‘‘WHEELCHAIR SKILLS CAPACITY, CONFIDENCE AND PERFORMANCE OF MANUAL WHEELCHAIR USERS WITH SPINAL CORD INJURY IN SELECTED COMMUNITY OF BANGLADESH’’

By

Md. Saddam Hossain

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This research proposal is submitted in total fulfillment of the requirement for the subject RESEARCH 2 & 3 and partial fulfillment of the requirement for degree

Bachelor of Science in Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Faculty of Medicine,
University of Dhaka

Study completed by:

Md. Saddam Hossain

4th year, B.Sc. in Occupational Therapy

Department of Occupational Therapy

BHPI, CRP, Savar, Dhaka-1343.

Signature

Study Supervisor's name and signature:

Md. Julker Nayan

Assistant Professor & Head of OT

Occupational Therapy Department

CRP, Savar, Dhaka-1343.

Signature

Study Supervisor's name and signature:

Shamima Akter

Lecturer in Occupational Therapy

Department of Occupational Therapy

BHPI, CRP, Savar, Dhaka-1343.

Signature

Head of department's name and signature:

SK Moniruzzaman

Assistant Professor

Head of the department

Department of Occupational Therapy

BHPI, CRP, Savar, Dhaka-1343.

Signature

Statement of Authorship

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The ethical issues of the study has been strictly considered and protected. In case of dissemination the finding of this project for future publication, research supervisor will highly concern and it will be duly acknowledged as undergraduate thesis.

Signature: _____ Date: _____

Md. Saddam Hossain
4th year, B.Sc. in Occupational Therapy

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Abstract

Background: Wheelchair has become an important part of people with Spinal Cord Injury. Most of Spinal Cord Injury people depend on manual wheelchair for community mobility and participate in daily living activities. Wheelchair skills training are provided as a part of community re-integration process for people with spinal cord injury. Occupational therapist has a significant role along with other professionals in wheelchair skills training program. However manual wheelchair users needed to wheelchair skills capacity, confidence for better performance in the community mobility and daily living activities. The purpose of the study is find out the level of wheelchair skills capacity, confidence, performance and associate demographic factors of people with SCI in selected community.

Objectives: The objectives are to find out the level of wheelchair skills capacity, confidence, and performance of persons with SCI, to gather the socio-demographic information of wheelchair users with SCI people, to determine compare between level of injury, sex and wheelchair skills capacity, confidence, performance, to find the association between socio-demographic factor (age, causes of injury, pressure sore, duration of a wheelchair use) and wheelchair skills capacity, confidence, performance, to determine the correlation between wheelchair skills capacity among the wheelchair skills confidence and performance.

Methodology: The descriptive cross-sectional study was carried out in the three communities of Bangladesh using WST-Q version 4.3. 90 manual wheelchair users selected purposively from the community. Non-parametric test was used to determine the correlation among wheelchair skills capacity, confidence, performance and association between the demographic factors.

Result: The WST-Q capacity, confidence and performance level was good of the manual wheelchair users in the community. The median values for WST-Q capacity, WST-Q confidence, and WST-Q performance were 74.26% (57.02%-78.78%), 75.75%

(66.66%-80.01%), and 72.00% (54.54%-76.47%). The mean age of the wheelchair users was 35 years, standard deviation was 12. 89% participants were male and 11% were female. Most of the participants were paraplegia 70% traumatic 93%, married 62%, Secondary School Certificate 51%, small business 36%. The level of median WST-Q Capacity, WST-Q Confidence and WST-Q Performance among the male and female were 75% (55.92%-78.78%), 75.75% (66.66%-81.81%), 72.005% (52.21%-76.47%) and 71.65% (64.33%-72.27%), 72.72% (64.70%-78.78%), 71.65% (64.50%-76.48%). There are significant *P<.537*, *P<.315*, and *P<.939*. The median levels of WST-Q Capacity, WST-Q Confidence and WST-Q Performance among the tetraplegia and paraplegia were 25.75% (8.82%-55.88%), 32.35% (15.15%-72.72%), 26.51% (15.15%-55.30%) and 76.47% (72.05%-80.30%), 81.81% (78.78%-88.23%), 75% (70.45%-78.30%). Here the significant were *P<.000*, *P<.000*, and *P<.000*. The total WST-Q capacity, confidence, performance scores were not significantly association with age, causes of injury, pressure sore, duration of a wheelchair use. The total WST-Q capacity scores significantly correlated with total WST-Q confidence scores (r=.95; *P*<.000) and total WST-Q capacity scores significantly correlated with the total WST-Q performance scores (r=.88; *P*<.000).

Conclusion: Many people with SCI are unable to do perform some of the wheelchair skills that would allow them to participate more fully. More intensive wheelchair skills training may improve the wheelchair skills capacity, confidence and performance that will enhance the participation, community mobility and quality of life.

Key word: Spinal cord injury, Manual Wheelchair, Capacity, Performance, Confidence.

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List of Abbreviations

BHPI: Bangladesh Health Professions Institute

CRP: Centre for the Rehabilitation of the Paralysed

IBR: Institutional Review Board

IQR: Interquartile range

SCI: Spinal Cord Injury

SCL: Spinal Cord Lesion

SPSS: The Statistical Package for Social Science

WST-Q: Wheelchair Skills Test- Questionnaire

WHO: World Health Organization

WST: Wheelchair Skills Test

WSTP: Wheelchair skills Training Program

CHAPTER- I INTRODUCTION

1.1 Introduction

Spinal cord injury (SCI) is a serious condition that results in loss of motor, sensory and autonomic function below the lesion level.[1] People with spinal cord injury (SCI) who are independent in mobility have better long-term outcomes, including well-being and participation, than those who are not mobility independence.[2] People with SCI who are not able to walk, a wheelchair is one of the most important mobility aids.[3] However, in Bangladesh 1.6 people would be needed wheelchair estimated by the World Health Organization.[4] A study reported that most of the people with spinal cord injury (SCI) were dependent on the manual wheelchair in Bangladesh.[5] So, manual wheelchair is very important to the spinal cord injury patients.

Manual wheelchairs may enhance the mobility of people with lower and upper limb impairments and allow them to engage in major life activities by increasing independence, providing more choice in activities and improving satisfaction with participation in many activities.[6] To participate independently, people who use manual wheelchairs for mobility must possess a variety of skills. The ability to propel their wheelchairs over even surfaces brings the freedom to move about within a wheelchair-accessible environment. Independent mobility within a greater variety of environments requires obstacle negotiation skills. These skills can make the difference between dependence and independence in daily life.[7] Wheelchairs skills improve the mobility and participation, reduce caregiver burden and reduce the likelihood of placement in a long-term-care facility.[8] Therefor wheelchair skills are most important for the manual wheelchair users.

Wheelchair skills training offered during rehabilitation and beneficial and influences the ability of wheelchair users to use their wheelchairs throughout their daily activities.[6] The wheelchair skills training improve the capacity, confidence, performance and it is an important factor for achieving an optimal level of functioning in daily life and enabling independent.[9] From the Bangladesh perspective, there have no studies about level of wheelchair skills capacity, performance, and confidence in the community so for the

better treatment of rehabilitation program service we need to find out this statistic about level of wheelchair skills capacity, performance, and confidence participation in community.

1.2 Background

Wheelchair provides a comfortable and effective mode of ambulation for those persons whose physical dysfunction makes walking impossible or impracticable.[10] Approximately 50–80% People with SCI uses a manual wheelchair for independent mobility in the world.[14] However, people with spinal cord injury (SCI) often depend on manual wheelchairs to complete daily mobility tasks in the community.[11] But community berries can prevent mobility community participation for persons with wheelchair users.[3] Wheelchair users face many mobility challenges which are created by the natural environment. A study by Meyers et al found that wheelchair users reported curbs, uneven terrain, and travel surface as barriers to their mobility.[11] So, wheelchair users require efficiency in different wheelchair skills for mobility and safety in the community.[12] The manual wheelchair users need to learn manual wheelchair skills for full community participation and the performance of various activities of daily living (ADLs).[13]

Manual wheelchair users must need wheelchair skills for accomplished their daily living activities independently, such as ability to use a wheelchair indifferent ways and circumstance, moving forward and backward, training around, and negotiating a curb to deal with the physical barriers. They will inevitably encounter in various environments. Mastering wheelchair skills can make a difference between dependence and independence in daily life and wheelchair skills training is vital part of the rehabilitation process.[14]

Rehabilitation program is one of primary goals for people with spinal cord injury[15] and wheelchair is among the most important of rehabilitation interventions. Wheelchair skills training can lead to improvements in wheelchair skills during initial rehabilitation.[16] Therefore, spinal cord injury patient needs a specialized and comprehensive rehabilitation services and spinal cord injury people also needed to influence training and rehabilitation

to get back to their own community.[17]

In Bangladesh, there are no specialized government hospitals for the treatment and rehabilitation of people with SCL. The only one non-government organization is the Centre for the Rehabilitation of the Paralysed, which has been working in this field for the last 30 years.[18] CRP has been working with both the Multi-Disciplinary Team (MDT) and Inter-Disciplinary Team (IDT) approach to promote the most possible independence to their community after getting discharges from rehabilitation program.[19] In CRP approximately 390 patients with spinal cord injury were admitted every year.[5] A study has recently shown that 349 people with spinal cord injury patients were discharged from the CRP in 2011. 59% patients with SCI were wheelchair-dependent. 93% were male wheelchair users and 7% female.[21] That's why wheelchair skills training program is the important part of the rehabilitation program at CRP. A spinal cord injury patient who needs the wheelchair can learn about the proper wheelchair skills through the rehabilitation program. For the people with SCI wheelchair skills training is very much important in their every aspect of life. Wheelchair skills training reflect the wheelchair skills capacity, confidence and performance to the manual wheelchair users.[20] Many international studies have been done about wheelchair skills capacity, confidence and performance, but in Bangladesh there have no related studies and resources available about wheelchair skills capacity, confidence and performance. Wheelchair skills capacity, confidence and performance are important for wheelchair users. So, researcher was interested to find out the level of wheelchair skills capacity, confidence and performance in the community of Bangladesh.

1.3 Justification of the study

The Wheelchair is the most commonly used mobility device for people with spinal cord injuries in Bangladesh. Wheelchairs are used to enhance function, to improve independence, and to enable a person to successfully live at home and in the community. SCI patients need a long-term rehabilitation program. In Bangladesh, Occupational is a new and very challenging health care profession and the Centre for the Rehabilitation of the Paralyzed (CRP) is the only place where the SCI patients are rehabilitated by a

holistic approach. Proper wheelchair skills training, education and participation in the community are very important part of the rehabilitation program.

At CRP Occupational therapy professionals are the leaders in this training program. For this reason Occupational therapy professionals need to know how SCI people use wheelchairs in the community and about their wheelchair skills capacity, confidence, and performance. Because wheelchair skill enhanced the community participation and participation in social and physical activities was found to be facilitated by environmental factors.[12] So proper wheelchair training is very important during rehabilitation period. Therefore, the ultimate rehabilitation goal for people with SCI is to maximize the extent of their participation and re-integration into the community. This research will explore the issue of wheelchair skills capacity, confidence and performance among the manual wheelchair user with SCI patient in the community. This knowledge will help to raise awareness among the professionals about the wheelchair skills training.

This study will be helpful for the professions and professionals of Occupational therapy and other professionals. It will also be helpful for SCI people to gain a better life style. Providing effective rehabilitation programs will also strengthen the Occupational therapy profession.

1.4 Research Question

What are the wheelchair skills capacity, confidence, performance of manual wheelchair users with SCI in community of Bangladesh?

1.5 Aim of the study

To determine the wheelchair skills capacity, confidence, performance of manual wheelchair users with SCI in community of Bangladesh.

1.6 Specific Objectives

- To find out the level of wheelchair skills capacity of persons with SCI.
- To find out the level of wheelchair skills performance of persons with SCI.

- To determine the level of confidence of the manual wheelchair users with SCI.
- To find out the socio-demographic factors of the manual wheelchair users with SCI.
- To determine compare between sex, level of injury and wheelchair skills capacity, confidence, performance.
- To determine association between socio-demographic factor and wheelchair skills capacity, confidence, performance.
- To determine the correlation between wheelchair skills capacity among the wheelchair skills confidence and performance.

1.7 Operational Definition

1.7.1 Spinal cord injury:

The term of spinal cord injury refers to neurological damage of the spinal cord that a result of impairment the motor, sensory, and autonomic function. Traumatic and non-traumatic injury to the spine due to occurs to the spinal cord injury. Injury may tear the spinal cord or its nerve fibers.

1.7.2 Tetraplegia:

Tetraplegia 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 and impairment of function in the arms as well as typically in the trunk, legs and pelvic.

1.7.3 Paraplegia:

Paraplegia 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.

1.7.4 Wheelchair:

Wheelchair is a mobility device with a seating support system for a person with impaired mobility, intended to provide mobility in a seated position as its primary function.

Wheelchair is one of the most commonly used assistive devices for improving the personal mobility who is unable to walk as a result of illness, injury, or disability. Wheelchair is a device providing wheeled mobility and seating support for a person with difficulty in walking or moving around.

1.7.5 Manual Wheelchair:

Manual wheelchair refers to which is propulsion by the manually and propelled by the user. People with SCI who have good upper body function they will be easily to move one place to another place by using the manual wheelchair.

1.7.6 Capacity:

Capacity has been defined as what can be achieved in a standardized environment.

1.7.7 Performance:

Performance refers to what people actually do in a life situation. Performance is more relevant to functional rehabilitation and successful community reintegration.

1.7.7 Confidence

Confidence is defined as the belief in one's current ability to perform each item safely and independently.

CHAPTER -II LITERATURE REVIEW

16 articles were identified in pubmed and google scholar. 5 articles were then selected from the title and abstracts as meeting the PEDro scale criteria and 8 articles were excluded due to not meeting the PEDro scale criteria and not support this study. 2 articles were hand searched and they fulfill the PEDro scale criteria. 3 studies of a randomized control trail and 3 articles were quantitative research was supported the wheelchair skills capacity, confidence, performance of manual wheelchair users with SCI in community of Bangladesh.

The spinal cord is the part of the central nervous system (CNS). Its seen at the vertebral canal which consists of the vertebral foramin. Spinal cord occupies upper two-thirds of vertebral canal and extends from upper border of atlas vertebra to the lower of second lumber vertebra. Spinal cord continuous with the medulla oblongata and inferiorly terminates an conus medullaris and it protected by the vertebra and associated muscle ligament, spinal meninges and cerebrospinal fluid (CSF). Spinal cord has 31 pair's spinal nerves which contains the motor and sensory to the parts of the body.[23]

The spinal cord is a pathway to carry impulse from brain to the body and from body to the brain.[24] The SCI is the ''highway'' through which motor and sensory information travels between the brain and body via nerves which pass up and down through the spinal cord along definite pathways, When the path is broken, the message cannot get through and this occurs when there is an injury to, or disease of the spinal cord. Recent research suggests that primary nerve injury occurs due to acute injury to the spinal cord that causes secondary damage by producing inflammation, ischemia, and toxicity.[25]

Spinal cord injury are most often traumatic caused by falls from the height, traffic accident related injury are most common and other related cause violence, sporting accident, being struck by an objects and incidents involving animals.[27] Non-traumatic spinal cord injury is caused of vertebral spondylosis, cancerous and infectious related

compression, and inflammatory disease. Spinal cord injury results in a high level of individual disability.[27]

Neurological impairment and long term disability in person with SCI result in inadequate social participation and community mobility. So, the people with SCI need mobility device or assistive technology mobility device for achieve the optimum level of social participation. The assistive technology mobility device is such as a wheelchair. Wheelchair is used for short distance mobility in the SCI population.[28]

There are three types of wheelchair such as manual wheelchair, power wheelchair and scooter.[29] Most of the SCI people use the manual wheelchair because manual wheelchairs have the advantage of being built out of light materials for quick folding and easy storage.[30] Manual wheelchair is based on two type of purpose one is pushed by someone and another is self-propulsion by the rider. People with SCI who have injury level are C_6 or below the C_6 can propel the manual wheelchair for their mobility.[29] Manual wheelchair helps the social participation, productivity and leisure activities of the person with SCI people.[28]

In power wheelchair is simply a manual wheelchair equipped with motor, batteries and joystick.[29] People who have high level of spinal cord injuries or injuries to the spinal cord at cervical level can result in severe motor deficits all limbs including weakness and uncoordinated movement. They used the power wheelchair to retain some movement and increase the quality of life and promote independence for individual with limited mobility.[31]

Bangladesh is a developing country and most of the people are poor.[32] Spinal cord injury continues to be a major cause of disability throughout Asia as well as in Bangladesh.[18] Most of the SCI people in Bangladesh use the manual wheelchair. Because of a large amount of SCI people in Bangladesh live rural area[5] and manual wheelchair is less expensive then power wheelchair.[29] On the other hand manual wheelchair user can simply make the transfer from the wheelchair to the automobile seat and the wheelchair

can be folded and placed in the trunk or back seat.[30] So, the SCI people in Bangladesh use the manual wheelchair.

Centre for the Rehabilitation of the Paralyzed (CRP) is one of the biggest rehabilitation centres for spinal cord injury patient in Bangladesh. CRP provides evidence based holistic health care to the SCI by the interdisciplinary team (Annual report, 2015-2016). Interdisciplinary team consists of Occupational therapists, Physiotherapist, Doctor, Nurse, Psychologist, Social worker. In active phase generally the wheelchair was provided to the SCI patients who have good sitting balance. During the rehabilitation phase the SCI people take wheelchair skills training. In CRP, Occupational therapists and physiotherapists were provided the wheelchair skills training. Wheelchair skills training duration is 20-30 minutes in every day. One week the training was provided by the Occupational therapists and week training was provided by the physiotherapist. In CRP, wheelchair skills training program follow to the world health organization (WHO) basic manual wheelchair skills training guidelines (information collected from Occupational therapy inpatient unit). The basic manual wheelchair skills training guidelines are[33]-

Pushing:

- Pushing correctly means less effort.
- Push from 10 o'clock to 2 o'clock position.
- Use a long smooth action to push.

Turning:

- Hold one push rim towards the front and the other towards the back.
- Pull the forward hand backwards and push the backward hand forwards at the same time.

Ups Slopes:

- Lean forward – this helps stop the wheelchair tipping.
- When practicing, have an assistant stand behind for safety.
- To stop or rest – park the wheelchair sideways

Down slopes:

- Lean backwards.
- Let the push rim slide slowly through the hands.
- Experienced wheelchair users who are able to do a "wheelie" (i.e. balance the wheelchair on the rear wheels only) may roll down a slope on their back wheels. This is very efficient.

Ups Steps with Assistance:

- Go up backwards.
- Tilt wheelchair on to the back wheels, positioned against the first step.
- Assistant pulls backwards and upwards – rolling the wheelchair up.
- Wheelchair user can assist by pulling the push rims backwards.
- A second assistant can assist by holding on to the wheelchair frame from the front (not footrests).

Down steps with Assistance:

- Go down forwards.
- Tilt the wheelchair on to the back wheels.
- Assistant lets the back wheels slowly roll down one step at a time.
- Wheelchair user can assist by controlling the wheelchair with the push rims.
- A second assistant can help by steadying the wheelchair from the front, holding on to the wheelchair frame (not footrests).

Partial Wheelie:

- Being able to do a partial wheelie is very useful for a wheelchair user.
- The wheelchair user can lift the front wheels to clear small kerbs, stones and bumps.
- Roll the wheelchair backwards until hands are at 10 o'clock, then push forwards quickly.
- The castor wheels should come up.

- With practice, it is possible to lift the castor wheels at the right time to clear small obstacles.
- Always make sure there is a person standing behind the wheelchair user when he/she begin to practice this skill.

The wheelchair skills training program (WSTP) represents the wheelchairs skills program developer's attempts to incorporate on the motor skills learning with the specific skills performance.[20] Wheelchair skills training program was improved the manual wheelchairs users performance and safety[3] and the wheelchair skills capacity. Wheelchair skills capacity enhanced the mobility of the wheelchair dependent people. Wheelchair skills capacity helps to the wheelchair user with SCI to reaching an optimal level of independent in daily life activities.[34]

Confidence refers to one's belief in his or her wheelchair skill capabilities. Confidence plays an important role in determining whether to perform a behavior, the degree of effort to invest, and the length of time one will persist in a given activity. On the other hand low confidence with wheelchair user might lead to self-imposed restriction. Confidence has been identified as an important construct to consider in the areas of wheelchair skills training and wheelchair provision. Confidence has also identified the gap between the wheelchair skills capacity and actual performance of wheelchair skills.[35]

Wheelchair skills performance is seen an important aspect for independent mobility and daily functioning.[36] Wheelchair skills performance was influenced by the physical capacity during the rehabilitation program. A study reported that manual wheelchair skills performance improved by the manual wheelchair skills training.[34]

However, the ability to perform them represents "capacity" and their use in everyday life represents "performance".[37] Confidence and performance are related to capacity, but also related to personal factors (e.g. age, sex) and the environment (e.g. weather, architectural barriers, opportunity).[20]

Kirby et al.[2] examined the wheelchair skills capacity and performance of 117 people with spinal cord injury in America. The median total Wheelchair Skills Test (WST) version

4.2 score was WST capacity 81.0% (69.0%-90.0%), WST-Q capacity, WST-Q performance WST-Q confidence were, 88.0% (77.0%-97.0%), 76.0% (66.3%-84.0%) and 88.5% (75.0%-97.0%). Researchers also found that the median total WST-Q capacity, WST-Q performance for male and female were 88.5% (81.0%-97.0%), 79.0% (67.0%-84.8%) and 76.0% (71.3%-77.8%), 68.0% (64.3%-69.0%). Male and female significant was *P< .001*. The median total WST-Q capacity, WST-Q performance for paraplegia and tetraplegia were 91.0% (81.0%-97.3%), 79.0% (68.0%-86.3%) and 76.0% (71.3%-77.8%), 68.0% (64.3%-69.0%). Paraplegia and tetraplegia significant was *P< .001*. The median age of the wheelchair user was 39 years and interquartile range was 29.3-49.8 years. Most of the wheelchair users were male 85.5%. The marital status of the wheelchair users were never married (single) 58.1%, married 22.2%, divorced 9.4%, separated 2.6%. The residence Place of wheelchair users were private residence 93.2%, nursing home 0.9%, group living situation 0.9%, hotel/motel 0.9%, other 4.3%. Most of the wheelchair user were paraplegia 76.9%, and the tetraplegia 22.2%.

Routhier et al.[38] tested the wheelchair skills test program (WSTP) for 39 peoples of manual wheelchair user in 3 rehabilitation centers of Canada. In this study, 1 of 3 occupational therapists was provided wheelchair training to the each participant. The training session was 4-8 and each session 45-60 minutes long. The training period was 2-4 weeks and it was stopped after 8 sessions. Here, outcome was measured by the wheelchair skills test (WST). Total percentage WST capacity scores were 77.4 ±13.8% for the WSTP group and 69.8 ± 18.4% for the Control group (p = 0.0296). Show that, after receive the wheelchair skills training the intervention group improve the wheelchair skills more than control group, particularly at the Community-skills level.

Lemay et al.[39] reported that 54 people with SCI from 2 sites in Canada. The mean total WST version 4.1 score of performance was 81%. There was a significant difference in total WST scores between participants with tetraplegia and those with low-level paraplegia (P<.01) (18). Researchers also found that the wheelchair users male and female were 75.9% and 24.1%. Level of the injury were high paraplegia (T_1- T_6) 18.5%, low paraplegia (T_7- L_2) 55.6% and tetraplegia (C_4 – C_8) 25.9%. The educational status among the wheelchair users were elementary 13.0%, high school 37.0%, college 22.2%,

university 20.4%, graduate status 7.4%. Marital status was 29.6% married, 44.4% single, 11.1% divorced.

Hosseini et al.[12] stipulated that 214 people with SCI from 6 SCI Model Systems centers in the United States. The mean total WST version 4.1 score was 84%, with a significant difference between participants with tetraplegia and those with paraplegia (P<.01). Hosseini identified 8 individual skills with success rates <75%.

Worobey et al.[40] discussed the effectiveness of group wheelchair skills in 114 peoples of manual wheelchair user with SCI in America. 2 trainers were provided the wheelchair training. The training class was continued 8 weeks and each class time was 90 minute (6 class is regular and 2 class is make-up). Other side, taken the general education class to the control group that were scheduled 1 to 3 weeks apart and class duration 1 hour. In these studies, the outcome was measured by the Wheelchair Skills Test Questionnaire (WST-Q) version 4.2. WST-Q capacity advanced level sub-scores was higher for the WSTP group than the control group (p=.02). WST-Q capacity total score was higher for the WSTP group, but not significantly (p=.060). WSTP participants were achieved 25% WST-Q capacity skills. But, there were no significant differences in WST-Q performance between the two groups.

Sakakibara[41] examined the effects of wheelchair skills training on confidence in older adults who are inexperience with using a wheelchair in Canada. The participants of this study were 20 who live in the community level. The intervention group received two 1 hour training sessions that followed the Wheelchair Skills Training Program (WSTP) protocol and control group received a 5 minute socialization contact. The main outcome was measured by the Wheelchair Use Confidence Scale-Manual (WheelCon-M). In this studies, the intervention group improves confidence with using a manual wheelchair among older adults and the significant difference between the intervention and control groups [$F(1,17) = 10.9$, $p = 0.004$]. The WSTP had greater effects on confidence in areas related to maneuvering around the physical environment, knowledge and problem solving, advocacy, and managing emotions, than in areas related to performing activities and behaving in social situations.

Inkpen[22] examined on the manual wheelchair skills capacity versus performance among the American people who use the wheelchair. Examiner found that mean total WST-Q capacity and performance scores ± SD were 72.5%±19.2% and 58.1%±21.2%. The total median of WST-Q capacity and performance were 76.6% and 60.9%.

Rushton[35] was reported on the manual wheelchair skills confidence among the 83 community-dwelling at British. Researcher found that the median wheelchair skills confidence was 84.6 % (71.3%–92.0%). Male wheelchair user's median wheelchair skills confidence was 85.6% (75.9%–91.3%) and female was 80.7% (56.3%–93.2%). The tetraplegia median wheelchair skills confidence was 86.5% (74.9%–91.5%) and paraplegia was 87.2% (75.7%–94.8%). Researchers also found that statistically significant difference was not found between the sexes ($p = 0.140$).

CHAPTER- III METHODOLOGY

3.1 Conceptual framework

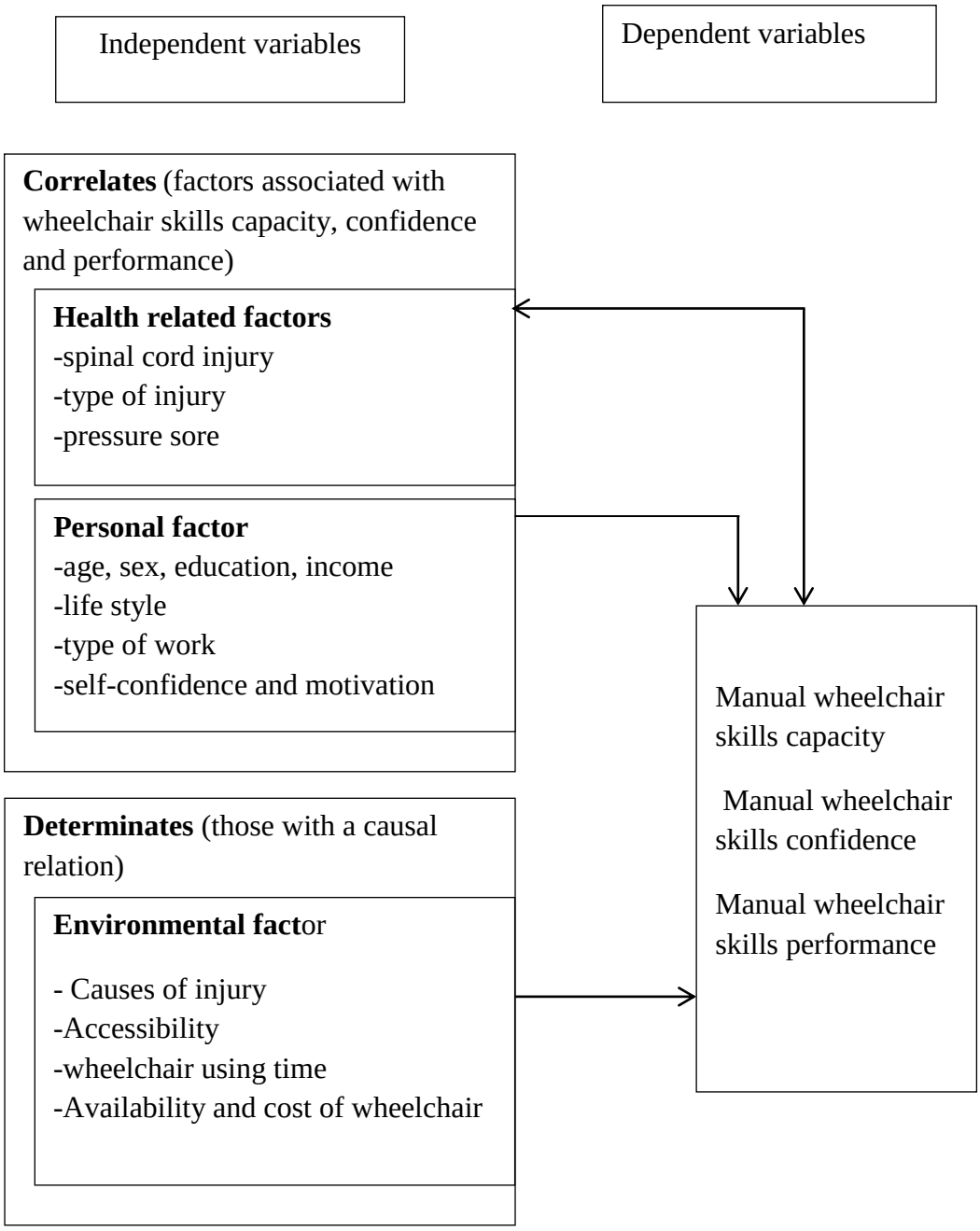

Figure-1: Model of level of wheelchair skills capacity, confidence, performance and association between the socio-demographic factors.

3.2 Study design

This study design was cross sectional. A cross-sectional descriptive study was performed with structured questionnaires and interviews conducted with SCI wheelchair users. It is the simplest variety of descriptive or observational epidemiology,[42] and it provides a snapshot of the frequency of a disease or other health related characteristics in a population at a given point in time.[43] Cross sectional survey is a research technique which involved collecting data from a large number of people in a time. Cross sectional studies are generally quick, easy, and cheap and often based on a questionnaire survey.[44]

3.3 Study Population

Wheelchair user people who had completed their rehabilitation program from CRP following SCI.

3.4 Study setting

Savar, Dhamrai and Singair upazila were chosen for this study. These area were selected because these area are closed than others area.

3.5 Study period

The study was conducted from October 2016- February 2017.

3.6 Sample size

For calculating sample size the investigator used the principle of sample size (n) determination: $z^2.pq/d^2$. Where n = required sample size, p = proportion of the population having the characteristic, $q = 1-p$ and d = confidence error.[45] The investigator used *95%* confidence interval for this study, thus the confidence interval, *= 1.96 and* 5*%* confidence error for this research, thus the confidence error, *d= 0.05*. As there was no published research the level of wheelchair skills capacity, confidence and performance of manual wheelchair user with SCI in Bangladesh, so the investigator use *P= 50% = 0.5* & *q= (1-p) = (1-0.5) = 0.5*, so *q= 0.5*. Then, investigator calculates the sample size *(n)* that stands for:

$N = z^2.pq/d^2$

$= z^2 \times p\ (1\text{-}p)\ / d^2$

$= (1.96)^2 \times 0.5 \times 0.5 / 0.05 \times 0.05$

$= 384$

However, it was quite difficult as a student to collect data within two months from this huge sample. That's why investigator selected 90 participants.

3.7 Inclusion and exclusion criteria

Inclusion criteria

Participants included matched the following criteria-

- Both male and female were included.
- Person who live in the community and use a manual wheelchair.
- Data were collected from the both tetraplegia and paraplegia patient.
- Wheelchair users' age range for the study was 15 to 65 years.
- Participant should have minimum of 1 months experience using a manual wheelchair in the community.

Exclusion criteria

Participants would be excluded if they met any of the following criteria-

- People who were not affected in SCI.
- People who does not use the manual wheelchair.
- Upper limb fracture person with SCI.

3.8 Sampling techniques

Sampling is a process or procedure that helps a researcher to select sample.[46] There are three type of sampling techniques such as convenience, purposive/purposeful and volunteer.[47] In this study researchers use the purposive sampling techniques. By purposive sampling, sample knows about the purpose of study and provides information about question from their knowledge.[48] On the other hand purposive sampling is very informative, [49] most cost-effective and time-effective.[50] That's why researchers use this sampling technique.

3.9 Data collection tools/materials

Following instruments were used during data collection period for the purpose of accumulating data from the participants and fulfill the aim and objectives of the study.

- Consent form and Information sheet
- WST-Q version 4.3.
- Paper
- Pen
- Pencil
- Eraser

3.9.1 Information sheet & Consent form

Information sheet and consent form is a vital part of any kind of study, because it is a formal settlement or agreement of participation which was taken from the participants before preliminary the interview {Appendix-D (English) and Appendix-E (Bangla)}.
An Information sheet including the details information on study aim and objectives, study design, study duration, institute affiliation, identity of investigator, participant's confidentiality, participant's rights and responsibilities, potential risk, benefit and further information related to study, was prepared for participants to provide prior to take informed consent.

A written consent form was also prepared for the participants to verify the level of understanding of the information sheet, awareness about the potential benefits and risks of the participants and their volunteer participation with signature. So it was significant to take consent from them who were interested to participate in the study. Before starting the interview, signatures were obtained from each participant on a consent form.

In the study the investigator was explained the investigator identity, study title, institute affiliation, participant's confidentiality, rights and their potential benefits in information sheet and participants were given their written agreement, when they were interested to participate in the study.

3.9.2 Wheelchair Skills Test Questionnaire version 4.3 (WST-Q version 4.3)

The WST-Q aim is for manual and powered wheelchair users or caregivers. The WST-Q to be representative of the range of skills that wheelchair users and/or caregivers may need to regularly perform. WST-Q version 4.3 have 34 individual skills and the initial question is about capacity (Can you do this skill?) and the capacity scoring options are "pass" (score of 2), "pass with difficulty"(score of 1), and "fail" (score of 0). Then ask the participants about confidence (How confidence are you?) and the confidence scoring option''fully confident'' (score of 2) ''Somewhat confident'' (score of 1) ''Not at all confident'' (score of 0). Investigator asked the participants who had the capacity to accomplish a skill about performance (How often do you do it?). The answer options are "Daily" (score of 4), "weekly" (score of 3), "monthly" (score of 2), "yearly" (score of 1), or " Never" (score of 0).[20] Then total WST-Q percentage scores calculate. Capacity, Confidence and Performance scores can be calculated as follows:

Total WST Capacity Score = sum of individual skill scores/ ([number of possible skills – number of NP scores – number of TE scores] x 2) X 100%
Total Confidence Score = sum of individual skill scores/ ([number of possible skills – number of NP scores – number of TE scores] x 2) X 100%
Total Performance Score = sum of individual skill scores/ ([number of possible skills – number of NP scores – number of TE scores] x 4) X 100%.[20]

3.10 Data Collection Methods

Investigator took ethical permission from Institutional Review Board (IRB) and permission corresponding author for using the skills. At first investigator took SCI patient (who use the wheelchair) list and patient address from the social welfare at Centre for the Rehabilitation of the Paralysed (CRP). Then investigator contacted with the SCI patient and took the opinions of patients who were interested and had appointments date and time was fixed with the participants according to his or her available time. Formally the investigator briefly explained about information sheet and consent form with study aim and objectives were mentioned to all the participants for making sense about the study

clearly and how they assist the investigator. Data collection method by face to face interview using structured questionnaires allowed investigator to briefly describe the terms of the questionnaire according to needs and understanding level of the participants, so they were able to response and answer appropriately.

Firstly, data related to personal and general information was collected. Secondly, standard Wheelchair Skills Test-Questionnaire (WST-Q) version 4.3 was used for collecting data. The questionnaire was filled up by the investigator when participants were illiterate and when participants were literate it was filled up by them. The investigator had to describe any question specifically while participants had any doubt. The investigator was neutral during data collection for ease off the personal biasness related to study. The data was noted down based on participant's estimation. Data was collected during the convenient time for the participants and not impede the participants' productivity. To collect data from each participant via questionnaires was taken grossly 20 minutes.

3.11 Data management and analysis

The total WST-Q percentage scores for capacity, confidence and performance were calculated according to the standard WST-Q version 4.3 formulates. The data analysis was performed in the SPSS (Statistical Package of Social Science) version 20.0 was used to compute descriptive statistics for fin out the total percentage of the wheelchair skills capacity, confidence and performance. The investigator check the normally distribution of data by using the Kolmogorov-smirnov and Shapiro –wilk test. Individual skills capacity and performance success rates were calculated for each skills. The total percentage WST-Q capacity, WST-Q confidence, and WST-Q performance were examined for their relation to the sex and level of injury by using Mann-Whitney U test. Investigator used the Spearman ρ test for find out the correlation between total wheelchair skills capacity and the wheelchair skills confidence, performance. The investigator graph technique was used for analyzing data, calculated as percentages and presented this using bar and pie charts by SPSS software version 20.0. SPSS is a comprehensive and flexible statistical analysis and data management solution. Each study

subject was given a code number and each question was account as a variable. Wheelchair capacity responses was yes, yes with difficulty, no, not possible with this wheelchair category, these was coded 2, 1, 0 responses. Confidence response was Full confident, Somewhat confident, Not at all confident and these were coded 2, 1, 0. Wheelchair performance responses was Daily, Weekly, Monthly, Yearly, Never, these were coded 4, 3, 2, 1, and 0. Then statistics input was implemented in the data view of SPSS in case of all study subjects. Finally, the computerized data was prepared for analysis. Then find out the percentage of WST-Q capacity, confidence and performance.

3.12 Quality control & quality assurance

The data was collected from the participants using a short translated "Bengali final version" (the local language) of the Wheelchair Skills Test Questionnaire {Appendix-G (English) and Appendix-F (Bangla)}. For translating WST-Q into Bengali, the investigator followed the translation guidelines of World Health Organization. In the first step, two translators were selected for forward translation A & B. Both translators converted the original WST-Q in Bengali independently with a focus to produce familiar & easily understandable language but not an exac**t** translation of wording. After receiving independent forward A & B translation, the investigator and a linguistic expert was discussed two forward versions of these questionnaires during a meeting. Then they approved a combined version from A & B in order to produce a conceptually equivalent translation named Bangla version WST-Q 1.0. After finalizing the Bangla version WST-Q 1.0, the investigator sent the questionnaire to bilingual expert who do not have any access to the original English version of the questionnaire. After that comparison of this backward translation with Bangla Version WST-Q 1.0 was done to find out any inconsistencies, errors, mistranslations, imprecision. After resolving misunderstanding in the Bangla version 1.0 and in backward translation, finally WST-Q version 2.0 was accomplished for the field test with 5 participants who speak in Bangla language in order to conduct a comprehension test through face to face interview. During this period, the investigator investigated whether the subjects had any difficulty in understanding and also examine the participant's interpretation or expression of all questions. Based on participant's interpretation what they choose better alternatives to their usual language

the third version of the questionnaire was developed. The Bangla version WST-Q 3.0 was considered as Bengali final version.

3.13 Ethical consideration

A research proposal was submitted to the Institutional Review Board (IRB) and Occupational therapy department of BHPI for taking approval to do the study {Appendix-A and Appendix-B}. Investigator took permission from the corresponding author for using scales that was used in the research {Appendix-C}. Then permission was taken from the Social welfare unit for collecting address of the SCI people for data collection from the community.

Investigator at first discussed the research related information with participants throughout the information sheet before taking the participants signature on consent form. Then participants would be asked to complete a self-administrative questionnaire which may need 20 minutes to fill. In this questionnaire there would be questions on socio-demographic factors (for example: Age, sex, occupation, educational status). It would also contain 34 items of the wheelchair skills questions.

Especially, in this study selected all of the patients with spinal cord injury who have used the manual wheelchair and live in community.

During the data collection period investigator ask some personal and confidential information. In this time participants may feel uncomfortable talking about some of the tropic. Participants do not need to answer any question or take part in the interview if participants don't wish to do so, and that is also okay. Participants do not have to give us any causes for not responding to any question, or for withdraw to take part in the interview. On the other hand, participants may not have any direct benefit by participating in this research, but your valuable participation is likely to help us finding out the level wheelchair skills capacity, confidence and performance which are very important to the rehabilitation program.

The participants were informed clearly that their information would be kept confidential. Their information was not shared with anyone outside of the research team. Investigator used the code number alternative of participant name. Participant's code number would know only the investigator and it shared with the study supervisor.

The knowledge that we get from this research would be shared with participant before it is made widely available to the public. Each participant would receive a summary of the results. There would also be small presentation and these would be announced. Following the presentations, investigator would publish the results so that other interested people may learn from the research.

CHAPTER -IV RESULTS

In this study cross sectional study design is used to conduct dissertation and all the data was analyzed by SPSS 20.0 software. These results were based on different types of variables such as socio-demographic variables, injury related variables and wheelchair related variables. Here descriptive data were collected and presented by pie chart, bar chart and tables by using Microsoft excel office 2010. In this study theme was find out by content analysis.

4.1 Age group

The study was conducted with 90 participants. Most of the participants 38% (n=34) were 25-35 years. Others participants 24% (n=22) were 15-25 years, 20% (n=18) were 36-45 years, 11% (n=10) were 46-55 years, 7% (n=6) were 56-65 years. The mean age of the participants was 35 and standard deviation 12, minimum age 16 years and the maximum age 65 years. (Figure-2)

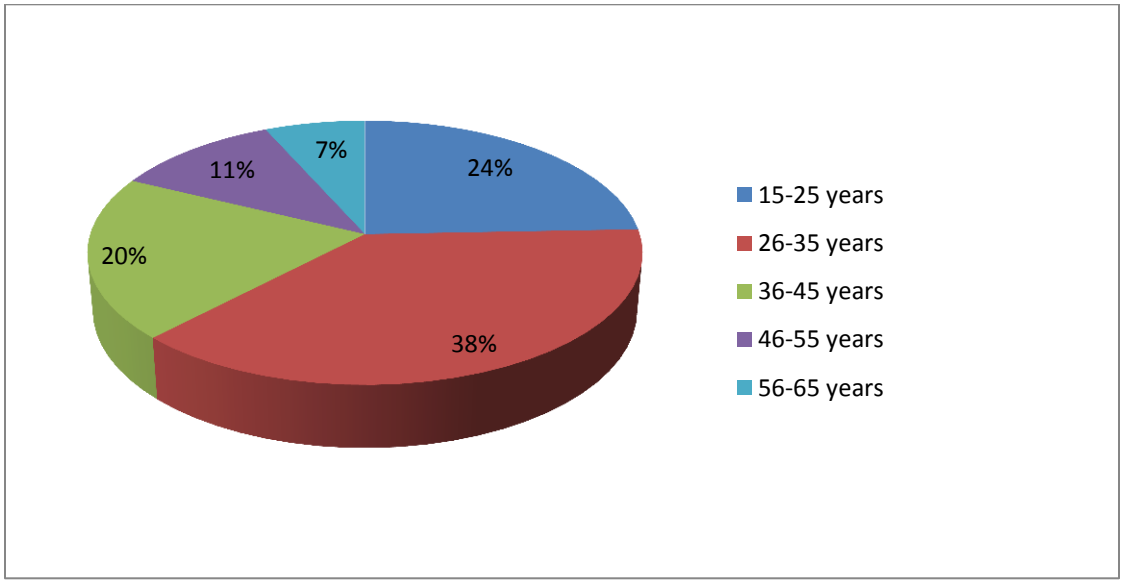

Figure-2: Age range of wheelchair users with SCI participants

4.2 Sex

Among the participants Male are 88.9% (n=80) and Female are 11.1% (n=10). (Figure-3)

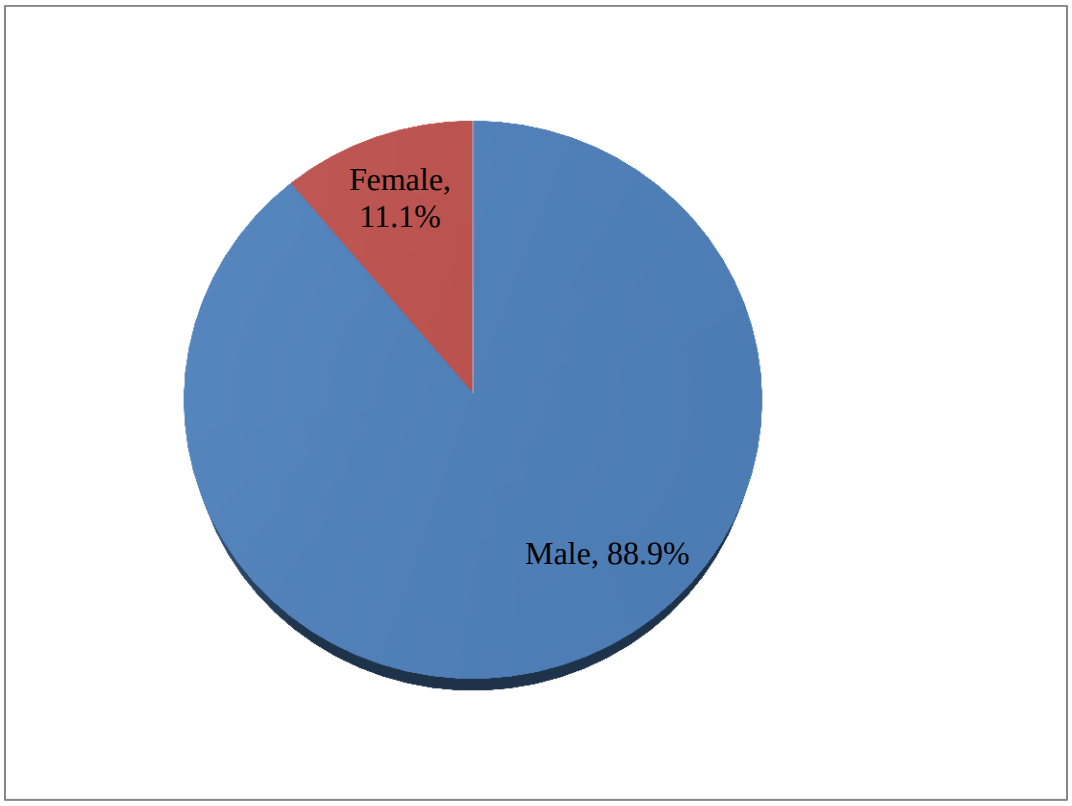

Figure-3: Sex distribution of SCI wheelchair users participants

4.3 Marital status

Most of the participants were married. Out of 100%, 62% (n=56) respondent was married, 35% (n=31) was unmarried and 3% (n=3) were divorced. (Figure-4)

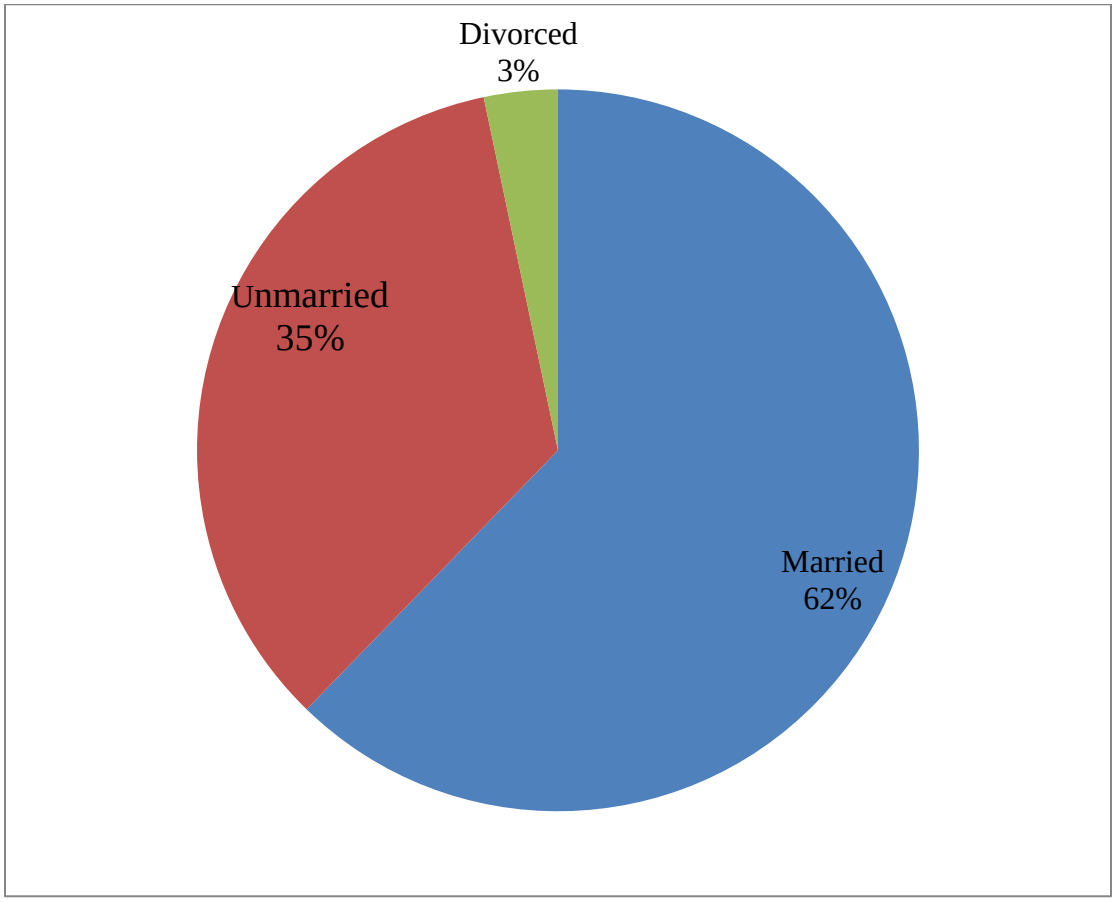

Figure-4: Marital status among the participant

4.4 Occupation

Among the participants 36% (n=32) had business, 23% (21) was service holder, and 15% (13) were day laborer, 11% (10) were farmer, 7% (n=6) were student, 3% (n=3) was shopkeeper, 3% (n=3) was house wife, 2% (n=2) retired. (Figure-5)

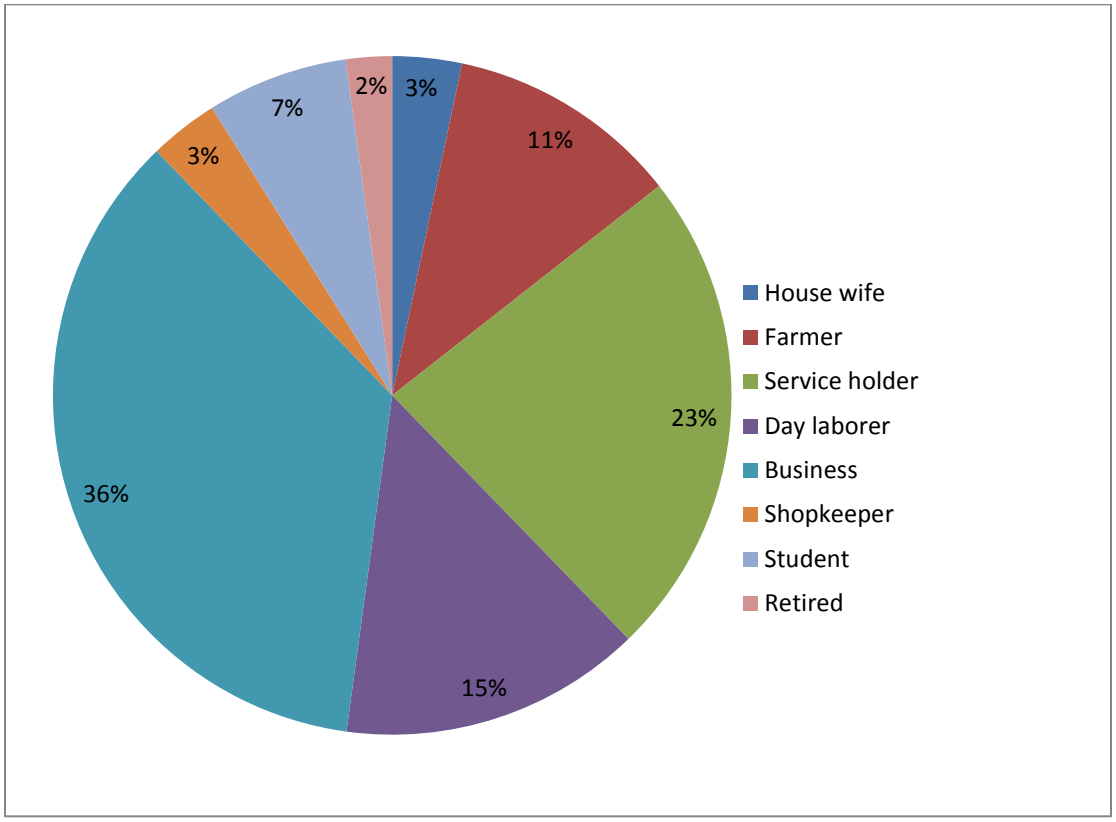

Figure-5: Occupational status among the participants

4.5 Educational status

Among the participants out of 100% respondent 51.1% (n=46) were complete secondary school certificate, 15.6% (n=14) complete primary school certificate, 10% (n=9) were higher secondary certificate, 3.3% (n=3) were B.sc, 4.4% (n=4) were M.sc, 1.1% (n=1) were degree pass and 14.4% (n=13) were illiterate. (Figure -6)

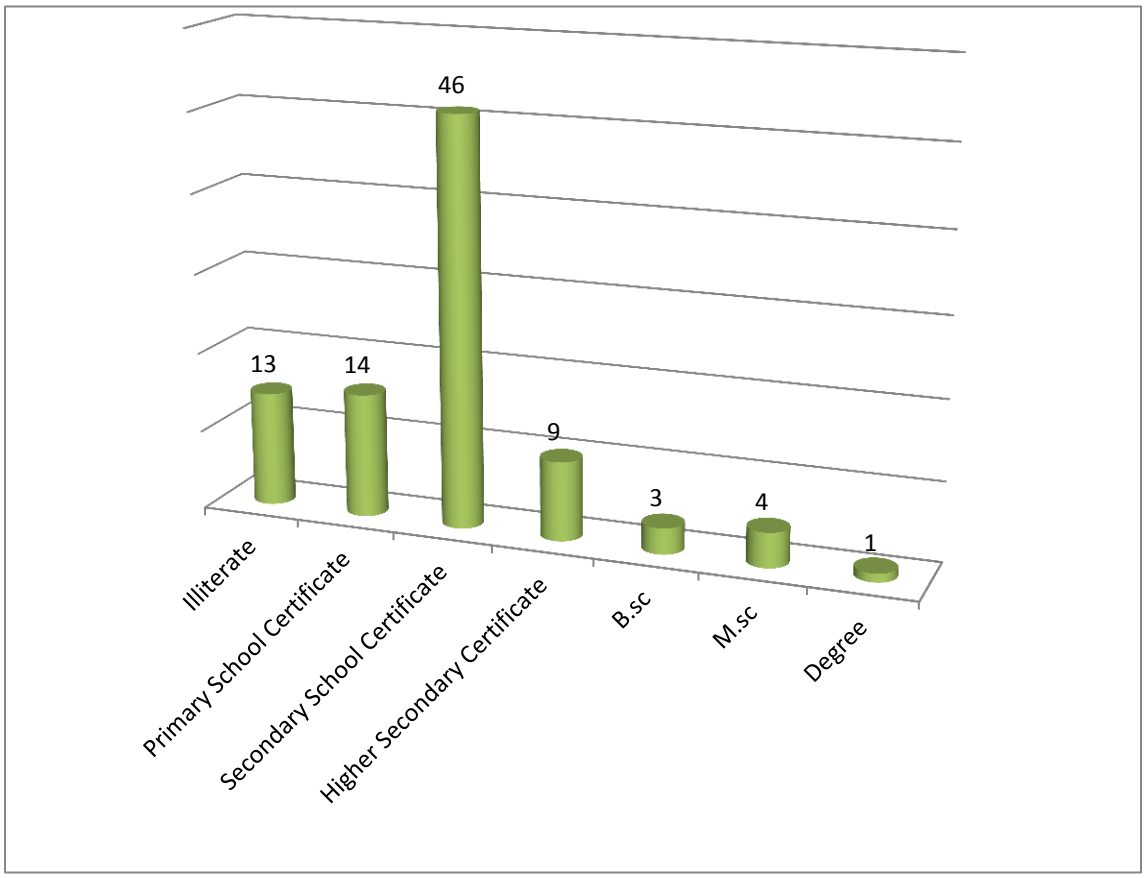

Figure-6: Educational status of SCI wheelchair users

4.6 Initial Diagnosis

Most of the participants were paraplegia 70% (n=63) and tetraplegia 30% (n=27). (Figure- 7)

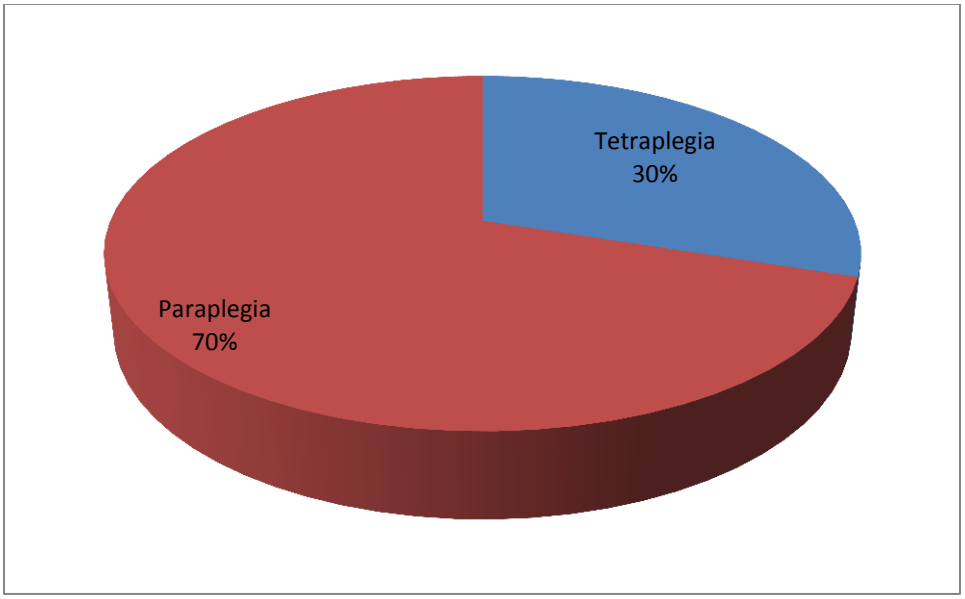

Figure-7: Initial diagnosis among the participants

4.7 Causes of injury

Most of the participants were traumatic 93.3% (n=84) and non-traumatic were 6.7% (n=6). (Figure-8)

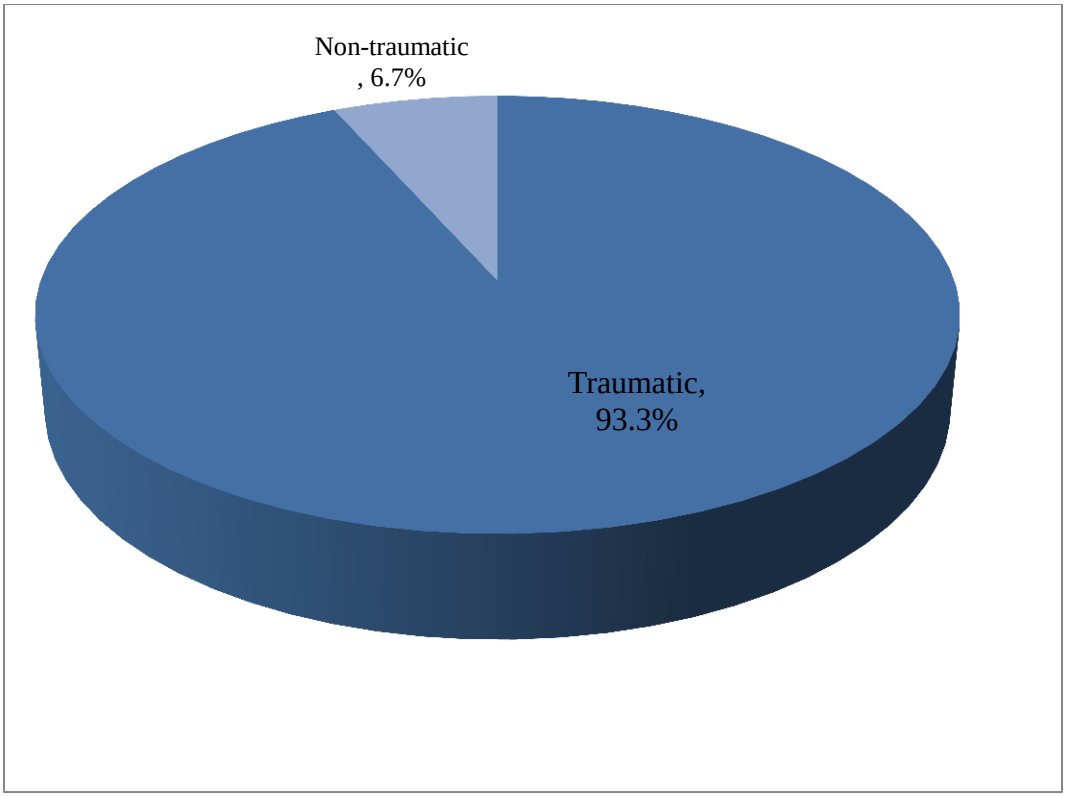

Figure-8: Causes of injury among the wheelchair user

4.8 Pressure sore

Among the participants of this study pressure sore was present 5.6% (n=5) and pressure sore was not present at 94.4% (n=85). (Figure-9)

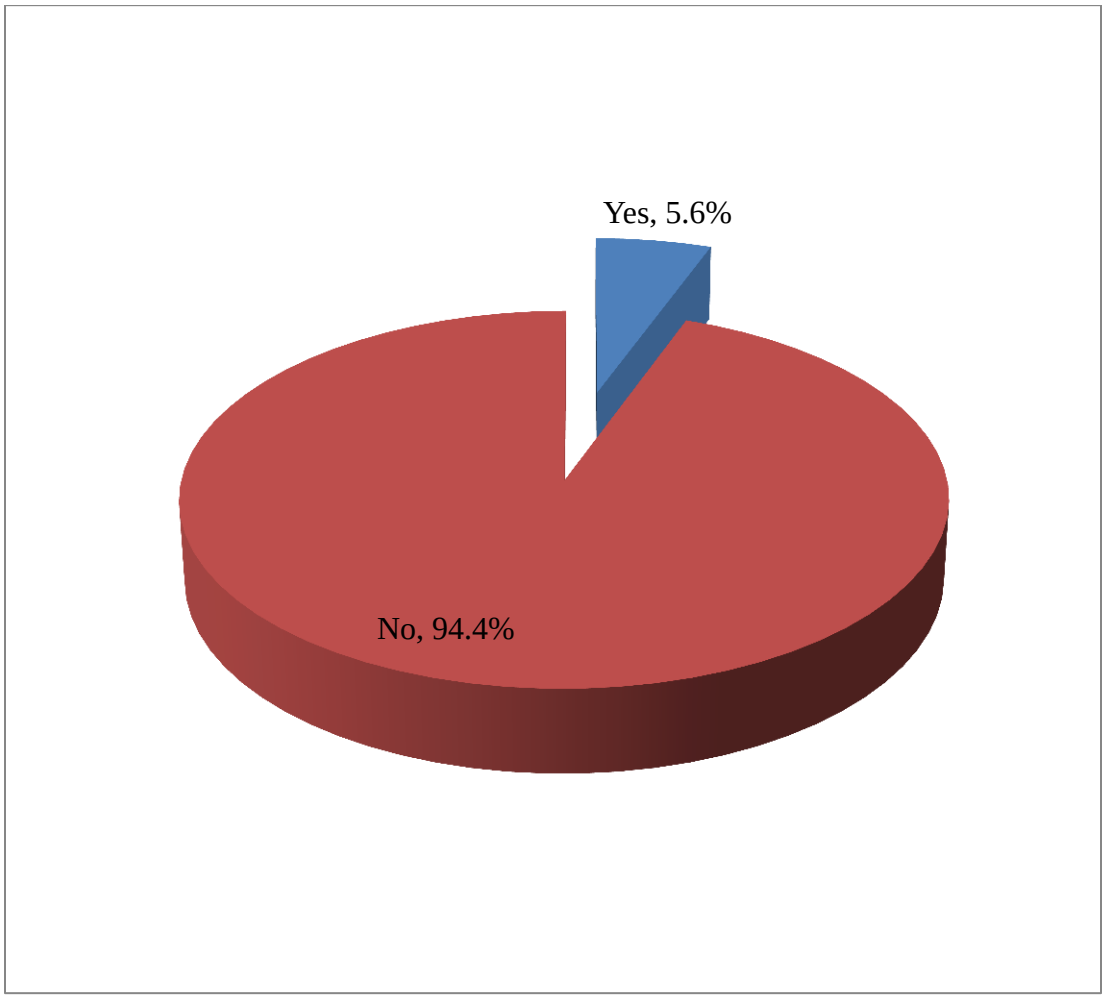

Figure-9: Pressure sore among the wheelchair users person with SCI

4.9 Duration of wheelchair use

The time use of wheelchair among the participants 20% (n=18) were less than one year, 45.6% (n=41) were 1-9 years, 30% (n=27) were 10-19 years, 4.4% (n=4) were 20 years above. (Figure-10)

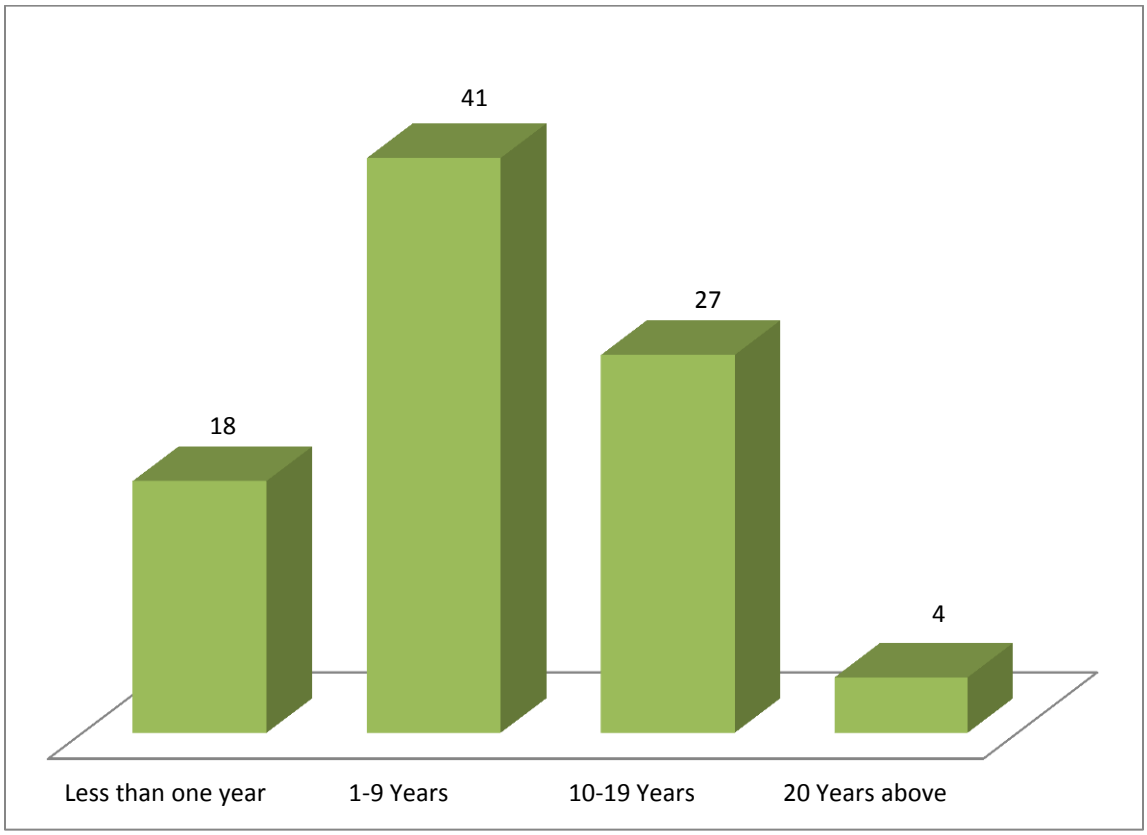

Figure-10: Duration of wheelchair use among the participants

4.11 Total WST-Q Capacity, Confidence and Performance

The study was conducted with 90 participants. Among the participants the median (interquartile range) values of WST-Q Capacity, WST-Q Confidence and WST-Q Performance were 74.26% (57.02%-78.78%), 75.75% (66.66%-80.01%), and 72.00% (54.54%-76.47%). The mean value of the WST-Q capacity 63.34%, WST-Q confidence 65.89% and WST-Q performance 60.47% .The standard deviation (SD) of WST-Q Capacity, WST-Q Confidence and WST-Q Performance were 26.03%, 25.43%, and 24.98%. The minimum value of WST-Q capacity, confidence and performance were 0%. On the other hand the maximum value of WST-Q capacity, confidence and performance were 100%, 100% and 92.82%. (Table-1)

Measure	WST-Q Capacity	WST-Q Confidence	WST-Q Performance
Range of possible value	0%-100%	0%-100%	0%-100%
N	90	90	90
Minimum value	0%	0%	0%
Maximum value	100%	100%	92.82%
Mean	63.34%	65.89%	60.47%
SD	26.03%	25.43%	24.98%
Median	74.26%	75.75%	72.00%
IQR	(57.02-78.78) %	(66.66-80.01)%	(54.54-76.47) %

Table-1: Total percentage scores for WST-Q Capacity, WST-Q Confidence, and WST-Q performance

4.12 Level of wheelchair skills capacity, confidence and performance among the manual wheelchair user in community

According to WST-Q version 4.3, table 2 mentions that here wheelchair skills capacity and wheelchair skills performance level was poor (0), fairly good (1-3060), good (3061-6120) for 90 manual wheelchair users. In this study, after calculate the total score by using SPSS 20 software researcher had got 3746 score for wheelchair skills capacity and 3947 score for wheelchair skills confidence from 90 manual wheelchair users which under the (3061-6120) range. So that means their wheelchair skills capacity and performance level was good. This table also mentions that the wheelchair skills performance level was very poor (0), poor (1-3060), fairly good (3061-6120), good (6121-9180), very good (9181-12280) for 90 manual wheelchair users. After calculate total score of wheelchair skills performance researcher had got 7247 score which under the (6121-9180) range. So, wheelchair skills performance was good. (Table-2)

Score	Wheelchair skills capacity level
0	Poor
1-3060	Fairly good
3061-6120	Good
Score	Wheelchair skills confidence level
0	Poor
1-3060	Fairly good
3061-6120	Good
Score	Wheelchair skills performance level
0	Very poor
1-3060	Poor
3061-6120	Fairly good
6121-9180	Good
9181-12280	Very good

Table-2: Level of wheelchair skills capacity, confidence and performance

4.12 WST-Q Capacity, Confidence and Performance among the sex and level of injury

The level of median (interquartile range) WST-Q Capacity, WST-Q Confidence and WST-Q Performance among the male were 75% (55.92%-78.78%), 75.75% (66.66%-81.81%), and 72.00% (52.21%-76.47%). Level of median (interquartile range) WST-Q Capacity, WST-Q Confidence and WST-Q Performance among the female were 71.65% (64.33%-72.27%), 72.72% (64.70%-78.78%), and 71.65% (64.50%-76.48%) . There are significant of WST-Q Capacity, WST-Q Confidence and WST-Q Performance were *P<.537*, *P<.315*, and *P<.939*. The median (interquartile range) levels of WST-Q Capacity, WST-Q Confidence and WST-Q Performance among the tetraplegia were 25.75% (8.82%-55.88%), 29.41% (8.82%-55.88%), and 26.51% (15.15%-55.30%). The paraplegia level of WST-Q Capacity, WST-Q Confidence and WST-Q Performance were 76.47% (72.05%-80.30%), 76.47% (72.05%-80.30%), and 75% (70.45%-78.30%). Here the significant were *P<.000*, *P<.000*, and *P<.000*. (Table-3)

Parameter	WST-Q capacity	*P*	WST-Q confidence	*P*	WST-Q Performance	*P*
Sex						
Male	75% (55.92-78.78) %	< .537	75.75% (66.66-81.81)%	< .315	72.00% (52.21-76.47) %	<.939
Female	71.65% (64.33-72.27) %		72.72% (64.70-78.78)%		71.65% (64.50-76.48) %	
Type of injury						
Tetraplegia	25.75% (8.82-55.88) %	<.000	29.41% (8.82-55.88)%	<.000	26.51% (15.15-55.30) %	<.000
Paraplegia	76.47% (72.05-80.30) %		76.47% (72.05-80.30)%		75% (70.45-78.30) %	

Table-3: Total WST-Q capacity, WST-Q confidence and WST-Q performance scores by sex and level of injury

4.13 Individual wheelchair skills success rate

Out of 34 individual skills for WST-Q Capacity found the 12 individual skills success rate in WST-Q Capacity were low. (Table-4)

Individual Skill	WST-Q Capacity n (%)	WST-Q Confidence n (%)
Rolls forwards short distance	84(93)	84(93)
Rolls backwards short distance	85(94)	85(94)
Turns in place	84(93)	84(93)
Turns while moving forwards	84(93)	84(93)
Turns while moving backwards	84(93)	84(93)
Maneuvers sideways	83(92)	83(92)
Reaches high object	78(87)	78(87)
Picks object from floor	71(79)	71(79)
Relieves weight from buttocks	72(80)	72(80)
Operates body positioning options	81(90)	81(90)
Level transfer	69(77)	69(77)
Folds and unfolds wheelchair	11(33)	11(33)
Gets through hinged door	71(79)	71(79)
Rolls longer distance	76(84)	76(84)
Avoids moving obstacles	76(84)	76(84)
Ascends slight incline	74(82)	74(82)
Descends slight incline	74(82)	74(82)
Ascends steep incline	72(80)	72(80)
Descends steep incline	72(80)	72(80)
Rolls across side-slope	70(78)	70(78)
Rolls on soft surface	73(81)	73(81)
Gets over threshold	68(76)	68(76)
Gets over gap	68(76)	68(76)
Ascends low curb	67(74)	67(74)
Descends low curb	67(74)	67(74)
Ascends high curb	44(49)	44(49)
Descends high curb	44(49)	44(49)
Performs stationary wheelie	8(9)	8(9)
Turns in place in wheelie position	6(7)	6(7)
Descends high curb in wheelie position	4(4)	4(4)
Descends steep incline in wheelie position	4(4)	4(4)
Gets from ground into wheelchair	23(26)	23(26)
Ascends stairs	4(4)	4(4)
Descends stairs	8(9)	8(9)

Table-4: Individual skills success rate for WST-Q Capacity

4.14 WST-Q individual skill performance scores

The WST-Q performance data on individual skills showed that most of the skills were performed at least monthly. (Table-5)

Individual Skill	WST-Q Performance Score				
	0 (Never) n (%)	1 (Yearly) n (%)	2(Monthly) n (%)	3 (Weekly) n (%)	4 (Daily) n (%)
Rolls forwards short distance	7(8)	0(0)	1(1)	1(1)	81(90)
Rolls backwards short distance	6(7)	0(0)	2(2)	1(1)	81(90)
Turns in place	7(8)	0(0)	1(1)	1(1)	81(90)
Turns while moving forwards	7(8)	0(0)	1(1)	1(1)	81(90)
Turns while moving backwards	7(8)	0(0)	1(1)	1(1)	81(90)
Maneuvers sideways	8(9)	0(0)	1(1)	1(1)	80(89)
Reaches high object	13(14)	0(0)	1(1)	6(7)	70(78)
Picks object from floor	21(23)	0(0)	2(2)	4(5)	63(70)
Relieves weight from buttocks	9(10)	0(0)	1(1)	1(1)	79(88)
Operates body positioning options	10(11)	0(0)	1(1)	1(1)	78(87)
Level transfer	23(26)	0(0)	1(1)	1(1)	65(72)
Folds and unfolds wheelchair	25(28)	1(1)	3(3)	0(0)	4(5)
Gets through hinged door	23(25)	0(0)	2(2)	6(7)	59(66)
Rolls longer distance	16(18)	0(0)	3(3)	9(10)	62(69)
Avoids moving obstacles	16(18)	0(0)	3(3)	6(7)	65(72)
Ascends slight incline	17(19)	0(0)	2(2)	1(1)	70(78)
Descends slight incline	17(19)	0(0)	2(2)	1(1)	70(78)
Ascends steep incline	20(22)	0(0)	4(5)	3(3)	63(70)
Descends steep incline	20(22)	0(0)	4(5)	3(3)	63(70)
Rolls across side-slope	21(23)	0(0)	4(5)	6(7)	59(66)
Rolls on soft surface	18(20)	0(0)	5(6)	5(5)	62(69)
Gets over threshold	34(38)	2(2)	1(1)	2(2)	51(57)
Gets over gap	25(28)	0(0)	4(4)	9(10)	52(58)
Ascends low curb	26(29)	0(0)	4(4)	6(7)	54(60)
Descends low curb	26(29)	0(0)	4(4)	6(7)	54(60)
Ascends high curb	52(58)	2(2)	4(4)	10(11)	22(25)
Descends high curb	52(58)	2(2)	4(4)	10(11)	22(25)
Performs stationary wheelie	82(91)	2(2)	3(4)	0(0)	3(3)
Turns in place in wheelie position	85(95)	1(1)	1(1)	0(0)	3(3)
Descends high curb in wheelie position	88(98)	0(0)	1(1)	0(0)	1(1)
Descends steep incline in wheelie position	88(98)	1(1)	0(0)	0(0)	1(1)
Gets from ground into wheelchair	72(80)	3(3)	3(3)	5(6)	7(8)
Ascends stairs	87(97)	0(0)	2(2)	0(0)	1(1)
Descends stairs	85(95)	2(2)	2(2)	0(0)	1(1)

Table-5: WST-Q individual skill performance scores

4.15 The association between demographic factor (age, causes of injury, pressure sore, duration of a wheelchair use) and wheelchair skills capacity, confidence, performance.

In this study shows the association between demographic factor (age, causes of injury, pressure sore, duration of wheelchair use) and wheelchair skills capacity, confidence, performance. Chi-square test was performed to show the association between these variables.

There was no strong association between age and wheelchair skills capacity, confidence, performance. Wheelchair skills capacity was (n=90, $\chi 2$ =211.63, P<.114), wheelchair skills confidence was (n=90, $\chi 2$=152.06, P<.164) and performance was (n=90, $\chi 2$ =226.71, P<.232). (Table-6)

Component	Age						
	15-25 years	26-35 years	36-45 years	46-55 years	56-65 years	$\chi 2$ value	*p*-value
Wheelchair skills capacity	24.4% (n=22)	37.8% (n=34)	20% (n=18)	11.1% (n=10)	6.7% (n=6)	211.63	.114
Wheelchair skills confidence	24.4% (n=22)	37.8% (n=34)	20% (n=18)	11.1% (n=10)	6.7% (n=6)	211.63	.164
Wheelchair skills performance	24.4% (n=22)	37.8% (n=34)	20% (n=18)	11.1% (n=10)	6.7% (n=6)	211.63	.232

Table-6: Association between the ages and wheelchair skills capacity, confidence, performance

The association between causes of injury and wheelchair skills capacity, confidence, performance was not strong. Wheelchair skills capacity was (n=90, $\chi 2$=40.06, P<.753), wheelchair skills confidence (n=90, $\chi 2$=19.98, P<.973) and wheelchair skills performance (n=90, $\chi 2$=48.29, P<.658). (Table-7)

Component	Cause of injury			
	Traumatic	Non-traumatic	$\chi 2$ value	*p*-value
Wheelchair skills capacity	93.3%(n=84)	6.7%(n=6)	40.06	.753
Wheelchair skills confidence	93.3%(n=84)	6.7%(n=6)	19.98	.973
Wheelchair skills performance	93.3%(n=84)	6.7%(n=6)	48.29	.658

Table-7: Association between the causes of injury and wheelchair skills capacity, confidence, performance

There is no strong association between the pressure sore and wheelchair skills capacity, confidence, performance. Here the wheelchair capacity was (n=90, $\chi 2$=47.75, P<.442), wheelchair confidence was (n=90, $\chi 2$=42.19, P<.158), and wheelchair skills performance was (n=90, $\chi 2$=51.88, P<.518). (Table-8)

Component	Pressure sore			
	Yes	No	$\chi 2$ value	*p*-value
Wheelchair skills capacity	5.6%(=n5)	94.4%(n=85)	47.75	.442
Wheelchair skills confidence	5.6%(=n5)	94.4%(n=85)	42.19	.158
Wheelchair skills performance	5.6%(=n5)	94.4%(n=85)	51.88	.518

Table-8: Association between the pressure sore and wheelchair skills capacity, confidence, performance

Here showed that the association between duration of wheelchair use and wheelchair skills capacity, confidence was not strong. Wheelchair skills capacity (n=90, $\chi 2$=135.99, P<.603), wheelchair skills confidence (n=90, $\chi 2$=107.73, P<.330), wheelchair skills performance was (n=90, $\chi 2$=181.94, P<.103). (Table-9)

Component	Duration of wheelchair use					
	Less than one year	1-9 years	10-19 years	20 years above	$\chi 2$ value	p-value
Wheelchair skills capacity	20%(n=18)	45.6%(n=41)	30%(n=27)	4.4%(n=4)	135.99	.603
Wheelchair skills confidence	20%(n=18)	45.6%(n=41)	30%(n=27)	4.4%(n=4)	107.73	.330
Wheelchair skills performance	20%(n=18)	45.6%(n=41)	30%(n=27)	4.4%(n=4)	181.94	.103

Table-9: Association between the duration of wheelchair use and wheelchair skills capacity, confidence, performance

4.16 Correlation between the total WST-Q Capacity and WST-Q Confidence

The total WST-Q capacity scores correlated significantly with the total WST-Q confidence scores (r=.95; *P*<.00). (Figure-11)

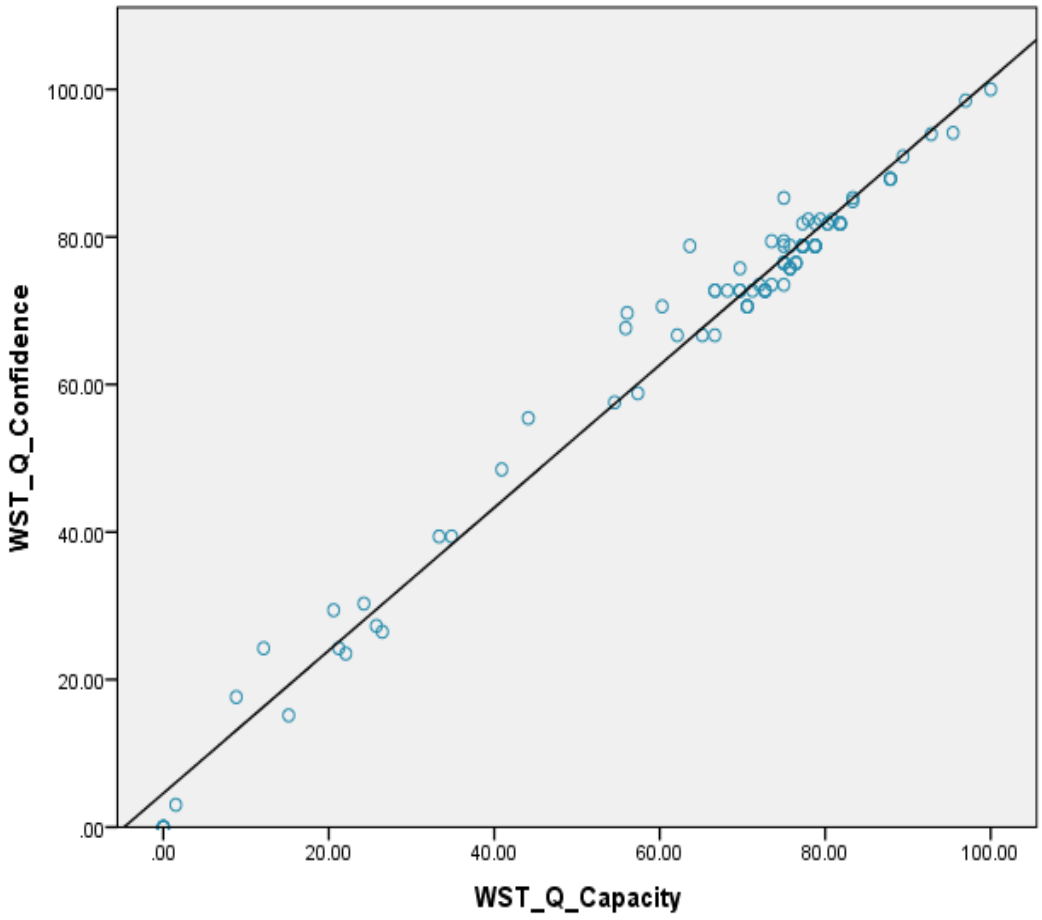

Figure-11: Correlation between total WST-Q capacity and confidence

4.16 Correlation between the total WST-Q Capacity and WST-Q Performance

The total WST-Q capacity scores correlated significantly with the total WST-Q performance scores (r=.88; *P*<.00). (Figure-12)

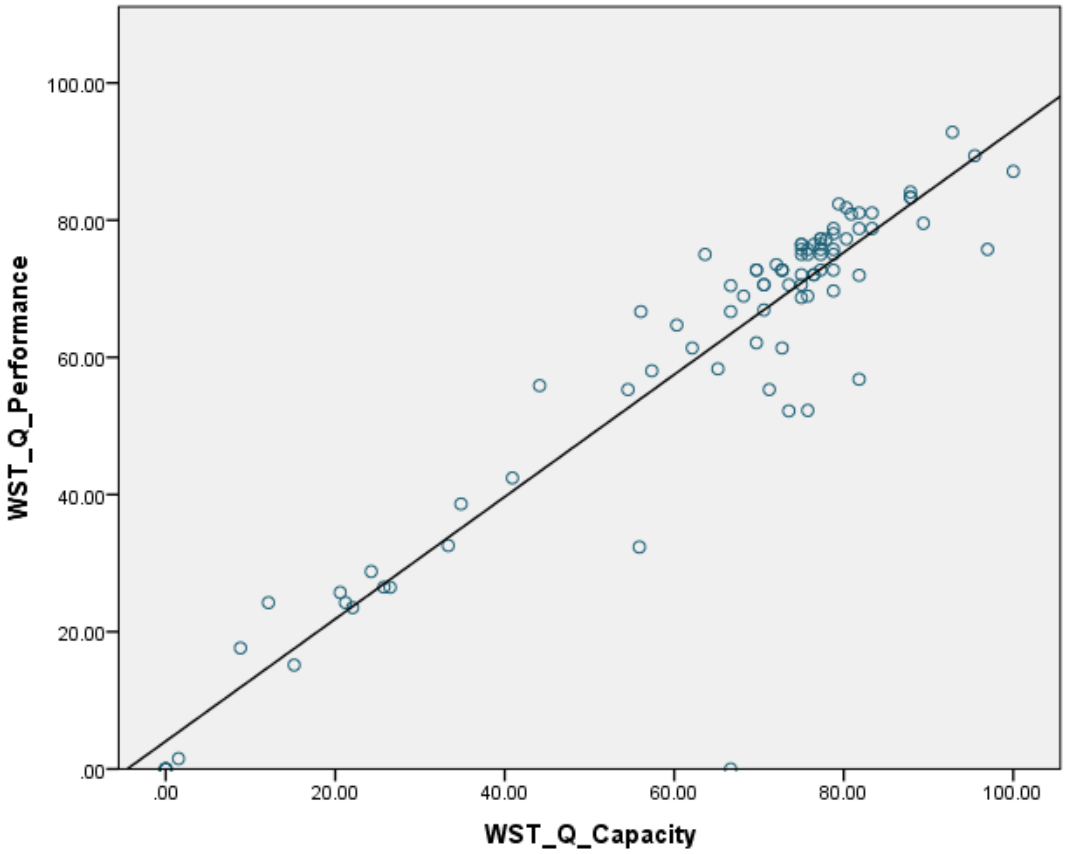

Figure-12: Correlation between total WST-Q capacity and performance

CHAPTER -V DISCUSSION & CONCLUSION

5.1 Discussion

The aim of this study was to determine the wheelchair skills capacity, confidence and performance of manual wheelchair users with SCI in the community. Although it was realized that the sample size was small; this study provides information about wheelchair skills capacity, confidence, and performance of manual wheelchair users with SCI in our country. Total 90 patients were taken in this study period. The study population consisted of 80 (88.9%) males and 10 (11.1%) females. Here show that most of the participants were males. Their age ranged from 15 to 65 years with a mean age of the patients was 35 years. The minimum and maximum ages among the participants were 16 years and 65 years. The majority of the patients were aged between 26-35 years. Most of the participants were young age. In this study most of the participants were married (62%), living private residence (42%), secondary school level (51.1%), paraplegia (70%), and traumatic (93.3%). Kirby et al.[2] found that most of the wheelchair users with SCI patients were men (85.5%), unmarried (58.1%), paraplegia (76.9%). Another study Islam[18] was found that participants were married (65.4%), traumatic (93%). Lemay et al.[39] most of wheelchair users education level was high school (37.0%).

Achieved objectives of the wheelchair skills capacity, confidence and performance of manual wheelchair users with SCI. This shows that the median value for WST-Q capacity 74.26%, WST-Q confidence 75.75% and WST-Q performance 72.00%. There have some different finding of median total value for WST-Q capacity, performance and confidence were 88%, 76% and 88.5% was finding by the Kirby et al in American manual wheelchair users with SCI.[2] Inkpen identify the total median value of the 76.6% WST-Q capacity and 60.9% WST-Q performance.[22] Rushton found out the median confidence value among the manual wheelchair user was 84.6 %.[35]

In this study researcher found that the WST-Q capacity, confidence, performance level was good of the manual wheelchair users with SCI in community of Bangladesh. But researcher not found any literature for support this finding.

Hosseini et al.[12] identified the individual skills for WST-Q capacity success rate was > 75%. In this study researcher found that 12 individual skills were low success for WST-Q capacity out of 34 skills. Kirby et al.[2] reported that 6 individual skills was low success for WST-Q capacity. Inkpen said that wheelchair users may not perform skills that they are capable of for various reasons including low confidence, lack of opportunity, or infrequent need.[22]

The result found that in this study level of injury as paraplegia the median total WST-Q capacity, WST-Q confidence and WST-Q performance scores were 76.47%, 76.47% and 75%. The tetraplegia median total WST-Q capacity, WST-Q confidence and WST-Q performance scores were 25.75%, 29.41%, and 26.51%. The male total median WST-Q capacity 75%, WST-Q confidence 75.75%, WST-Q performance 72.00% and the female total median WST-Q capacity 71.65%, WST-Q confidence 72.72%, and WST-Q performance 71.65%. Kibly et al.[2] found that paraplegia median total WST-Q capacity 91.0%, WST-Q performance 79.0% and tetraplegia median total WST-Q capacity 76.0%, WST-Q performance 68.0%. The male total WST-Q capacity 88.5%, WST-Q performance 79.0% and the female total median WST-Q capacity 76.0%, WST-Q performance 68.0%. Another study Rushton was identified the median value of wheelchair skills confidence were paraplegia 87.2% and tetraplegia 86.5%. The median value of wheelchair skills confidence was male 85.6% and female 80.7%.[35]

Kibly et al.[2] also found that the level of injury and sex was associated with the total WST-Q capacity, and WST-Q performance scores. Participants with paraplegia scored significantly higher than those tetraplegia ($P<.001$, and $P<.001$). Sex was associated with the total WST-Q capacity, and WST-Q performance scores; with female having lower scores than male ($P<.001$, and $P<.001$).[12] Rushton also found that statistically significant difference was not found between the sexes ($P< 0.140$).[35] In this study investigator found

that the significant difference of wheelchair skills capacity, confidence, performance between the tetraplegia and paraplegia ($P<.000$, $P<.001$, and $P<.001$). But the investigator not found the significant difference of wheelchair skills capacity, confidence, performance between the male and female ($P<.537$, $P<.315$, $P<.939$).

In this study researcher not found the strong association of the wheelchair skills capacity, confidence, performance between ages, causes of injury, pressure sore. Researcher also found out in this study there have no strong association of the wheelchair skills capacity, confidence and performance between the duration of wheelchair use. Only one study Rushton found that statistically significant difference was not found the wheelchair skill confidence between ages.[35]

Researcher found in this study significantly correlation between the total scores WST-Q capacity and WST-Q confidence (r=.95; $P<.000$). Researcher also found that in this study significantly correlation between the total scores WST-Q capacity and WST-Q performance (r=.88; $P<.00$). Kirby et al.[2] reported that total WST-Q capacity scores significantly correlated with the total WST-Q performance scores were (r=.63; $P<.001$). Kirby et al. also found that total WST-Q capacity scores significantly correlated with the total WST-Q confidence were(r=.610; $P<.01$)

5.2 Limitation

Regarding this study, there were some limitations or barrier to consider the result of the study as below:

The limitation of this study was sample size. It was taken only 90 samples, because it was so difficult to go to the wheelchair users with SCI people in the community, their residence was so far from my resident. The major limitation was time. The period was very limited to conduct the research project on this topic. As the study period was short so the adequate number of sample could not arrange for the study. There have not enough literature about manual wheelchair user with SCI in Bangladeshi context or south Asian context. Investigator not found the literature about the association between demographic

factor (age, causes of injury, pressure sore, and duration of wheelchair use) and wheelchair skills capacity, confidence, performance. This study is a quantitative study. Researcher selected purposive sampling in this study. The study was conducted by small sample size. Small sample size is not representing all population of a country. So the data is not generalized to all manual wheelchair users with SCI.

5.3 Conclusion

The debilitating consequence of a SCI often leads to impairment in the ability to engage in everyday activities and limit mobility function and participation. So, most of the SCI people use the manual wheelchairs for their participation and community mobility. They face many problems to participate in community with wheelchair. However full community participation by the manual wheelchair they needed to advance level of wheelchair skills. From this study researcher got so many information about the wheelchair skills capacity, confidence and performance level of the manual wheelchair users with SCI in the community. We show that in this study many people with SCI are unable to perform some of the advance level wheelchair skills that would allow participating more fully. So, this study is helpful for the wheelchair users SCI people. More advance level of wheelchair skills training enhances participation and quality of life with SCI patients. So, this study is helpful for the wheelchair users SCI people.

5.4 Recommendation

Recommendations for Occupational therapists (OTs) in Bangladesh

OTs should implement a broader role and holistic treatment techniques for the manual wheelchair users with SCI. OTs need to update their knowledge in this area. OTs should involve the wheelchair skills training program to the wheelchair user with SCI people for improving the community and activities participation. OTs need to concentrate more on the wheelchair skills during the wheelchair skills training program.

Recommendations for further research

The researcher's recommendation is that OTs need to study this topic in depth. This may involve

- Effectiveness of wheelchair skills training program among the manual wheelchair users.
- Participation barrier among the manual wheelchair users with the SCI people in the community.
- Psychosocial impact of the wheelchair users with SCI in the community.
- Quality of life among the manual wheelchair users with SCI in the community.

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APPENDIX:A

Approval letter from IRB

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

BANGLADESH HEALTH PROFESSIONS INSTITUTE

Ref. CRP-BHPI/IRB/01/17/24

Date: 03/01/2017

Md. Saddam Hossain
4th year B. Sc in Occupational Therapy
Session: 2012-2013, DU Reg. 5209
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal – "Wheelchair Skills Capacity, Confidence, Performance and Associate Demographic Factors of Manual Wheelchair Users with Spinal Cord Injury in the Community of Bangladesh" by IRB of BHPI.

Dear Saddam Hossain,

Congratulation!

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on December 1, 2016 to conduct the above mentioned thesis, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

SL#	Name of the Documents
1	Thesis Proposal
2	Questionnaire
3	Information sheet & consent form.

Since the study involves answering a questionnaire that takes 10 minutes, have no likelihood of any harm to the participants rather possibility of benefit by knowing the wheelchair skills capacity, confidence, performance and associate demographic factors of manual wheelchair users with spinal cord injury from the information of Questionnaire, IRB has approved the study to be conducted in the presented form at the meeting held at 08:30 AM on December 17, 2016 at BHPI.

IRB 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. IRB of BHPI is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards

Millat Hossain

Muhammad Millat Hossain
Senior Lecturer,
Dept. of M.Sc. in Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ, ফোন ঃ ৭৭৪৫৪৬৪-৫, ৭৭৪১৪০৪ ফ্যাক্স ঃ ৭৭৪৫০৬৯
CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404, Fax : 7745069, E-mail : contact@crp-bangladesh.org, www.crp-bangladesh.org

APPENDIX:B

Permission letter for data collection

22nd December, 2016

The Head of the Department
Department of Occupational Therapy
CRP, Chapain, Savar, Dhaka-1343

Subject: An application for seeking permission for collecting the data to conduct the research.

Dear Sir,
With due respect and humble submission to state that I am Md. Saddam Hossain, student of 4th year B.Sc. in Occupational Therapy at Bangladesh Health Professions Institute (BHPI); the academic institute of Centre for the Rehabilitation of the Paralysed (CRP). I am sincerely seeking permission for collecting the data to conduct my research as the part of fulfillment of the requirements of degree of B.Sc. in Occupational Therapy. The title of my research is, "wheelchair skills capacity, confidence, performance and associate demographic factors of manual wheelchair users with SCI in community of Bangladesh."
The aim of the study is "To determine the wheelchair skills capacity, confidence, performance and associate demographic factors of manual wheelchair users with SCI."
I, therefore, pray & hope that you would be kind enough to grant my application & give me permission of collecting the data and will help me to complete a successful study as a part of my course.

Sincerely yours
Md. Saddam Hossain

Md. Saddam Hossain
Roll:08, Session: 2012-2013
4th year, B.Sc. in Occupational Therapy,
Bangladesh Health Professions Institute (BHPI).
CRP-Chapain, Savar, Dhaka-1343

Approved by	Signature and Recommendation
Head of the Department Md.Julker Nayan Assistant professor Dept. Of occupational therapy CRP-Chapain, Savar, Dhaka-1343	He may allowed to conduct study at OT Dept. and start Data collection. 22.12.16
Research supervisor Shamima Akter Lecturer in Occupational Therapy, Department of Occupational therapy BHPI,CRP-Chapain ,Savar,Dhaka-1343	The methodological aspect is sound and wishing best of luck for conducting the study. 22/12/16

APPENDIX:C

Author permission letter for WST-Q version 4.3

Kirby, Lee <Lee.Kirby@nshealth.ca> Mon, Oct 24, 2016 at 6:01 PM
To: Saddam Hossain <saddamot6@gmail.com>

Saddam,

We are pleased to learn of your project. I attach a copy of the paper that it seems you are aware of.

You are welcome to use any of the materials posted on our website, within the Conditions of Use posted there (http://www.wheelchairskillsprogram.ca/eng/conditions.php).

I suggest that you use the latest version of the WST-Q (Version 4.3).

LK

R. Lee Kirby, MD, FRCPC
Division of Physical Medicine and Rehabilitation, Dalhousie University
c/o Capital District Health Authority, Nova Scotia Rehabilitation Centre Site, Room 206
1341 Summer Street, Halifax, NS, Canada B3H 4K4
Phone: 902-473-1268; Fax: 902-473-3204; E-mail: kirby@dal.ca
www.wheelchairskillsprogram.ca

APPENDIX: D

Part-1

Information Sheet (English)

Assalamualaikum,

My name is Md. Saddam Hossain. I am a student of B sc.in Occupational Therapy of Bangladesh Health Professions Institute (BHPI) which is the academic institute of the Centre for the Rehabilitation of the Paralysed (CRP). In regards to fulfillment of B.Sc. Degree, it is mandatory to conduct an academic research in 4th year. It will be very helpful if you accept my invitation and take part in my study. My research title "Wheelchair Skills Capacity, Confidence, Performance and associate demographic factors of Manual Wheelchair user with Spinal Cord Injury (SCI) in Community of Bangladesh". The aim of this study is to find out the Wheelchair Skills Capacity, confidence, Performance and associate demographic factors of Manual Wheelchair user with Spinal Cord Injury (SCI) in Community of Bangladesh.

This study result will be helpful to better design of wheelchair skills training program. Also help to Rehabilitation professional. You will be not forced to participate at all. If you want to withdraw from the study, you may do that at any time without any hesitation.

I will collect data by some questionnaire and some observation during participants dealing. To collect data will take 10 minutes time. Only your personal details and answers of the questionnaire will be documented and used for the study purpose. Without investigator and study supervisor nobody will permit to know the data associated with study. The investigator will maintain confidentiality of all proceedings. Without your permission, the data provided by you will never be used. If you have any questions you may ask me at any time. I will appreciate it if you can explain as much as possible and be as truthful as possible in your answers.

Md. Saddam Hossain

B Sc.in Occupational Therapy

BHPI

Participant's signature: Date:

Investigator's signature: Date:

Part-2

Consent Form (English)

Please read the following statements and put right marks on yes or no. Following information will state your opinion about participation in the study.

1. Have you read the information sheet? ----------Yes / No

2. Have you had an opportunity to discuss this study and ask any question?-Yes/ No

3. Have the researcher explain the study to you? ----------Yes / No

4. Do you understand that you are free to withdraw from the study at any time, without having to give a reason? ----------Yes / No

5. Information from interview and question, those will be collected by the investigator might be examined by other research supervisor. However, all personal details will be treated as highly confidential. Do you give your permission for the research supervisor to have access to your records? ----------Yes / No

6. Do you have sufficient time to come to your decision about participation----------Yes / No

7. Do you agree to take part in this study? ----------Yes / No

Participant's signature _____Date_____

Investigator

I have explained the study to the above participant precisely and he/she has indicated his/her willingness to take part in the study.

Investigator's signature _____Date _____

APPENDIX: E

অংশগ্রহণকারীর তথ্য ও সম্মতিপত্র

পর্ব-১

তথ্যপত্র

আসসালামুআলাইকুম

আমার নাম মোঃ সাদ্দাম হোসেন। আমি বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউটের বি এস সি ইন. অকুপেশনাল থেরাপি বিভাগের অধ্যায়ণরত একজন ছাত্র, যা কিনা পক্ষাঘাতগ্রস্থদের পুনর্বাসন কেন্দ্র (সিআরপি) এর একটি শিক্ষা প্রতিষ্ঠান। এই কোর্সে অংশ হিসাবে চতুর্থ বর্ষের আবশ্যকভাবে একটি গবেষণা কর্ম সম্পন্ন করতে হয়। যদি আপনি আমার আমন্ত্রণ গ্রহণ করেন এবং আমার গবেষণায় অংশ নিতেন এটা খুবই উপকার হত। আমার গবেষণার বিষয়-বাংলাদেশের সমাজ ব্যাবস্থায় মেরুরজ্জু জনিত। আঘাত প্রাপ্ত ব্যক্তিদের ক্ষেত্রে হুইল চেয়ার চালানোর সামর্থ্য, আত্মবিশ্বাস, কর্মদক্ষতা এবং জনসংখ্যা বিষয়ক কারণ খুজে বের করা।

এই গবেষণায় ফলাফল সহায়ক করবে হুইলচেয়ার দক্ষতা প্রশিক্ষণের একটি ভাল নকশা তৈরি করবে। এছাড়া ও পুনর্বাসন পেশাজীবীদের সাহায্য করবে। এই গবেষণায় আপনার অংশ গ্রহণ ঐচ্ছিক। আপনা কে অংশগ্রহণের জন্য কোন বল প্রয়োগ করা হবে না। যদি আপনি এই গবেষণা থেকে নিজেকে প্রত্যাহার করতে চান, আপনি যে কোন সময় কোন দ্বিধা ছাড়াই তা করতে পারবেন।

অংশগ্রহণকারীর সাক্ষাৎকারের সময় আমি কিছু প্রশ্নবলী এবং পর্যবেক্ষণ দ্বারা তথ্য সংগ্রহ করব। এই তথ্য গুলো সংগ্রহ করতে ১৫ মিনিট সময় লাগতে পারে। একমাত্র আপনার ব্যক্তিগত বিবরণ ও প্রশ্নপত্রের উত্তরসমূহের দলিল রাখা ও ব্যবহার করা হবে এই গবেষণায় উদ্দেশ্যে। গবেষক এবং গবেষণার তত্ত্বাবধায়ক ছাড়া অন্য কাউকে গবেষণা বিষয়ক তথ্যবলী সম্বন্ধে অবিহিত করা হবে না। গবেষক গবেষণা চলাকালীন প্রতিটি ধাপে গোপনীয়তা বজায় রাখবেন। আপনার অনুমিত ছাড়া আপনি যে তথ্যাবলী দিয়েছেন তা কখনোই ব্যবহার করা হবে না। যদি আপনার কোন প্রশ্ন থাকে আপনি আমাকে যে কোন সময়ে করতে পারেন। আমি আপনাকে উৎসাহ প্রদান করবো যদি আপনি যতটুকু সম্ভব ততটুকু সত্য ও সঠিক উত্তর প্রদান করেন।

মোঃ সাদ্দাম হোসেন
বি এস সি ইন. অকুপেশনাল থেরাপি
বিএইচপিআই

অংশগ্রহণকারী স্বাক্ষর ঃ..... তারিখ ঃ.....
গবেষকের স্বাক্ষর ঃ..... তারিখ ঃ.....

পর্ব-২

সম্মতিপত্র

দয়া করে নিচের তথ্য গুলো পড়ে হ্যাঁ অথবা না এর উপর টিক চিহ্ন দিন। নিম্নলিখিত তথ্য গুলো গবেষণায় আপনার অংশগ্রহণের মতামত প্রকাশ করবে।

১। আপনি কি তথ্য পত্রটি পড়ছেন?.....হ্যাঁ/না।

২। এই গবেষণা আলোচনা এবং কোন প্রশ্ন জিজ্ঞাসা করাতে আপনার কি সুযোগ হয়েছে?.....হ্যাঁ/না।

৩। গবেষক কি আপনার কাছে গবেষণাটি ব্যাখ্যা করছেন?.....হ্যাঁ/না।

৪। আপনি গবেষণা থেকে যে কোন সময় অংশগ্রহণ প্রত্যাহার করতে পারেন এবং এজন্য কারো কাছে জবাবদিহি করতে হবে না। এ সম্পর্কে আপনি কি বুঝতে পেরেছেন?.....হ্যাঁ/না।

৫। প্রশ্নমালা এবং সাক্ষাৎকার থেকে গবেষক কর্তৃক সংগৃহিত তথ্য গবেষণাকারী তত্ত্বাবধায়ক দ্বারা নিরীক্ষণ করা হবে। সমস্ত ব্যক্তিগত তথ্য অত্যধিক গোপনীয় থাকবে। আপনি কি গবেষণাকারী তত্ত্বাবধায়ককে আপনার তথ্য জানার অনুমতি প্রদান করছেন?.....হ্যাঁ/না।

৬। আপনি কি অংশ গ্রহণের ব্যাপারে সিদ্ধান্ত নেয়ার জন্য পর্যাপ্ত সময় পেয়েছেন?.....হ্যাঁ/না

৭। আপনার কি এই গবেষণায় অংশ গ্রহণে সম্মত আছে?.....হ্যাঁ/না।

অংশগ্রহণকারী স্বাক্ষর ঃ..... তারিখ ঃ.....

গবেষক

আমি গবেষণা সম্পর্কে উপরোক্ত অংশগ্রহণকারীর কাছে যথাযথভাবে ব্যাখ্যা করেছি এবং তিনি এই গবেষণায় স্বেচ্ছায় অংশগ্রহণের সম্মতি প্রকাশ করেছেন।

গবেষকের স্বাক্ষর ঃ..... তারিখ ঃ.....

APPENDIX: F

Questionnaire in English

Code no:
Date:
Contact no:

Age:

Sex:
- Male
- Female

Body mass index (BMI):
- Height
- Weight

Marital status
- Married
- Unmarried
- Divorced

Occupation:

Address:
Village: Post office:

Thana: District:

Place of residence:

- Private residence
- Inpatient
- Nursing home
- Others

Educational level:
- Illiterate
- Primary school certificate (PSC)
- Secondary school certificate (SSC)
- Higher secondary certificate (HSC)
- B.Sc
- M.Sc
- Others

Type of injury:
- Tetraplegia
- Paraplegia

Level of injury:

Cause of injury:
- Traumatic How:
- Non traumatic How:

Pressure sore:
- Yes
- No

Vocational training/ work rehabilitation:
- Yes
- No

Type of wheelchair
- Manual wheelchair
- Power wheelchair

Time using wheelchair:

Age of wheelchair used most often:

Accessibility at home:

Furniture arrangement:
- Yes
- No

Bed room modification:
- Yes
- No

Kitchen modification:
- Yes
- No

Ramp:
- Yes
- No

Toilet modification:
- Yes
- No

Spinal Cord Independent Measure (SCIM):

Component	Score
Self-care	
Respiration and Sphincter Management	
Mobility (room and toilet)	
Mobility (indoors and outdoors, on even surface**)**	
Productivity	
Leisure	
Domestic ADL	

Wheelchair Skills Test Questionnaire (WST-Q), Version 4.3

Scoring Options for Individual Skills

Capacity question: "Can you do this skill?"		
Answer	**Score**	**What this means**
Yes	2	I can safely do the skill, by myself, without any difficulty.
Yes with difficulty	1	Yes, but not as well as I would like.
No	0	I have never done the skill or I do not feel that I could do it right now.
Not possible with this wheelchair	NP	My wheelchair does not have the parts to allow this skill. (This option is only presented for skills where such a score is a possibility.)
Testing error	TE	When answers have not been recorded (e.g. inadvertently or because the test subject did not understand the question).
Confidence question: "How confident are you?"		
Answer	Score	What this means
Fully confident	2	As of now, I am fully confident that I can do this skill safely and consistently.
Somewhat confident	1	As of now, I am somewhat confident that I can do this skill safely and consistently.
Not at all confident	0	As of now, I am not at all confident that I can do this skill safely and consistently.
Not possible with this wheelchair	NP	My wheelchair does not have the parts to allow this skill. (This option is only presented for skills where such a score is a possibility.)
Testing error	TE	When answers have not been recorded (e.g. inadvertently or because the test subject did not understand the question).

Performance question: "How often do you do it?"		
Answer	**Score**	**What this means**
Daily	4	Generally, at least once a day.
Weekly	3	Generally, at least once a week.
Monthly	2	Generally, at least once a month.
Yearly	1	Generally, at least once a year.
Never	0	Generally, less often than once a year or never.
Not possible with this wheelchair	NP	My wheelchair does not have the parts to allow this skill. (This option is only presented for skills where such a score is a possibility.)
Testing error	TE	When answers have not been recorded (e.g. inadvertently or because the test subject did not understand the question).

Question: "Is this a training goal?"	
Possible Answers	**What This Means**
Yes	I am interested in receiving training for this skill.
No	I am not interested in receiving training for this skill.

#	Individual Skill	Capacity (0-2)	Confidence (0-2)	Performance (0-4)	Training Goal? (Y/N)
1	Rolls forwards short distance				
2	Rolls backwards short distance				
3	Turns in place				
4	Turns while moving forwards				
5	Turns while moving backwards				
6	Maneuvers sideways				
7	Reaches high object				
8	Picks object from floor				
9	Relieves weight from buttocks				
10	Operates body positioning options				
11	Level transfer				
12	Folds and unfolds wheelchair				
13	Gets through hinged door				

14	Rolls longer distance				
15	Avoids moving obstacles				
16	Ascends slight incline				
17	Descends slight incline				
18	Ascends steep incline				
19	Descends steep incline				
20	Rolls across side-slope				
21	Rolls on soft surface				
22	Gets over threshold				
23	Gets over gap				
24	Ascends low curb				
25	Descends low curb				
26	Ascends high curb				
27	Descends high curb				
28	Performs stationary wheelie				
29	Turns in place in wheelie position				
30	Descends high curb in wheelie position				
31	Descends steep incline in wheelie position				
32	Gets from ground into wheelchair				
33	Ascends stairs				
34	Descends stairs				
Total scores:					

APPENDIX: G

প্রশ্নবলী (বাংলা)

কোড নং ঃ

তারিখ ঃ

ফোন নাম্বার ঃ

বয়স ঃ

লিঙ্গ ঃ

- পুরুষ
- নারী

শারীরিক ভরের সূচক ঃ

- উচ্চতা
- ওজন

বৈবাহিক অবস্থা ঃ

- বিবাহিত
- অবিবাহিত
- তালাকপ্রাপ্ত

পেশা ঃ

ঠিকানা ঃ

গ্রাম ঃ ডাকঘর ঃ

থানা ঃ জেলা ঃ

বসবাসের স্থান ঃ

- ব্যক্তিগত বাসভবন
- অন্তঃ বিভাগ
- নার্সিং হোম
- অন্যান্য

শিক্ষাগত যোগ্যতা ঃ

- অশিক্ষিত
- প্রাথমিক স্কুল সার্টিফিকেট (পি.এস.সি)
- মাধ্যমিক স্কুল সার্টিফিকেট (এস.এস.সি)
- উচ্চ মাধ্যমিক সার্টিফিকেট (এইচ.এস.সি)
- বি এস সি
- এম এস সি
- অন্যান্য

আঘাতের ধরন ঃ

- টেট্রাপ্লেজিয়া
- প্যারাপ্লেজিয়া

আঘাতের মাত্রা ঃ

আঘাতের কারণ ঃ

- আঘাত জনিত কীভাবে ঃ
- অ-আঘাত জনিত কীভাবে ঃ

চাপজনিত ঘা ঃ

- হ্যাঁ
- না

ভোকেশনাল প্রশিক্ষণ/ কর্ম পুনর্বাসন ঃ

- হ্যাঁ
- না

হুইলচেয়ারের ধরন ঃ

- হস্তচালিত হুইলচেয়ার
- পাওয়ার হুইলচেয়ার

হুইলচেয়ার ব্যবহারের সময়কাল ঃ

প্রায় কত বয়স ধরে হুইলচেয়ার ব্যবহার করছেন ঃ

বাড়ির প্রবেশযোগ্যতা ঃ

আসবাবপত্র বিন্যাস ঃ

- হ্যাঁ
- না

শয়নকক্ষ মডিফিকেশন ঃ

- হ্যাঁ
- না

রান্না ঘর মডিফিকেশন ঃ

- হ্যাঁ
- না

র‍্যাম্প ঃ

- হ্যাঁ
- না

টয়লেট মডিফিকেশন ঃ

- হ্যাঁ
- না

স্পাইনাল কর্ড ইনডিপেনডেন্স মেজার (স্কিম)

উপাদান	স্কোর
নিজের পরিচর্যা	
শ্বসনতন্ত্র এবং মলদ্বারের ব্যবস্থাপনা	
গতিশীলতা (কক্ষ এবং টয়লেট)	
গতিশীলতা (বিতর এবং বাহির, সমতল)	
উৎপাদন মূলক	
অবসর	
সাংসারিক কাজকর্মে	

হুইল চেয়ার দক্ষতা পরীক্ষার প্রশ্নবলী, ভার্সন ৪.৩

ব্যক্তিগত দক্ষতার জন্য বিকল্প স্কোরিং

সামর্থ্য সম্পর্কিত প্রশ্নঃ আপনি কি এই কাজটি করতে পারেন?		
উত্তর	স্কোর	যা বুঝায়
হ্যাঁ	২	আমি নিজেই কাজটি নিরাপদে কোন রকম কষ্ট ছাড়াই করতে পারব।
হ্যাঁ, কষ্টের সহিত	১	হ্যাঁ, কিন্তু আমি যেভাবে চাই সেভাবে নয়।
হাঁ	০	আমি কাজটি কখনো করিনি অথবা আমি মনে করি না যে আমি এখনই কাজটি করতে পারব।
এই হুইল চেয়ার দ্বারা সম্ভব নয়	এন পি	এই দক্ষতাটি করার জন্য আমার হুইল চেয়ারের সেই নির্দিষ্ট অংশটি নেই। (এই বিকল্পটি শুরু সেই দক্ষতার জন্য প্রযোজ্য যেখানে স্কোরের সম্ভাবনা আছে)।
পরীক্ষার ভুল	টি ই	যখন উত্তর সংরক্ষণ করা হয়নি। (উদাহরণ স্বরূপ অসাবধানতাবসত বা কারণবসত পরীক্ষার ব্যক্তি প্রশ্ন বুঝতে পারেনি)।
আত্মবিশ্বাস সম্পর্কিত প্রশ্ন ঃ আপনি কতটা আত্মবিশ্বাসী?		
উত্তর	স্কোর	যা বুঝায়
পুরোপুরি আত্মবিশ্বাসী	২	এখন আমি সম্পূর্ণ আত্মবিশ্বাসী যে আমি কাজটি নিরাপদে এবং ধারাবাহিকভাবে করতে পারব।
কিছুটা আত্মবিশ্বাসী	১	এখন আমি কিছুটা আত্মবিশ্বাসী যে আমি কাজটি নিরাপদে এবং ধারাবাহিকভাবে করতে পারব।
আত্মবিশ্বাসী নই	০	এখন আমি একটুও আত্মবিশ্বাসী নই আমি কাজটি নিরাপদে এবং ধারাবাহিকভাবে করতে পারব।
এই হুইল চেয়ার দ্বারা সম্ভব নয়	এন পি	এই দক্ষতাটি করার জন্য আমার হুইল চেয়ারের সেই নির্দিষ্ট অংশটি নেই। (এই বিকল্পটি শুধু সেই দক্ষতার জন্য প্রযোজ্য যেখানে স্কোরের সম্ভাবনা আছে)।
পরীক্ষার ভুল	টি ই	যখন উত্তর সংরক্ষণ করা হয়নি। (উদাহরণ স্বরূপ অসাবধানতাবসত বা কারণবসত পরীক্ষার ব্যক্তি প্রশ্ন বুঝতে পারেনি)।
কর্মদক্ষতা সম্পর্কিত প্রশ্ন ঃ আপনি কতবার এটি করেন?		
উত্তর	স্কোর	যা বুঝায়
প্রত্যেক দিন	৪	সাধারণত দিনে কমপক্ষে একবার
সাপ্তাহিক	৩	সাধারণত সাপ্তাহে কমপক্ষে একবার
মাসিক	২	সাধারণত মাসে কমপক্ষে একবার
বাৎসরিক	১	সাধারণত বছরে কমপক্ষে একবার
কখনোই না	০	সাধারণত বৎসরে একবারের কম বা কখনোই না।

এই হুইল চেয়ার দ্বারা সম্ভব নয়	এন পি	এই দক্ষতাটি করার জন্য আমার হুইল চেয়ারের সেই নির্দিষ্ট অংশটি নেই। (এই বিকল্পটি শুধু সেই দক্ষতার জন্য প্রযোজ্য যেখানে স্কোরের সম্ভাবনা আছে)।
পরীক্ষার ভুল	টি ই	যখন উত্তর সংরক্ষণ করা হয়নি। (উদাহরণ স্বরূপ অসাবধানতাবসত বা কারণ বসত পরীক্ষার ব্যক্তি প্রশ্ন বুঝতে পারেনি)।

প্রশ্ন ঃ এটি কি একটি প্রশিক্ষণের লক্ষ্য?	
সম্ভাব্য উত্তর	যা বুঝায়
হ্যাঁ	আমি এই কাজের জন্য প্রশিক্ষণ গ্রহণ করতে আগ্রহী।
ইা	আমি এই কাজের জন্য প্রশিক্ষণ গ্রহণ করতে আগ্রহী নই।

#	স্বতন্ত্র দক্ষতা	সামর্থ্য (০-২)	আত্মাবিশ্বাস (০-২)	কর্মদক্ষতা (০-৪)	প্রশিক্ষণ (হ্যাঁ/না)
১	সামনের দিকে অল্প দূরে যেতে				
২	পিছনের দিকে অল্প দূরে যেতে				
৩	নির্দিষ্ট জায়গায় ঘুরানোর ক্ষেত্রে				
৪	সামনের দিকে অগ্রসরের সময় ঘুরানোর ক্ষেত্রে				
৫	পিছনের দিকে আসার সময় ঘুরানোর ক্ষেত্রে				
৬	পার্শ্ব বরাবর পরিচালনার ক্ষেত্রে				
৭	উপরের বস্তু ধরার ক্ষেত্রে				
৮	মেঝে থেকে বস্তু উত্তোলন করার সময়				
৯	নিতম্বের চাপমুক্ত রাখার ক্ষেত্রে				
১০	শরীরের বিভিন্ন অবস্থান পরিচালনার ক্ষেত্রে				
১১	সমান উচ্চতায় স্থানান্তর হওয়ার সময়				
১২	হুইলচেয়ার ভাঁজ করা এবং খোলার ক্ষেত্রে				
১৩	কজাযুক্ত দরজা দিয়ে চলাচলের ক্ষেত্রে				
১৪	দীর্ঘ দূরত্বে যাওয়ার ক্ষেত্রে				
১৫	চলার সময় বাধা অতিক্রম করার ক্ষেত্রে				
১৬	সামান্য ঢালে উঠার ক্ষেত্রে				
১৭	সামান্য ঢালে নামার ক্ষেত্রে				

১৮	খাঁড়া ঢালে উঠার ক্ষেত্রে				
১৯	খাঁড়া ঢাল নামার ক্ষেত্রে				
২০	পার্শ্ব ঢাল বরাবর যাওয়ার ক্ষেত্রে				
২১	নরম জায়গার উপর চলার ক্ষেত্রে				
২২	চৌকাঠ পার হওয়ার ক্ষেত্রে				
২৩	ফাঁকাস্থান পার হওয়ার ক্ষেত্রে				
২৪	অল্প প্রতিবন্ধকতা উঠার করার ক্ষেত্রে				
২৫	অল্প প্রতিবন্ধকতায় নামার ক্ষেত্রে				
২৬	উচ্চু প্রতিবন্ধকতায় উঠার ক্ষেত্রে				
২৭	উচ্চু প্রতিবন্ধকতায় নামার ক্ষেত্রে				
২৮	হুইলি করে স্থির হয়ে থাকার ক্ষেত্রে				
২৯	হুইলি অবস্থায় ঘুরানোর ক্ষেত্রে				
৩০	হুইলি অবস্থায় উচ্চু প্রতিবন্ধকতায় নামার ক্ষেত্রে				
৩১	হুইলি অবস্থায় খাঁড়া ঢাল নামার ক্ষেত্রে				
৩২	মেঝে থেকে হুইলচেয়ারে উঠার ক্ষেত্রে				
৩৩	সিঁড়ি দিয়ে উঠার ক্ষেত্রে				
৩৪	সিঁড়ি দিয়ে নামার ক্ষেত্রে				
	সম্পূর্ণ স্কোর				