Dhaka, Bangladesh. The data were collected by using a questionnaire and were analyzed by descriptive statistics through using SPSS software version 20.0. Results: 50 patients were included as sample. Among them most of the participants were young aged range from 16-20 years and male are predominantly higher than female. Majority of the patients were from rural areas having poor educational status. Among them, about 86% shoulder pain, wrist pain 16%, back pain 54%, 36% felt discomfort during the time of propelling the wheelchair. **Conclusion:** The results of this study provided about the prevalence of musculoskeletal disorders in a group of patients with paraplegic wheelchair users. More research is needed to evaluate the rehabilitation program for these patients.

CHAPTER-I: INTRODUCTION

Bangladesh is one of the most densely populated countries in the world and is situated in the South Asian subcontinent. The total population of this country is about 130 million and about 830 people live in per square kilometer area. More than 80% population lives in the village and about 60% of the total labor forces are involved in agriculture (Jahan, 2008).

Persons with spinal cord injury (SCI) are likely to experience serious health problems associated with this condition .These secondary health conditions (SHCs) have been defined as "physical or psychological health conditions that are influence directly or indirectly by the presence of a disability or underlying physical impairment" (Jensen et al., 2012).

Spinal Cord Injury is the most complex injury of all catastrophic injuries where patients usually have permanent and devastating neurologic deficits with disability and the injury causes negative effect on the injured person's functional, medical, psychological and economic well-being (Smith et al., 2013).

Spinal cord injury (SCI) is a traumatic or non-traumatic, life altering event for the injured people. SCI puts tremendous stress on injured individuals and their families (Otaghsara et al., 2014).

Spinal cord injury (SCI) is one of the most serious injuries of the musculoskeletal system which most cases brings about permanent disability and the unexpected occurrence of the injury and experiencing a new life situation result in a decrease in the quality of life in individuals with SCI and its direct consequences entail dramatic changes in the functioning of a person, thus affecting virtually every dimension of life. Disorders of the respiratory, cardiovascular, digestive and urinary systems as well as sexual dysfunctions, spasticity, edema, pain, autonomic dysreflexia, dysfunctions of the endocrine system or disorders of biochemical processes are some of the many severe consequences and complications regarding particular body organs and systems (Pokaczajło et al., 2016).

SCI is a condition with an annual incidence of 12.1–57.8 cases per million worldwide (Munce et al., 2013). According to the Noonan et al., (2012) , a number of people living with SCI in the US is approximately 270,000.

Every year, an estimated 11,000 SCIs occur in the U.S (American Association of Neurological Surgeons, 2017) and in Europe, the incidence is from 10.4 per million per year to 29.7 per million per year (Moghimian et al., 2015).

Lim et al., (2017) stated that the highest prevalence of SCI is 906 per million in the United States. In Asia, the incidence rates of SCI range from 12.06 - 61.6 per million, while the average age range of affected persons is 26.8 - 56.6 years (Ning et al., 2012). In the United States, the annual incidence of traumatic SCI is 40 cases per million or 12000 new cases each year (Rabadi et al., 2013).

The picture of spinal cord injury (SCI) is changing with increased age of injury, more cervical level SCIs and fewer neurologically complete lesions in those with traumatic injury (De Vivo,2012) and an increasing prevalence of non-traumatic SCI accompanied by progressive diseases requiring complex health interventions (Bickenbach et al., 2013). Epidemiological studies have reported that the mean age of SCI in the United States population is 45.4 years, with an increase in new SCI in those aged 60 and over and longer life expectancy for those with paraplegia (Vivo, 2012).

The causes of SCI may differ from person to person due to different age, sex, race and socio- cultural activities (Hoque et al., 2012). The most frequent cause of traumatic spinal cord injury is motor vehicle accidents (Chen et al., 2013).

For many individuals with spinal cord injury (SCI), independence depends on the integrity of their upper limbs. Unfortunately, activities like wheelchair propulsion and transfer place great demands on the bones, joints, and soft tissues of the upper limbs. These essential activities can hasten the aging process, leading to injury and pain. The impact of pain is considerable. In one of the largest studies on upper-limb pain, Sie et al. found that significant pain was present in 59 percent of individuals with tetraplegia and 41 percent of individuals with paraplegia (Sie et al., 2012).

Significant pain was defined as pain requiring analgesic medication, pain associated with two or more activities of daily living, or pain severe enough to result in cessation of activity. The tasks most commonly associated with upper-limb pain in individuals with SCI (e.g., work/school, transfers, outdoor wheeling, and driving) are the activities necessary for independence and community integration (Pentland &Twomey, 2006).

There is an estimated 1.6 million manual wheelchair users in the United States. At are ported 3.3% of that figure, spinal cord injury patient account for only a small proportion of those users. However, the National Spinal Cord Injury Statistical Center estimates that the prevalence of spinal cord injury in the US is approximately 276,000 with an annual incidence of about 12,500 cases (Plante et al., 2012).

Rationale

People with spinal cord injury may suffer from musculoskeletal problems that are similar to general people. Such as pushing wheel chair can cause shoulder problem to the wheel chair users people. Injuries that are affecting the spinal cord and complicated by neurological damage are an important health problem in Bangladesh as they carry a high rate of morbidity and mortality. In our country paraplegia is the most common type of spinal cord injury. Spinal cord injury patient especially paraplegic wheelchair patient feel some musculoskeletal problems or disorders which affect their life style. By doing this research, the problems or disorders may be drawn out. And patients are try to enhance these facts during the wheelchair training program in the rehabilitation program. Thus the research may help the paraplegic patients with manual wheelchair and make aware about the arising problems during living in the community. The research may also aware the medical professional about the arising musculoskeletal disorders among paraplegic wheelchair users and thus it enhances them to take further measures to minimize these disorders. The interventions which are provided to the spinal cord injury (SCI) patients have been limited to prevention, good initial resuscitation, pharmacotherapy and nursing care. As the Bangladesh is a developing country and trying to develop health care system. So the spinal cord injury patient needs a specialized and comprehensive rehabilitation services to continue their activities of daily living in the community.

Research question

What are the common musculoskeletal disorders found among paraplegic wheelchair users?

Study objectives

General objective

To find out common musculoskeletal disorders among paraplegic wheelchair users.

Specific objectives

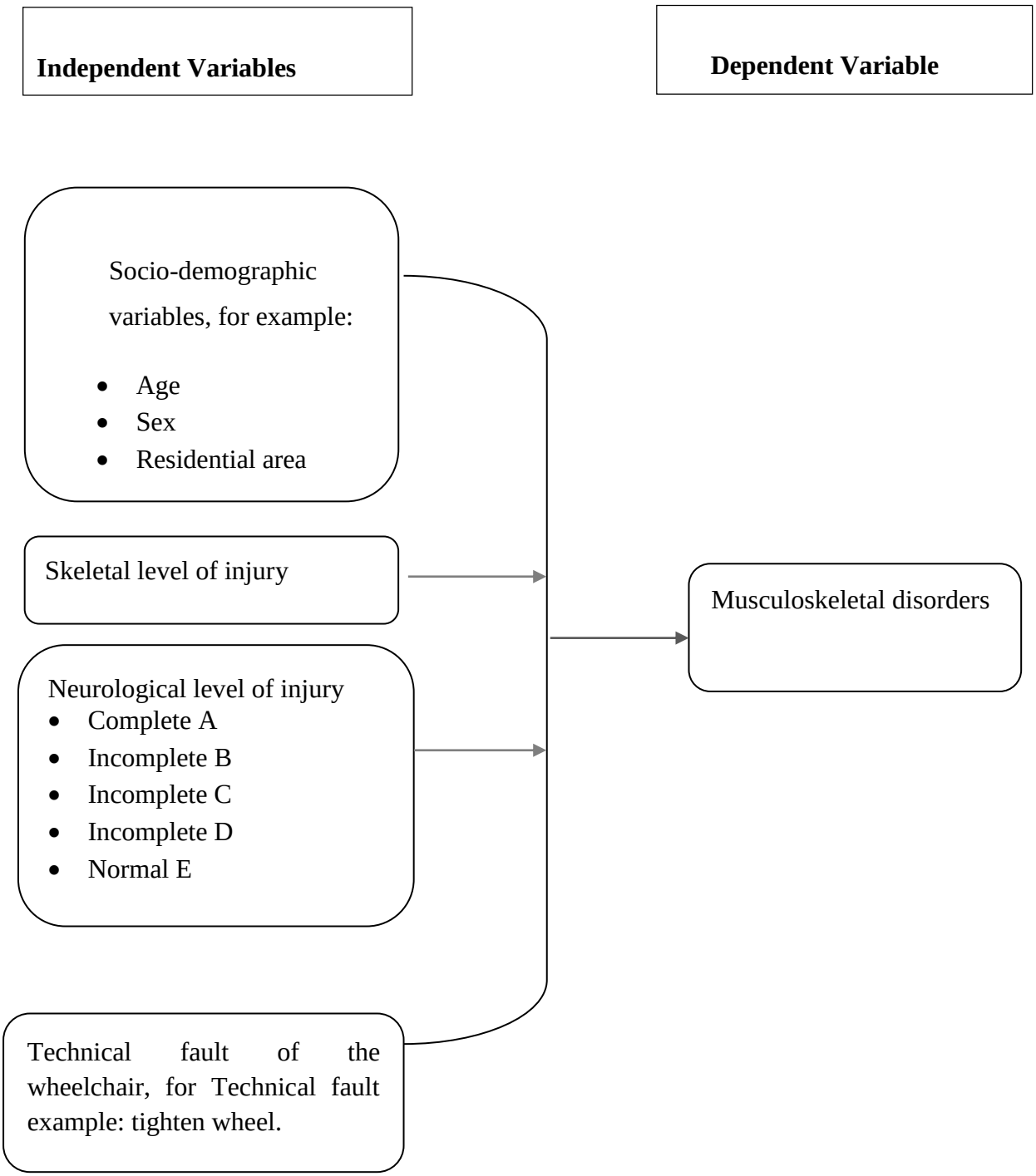
1. To demonstrate the socio-demography among the paraplegic wheelchair users.

2. To identify the problems while using manual wheelchair.

3. To find out different body parts involved with musculoskeletal disorders.

4. To define secondary mobility related complications after SCI.

List of variables



Operational definition

Spinal cord injury: When the spinal cord is damaged following trauma to the spine or disease process than it is called spinal cord injury which resulting in either temporary or permanent change in its normal motor, sensory, or autonomic functions.

Paraplegia: The term paraplegia means impairment of motor and/ or sensory function in the thoracic, lumber and sacral segments of the spinal cord which is secondary to the damage of neural elements within the spinal canal.

Complete lesion: Absence of sensory and motor functions in the lowest sacral segments.

Incomplete lesion: An incomplete lesion is the term used to describe partial damage to the spinal cord. With an incomplete lesion, some sensory and/or motor function remains at the lowest sacral segments.

Prevalence: Prevalence specifically refers to the all current case (old & new) existing at a given point in time or over a period of time in a given population.

Musculoskeletal: The word musculoskeletal is related to the involvement of muscles, tendons, ligaments and bones.

Wheelchair: A wheelchair is a chair with special arrangement including wheels, designed to be a replacement for walking for the disabled.

Illiterate: Illiterate persons are those who only can sign.

Literate: Those persons who only can read and write.

Well Educated: Well educated are those who have at least one board certificate.

CHAPTER-II: LITERATURE REVIEW

In Bangladesh, 63% of SCI is caused by falling from a height (Hoque et al., 2012). Another common cause (18%), in Bangladesh Falling while carrying a heavy load on the head, usually resulting in tetraplegia (Razzak et al., 2011).

Traumatic SCI results from motor vehicle collisions (36.5%), falls (28.5%), violence (14.3%) and sports (9.2%) activities being leading causes . Since (2010), motor vehicle crashes account for 36.5% of reported SCI cases. In a study of (Razzak, 2013), found that the rate of depression after SCI in Bangladesh because of traumatic injury is 16.9% at CRP. Particularly for rehabilitation of people with traumatic SCI, have been concerned not only with degree of loss of function, but also with quality of life (Geyh et al, 2010).

Non-traumatic SCI is less severe injury than the traumatic injury. Non-traumatic SCI almost have incomplete injuries, while traumatic injuries are slightly more likely to have to have incomplete injuries. Incomplete injuries are far better prognosis for neurologic improvement than complete injuries. Persons with traumatic SCI; persons with non-traumatic SCI are significantly more likely to have paraplegia than tetraplegia (Ranvi, 2010). An estimate of the incidence of non-traumatic as well as traumatic SCI is needed for adequate health care planning (Gurcay et al., 2010).

A spinal cord injury (SCI) results in a number of motor, sensory, and autonomic impairments. It predisposes individuals to multisystem dysfunction, leading to an increased likelihood of a range of related secondary complications (Tonack et al., 2008), defined as medical consequences that can cause functional limitations. Common secondary health complications after SCI include pressure ulcers, urinary tract infections, bowel problems, fractures, chronic pain, and depressive disorders (New et al., 2013).

Despite the fact that many of these complications are amenable to treatment and/or

prevention, secondary complications represent a significant burden at both the health system and individual level (Dorsett & Geraghty et al., 2008).

As a result of secondary complications, individuals with a SCI have greater rates of contact with the health care system than the general population, and also have multiple re hospitalizations throughout their lifetime. (Dorsett &Geraghty2008) found that compared with a control group, individuals with a SCI required 30 more hours of home-care services, were 2.7times more likely to have physician contact, spent 3.3 more days in hospital, and were re hospitalized 2.6 times more often. Re hospitalization following SCI has been studied in a number of countries including the United States (US), Britain, Australia, the Netherlands (Hamell, 2007), Italy (Rabadi et al., 2013) and Turkey (Jaglal et al., 2009).

These studies have reported that approximately one-third of persons with a traumatic SCI will be re hospitalized each year (Smith et al., 2013). More recently, our team reported a similar readmission rate of 27.5% one year after initial acute care discharge among individuals with traumatic SCI in Ontario. Secondary complications, including musculoskeletal, respiratory, gastrointestinal, and urological disorders, were the main reasons for readmission (Jaglal et al., 2009)

The most common causes of SCI in the world are traffic accidents, gunshot

injuries, knife injuries, falls and sports injuries. Diving was reported to be the most common sport injury. Injury is usually caused by flexion, compression, hyperextension or flexion-rotation mechanisms. This is called “primary damage’’ that occurs as a result of these mechanisms. The responses of the body in order to overcome the primary damage, such as hemorrhage, inflammation and the release of various chemicals, are described as secondary damage. **(**Sipski & Richards, 2006)

This term refers to impairment or loss of motor and/or sensory function in the cervical segments of the spinal cord due to damage of neural elements within the spinal canal. Tetraplegia results in impairment of function in the arms as well as typically in the trunk, legs and pelvic organs, *i.e.,* including the four extremities. It does not include brachial plexus lesions or injury to peripheral nerves outside the neural canal (Nas et al., 2015).

This term refers to impairment or loss of motor and/or sensory function in the thoracic, lumbar or sacral (but not cervical) segments of the spinal cord, secondary to damage of neural elements within the spinal canal. With paraplegia, arm functioning is spared but the trunk, legs and pelvic organs may be involved depending on the level of injury. The term is used in referring to cauda equine and conus medullaris injuries, but not to lumbosacral plexus lesions or injury to peripheral nerves outside the neural canal (Nas et al., 2015).

According to Gibson, 2004; Complete injury means full loss of motor and sensory functions at the distal level of injury.

Incomplete injury defines partial preserving of sensory and motor functions below the neurological level and in the lower sacral segments. With this lesion, deep anal sensation and/or anal musculocutaneous superficial sense is expected to be preserved. The status of the lesion could be unclear until the end of the spinal shock period. Although the signs indicating the end of this period are disputed, an increase in reflex activity is known to be a positive indicator (Nas et al., 2015).

Musculoskeletal pain comes from problems in the muscles or skeleton and is common in the population as a whole, especially as people get older. In the spinal cord injury (SCI) population, musculoskeletal pain can be produced by injury at the time of SCI, injury following SCI, overuse or strain, arthritic changes, or wear and tear of the joints, often from wheelchair use (Northwest Regional Spinal Cord Injury System, 2008).

An epidemiological, etiological and path mechanical literature review showed that complaints of pain in the shoulder are more common in tetraplegics, patients with complete injuries, females and individuals with advanced age. Some risk factors are include the time of injury, higher body mass index (BMI) and the use of a manual wheelchair (Dyson & Kirshblum, 2005)

Shoulder pain is a common problem in paraplegia. Wheelchair propulsion as well as transfers are supposed to cause and increase upper extremity pain, such as shoulder pain in active wheelchair users (Samuelsson et al., 2004). There are many different mechanical causes of shoulder pain after spinal cord injury (SCI) such as stiffness, tight muscles, muscle tears (rotator cuff), overuse, biomechanical problems, disuse, impingement, inflammation, arthritis and excess weight bearing while strengthening (Alm et al ., 2008).

The shoulder has been reported to be the joint most commonly associated with pain above the level of injury in individuals with paraplegia following spinal cord injury (SCI).The reported prevalence of shoulder pain in paraplegic individuals is high, usually between 30% and 70% (Samuelsson et al., 2005)

The lifetime prevalence of common LBP among the general population is above 80%. LBP is the leading cause of "years lived with disability" worldwide, while NP is the fourth Common low back pain (LBP) is defined as pain between the costal margins and the inferior gluteal folds, which is usually accompanied by painful limitation of movement. It may be associated with pain referred down to the leg, and is not related to fracture, direct trauma, or systemic diseases such as neoplastic, infectious, vascular, metabolic, or endocrine-related processes. Common thoracic pain (TP) is diagnosed when pain is located between the costal margins and the base of the neck, and common neck pain (NP) is diagnosed when pain is located above that level. The latter may be accompanied by pain referred to the arm (Dagenais & Haldeman, 2008)

Individuals who use a wheelchair for mobility and have poorly innervated trunk muscles must rely on their upper extremities for stability and mobility. In the chronic stage after SCI, soft tissue structures are exposed to overuse in activities of daily living, for example, in wheelchair propulsion and transfer in which the shoulder becomes a weight-bearing joint. Sub acromial impingement with bursitis; tendinopathy; and tears of the rotator cuff (especially the supraspinatus), the biceps tendon, or both are the most common diagnoses of individuals with paraplegia suffering from chronic nociceptive shoulder pain. (Escobedo et al., 2008)

Wrist pain following spinal cord injury is a common phenomenon in the patient with paraplegic wheel chair users those who use manual wheelchair in a much greater speed than normal or those who were participates in sports activity such as wheelchair basket-ball, wheelchair race or running the wheelchair in up and down slopes (Dalyan et al .,2008).

Wheelchair users with SCI who fall are at great risk of fractures, since they have an increased prevalence of osteoporosis (Karapolat et al., 2009)

Loss of range of motion (known as a contracture) is probably the most common musculoskeletal problem following spinal cord injury (SCI). Range of motion is very important for seating, transferring, and other functional activities (Dalyan et al., 1998). The causes of decreased range of motion are numerous, although the most common cause is staying in the same position for prolonged periods of time, such as sitting, decreasing flexibility; arthritis-people with joint problems commonly lose range of motion (Goldstein et al., 2007)

Wheelchairs are primary mobility devices for individuals with locomotive disabilities for whom ambulation is not possible or practical. More than half of individuals with amyotrophic lateral sclerosis, cerebral palsy, multiple sclerosis, multiple system atrophy, progressive supranuclear palsy, and spinal cord injury (SCI) rely on wheelchairs for mobility(Simpson et al.,2008).

CHAPTER-III: METHODOLOGY

Study design

A cross sectional study design was selected by the researcher to carry out the research. These types of research were primarily used to determine prevalence. Prevalence equals the number of cases in a population at a given point in time. All the measurements on each person were made at one point in time. The data are collected within a short time frame. A cross-sectional design provides a snapshot of the variables included in the study, at one particular point in time .The researcher collected data from the spinal cord injury (SCI) unit of physiotherapy department of CRP through a standard questionnaire.

Settings

The researcher selected the SCI unit of physiotherapy department of CRP for data collection. At first researcher developed a standard questionnaire and then selected the paraplegic wheelchair patient of SCI unit as sample for data collection.

Study population and sample population

A population is the total group or set of events or totality of the observation on which a research is carried out. It is the group of interest to the researcher, the group whom the researcher would like to generalize the result of the study. In this study the researcher choose the paraplegic spinal cord injury patient in the CRP as population to carry out this study. The sample population or sample is a relatively small subset of population that is selected to represent or stand in for the population. A sample is the researcher defined subgroup of the population. The researcher chooses the paraplegic wheelchair patients in CRP as a sample.

Sampling technique

Sampling refers to the process of selecting the subjects/individual. The researcher selected the convenience technique to draw out the sample from the population. The simple random technique is the process where every single subjects of the population has an equal chance of being selected as a sample. It is the most unbiased manner to selecting the data from the population.

Sample size

In this project study, the researcher selected 50 paraplegic wheelchair patients from the spinal cord injury (SCI) unit of CRP through convenience technique.

Data management and analysis plan

The data that the researcher collected is descriptive data. The researcher used the graph technique for analyzing data, calculated software version 20.0 SPSS is a comprehensive and as percentages, and presented this using bar and pie charts by SPSS (Statistical Package for social Science) flexible statistical analysis and data management solution. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and conduct complex statistical analyses.

Informed consent

Written consent (appendix 1& 2) was given to all participants prior to completion of the questionnaire. The researcher explained to the participants about his or her role in this study. The researcher 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. The researcher assured the participants that the study would not be harmful to 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 get benefit from it. The participants had the rights to withdraw consent and discontinue participation at any time without prejudice to present or future care at the spinal cord injury (SCI) unit of CRP. Information from this study was anonymously coded to ensure confidentiality and was not personally identified in any publication containing the result of this study.

Ethical consideration

The researcher took permission initially from the supervisor of the research project and from the course coordinator before conducting the study. The necessary information has been approved by Institutional Review Board (IRB) of BHPI and the researcher was permitted to do this research. Also the necessary permission was taken from the in-charge of the rehabilitation division of CRP. The participants were explained about the purpose and goal of the study before collecting data from the participants. Pseudonyms were used in the notes, transcripts and throughout the study. It was ensured to the participants that the entire field notes, transcripts and all the necessary information will be kept in a locker to maintain confidentiality and all.

3.9 Limitation of the study

It is absolutely uncertain to ensure 100% accuracy in any research so that there must be some limitations. Regarding this study, there were so information may be destroyed after completion of the study. The participants were also assured that their comments may not affect them about any bad thing limitations or barriers to consider the result of the study as below:

The first limitation of this study was small sample size. Only 50 samples were selected.

A very few researches have done on a few of musculoskeletal disorders.

So there was little evidence to support the result of this project study in the context of Bangladesh.

CHAPTER-IV: RESULTS

In this study cross sectional study design was used to find out the prevalence of musculoskeletal disorders among paraplegic wheel chair using patients by self-administrated questionnaire. Total number of participants were 50.

Socio-demographic information

Age range:

In this study age of the participant mean age was 26.32 years standard deviation was (±11.70) years median age was 22.5 years and mode was 18 years .The study showed that 12% (n=6) of participants were between the age group of 9-15 years. Most of the participants were in between the age range of 16-30 years which was 62%. Rest of the 26% (n=13) were belongs to the age group of above 31 years.

Age group	Number	Percent (%)
Below 30 years	37	74
31 – 75 years	13	26
Total	**50**	**100**

Table-1: Age range of the participants**.**

Sex ratio:

50 paraplegic spinal cord injury patients participated in the study, among them 86% (n=43) were male and about 14% (n=7) were female where male participants are more in number than the female participants.

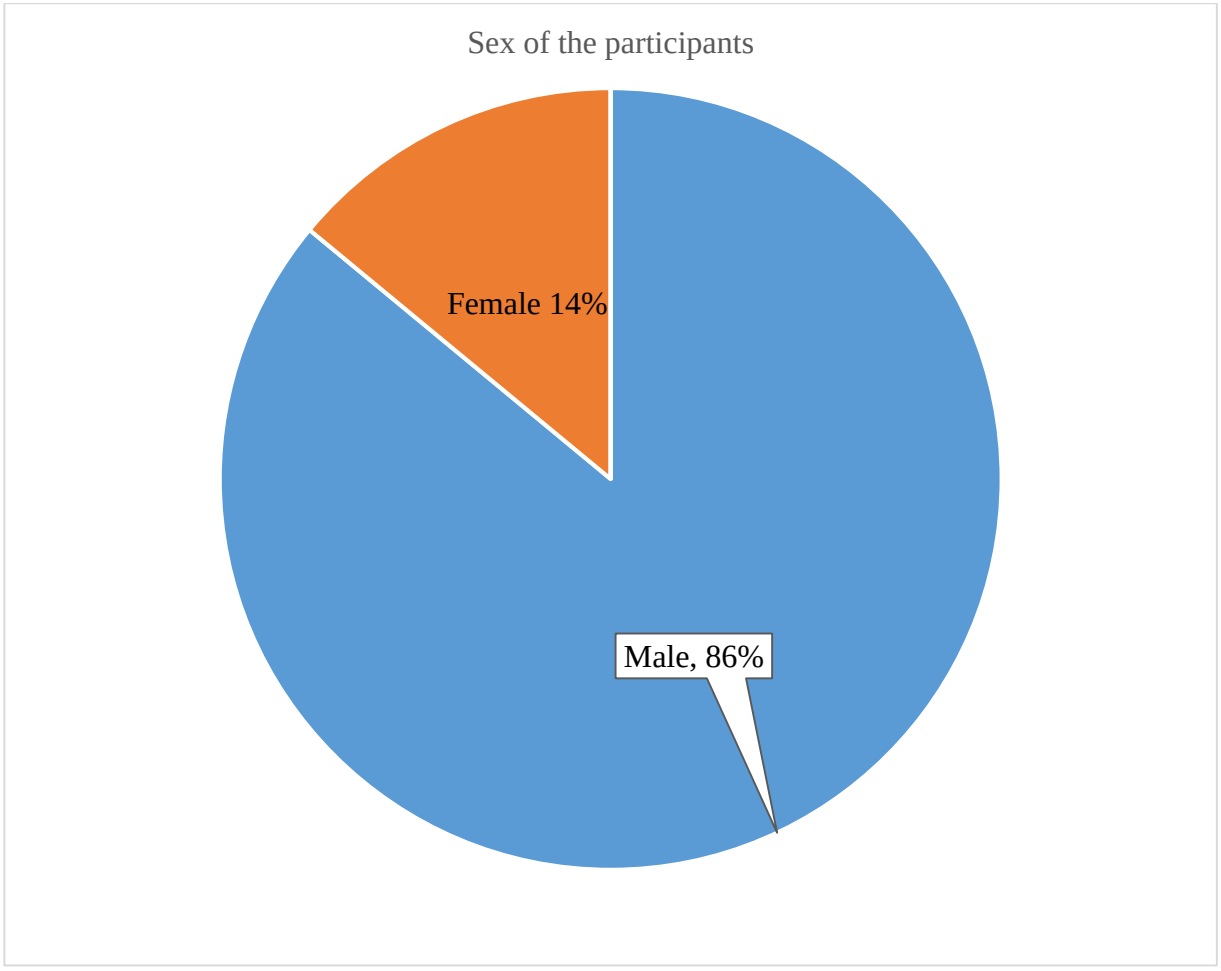


Figure-1: Sex of the participants.

Marital status of the participants:

Out of 50 participants, it was observed that there were no marked differences on marital status of the participants. However, unmarried was slightly higher that was (56%) than married (44%).

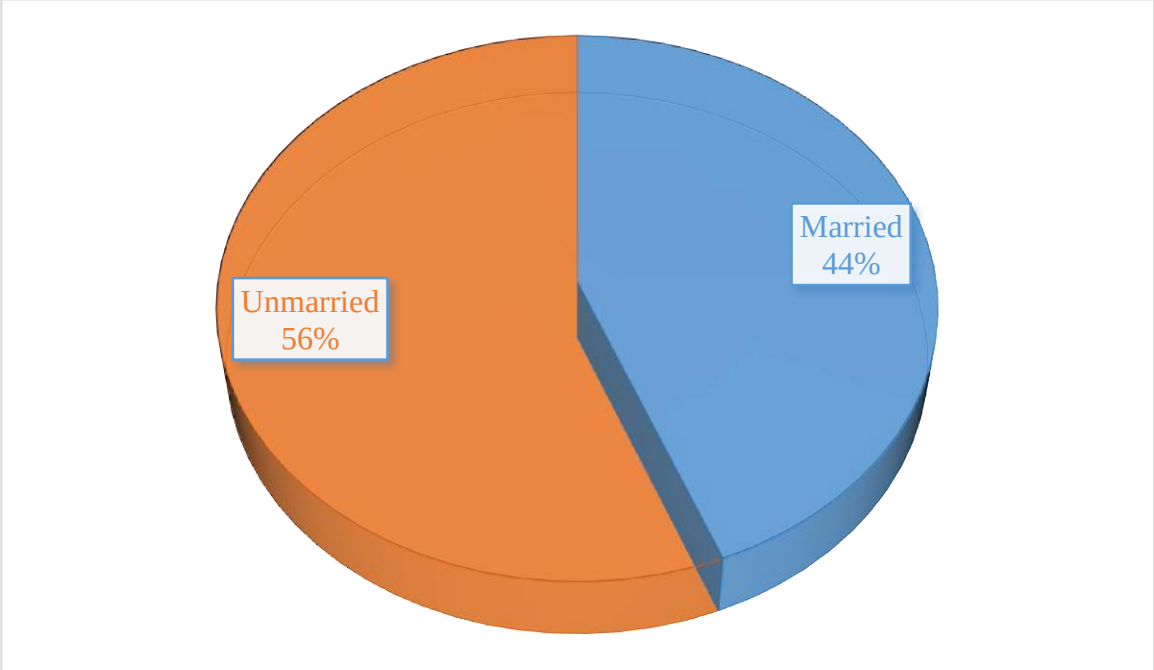


Figure-2: Marital status of the participants

Educational level:

Among 50 participants in this study, 82% patients were illiterate (those who only can sign), about 4% patients were literate (those who only can read and write) and about 14% were well educated (those who have at least one board certificate).

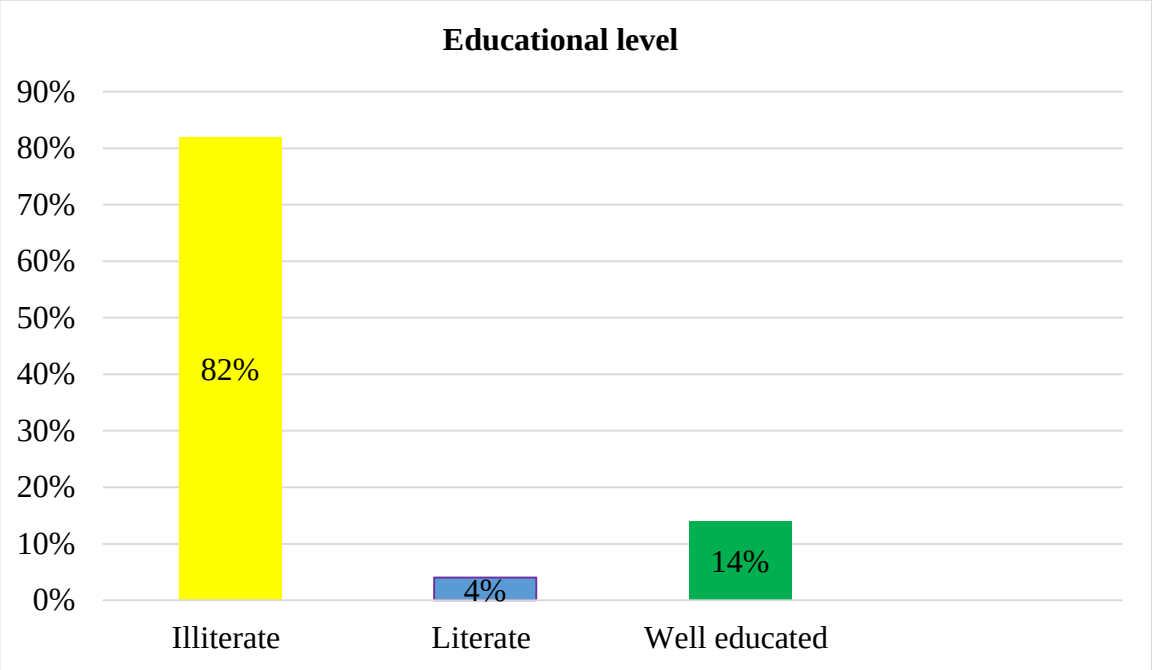


Figure-3: Educational level of the participants

Occupation:

About 50 participant were involved as sample in this study. Among them student were (30%), Day laborer were (20%), service holder were (20%), Factory/Garments worker (16%), housewife (4%), Unemployed (4%), Rickshaw puller (2%), farmers (2%), businessman (2%). In this study it is found that day laborer are the most vulnerable group to prone in spinal cord injuries.

Occupation	**Number (n)**	**Percentage (%)**
Student	15	30
Day laborer	10	20
Service holder	10	20
Factory/Garments worker	8	16
Housewife	2	4
Unemployed	2	4
Rickshaw puller	1	2
Farmer	1	2
Businessman	1	2
Total	**50**	**100**

Table- 2: Occupation of the participants

Residential area:

In this study about 70% people lived in rural area and leads poor qualities of life, about 30% people were from urban areas. The research showed that spinal cord injury was more common in the rural people who had lower educational status.

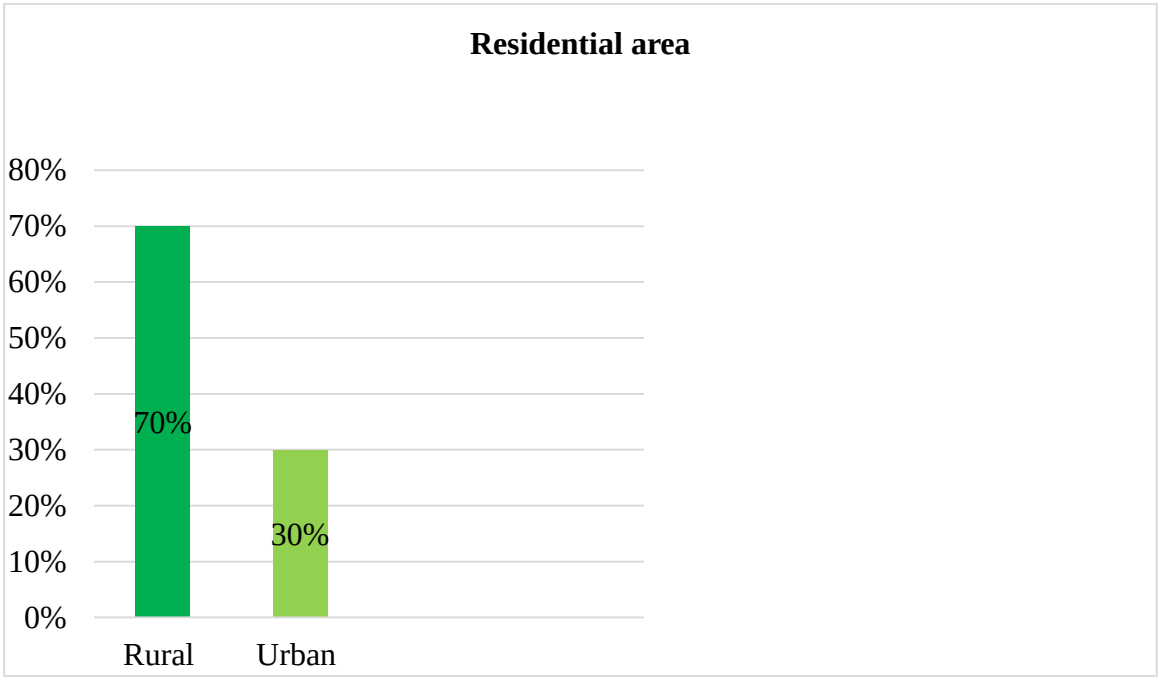


Figure-4: Residential area of the participants

Causes of injury:

In this study it was found that among 50participants (50%) were injured by fall from height, (22%) by motor vehicle accident,(10%) by pathology of the spine, (8%) by dive into shallow water, (6%) by gun shoot injury, (4%) by fall while caring heavy objects. Almost half of the injury occurred due to fall from height.

Causes	**Number (n)**	**Frequency (%)**
Fall from height	25	50
Motor vehicle accident	11	22
Pathology of the spine	5	10
Dive into shallow water	4	8
Gun shoot injury	3	6
Fall while caring heavy object	2	4
Total	**50**	**100**

Table-3: Causes of injury

Diagnosis:

Among this 50 paraplegic spinal cord injury patients, researcher found that 76% were complete spinal cord injured and 24% were incomplete spinal cord injured. The complete injury participants are more in number and it was due lower thoracic level injury.

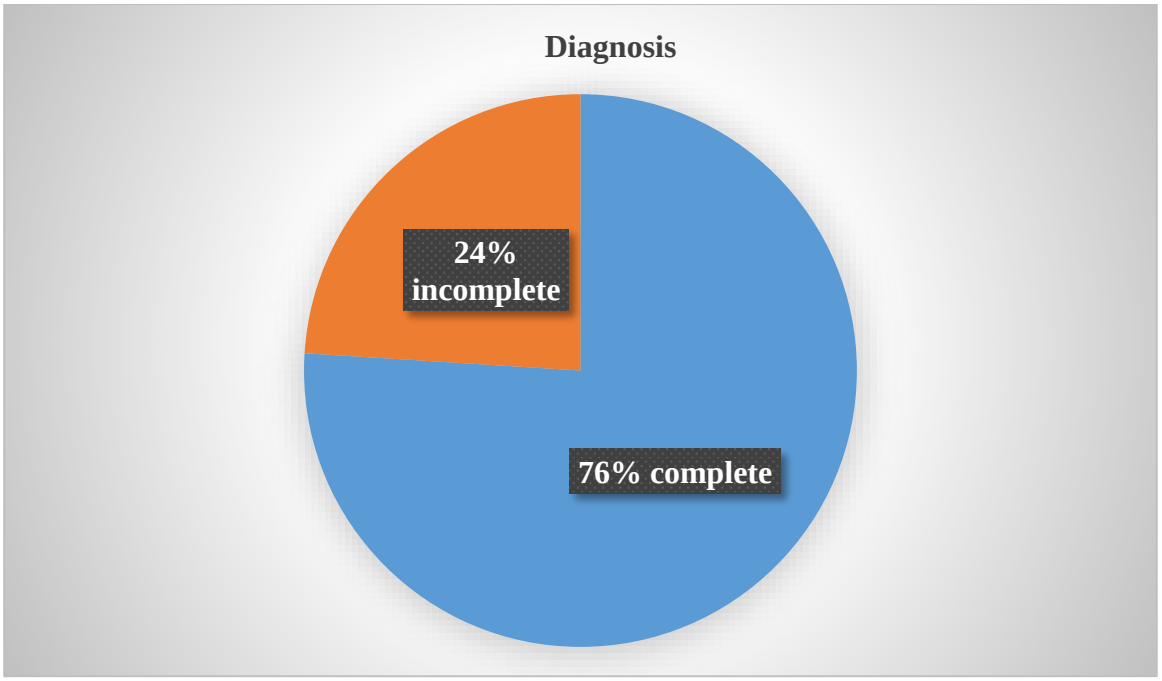


Figure-5: Diagnosis of the participants

When wheelchair started:

Among the 50 participants in this study all are wheelchair user. The mean value of duration of wheelchair use was 3.84 months with the standard deviation (±1.89) months and the median value was 3.50 months.

Musculoskeletal disorders:

Shoulder pain:

From the data of the present study, the researcher was found that about 76% paraplegic spinal cord injury patient have shoulder pain and 24% patient have no shoulder pain. The pain occurred due to tighten wheel and weakness of the muscles.

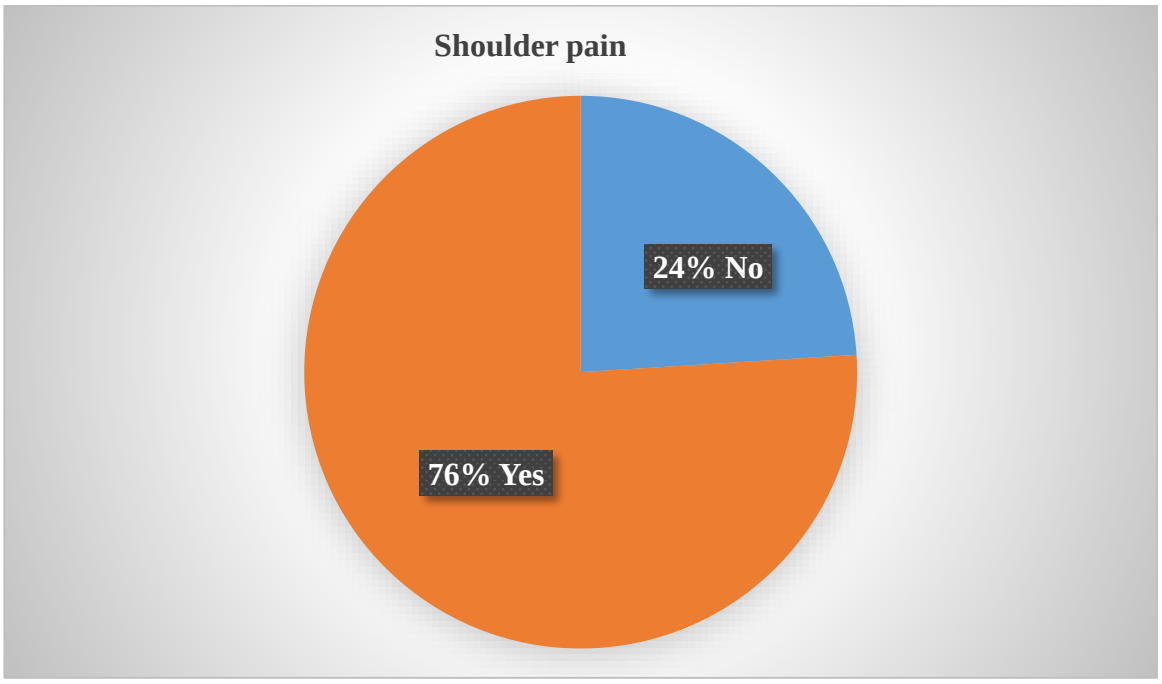


Figure-6: Shoulder pain of the participants.

Wrist pain:

Among 50 paraplegic wheelchair participants, the researcher found that about 16% complained of wrist joint pain and 84% has no complain of wrist pain during the propulsion of wheelchair.

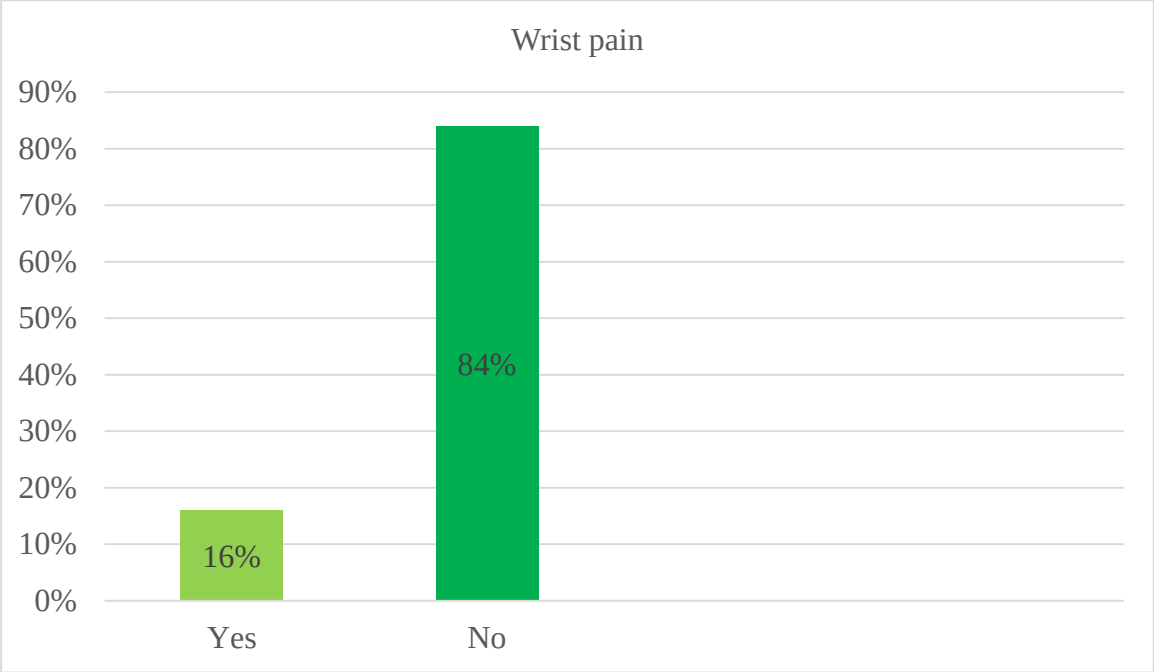


Figure-7: Wrist pain of the participants.

Elbow pain:

In this study, the researcher found that among 50 participants 22% had elbow pain and 78% has no complain of elbow pain. The cause of elbow pain was mostly due to tennis elbow.

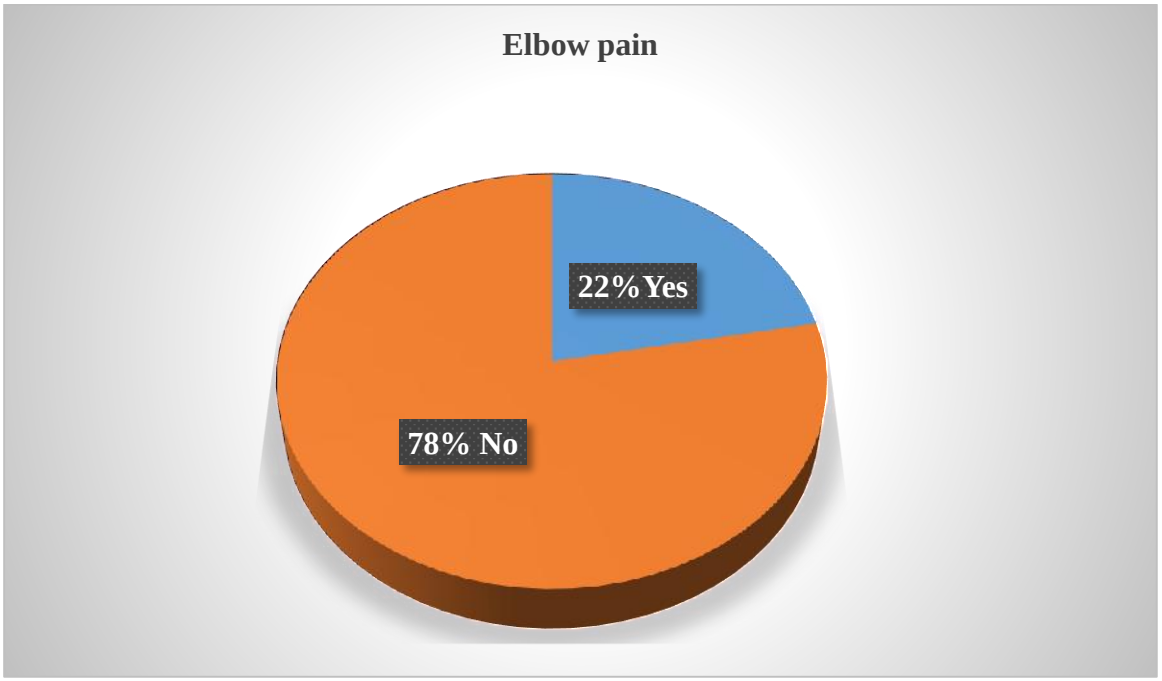


Figure-8: Elbow pain of the participants.

Back Pain:

In this study, the researcher found that among 50 participants 60% had back pain and 40% had no complain of back pain. The participants suffered from back pain were more in number.

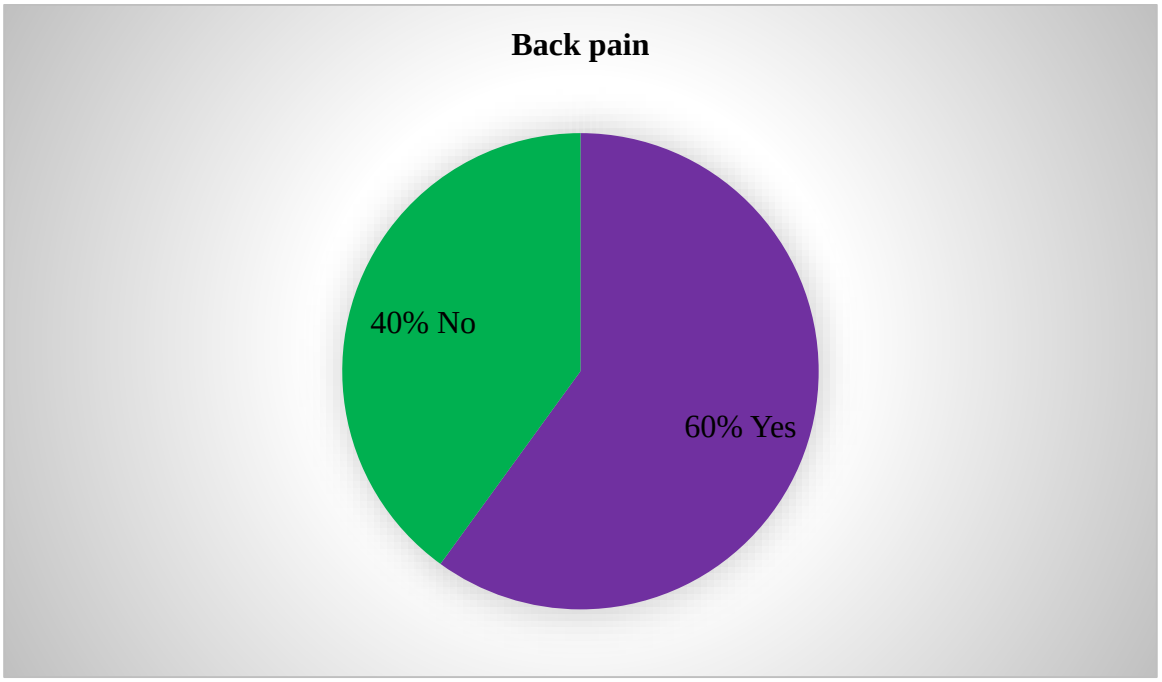


Figure-9: Back pain of the participants.

Fracture after injury:

In this study, among 50 paraplegic SCI patients there was no history of fracture during the rehabilitation process after injury. It was found that, fractures are very common in people with spinal cord injury (SCI). As all patients involved in this study were under rehabilitation program and the patients have no history of fall from the bed and wheelchair during rehabilitation program that's why researcher does not find any patient with fracture in this study.

Neck Pain:

50 paraplegic spinal cord injury participants were used as sample in this study. Among them, the researcher found that 54% had neck pain and rest 46% had no complain of neck pain.

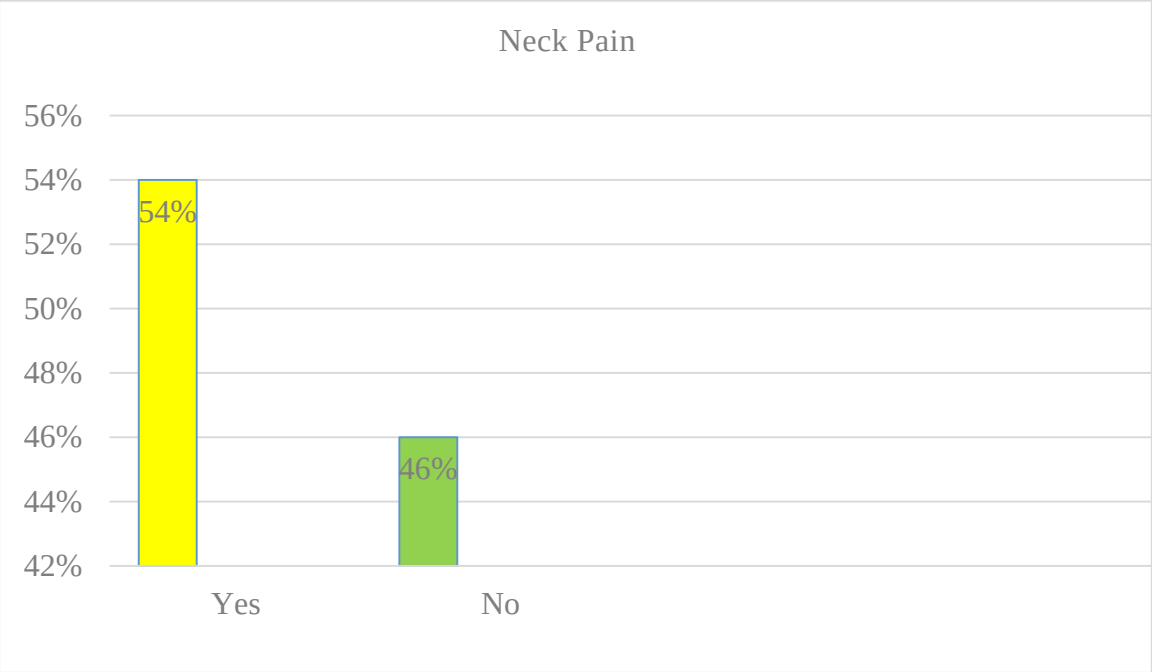


Figure-10: Neck pain of the participants.

Buttock Pain:

In this study it is found that about 72% participants had buttock pain and rest 28% participants had no complain of buttock pain.

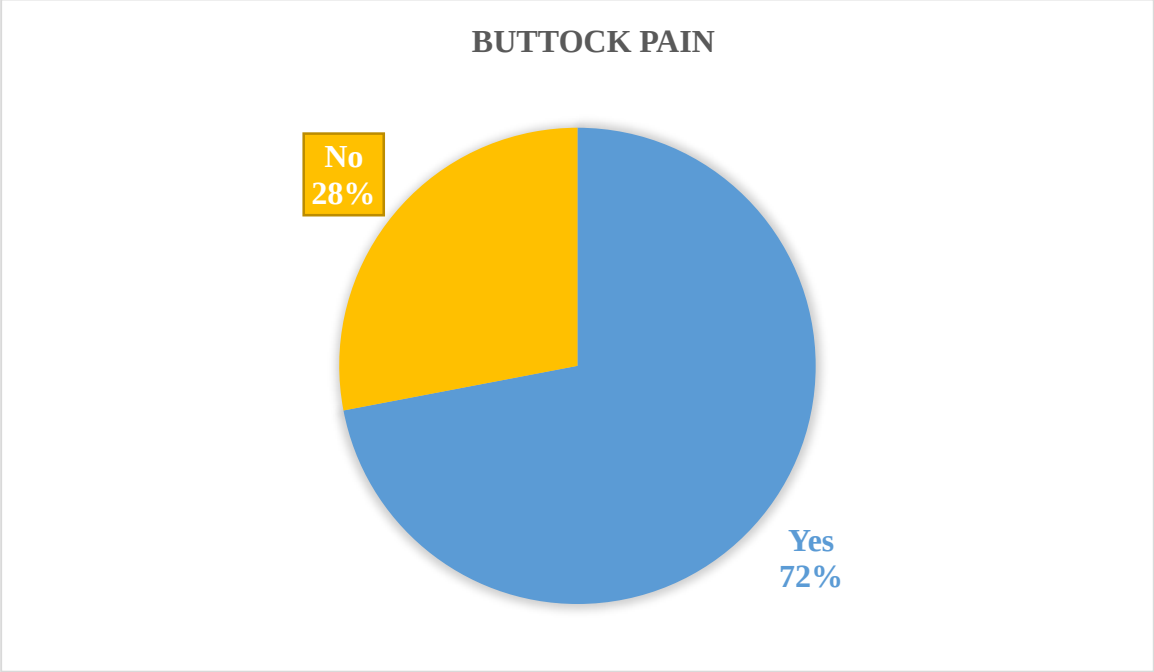


Figure-11: Buttock pain of the participants.

Pain on the Chest:

Among 50 participants, only 16% participants complained of chest pain and 84% participants had no complain of chest pain.

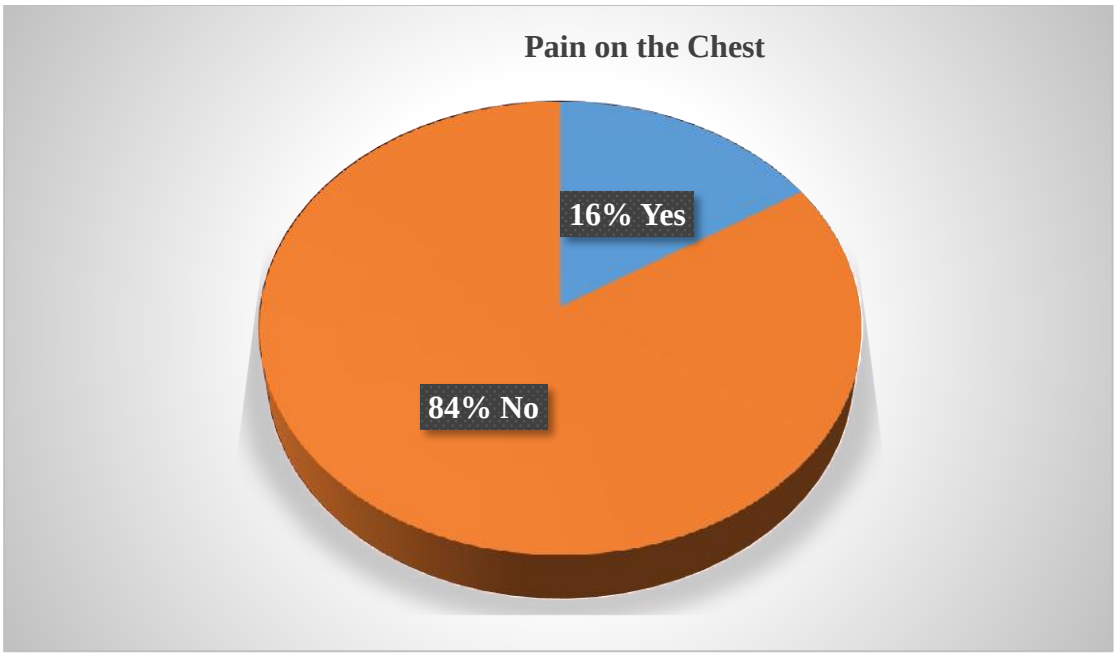


Figure-12: Pain on the chest of the participants.

Swelling on the Ankle Joint:

Among 50 participants, only 50% participants had swelling on the ankle joint and 50% participants had no swelling on the ankle joint.

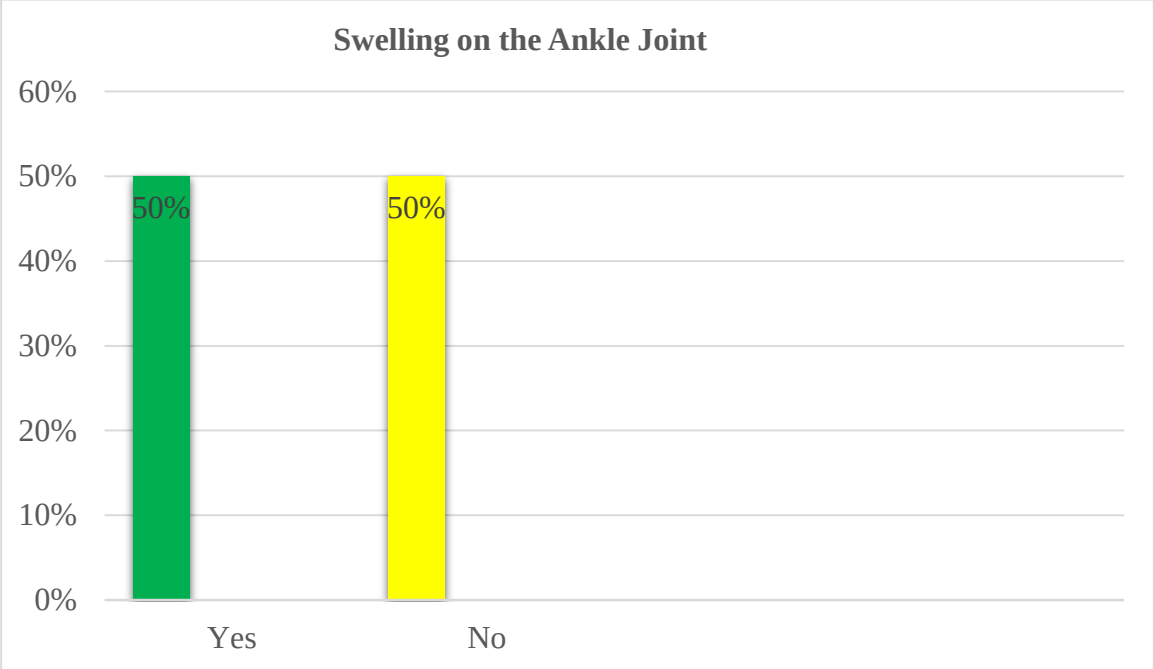


Figure-13: Swelling on the Ankle Joint of the participants.

Discomfort due to technical problem:

Among 50 samples, about 36%patients felt discomfort during the time of wheelchair propulsion and 64% had no complain of problem or discomfort.

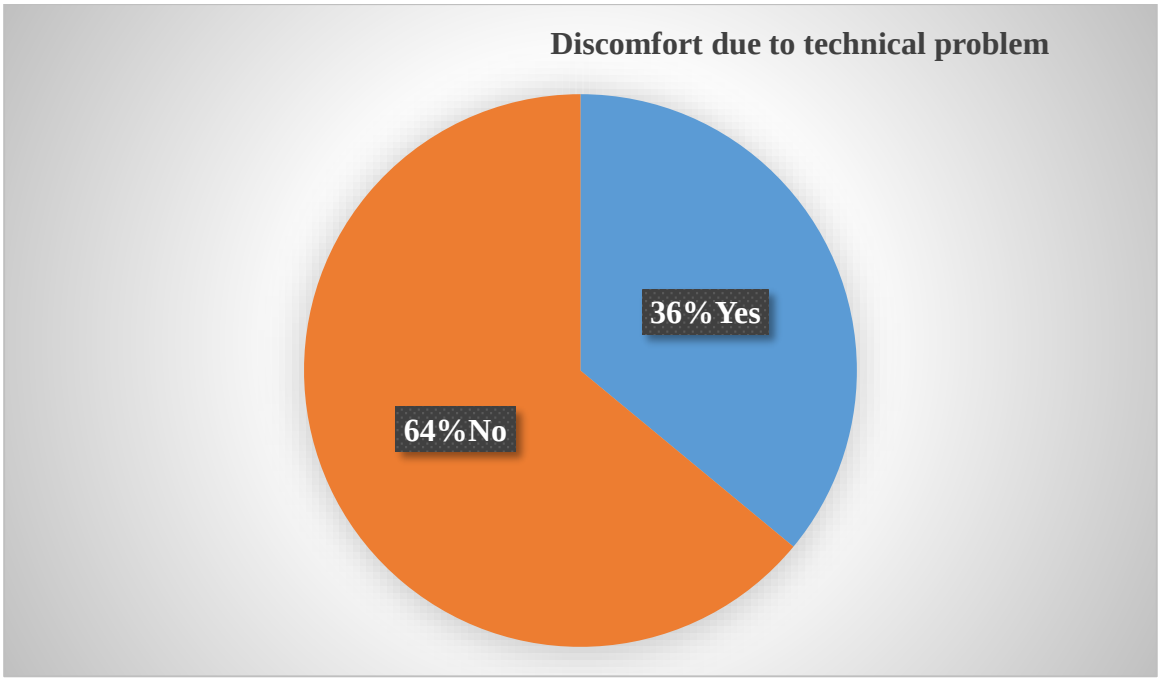


Figure-14: Discomfort due to technical problem.

Association between Demographic characteristics and disease conditions related variable:

Demographic variables like sex, occupation, residential area, education, marital status associated with disease condition such as-neurological level of injury, shoulder pain, elbow pain, wrist pain, back pain swelling on the ankle joint, discomfort in the wheelchair, heterotrophic bone ossification**.** Association between marital status and back pain, residential area and discomfort in wheelchair, association between residential area and chest pain is insignificant. The significant association are given below:

Association between Sex and Neurological level of injury:

In the study the association between the sex ratio and neurological level of injury is 0.109 where the complete male participants are 31 and female are 7 and incomplete male are 12.Association between sex and neurological level of injury is 0.109. The result is significant.

	Neurological level of injury			
Sex	**Complete**	**Incomplete**	**Total**	**Chi-square**
Male	31	12	43	
Female	7	0	7	0.109
Total	**38**	**12**	**50**	

Table-4: Association between Sex and Neurological level of injury.

Association between shoulder pain and neck pain:

Among the 50 participants 12 participants have shoulder pain and 38 participants have no shoulder pain .In addition 27 participants have neck pain and 23 participants have no neck pain .The association between shoulder pain and neck pain is 0.313.

	Yes	**No**	**Total**	**Chi-square**
Shoulder pain	12	38	50	
				0.313
Neck pain	27	23	50	

Table-5: Association between shoulder pain and neck pain.

Result: Significant.

Interpretation: There is positive relationship between shoulder pain and neck pain. So, if the shoulder pain exist neck pain also exist.

Association between elbow pain and wrist pain:

In the study among 50 participants 11 participants have elbow pain and 39 participants have no elbow pain, 8 participants have wrist pain and 42 participants have no wrist pain .The association between elbow pain and wrist pain is 0.037.

	Yes	**No**	**Total**	**Chi-square**
Elbow pain	11	39	50	
				0.037
Wrist pain	8	42	50	

Table-6: Association between elbow pain and wrist pain**.**

Result: Significant.

Interpretation: There is positive relationship between elbow pain and wrist pain. If the elbow pain exist wrist pain also exist.

Association between back pain and discomfort in wheelchair:

In the study 30 participants have back pain and 20 participants have no back pain among the 50 participants .18 participants have feeling discomfort in wheelchair and 32 participants have no discomfort in wheelchair .The association between back pain and discomfort in wheelchair is 0.012.

	Yes	**No**	**Total**	**Chi-square**
Back pain	30	20	50	
				0.012
Discomfort in wheelchair	18	32	50	

Table-7: Association between back pain and discomfort in wheelchair.

Result: There is positive relation between back pain and discomfort in wheelchair. So, if the back pain exist discomfort in wheelchair also exist.

Association between occupation and elbow pain:

Total participants are 50, among them-the variables are housewife, service holder, rickshaw puller, farmer, factory/garments worker, businessman, day laborer, unemployed and student. The association between elbow pain and occupation is 0.012.

	Elbow pain			
Occupation	**Yes**	**No**	**Total**	**Chi-square**
Housewife	2	0	2	
Service holder	2	8	10	
Rickshaw puller	0	1	1	
Farmer	1	0	1	
Factory/garments worker	3	5	8	0.012
Businessman	1	0	1	
Day laborer	0	10	10	
Unemployed	0	2	2	
Student	2	13	15	
Total	**11**	**39**	**50**	

Table-8: Association between occupation and elbow pain.

Result: The result is significant.

Interpretation: There is positive relation between occupation and elbow pain.

Association between occupation and shoulder pain:

Total participants are 50, among them-the variables are housewife, service holder, rickshaw puller, farmer, factory/garments worker, businessman, day laborer, unemployed and student. The association between occupation and shoulder pain is 0.045.

	Shoulder pain			
Occupation	**Yes**	**No**	**Total**	**Chi-square**
Housewife	2	0	2	
Service holder	1	9	10	
Rickshaw puller	0	1	1	
Farmer	1	0	1	
Factory/garments worker	2	6	8	0.045
Businessman	1	0	1	
Day laborer	1	9	10	
Unemployed	0	2	2	
Student	4	11	15	
Total	**12**	**38**	**59**	

Table-9: Association between occupation and shoulder pain

Result: Significant

Interpretation: There is positive relation between occupation and shoulder pain.

Association between education and heterotrophic ossification:

Among the 50 participants 41 participants illiterate and they have no heterotrophic bone ossification, 2 participants are well educated and they also have no ossifications. The rest 7 participants are well educated and among them 1 participant have heterotrophic bone ossification. The association between education and heterotrophic bone ossification is 0.044 and the association is significant.

	Heterotrophic bone ossification			
Education level	**Yes**	**No**	**Total**	**Chi-square**
Illiterate	0	41	41	
Literate	0	2	2	0.044
Well educated	1	6	7	
Total	**1**	**49**	**50**	

Table-10: Association between education and heterotrophic ossification:

Result: Significant

Interpretation: There is positive relation between education and heterotrophic bone ossification.

Association between marital status and swelling on the ankle joint:

In the study total participants are 50. Among them 22 participants are married and 28 participants are unmarried.15 participants have swelling on the ankle joint among the married and from the unmarried 10 participants have swelling on the ankle joint. Association between marital status and swelling on the ankle joint is 0.023

	Swelling on the ankle joint			
Marital status	**Yes**	**No**	**Total**	**Chi-square**
Married	15	7	22	
Unmarried	10	18	28	0.023
Total	**25**	**25**	**50**	

Table-11: Association between marital status and swelling on the ankle joint.

Result: The result is significant.

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Interpretation: There is positive relation between marital status and swelling on the ankle joint.

CHAPTER-V DISCUSSION

The purpose of the study was to describe the prevalence of socio-dynamic (i.e., age, sex, marital status, education, occupation, family income, living area) and musculoskeletal disorders among paraplegic wheel chair patients at spinal cord injured patient at CRP.

Musculoskeletal disorders are joint tightness , shoulder pain , back pain ,fracture ,neck pain ,buttock pain chest pain , ankle joint swelling ,discomfort due to technical problem .

In this study age of the participant mean age was 26.32 years standard deviation was (± 11.70) years, median age was 22.5 years and mode was 18 years. The study showed that 12% (n=6) of participants were between the age group of 9-15 years. Most of the participants were in between the age range of 16-30 years which was 62%. Rest of the 26% (n=13) were belongs to the age group of above 31 years. In a study, it was found that the biggest sample contains in the age range of 16-30 years and the lowest sample contains in the 61-75 years. In a study, it was found that the majority of the spinal cord injury patients were aged 41-50 (n =26) years and the minimum age range were nearly 51-60 (n=22) years (Marie et al., 2008).

In this study among 50 participants 44% are married and 56 % are unmarried .In other study among 101 participants 50 % were unmarried and others were married (Marie et al., 2008).

In this study among 50 participants 76% people were suffering from shoulder pain and the 24% people were not suffering from shoulder pain. In another study among Few of the 88 subjects reported that they had experienced shoulder pain before becoming a wheelchair user (8%), whereas 59 subjects (67%) reported a history of shoulder pain since becoming a wheelchair user (Marie et al., 2008).

Shoulder pain occurs due to muscular weakness and tighten of the wheelchair.

In this study among 50 paraplegic wheelchair participants, the researcher found that about 16% was complained of wrist joint pain and 84% has no complain of wrist pain during the propulsion of wheelchair. In another study among 451 participants33% reported elbow joint pain (Kentar et al.2017).

Among 50 paraplegic wheelchair participants, the researcher found that about 16% was complained of wrist joint pain and 84% has no complain of wrist pain during the propulsion of wheelchair. In another study among 451 participants 195 participants (43%) had wrist pain (Kentar et al.2017).

In this study, the researcher found that among 50 participants 60% has back pain and 40% has no complain of back pain. In a study, it was said that among 788 participants 45% reported neck joint pain (Kovacs et al.2017).

50 paraplegic spinal cord injury participants were used as sample in this study. Among them, the researcher found that 54% has neck pain and rest 46%has no complain of neck pain. In another study 750 participants in thoracic level injury were included as sample who used wheelchair more than 1 year and it was found that 95% participants have neck pain(Kovacs,2018).

In this study, the researcher found that among 50 participants 60% has back pain and 40% has no complain of back pain. .In another study 750 participants were included as sample who used wheelchair more than 1 year and it was found that 73% participants have low back pain (Kovacs.2018).

In this study it is found that about 72% participants has buttock pain and rest 28% participants has no complain of buttock pain. In a study across 28 participants blood flow was significantly reduced due to high loads and buttock displaced an average of 9.3 mm (Sharon et al., 2018)

In a study 43 participants included as sample. Out of the 43 participants, 79.1% (n=34) used mobility devices, the majority (n=20) used wheelchairs. Most of the participants (n=41) played wheelchair basketball for more than five years and 32 participants did not participate in other sport. Almost half of the participants (n=25) experienced musculoskeletal pain in the last twelve months or at present, 75% of whom (n=12) visited a Physiotherapist for the participants responded yielding an 89.58% response rate. More than half of these participants (n=15; 60%) reported that the pain negatively affected their basketball performance. It was established that arm pain occurred frequently in lower point classified players (1.0-2.5 point players) and that hand and wrist pain was also more prevalent in lower point players than in higher point players. The prevalence of lower extremity pain was low and there was no statistically significant difference between higher and lower point classified players (Mateus 2016).

CHAPTER-V: CONCLUSION AND RECOMMENDATION

5.1 Conclusion

In Bangladesh the number of spinal cord injury patient is increasing day by day. And paraplegia is more common than tetraplegia. This study was aimed to find out the common musculoskeletal disorders among paraplegic wheelchair users. For the fulfillment of the study the researcher was designed a quantitative study design (cross- sectional study) and collected 50 data from the samples through a standard questionnaire. From the data base, it was found that the age range between 16-30 years is more vulnerable to have spinal cord injury (SCI). Male are predominantly more affected than female. The educational level were very poor in most the patients, about 82% patients have lower level of educational status and most of them are from rural areas. From the research findings, the researcher found that loss of range of motion or contracture is more common in the lower educational level of patients, it may due to the lack of awareness in that group of patients. The researcher have also found that those who have technical problem in their wheelchair (for example- tighten wheel where patients need extra effort to propel the wheelchair), they had more shoulder pain and it was about 76%, this may due to needed of extra effort or abnormal wheelchair propulsion. The researcher also found that besides these, there are some other disorders with lower prevalence may have occurred such as ankle swelling, buttock pain, chest pain, neck pain and fracture. Last of all the study will try to represent the strong evidence among paraplegic wheelchair users with the musculoskeletal disorders.

5.2 Recommendation

In this study, the researcher takes information from the participants' trough a standard questionnaire to identify the common musculoskeletal disorders among paraplegic wheelchair users. Though the research has some limitations but researcher identified some further step that might help for the better accomplishment of further research. To ensure the generalizability of further research it is recommended to investigate a large sample. In this study researcher investigate only paraplegic wheelchair patient. So researcher is strongly recommended to include both paraplegic and tetraplegic wheelchair patients for further study. Comparative study should be done including the 't' test. In case of further long duration research study with more samples will bring more significant results. This research has been performed with 51 samples from the Center for the Rehabilitation of the Paralyzed which will not represent the whole country. So, it is finally recommended by the researcher for further study to take setting in whole Bangladesh as much as possible to generalize the study.

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Appendix-1

VERBAL CONSENT STATEMENT

(Please read out to the participants)

Assalamualaikum/Namasker, my name is Mst. Alpana Khatun, I am conducting this study for a B.Sc. in Physiotherapy project study dissertation titled "Prevalence of common musculoskeletal disorders among paraplegic wheelchair users" under Bangladesh Health Professions Institute (BHPI), University of Dhaka. I would like to know about some personal and other related information regarding Spinal Cord Injury (SCI). You will perform some tasks which are mention in this form. This will take approximately 20-30 minutes.

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

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

Do you have any questions before I start?

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

Yes ☐

No ☐

Signature of the Participant ----------

Signature of the Interviewer ----------

Appendix-2

মৌখিকঅনুমতিপত্র / সম্মতিপত্র

(অংশগ্রহণকারীকেপড়েশোনাতেহবে)

আসসালামুয়ালাইকুম/ নমস্কার আমার নাম মোছা:আলপনাখাতুন ,আমি এই গবেষণা প্রকল্প টি বাংলাদেশ হেলথ প্রফেসন্স ইন্সিটিউট (বিএইচপিআই)- এ পরিচালনা করছি যা আমার ৪র্থ বর্ষ বি এস সি ইন ফিজিওথেরাপি কোর্সের অধিভুক্ত। আমার গবেষণার শিরোনাই হল –'' হুইল চেয়ার ব্যবহারকারী অর্ধাঙ্গের পক্ষঘাত গ্রস্তদের মধ্যে অস্তিপিঞ্জর এবং পেশীসমূহের সচারচর দৃষ্ট অস্বাভাবিকতার সর্বব্যাপীতা। ''আমি এক্ষেত্রে আপনাকে কিছু ব্যক্তিগত এবং আনুসাঙ্গিক প্রশ্ন মেরুরজ্জু ক্ষতিগ্রস্ত সম্পর্কে করতে যাচ্ছি।এতে আনুমানিক ২০-৩০ মিনিট সময় নিবো

আমি আপনাকে অনুগত করছি যে , এটা আমার অধ্যয়নের অংশ এবং যা অন্য কোন উদ্দেশে ব্যবহত হবেনা।গবেষক সরাসরি এই স্নায়ু জ্ঞান অধ্যয়নের সাথে অন্তর্ভুক্ত নয়। তাই এই গবেষণায় অংশগ্রহণ আপনার বর্তমান এবং ভবিষ্যৎ চিকিৎসায় কোন প্রকার প্রভাব ফেলবেন । আপনি যেসব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং আপনার প্রতিবেদনের ঘটনা প্রবাহে এটা নিশ্চিত করা হবে যে এই তথ্যের উৎস অপ্রকাশিত থাকবে।

এইঅধ্যয়নেআপনারঅংশগ্রহনস্বেচ্ছাপ্রণোদীতএবংআপনিযেকোনসময়এইঅধ্যয়নথেকেকোননেতিবাচকফলাফলছাড়াইনিজে কেপত্যাহারকরতেপারবেন।এছাড়াওকোননির্দিষ্টপ্রশ্নঅপছন্দহলেউত্তরণাদেয়ারএবংসাক্ষাতকারেরসময়কোনউত্তরনাদিতেচাও য়ারঅধিকারওআপনারআছে।
এইঅধ্যয়নেঅংশগ্রহণকারীহিসেবেযদিআপনারকোনপ্রশ্নথাকেতাহলেআপনিআমাকেঅথবা / এবংমোঃসফিকুলইসলাম , সহকারীঅধ্যাপকফিজিওথেরাপিবিভাগ ,বিএইচপিআই , সিআরপি , সাভার , ঢাকা -১৩৪৩তেযোগাযোগকরতেপারেন।

সাক্ষাৎকারশুরুরপূর্বেআপনারকীকোনপ্রশ্নআছে ?

আমিআপনারঅনুমতিনিয়েএইসাক্ষাৎকারশুরুকরতেযাচ্ছি

হ্যাঁ ☐
না ☐

১।অংশগ্রহণকারীরসাক্ষর _____

২।সাক্ষাৎকারগ্রহণকারীরসাক্ষর _____

Appendix-3

Title: Prevalence of common musculoskeletal disorders among paraplegic wheelchair users in CRP

Questionnaire

	Interview Schedule **Part- I: Patient's Identification (to be provided by patient or attendant)**	
1.1	Identification number:	Date of Interview:
1.2	Address:	Contact no:
1.3	Consent Taken: Yes No	

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

2.1	Age (In year): ……. Years		
2.2	Sex:	Female	01
		Male	02
2.3	Marital status:	Married	01
		Unmarried	02
2.5	Educational level?	Illiterate	01
		Literate	02
		Well educated	03
2.6	Occupation?	Rickshaw puller	01
		Agriculture	02
		Factory/garments worker	03
		Driver	04
		Businessman.	05
		Day laborer.	06
		Unemployed	07
		Housewife	08
		Teacher	09
		Student	10
		Other(Specify):_____	11

2.7	What is the average monthly Income of your household?	_____ (*Taka*)

2.8	Residential Area	Rural Urban	01 02

Part-III: Physiotherapy related Information

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

QN	Questions	Responses/Answers	Code
III a:	History of injury (HI)		
3.1	Date of injury:		
3.2	Date of admission:		
3.4	Causes of injury:	☐ Motor Vehicle Injury ☐ Fall From Height ☐ Fall while carrying heavy Load ☐ Dive into shallow water ☐ Pathology of the spine ☐ Other (Please Specify)	01 02 03 04 05 06
3.5	Level of injury:	☐ Thoracic ☐ Lumber ☐ Thoraco lumber ☐ Sacral	01 02 03 04
III b:	Physical status at admission	☐ Paralyzed lower limbs ☐ Weakness of lower limbs	01 02
III c:	Initial Neurological level by ASIA:	☐ Complete **A** ☐ Incomplete **B** ☐ Incomplete **C** ☐ Incomplete **D** ☐ Normal **E**	01 02 03 04 05
III d:	Skeletal level	☐ Thoracic ☐ Lumber ☐ Thoraco lumber ☐ Sacral	01 02 03 04

III e:	Diagnosis(During admission)	☐T/P • Complete **A** • Incomplete **B/C/D/E**	 01 02
III f	When you start using wheel chair		
4 .0	How long you used wheelchair in a day		

Part IV: Musculoskeletal Disorders related questions (To be provided by the patient/attendant)

4.1	Have you feel tightness or (decreased JROM) contracture of your any joint?	☐Yes ☐No	01 02
4.2	Have you feel any pain on your shoulder?	☐Yes ☐No	01 02
4.3	Have you feel any pain on your wrist?	☐Yes ☐No	01 02
4.4	Have you feel pain on your elbow?	☐Yes ☐No	01 02
4.5	Have you feel any pain on your back?	☐Yes ☐No	01 02
4.6	Have you any fracture after injury?	☐Yes ☐No	01 02
4.7	Have you feel pain on your neck?	☐Yes ☐No	01 02
4.8	Have you feel pain on your buttock?	☐Yes ☐No	01 02
4.9	Have you feel pain on your chest?	☐Yes ☐No	01 02
5.0	Have swelling in any of your joint (ankle)?	☐Yes ☐No	01 02
5.2	Have you feel any other problem/discomfort due to technical problem of your wheelchair?	☐Yes ☐No	01 02

Appendix-4

শিরোনাম -

হুইলচেয়ারব্যবহারকারীঅর্ধাঙ্গেরপক্ষঘাতগ্রস্তদেরমধ্যেঅস্থিপিঞ্জরএবংপেশীসমূহেরসচারচরদৃষ্টঅস্বাভাবিকতারসর্ব্বব্যাপীতা।

সাক্ষাৎকারেরসময়সূচি পর্ব – ০১রোগীরসনাক্তকরন / পরিচয় (রোগীঅথবারোগীরসহকারীতথ্যপ্রদানকরবেন)	
১.১সনাক্তকরণনম্বর-	**সাক্ষাৎকারেরতারিখ -**
১.২ঠিকানা -	**যোগাযোগফোননম্বর -**
১.৩অনুমতিনেওয়াহল–হাঁনা ☐	☐

প্রশ্নবলী / প্রশ্নমালা

পর্ব – ০২রোগীরআর্থসামাজিকঅবস্থারতথ্যাবলী

ক্রমিকনং	প্রশ্ন	উত্তর	কোড
২.১	আপনারবয়স	.....বছর	
২.২	লিঙ্গ	▪ পুরুষ ▪ মহিলা	০১ ০২
২.৩	বৈবাহিকঅবস্থা	▪ বিবাহিত ▪ অবিবাহিত	০১ ০২
২.৪	শিক্ষাগতযোগ্যতা	▪ অক্ষরজ্ঞানসম্পূর্ণ ▪ নিরক্ষর ▪ সুশিক্ষিত	০১ ০২ ০৩
২.৫	পেশা	▪ গৃহিণী ▪ চাকুরীজীবী ▪ অন্যান্য	০১ ০২ ০৩
২.৬	মাসিকআয়	..... টাকা	
২.৭	আবাসিকএলাকা	▪ গ্রাম ▪ শহর	০১ ০২

(রোগীঅথবারোগীরসহকারীতথ্যপ্রদানকরবেন)

পর্ব -০৩ফিজিওথেরাপিসম্পর্কিতপ্রশ্নাবলী

আঘাতেরইতিবৃত্ত

৩.১	আঘাতপ্রাপ্তেরতারিখ		
৩.২	ভর্তিরতারিখ		
৩.৩	আঘাতেরকারণ	▪ মোটরযানেরআঘাত ▪ উপরথেকেপরে ▪ ভারীকিছুবহনকরারকারণে ▪ অগভীরপানিতেঝাপদিয়ে ▪ অন্যান্য	০১ ০২ ০৩ ০৪ ০৫
৩.৪	মেরুদণ্ডেরকোনঅংশেআঘাতপেয়েছেন	▪ বক্ষদেশীয়অংশ ▪ কটিদেশীয়অংশ ▪ বক্ষদেশীয়অংশএবংকটিদেশীয়অংশ ▪ শ্রেণীদেশীয়অংশ	০১ ০২ ০৩ ০৪
৩.৫	ভর্তিকালীনশারীরিকঅবস্থা	▪ নিম্নাঙ্গেরপক্ষাঘাত ▪ নিম্নবাহুরদুর্বলতা	০১ ০২
৩.৬	প্রারম্ভিকস্নায়ুতন্ত্রেরঅবস্থা(এশিয়াস্কেলঅনুযায়ী)	▪ A 1 ▪ B 2 ▪ C 3 ▪ D 4 ▪ E 5	০১ ০২ ০৩ ০৪ ০৫
৩.৭	প্রারম্ভিকস্নায়ুতন্ত্রেরঅবস্তা	▪ বক্ষদেশীয়অংশ ▪ কটিদেশীয়অংশ ▪ বক্ষদেশীয়অংশএবংকটিদেশীয়অংশ ▪ শ্রেণীদেশীয়অংশ	০১ ০২ ০৩ ০৪

৩.৮	নিশ্চিতপক্ষাঘাতেরধরণ	☐ অর্ধাঙ্গেরপক্ষাঘাত ▪ সম্পূর্ণA ▪ অসম্পূর্ণ B/C/D/E	০১ ০২
৩.৯	কবেথেকেআপনিহুইলচেয়ারচালানোশুরুকরেছেন		
৪.০	আপনিদিনেকতক্ষণহুইলচেয়ারচালান		

পর্ব -৪অস্থিপিঞ্জরওপেশীসমূহেরঅস্বাভাবিকতাসম্পর্কিত

(রোগীঅথবারোগীরসহকারীতথ্যপ্রদানকরবেন)

৪.১	আপনারকিকোনসন্ধিআঁটসাঁটঅথবা কনট্রাকচারহয়েছে	হাঁ = ০১ না = ০২
৪.২	আপনিকীকাঁধেকোনব্যাথাঅনুভবকরেন	হাঁ = ০১ না = ০২
৪.৩	আপনিকিকব্জিতেকোনব্যাথাঅনুভবকরেন	হাঁ = ০১ না = ০২
৪.৪	আপনিকিকুনুইতেকোনব্যাথাঅনুভবকরেন	হাঁ = ০১ না = ০২
৪.৫	আপনিকিকটীদেশীয়অংশেকোনব্যাথাঅনুভবকরেন	হাঁ = ০১ না = ০২
৪ .৬	আঘাতপরবর্তীসময়েকিআপনারকোনঅংশভেঙেগিয়েছিল	হাঁ = ০১ না = ০২
৪. ৭	আপনিকিগ্রীবাদেশীয়অংশেকোনব্যাথাঅনুভবকরেন	হাঁ = ০১ না = ০২
৪.৮	আপনিকীবাটোকঅংশেকোনব্যাথাঅনুভবকরেন	হাঁ = ০১ না = ০২
৪.৯	আপনিকিবুকেকোনকোনব্যাথাঅনুভবকরেন	হাঁ = ০১ না = ০২

৫.০	আপনারঅ্যাঙ্কেলসন্ধিকীফুলাআছে	হাঁ = ০১ না = ০২
৫.১	আপনারকিশরীরেরকোথাওঅস্থিসন্ধিহাড়েপরিণতহয়েছে	হাঁ = ০১ না = ০২
৫.২	হুইলচেয়ারেরযান্ত্রিকসমস্যারকারণেআপনিকিকোনকোনব্যাথাঅনুভবকরেছেন	হাঁ = ০১ না = ০২

.....

আপনারসহযোগীতারজন্যধন্যবাদ

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)
(The Academic Institute of CRP)
CRP-Chapain, Savar, Dhaka-1343. Tel: 02-7745464-5, 7741404

Ref: CRP-BHPI/IRB/09/19/1352 Date: 23/09/2019

To
Mst. Alpana khatun
4th professional B.Sc. in Physiotherapy
Session: 2014-2015, Student ID: 112140247
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

Subject: Approval of the thesis proposal **"Prevalence of common musculoskeletal disorders among paraplegic wheelchair users in CRP"** by ethics committee.

Dear Mst. Alpana khatun,

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

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

The purpose of the study is to find out Prevalence of common musculoskeletal disorders among paraplegic wheelchair users in CRP The participant may take 5 minutes to answer the questionnaire. There is no likelihood of any harm to the participants. Data collectors will receive informed consents from all participants. Any data collected will be kept confidential. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 10 AM on 11th August 2018 at BHPI.

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

Best regards,

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