PRACTICE OF PASSIVE MOVEMENT AND STRETCHING EXERCISE OF THE LIMBS BY THE REHABILITATION PROFESSIONALS FOR SPINAL CORD INJURY PATIENTS AT CRP

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

PRACTICE OF PASSIVE MOVEMENT AND STRETCHING EXERCISE OF THE LIMBS BY THE REHABILITATION PROFESSIONALS FOR SPINAL CORD INJURY PATIENTS AT CRP

Submitted by **Roksana Afrin**, for the partial fulfillment of the requirement for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT).

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DECLARATION

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

Signature: **Date:**

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Acknowledgement

First of all, I want to express my gratitude to Allah, the Almighty. When I started the study, I didn't know whether I could complete it or not but I believed that "Fortune favors the brave." So, I was determined to try my best to make it successful and I am most grateful to Allah. After that, I must go to my family, who always inspires me and provides the necessary support. I am grateful to them.

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Acronyms

PM:	Passive Movement
SSE:	Static Stretching Exercise
PT:	Physiotherapy
OT:	Occupational therapy
CRP:	Center for the Rehabilitation of the Paralysed
BHPI:	Bangladesh Health Professions Institute
SCI:	Spinal Cord Injury
ROM:	Range of Motion
US:	United States
WHO:	World Health Organization
SPSS:	Statistical Package for the Social Sciences

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ABSTRACT

Objectives: To explore the practice of passive movement and static stretching exercises as interventions practiced by rehabilitation professionals for spinal cord injury patients at CRP. ***Methodology:*** This study was conducted through a cross-sectional design. A total of 19 participants were selected conveniently for this study from the spinal cord injury unit, Center for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka. Data were collected using a semi-structured questionnaire. The study was conducted using quantitative descriptive analysis (Chi-square test & Pearson correlation test) through Statistical Package for the Social Sciences (SPSS) software 20.0 version. ***Results:*** Out of 19 participants 73.68% (n=14) were physiotherapists and 26.32% (n=5) were occupational therapists. Among them 52.6% were male (n=10) and 47.37% (n=9) were female. The majority 57.89% (n=11) aged between 31-40 years. Out of 14 physiotherapists, the majority 42.86% (n=6) were assistant physiotherapists. 60% (n=3) were clinical occupational therapists, among 5 occupational therapists. The majority of participants 21.05% (n=4) worked for 11 years and 1 set of 14.44 to 15.25 repetitions in 4 to 5 minutes of passive movement and 1 set of 13.52 to 14.18 repetitions in 6.62 to 7.15 minutes of static stretching was given by the rehabilitation professionals. 31.58% (n=6) participants practiced passive movement to increase blood circulation and 42.1% (n=8) practiced static stretching to maintain joint range of motion. Participants' practice of passive movement and static stretching exercises (repetition, set, or timing) didn't vary based on their age and job experience. But the reasoning to perform those interventions varied only with the physiotherapist's designation. The purpose of interventions is usually not related to participants' gender but related to their age group only for passive movement. ***Conclusion***: Spinal cord injury is a traumatic or non-traumatic event and requires multidisciplinary treatment. Rehabilitation professionals try to minimize their disability by maximizing their functional levels by using various physical interventions, such as passive movement and static stretching exercises. And they apply those for specific purposes by maintaining a standard pattern. ***Keywords:*** Spinal cord injury, repetition number, set number, required time, physiotherapist, occupational therapist.

CHAPTER-I	INTRODUCTION

1.1. Background

Spinal cord injury is defined as damage to the spinal cord that causes a loss of function such as motion or sensation (Fyffe et al., 2014). The damage to the spinal cord from the foramen magnum to the cauda equine as a result of force, incision, or contusion (Nas et al., 2015) is a catastrophic neurological disorder that affects around 250,000 to 500,000 people each year (Quadri et al., 2020).

The neurological segmental levels of the spinal cord corresponding to the nerve roots that emerge from the spinal column between each of the individual vertebrae. There are eight cervical nerve roots; twelve thoracic nerve roots; five lumbar nerve roots; five sacral nerve roots and one coccygeal nerve root. Damage to the neuronal elements of the spinal canal, such as the spinal cord and cauda equine, can result in temporary or permanent neurological deficits (New and Marshall, 2014).

Nerve cell bodies and ascending and descending routes are found in the gray and white matter of the spinal cord. As a result, SCI can cause a wide range of disabilities, from incomplete sensory or motor loss to complete paralysis below the injury site, as well as acute and long-term problems. The limited regenerative capacity of the spinal cord is linked to the depressing consequences of SCI, while the central nervous system has some inherent regenerative capacity but it is insufficient. The poor regenerative potential of the spinal cord is exacerbated by the fact that SCI is typically accompanied by several underlying malfunctioning conditions that are associated with one another (Fan et al., 2018).

The cause of SCI can be traumatic or non-traumatic but it must occur suddenly (Fyffe et al., 2014). According to studies, falling is the most prevalent traumatic cause of SCI (27.1%), followed by violent acts, mainly bullet wounds (15.3%) and sporting activities (15.3%). Studies showed that falling represents 57.85% of SCI in Pakistan, followed by RTA at 25.2% and shooting at 25.2%.

Road traffic accidents (80 percent), falls (9.4%) and gunfire were the most common sources of SCI in Saudi Arabia (6.4%). Sports injuries cause traumatic damage to the spinal cord, while diseases including transverse myelitis, fibro cartilaginous embolism, and spinal cord vascular malformation cause non-traumatic damage (Fakhoury, 2015).

In the United States, there were around 10,000 cases of traumatic spinal cord injury each year, with an estimated prevalence of over 200,000 (Sadowsky et al., 2002). Between 24 and 77 percent of people were thought to be infected in the United States, resulting in 12,000 to 20,000 new cases per year. The majority of incidents involved motor vehicles and 80 percent of those who were afflicted were men. In the United States, there were an estimated 270,000 living spinal cord injury survivors, ranging from 238,000 to 332,000 people (Ma et al., 2014).

A spinal cord injury is one of the worst and disabling injuries a person may suffer (West et al., 2013). It causes temporary or permanent impairments in the normal motor, sensory or autonomic activities of the spinal cord (Krassioukov, 2009). This happens because SCI causes the death of neurons, oligodendrocytes, and astrocytes, as well as a significant loss of sensory and motor functions below the damage site. At the initial stage of injury, subsequent alterations such as oligodendrocyte death and severe axon demyelination occur (Sharif and Jazaib, 2020). Later cardiovascular problems such as severe hypotension and cardiac arrest occur (West et al., 2013).

SCI symptoms depend on where the spinal cord and nerve roots have been injured. Partial or complete tetraplegia (paralysis of all four limbs) results from high cervical injuries, whereas paraplegia (paralysis of the lower body) results from lower cervical lesions (Sharif and Jazaib, 2020). Over 130,000 people are projected to be afflicted by SCI each year, with over 2 million people living with SCI-related impairment globally (Wyndaele and Wyndaele, 2006). SCI can be a severe burden on society in terms of economic expenditures, in addition to the terrible impact it causes on individuals (Sharif and Jazaib, 2020).

SCI refers to a group of spinal injuries produced by external sources, either directly or indirectly. Symptoms might range from motor and sensory abnormalities to muscular dystonia and the emergence of pathological reflexes, depending on the injured segment. The injury induced by external forces acting directly or indirectly on the spinal cord is referred to as primary SCI. Secondary SCI is the result of further damage to the spinal cord caused by edema, hemorrhage, compressive fractures, and fractured intervertebral disc tissue. High morbidity, high expense, and early patient age are all characteristics of spinal cord injury, which frequently results in severe permanent disability. SCI has an impact on not just the quality of life of patients but also their families and society. According to the most recent estimates, the global incidence of spinal cord injury is around 236–1009 per million people. Each year, around 250,000 people in the United States suffer from varying degrees of SCI, with an annual rate of up to 28–50 per million (Fu et al., 2016).

Spinal cord injury is frequently a life-altering occurrence that needs extensive long-term therapy. The ability to develop resilience is crucial in deciding how spinal cord injury survivors deal with their injuries and rehabilitation (Kornhaber et al., 2018). But SCI demands a holistic approach to treatment. SCI has yet to be cured because the cell and tissue response to injury is broad and progressive, requiring a specific treatment sequence to repair damage and build new brain connections. Neurorehabilitative training, such as exercise, is a non-invasive treatment that allows patients to engage in repetitive physical activity while also giving rhythmic stimulation to afflicted spinal cord regions. Exercise has been found to maintain muscle mass, restore motor and sensory function, increase strength or endurance, synaptic plasticity through neurotropic factor production, raise neurotropic factor concentration in spinal and muscular tissue, and reduce inflammation surrounding the lesion site (Zbogar et al., 2017).

Passive movement is commonly used to cure and prevent contractures in people with a range of illnesses, including spinal cord damage, as well as serious injuries and medical problems. People with chronic impairments in spinal cord injury are frequently given passive motions daily. For at least 60 years, passive motions have been part of normal therapy for people with or at risk of contractures, spasticity, decreased range of motion, and decreased muscular strength (Harvey, 2016). Passive movements are interventions in which another person, usually a therapist or a caretaker, cyclically moves an individual's joints through their available range of motion. The fundamental purpose of passive movement is to influence the extensibility of soft tissues overlapping joints to preserve or increase joint mobility or range of motion. It is also used to reduce the risk of subsequent problems like cartilage deterioration if given 3 to 30 repetitions for 7 to 10 minutes (Prabhu et al., 2013).

One of the most effective workouts for increasing muscle strength is continuous isometric muscle contraction, often known as a static stretching exercise. Stretching exercises help to relieve muscle tension and improve blood circulation. Stretching increases trunk and leg movement, which improves muscle strength, decreases low back discomfort and aids in the return of normal movements (Kim et al., 2017). Joint ROM is frequently increased by static stretching exercises if held for 20 to 30 seconds, repeating 2–5 times and it gives maximum outcome (Page, 2012).

1.2 Rationale

SCI causes sensory, motor, and autonomic dysfunction below the cord's lesion. Studies showed that around 130,000 individuals every year are being affected by SCI (Fakhoury, 2015). Recent studies showed the prevalence of traumatic spinal cord injury was 236.0 to 1298.0 million every year. The incidence was 8.0 to 246.0 cases per million individuals per year (Serpanou et al., 2019). Due to a lack of understanding, spinal cord injury is now the most common cause of disability in all developing countries around the world. Spinal cord injuries that are worsened by physical injury are a major public health concern in Bangladesh. Treatment of traumatic paraplegia requires a multidisciplinary approach both in the acute and rehabilitation stages. In the rehabilitation stage, physiotherapists work with passive movement, stretching exercises, strengthening exercises, and others according to patients' needs (Rabinstein, 2018). But both physiotherapists and occupational therapists play a vital role in the rehabilitation process. The multidisciplinary team provides rehabilitation. When a therapist doe’s passive movement, neuroplasticity is generated, which fosters the normal process of neuroplasticity development. Passive movement helps to minimize contracture, stiffness, adhesion formation, muscular soreness, and muscle atrophy, increases joint range of motion, strength, muscle power, and flexibility. On the other hand, static stretching exercises increase blood circulation, maintain joint range of motion, and so on. These interventions give maximal outcomes if therapists do evidence-based practice (Babur et al., 2014). In their study, Harvey et al. (2017) showed the effects and durations of stretching. The outcomes of these studies can be categorized as either acute or chronic effects for only one condition: contracture. This study doesn't provide information about the various effects of static stretching exercise, as well as other therapeutic interventions. Measuring repetitions or timing is also crucial since it serves as a foundation for task-specific practice, which helps the functional results. Repetitions of arm movements, for example, may strengthen the arms and aid in the learning of correct movements. Unfortunately, little data estimates the number of movement repetitions during human SCI rehabilitation, so we don't know if patients are getting enough repetitions to enhance their recovery. By quantifying movement repeats during inpatient SCI recovery, this study will enrich the information and knowledge towards fulfilling this gap (Zbogar et al., 2017).

1.3 Research Question

How rehabilitation professionals practice passive movement and static stretching exercises as interventions for spinal cord injury patients at CRP?

1.4 Aim

This study aimed to find out the practice of passive movement and static stretching exercises of the limbs as an intervention by the rehabilitation professionals.

1.5 Objectives of the study

1.5.1 General Objectives

- To explore passive movement and static stretching exercises as interventions practiced by rehabilitation professionals for spinal cord injury patients at CRP.

1.5.2 Specific objectives

- To find out how rehabilitation professionals practice passive movement as an intervention for spinal cord injury patients at CRP.
- To find out how rehabilitation professionals practice static stretching exercise an as intervention for spinal cord injury patients at CRP.
- To find out why rehabilitation professionals practice passive movement and static stretching exercise as interventions for spinal cord injury patients at CRP.

1.6 Conceptual framework

Independent variables	**Dependent variables**
Age Sex Profession Designation Job experience Repetition number Set number Required time Purpose of intervention	Passive movement and static stretching exercise

1.7 Operational definition

Spinal Cord Injury: SCI is damage to the spinal cord that results in temporary or permanent alterations in function. Muscle function, sensory function, and autonomic function in regions of the body serviced by the spinal cord below the site of the lesion are all affected by these alterations.

Repetition number: The repetition of a movement refers to how many times the joint moves when performing motions that are performed by the therapist in each joint.

Set number: A set is a group of repetitions.

Required time: Required time refers to how long it takes a therapist to perform each joint independently in each exercise.

Physiotherapist: A person who treats disease, injury, or deformity by using physical interventions, such as massage, heat treatment, and exercise.

Occupational therapist: Someone whose job is to treat people suffering from mental or physical health problems by getting them to do activities.

CHAPTER-II LITERATURE REVIEW

The most debilitating condition that patients typically face is spinal cord damage or injury. The global incidence of spinal cord injury was 10.4–83% cases per million and it continues to be a significant source of morbidity as well as a socioeconomic burden (Karsy and Hawryluk, 2019).

The annual number of traumatic SCI cases in the United States was 40 per million and 1200 new cases (Rabadi et al., 2013). Males were more affected than females in non-traumatic SCI in Australia, with a ratio of 197:169 and paraplegia was more prevalent than tetraplegia (98 per million) (New et al., 2013). Because men are more vulnerable than women to traumatic spinal cord injuries, with the primary causes being motor vehicle crashes and falls. In Asia, the incidence rates of SCI range from 12.06 to 61.6 per million, with the average age being 26.8 to 56.6 years old (Ning et al., 2012).

According to the National Spinal Cord Injury Statistical Center, around 291,000 people are affected by SCI every year. In the United States, a systematic analysis suggested that around 2.6 million people had SCI. According to another study, there were 1.5 million people with SCI. Between 1993 and 2012, the incidence rate was between 52 and 54 cases per 1,000,000. SCI is more common in men than in women, with men accounting for 78% of new cases. Surprisingly, the average age of SCI has risen (43 years in 2019 versus 29 in the 1970s), possibly due to an increase in the proportion of SCIs caused by falls among an aging population (Lo et al., 2021). Over time, epidemiological data have revealed that spinal cord damage mostly affects young adults. But the average age of injury is currently considered to be 45 years. In all age groups, incomplete tetraplegia accounted for 30.1% of people, followed by complete paraplegia (25.6%), complete tetraplegia (20.4%), and incomplete paraplegia (18.5%) (Sharif and Jazaib, 2020).

Motor vehicle accidents are one of the most common cause of injury in children. After children attend school and participate in organized sports, sports-related injuries account for the majority of spinal injuries (Cantu et al., 2013). 60 to 80 percent of all spinal injuries in children occur in the cervical region. The remaining 20%–40% is distributed evenly between the thoracic and lumbar regions (Gerland et al., 2014). However, Branco et al. (2007) showed in their study that males were (83%) more affected than females in the CRP, Bangladesh. The majority of patients had paraplegia 56%, cervical lesions 44%, thoracic lesions 27%, and lumber lesions 29% at the time of admission (Islam et al., 2011). Individuals with tetraplegia commonly have a greater mortality rate than those with paraplegia (Branco et al., 2007).

Approximately 12,000 new injuries occur in the United States each year, with 5,000 of those injured dying during their hospitalization (Branco et al., 2007). People with SCI often have considerable functional limitations and a lack of independence, depending on the severity of their impairment. SCI, which causes limb paralysis and injuries such as compression, contusion, or laceration, disrupts autonomic function at the site of injury or below and can result in permanent disability such as paralysis, loss of sensation, neuropathic pain, and so on (Mothe and Tator, 2013). Mainly SCI has different effects on activities based on disability - mild, persistent spasticity is reported by 85% of patients with any type of SCI. 60% of cervical injuries and 40% of complete tetraplegia carry disability. Cervical SCIs carry more than half (66%) of all SCI-related disabilities (Lo et al., 2021).

Paralysis is the most evident complication of spinal cord injury. On the other hand, it has far-reaching consequences for many body functions, including bladder, bowel, respiratory, cardiovascular, and sexual functions, as well as social, financial, or psychological consequences. Musculoskeletal injuries, pain, osteoporosis, and other issues are also common (Harvey, 2016). So, SCI is a life-threatening neurological illness with significant socioeconomic consequences for sufferers and their caregivers. People with SCI have difficulty walking as they suffer from paralysis of upper or lower limbs as well as impaired sensation, muscle weakness or tightness, loss of range of motion, and others. So, the ability to walk again is an extremely important fact for SCI patients and it is the desired outcome for both patients and physicians. As a result, in the present period, improving motor power to treat paralysis has been the primary focus of rehabilitative therapies (Sharif and Jazaib, 2020).

The care and treatment of people with SCI involve a variety of medical professionals (Quadri et al., 2020). Treatment responsibilities for SCI rehabilitation may be split among the treating disciplines. Physiotherapists, occupational therapists, recreational therapists, rehabilitation nurses, rehabilitation psychologists, counselors, social workers, dietitians, and other specialists are all part of a rehabilitation team. Treatment is coordinated by a caseworker or program manager. Physiotherapists concentrate on upper and lower extremity function as well as mobility issues. Upper extremity dysfunction and problems in daily tasks were addressed by occupational therapists. Physiotherapists' exercise not only strengthens paralyzed muscles and promotes motor function recovery, but also promotes brain remodeling, improves the spinal microenvironment, and protects damaged distal motor neuron functions by promoting functional recovery (Fu et al., 2016).

Physiotherapy is an important part of the recovery process after a spinal cord injury and it includes a wide range of interventions that target multiple domains in ICF adopted by the World Health Organization (WHO). These interventions potentially target all three ICF functioning domains: body functions and structures, activities, and a sense of self-modifying certain physical deficiencies such as strength, joint range of motion, endurance, joint mobility, muscular extensibility, and muscle power. Physiotherapies achieve the ultimate goal of rehabilitation and thus improve overall function by reducing activity constraints (Gomara-Toldra et al., 2014). PMs are usually given for a few minutes to joints that people can't move because of paralysis, or pain. PMs can take 20 to 30 minutes to give in to people with many afflicted joints (Prabhu et al., 2013). If the patient is paraplegic or tetraplegic, extensive passive exercises must be used to keep the lower extremities in working order. Contractures are prevented and functional capacity is maintained with passive exercises. These movements should be done at least once a day to 2-3 times a day (Zbogar et al., 2017).

Occupational therapy is an essential component of the recovery process. In industrialized countries, occupational therapy is provided by the rehabilitation team's occupational therapist. Occupational therapists evaluate a patient's limitations and develop a treatment plan. Before and after an accident, occupational therapy is designed and conducted based on an individual's social and cultural features, level of education, personality traits, interests, values, attitudes, and behaviors (Nas et al., 2015). They also incorporate therapeutic strengthening, endurance, range of motion or stretching, and balancing activities (Zbogar et al., 2017).

There are several stretching techniques, which includes static, ballistic, dynamic, and proprioceptive neuromuscular facilitation. The most commonly used technique is the static stretching exercise. It has been used because it seems to be easier and safer to apply than the other ones (Bacurau et al., 2009). Static stretching exercises have been performed for thousands of years, primarily by warriors before battle. Exercises that include static stretching involves either intentionally tightening the muscles of the agonist or employing outside forces like gravitation, a collaborator, or stretching tools to move to the limit of mobility of one or more joints. The individual retains the muscle in a lengthening posture for a set amount of time at the final position (Behm et al., 2016).

Alaparthi et al., (2021), showed in their study that physical therapy such as passive movement and static stretching exercises were considered more effective interventions to treat paralysis due to SCI. Repetitions of the passive movement were variable, ranging from 3 to 30 repetitions for 7 to 10 minutes. This increased muscle power. They also showed that among 33 physiotherapists, 84.8% (n = 26) stated they regularly did passive movement on all the joints. Among them 63.6% (n = 19) of respondents' aim was maintaining a joint range of motion for performing PM.

However, Harvey, (2016), showed that among 150 participants with spinal cord injury, passive movement increased blood circulation by 50% (n =75), joint range of motion by 26% (n =38), strength by 10% (n =12) and flexibility 15% (n =25). Prabhu et al., (2013) showed that static stretching exercises maintained range of motion by 60% (n = 60) and improved function by 20% (n = 12) among 80 spinal cord injury patients (Prabhu et al., 2013).

Page, (2012) showed that the greatest change in ROM with a static stretch occurred between 15 and 30 seconds but it was also suggested that 10 to 30 seconds was sufficient for increasing flexibility. Two comprehensive systematic reviews demonstrated that short-duration SSE (the 60s) has trivial negative effects on measures of strength and power as opposed to prolonged SSE (>60 s) (Kay and Blazevich, 2012). Fowles et al., (2000) examined the effects of SSE, 13 repetitions of 135s in each joint improved mobility by 1%, improved the quality of life by 1%, decreased pain by 2%, improved the ability to move by 1%, and maintained range of motion 10%. Studies showed that long-duration static stretching exercises (i.e180s and 300s) on the contractile properties are more effective (Matsuo et al., 2013). Authors reported significant decreases in stiffness in the 300s and 180s static stretching exercises. In addition, no increase in muscle elongation occurs after 2 to 4 repetitions (page, 2012).

CHAPTER-III	METHODOLOGY

3.1 Study design

This study aimed to explore the practice of passive movement and static stretching exercises as interventions practiced by rehabilitation professionals for spinal cord injury patients at CRP. For that reason, a quantitative research model in the form of a cross-sectional type of study was chosen to perform the study. It is the simplest variety of descriptive or observational epidemiology and is also known as surveys, which are a useful way to gather information on important health-related aspects of people's knowledge, attitudes, and practices.

3.2 Study area

Data was collected from the physiotherapists and occupational therapists who worked at the spinal cord injury unit, Center for the Rehabilitation of the Paralysed (CRP), Savar, Dhaka.

3.3 Study population

The study population was the spinal cord injury rehabilitation professionals, including physiotherapists and occupational therapists, who worked at the spinal cord injury unit, CRP, Savar, Dhaka.

3.4 Sample size

In this study the population was known, also called a finite population (physiotherapist and occupational therapist worked at SCI unit, CRP, Savar). So, a finite population formula was used. The equation of sample size for my dissertation is given below:

$$n = \frac{NZ^2\,P(1-P)}{d^2\,(N-1)+Z^2\,P(1-P)}$$

$= 18$

Here,

n = sample size

N = Population size (N=19)

Z = Level of confidence, 1.96 {95% confidence interval}

P = 0.5 (P= prevalence and P= 50%) (Naing et al., 2006)

d = Precision, 0.05 {margin of error at 5%}

In this study, the population size was near the sample size. So, the sample size (n=19) was equal to the population size.

3.5 Sampling technique

Samples were selected for the study by using a convenience sampling procedure. And samples were selected from the Center for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka, based on some inclusion and exclusion criteria.

Convenience sampling is the easiest and quickest method of sample selection. It is a kind of nonprobability sampling technique in which people are sampled because they are "convenient" sources of data for researchers. Non-probability sampling usually does not involve known non-zero probabilities of selection. It is a type of nonprobability or nonrandom sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included in the study (Etikan et al., 2016).

3.6 Inclusion criteria

- Physiotherapists and occupational therapists worked at the SCI unit, CRP, Savar.
- Willingly participated in this study.
- Both males and females were included.

3.7 Exclusion criteria

- Other health professionals who don’t practice passive movement and static stretching exercises at the SCI unit, CRP

3.8 Data collection method and tools

The face-to-face interview technique was done to collect data. For this, the materials to complete the interview session and collect the valuable data from the participants were used, such as question paper, consent form, pen, file, clipboard etc. A semi-structured questionnaire was used for collecting information related to the study for six days to find out the mean values of rehabilitation professionals practice.

3.9 Data analysis

Data were analyzed using the SPSS 20.0 version software program. All the data was entered into the computer with specific coding and then analyzed using the Statistical Package for the Social Sciences (SPSS) 20 version. Google Docs was also used to calculate the mean value of six days of collected data. The results were presented with the use of percentages (%), tables, columns, pie charts etc.

3.11 Informed Consent

Written consent (appendix) was given to all participants before the completion of the questionnaire. The researcher explained to the participants his or her role in this study. The researcher received a written consent form from every participant, including a signature. The participants were informed that they were completely free to decline to answer any question during the study and were free to withdraw their consent and terminate participation at any time.

3.12 Ethical consideration

The whole research project was done by following the Institution of Review Board (IRB) guidelines. The proposal for the dissertation, including the methodology, was approved by the Institutional Review Board (IRB) and obtained permission from the concerned authorities of Bangladesh Health Professions Institute (BHPI). Informed consent was used to get written permission from all participants. Participants' rights and privileges were ensured. All the participants were aware of the aim and objectives of the study. They were informed that there would be no risk or direct benefit to participating in the study. Each participant had the right to refuse to answer any questions or withdraw from the study. It was explained that the information given by participants will be published with their permission and at that time their identities will be protected by using coding. The findings were disseminated with the approval of the authorities. The researcher strictly maintained confidentiality regarding the participants' condition and treatment.

3.12 Rigor

This study was conducted systematically. All the steps of research were followed by a sequence during data collection and analysis; there was no influence on the whole process by our perspectives, values, and biases. When conducting the study, the researcher got help from the supervisor. There was never an influence on the participants by their perceptions during data collection. A trustful relationship with participants was always maintained and the documents were kept confidential. During data analysis, bias was avoided.

CHAPTER-IV RESULTS

A descriptive and inferential statistical analysis has been conducted to find out the result. In the descriptive section, the variables were measured in percentage and have been shown in different bar diagrams, and pie charts. In the inferential section, the chi-square test and Pearson's correlation test were conducted to find out the correlation between different dependent and independent variables.

Descriptive analysis

4.1 Participant's age

Out of 19 participants, 57.89% (n = 11) were between 31-40 years old, 36.84% (n = 7) were between 21-30 years old and only 5.26% (n = 1) were between 41-50 years old.

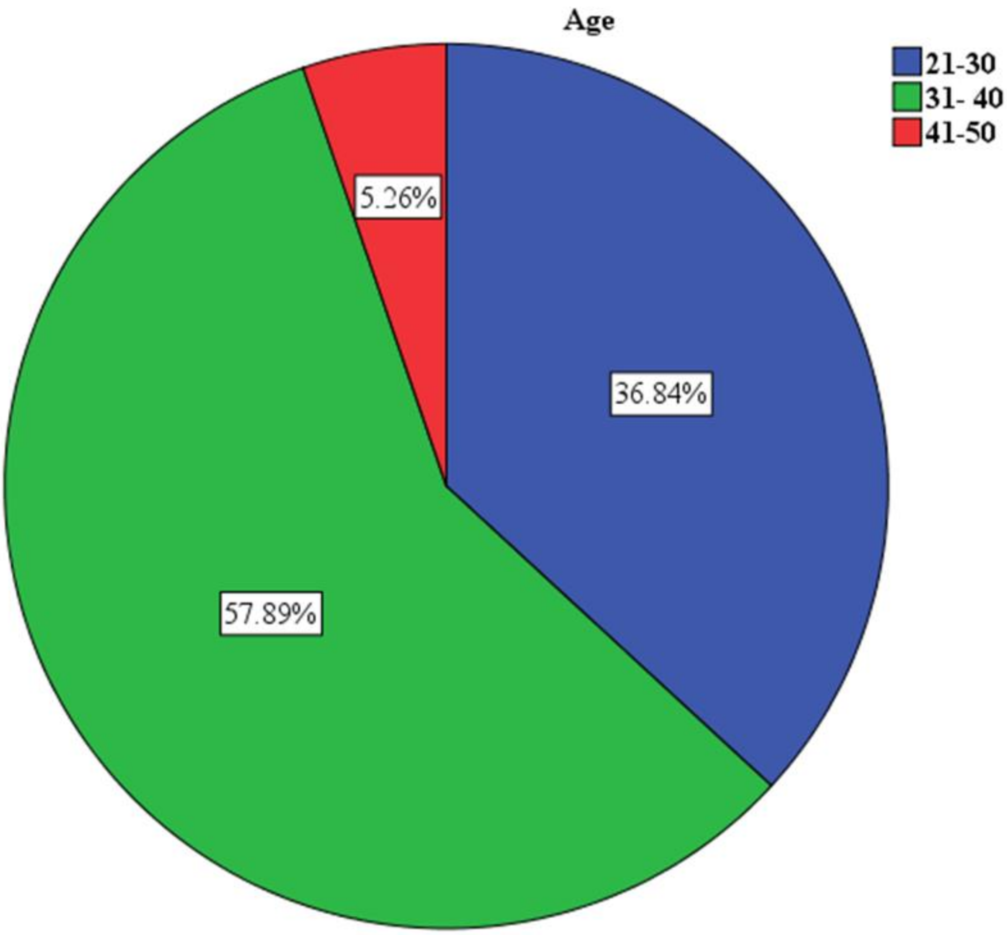

Figure: 01: Participant's age

4.2 Participant’s sex

Out of 19 participants, 52.6% (n = 10) of participants were male and 47.37% (n = 9) of participants were female.

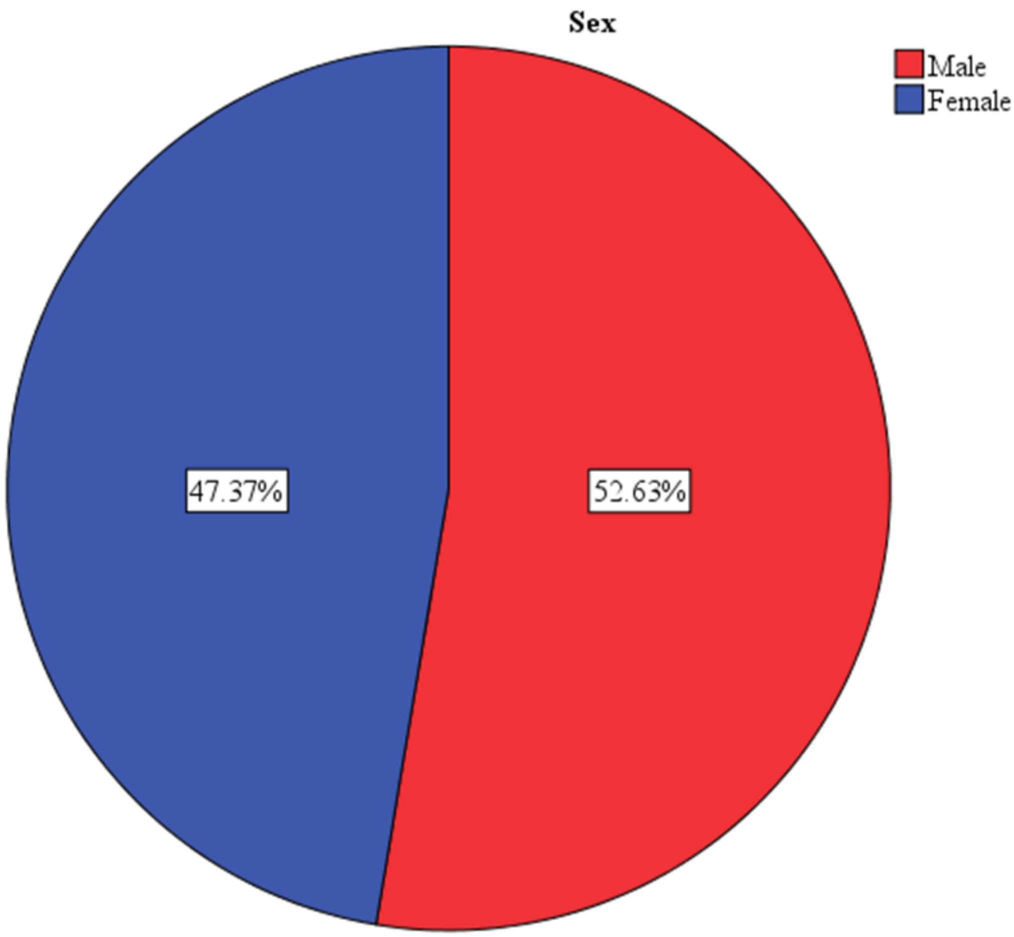

Figure 02: Participant’s sex

4.3 Profession

In this study, among 19 participants, 73.68% (n = 14) were physiotherapist and 26.32% (n = 5) were occupational therapist.

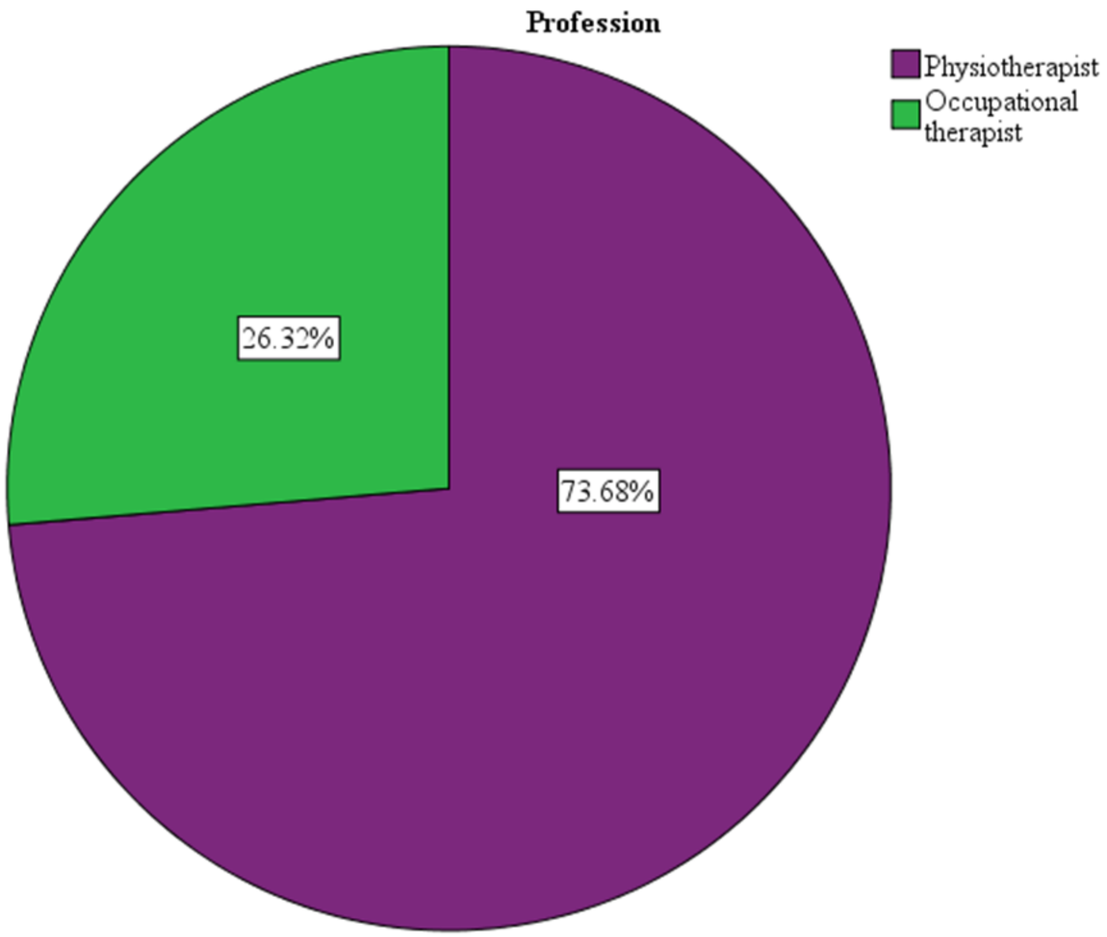

Figure 03: Participant's profession

4.4 Physiotherapist's designation

In this study, out of 14 physiotherapist, 42.86% (n=6) were assistant physiotherapist, 35.71% (n=5) were clinical physiotherapist and 21.43% (n=3) were diploma physiotherapist.

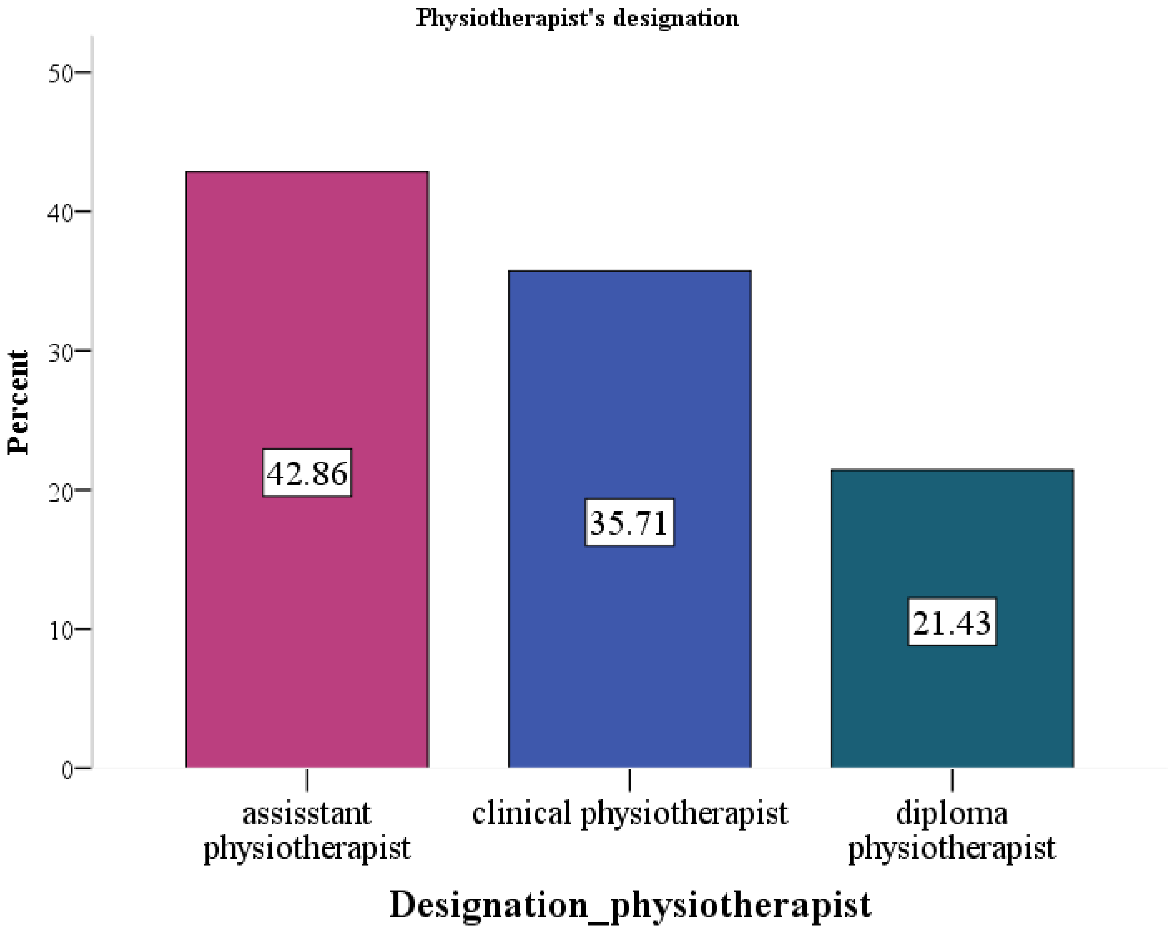

Figure 04: Physiotherapists' Designation

4.5 Occupational therapist's designation

In this study, out of 5 occupational therapist, 60% (n=3) were clinical occupational therapists, 20%% (n=1) were junior consultant occupational therapist and 20% (n=1) were diploma occupational therapist.

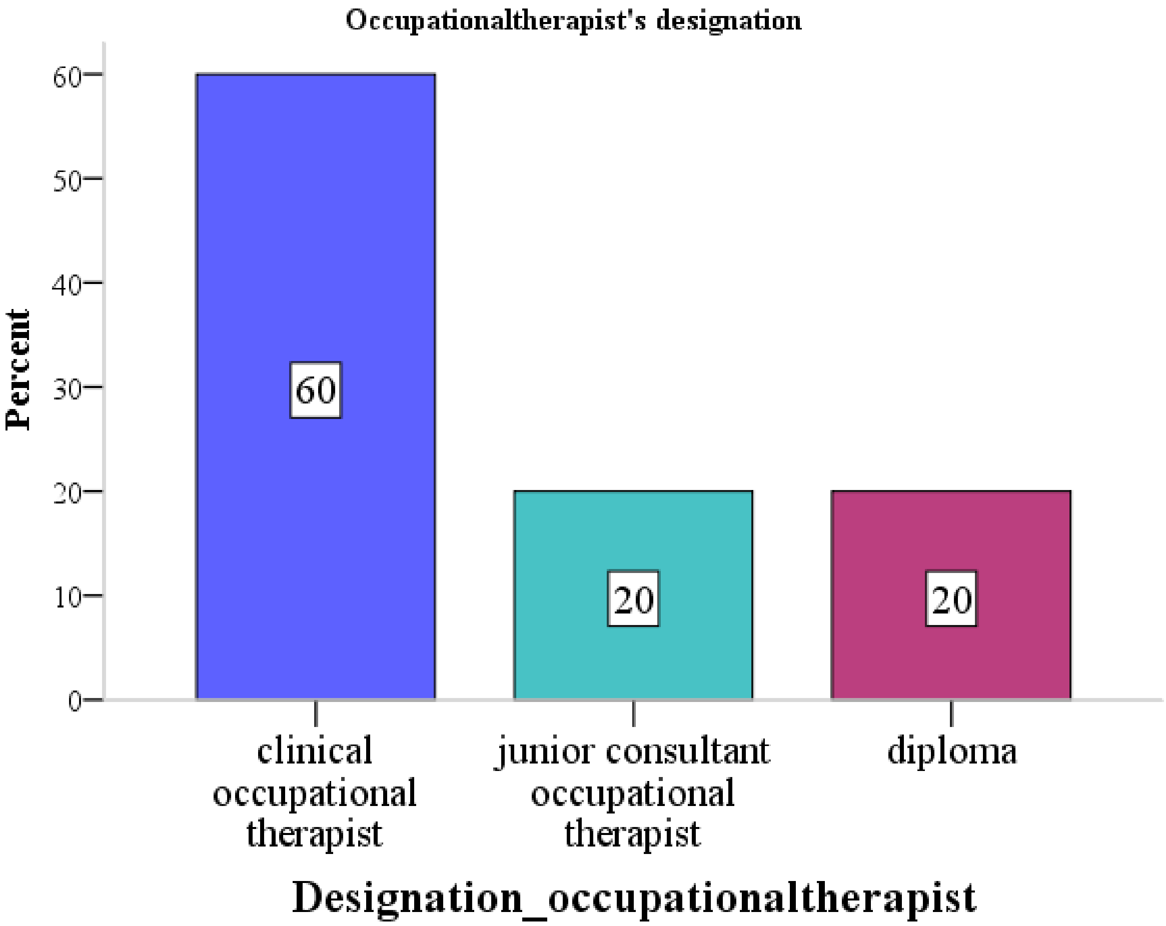

Figure 05: Occupational therapist's designation

4.6 Job experience

In this study, 21.05% (n = 4) participants worked for 11 years, 15.79% (n = 3) participants for 4 years, 10.5% (n=2) participants for 3 years, 10.5% (n = 2) participants worked for 5 years, 10.5 % (n = 2) participants for 6 years, 10.5% (n=2) participants for 13 years, 5.3% (n=1) participants for 7 years, 5.3% (n=1) participants for 10 years, 5.3% (n=1) participants for 12 years and 5.3% (n=1) participants for 25 years.

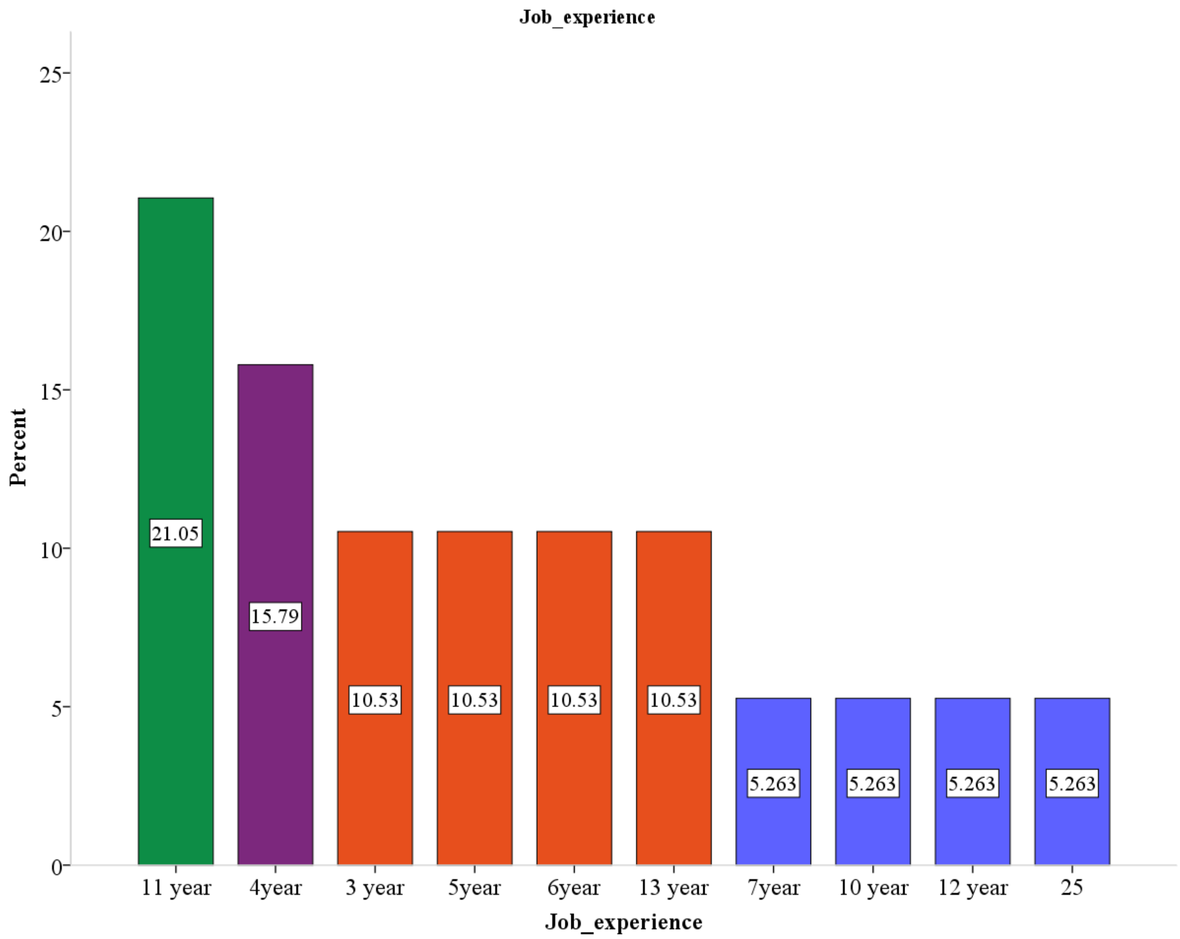

Figure 06: Job experience

4.7 Guideline protocol or treatment approach for passive movement

This study showed that no physiotherapists or occupational therapists followed any guidelines, protocols or treatment approaches to give passive movement.

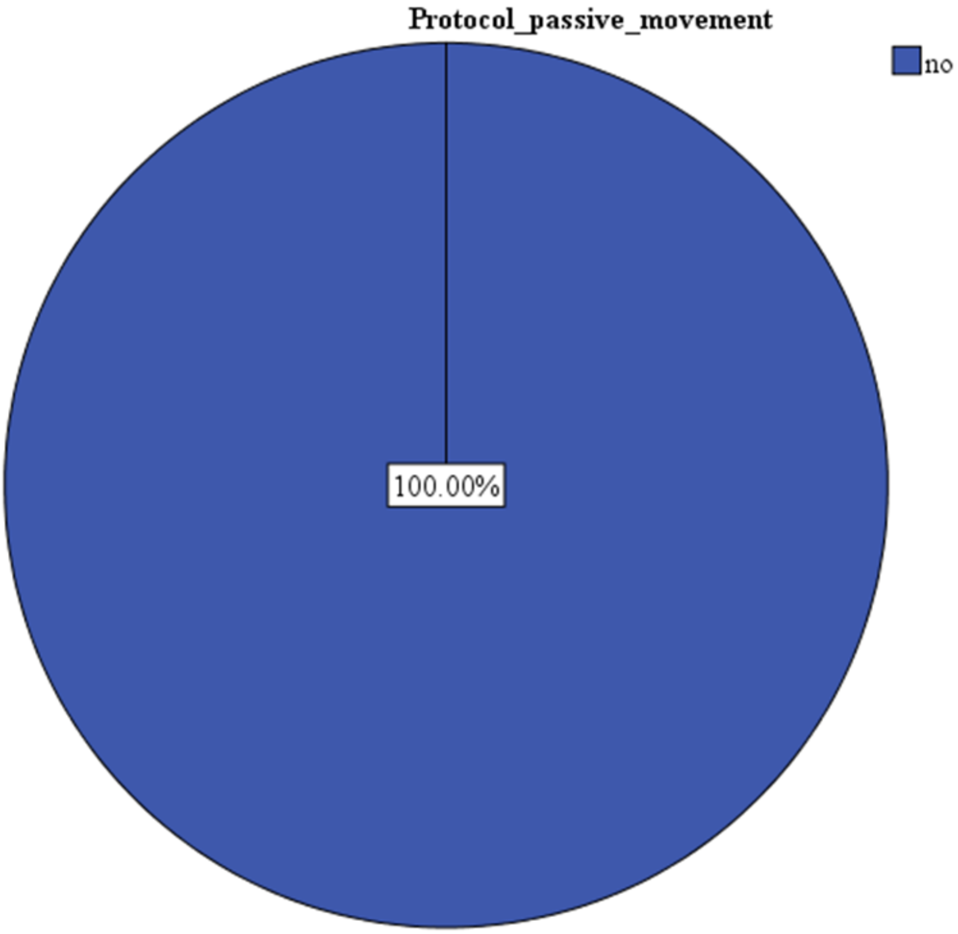

Figure 07: Guideline protocol or treatment approach to practice passive movement

4.8 Guideline protocol or treatment approach for static stretching exercise

This study showed that no physiotherapists or occupational therapists followed any guideline protocol or treatment approach to give static stretching exercises.

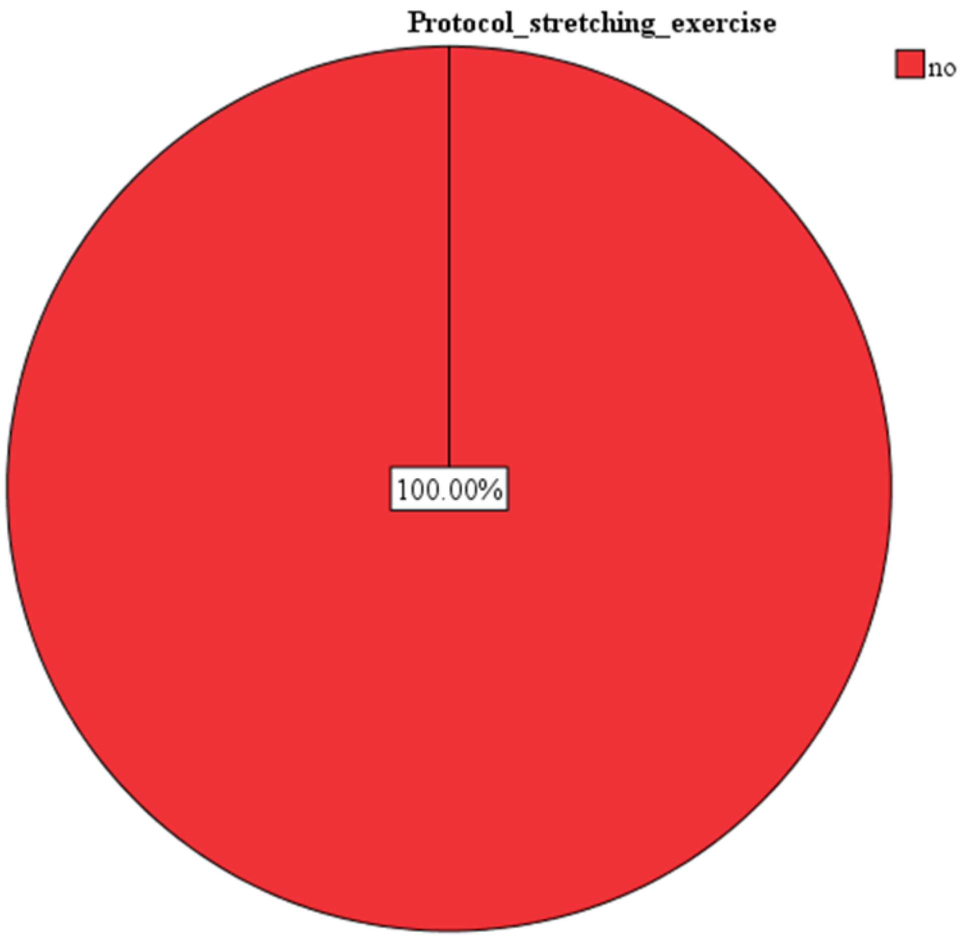

Figure 08: Guideline protocol or treatment approach to practice static stretching exercise

4.9 Treated patients type

In this study, participants treated 84.2% (n = 16) of both paraplegia and tetraplegia patients, 10.5% (n = 2) paraplegia patients and 5.3% (n = 1) tetraplegia patients.

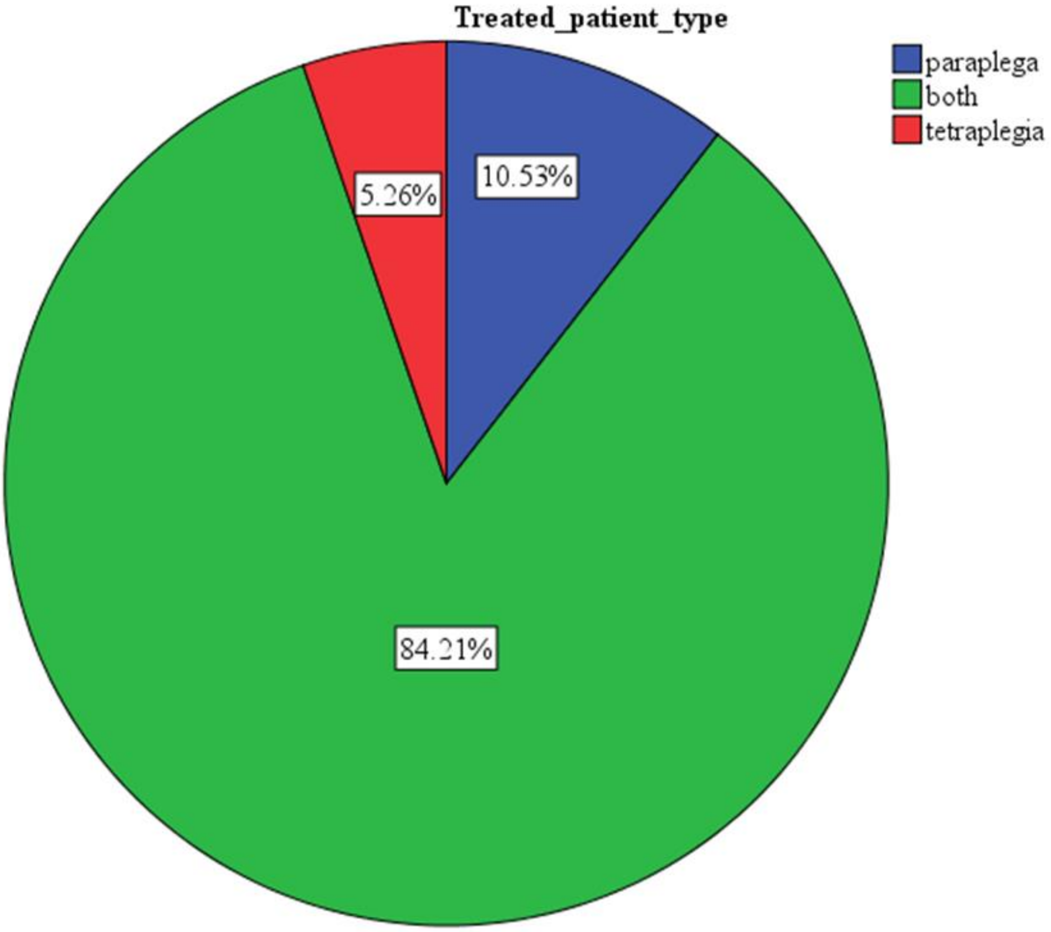

Figure-09: Treated patient's type

4.10 Purpose of giving passive movement

In this study, 31.58% (n = 6) participants practiced passive movement to increase blood circulation, 26.3% (n = 5) participants to maintain joint range of motion, 15.8% (n = 3) participants to increase range of motion, 15.8% (n = 3) participants to increase flexibility, 5.3% (n = 1) participants to improve function and 5.3% (n = 1) participants to increase muscle power.

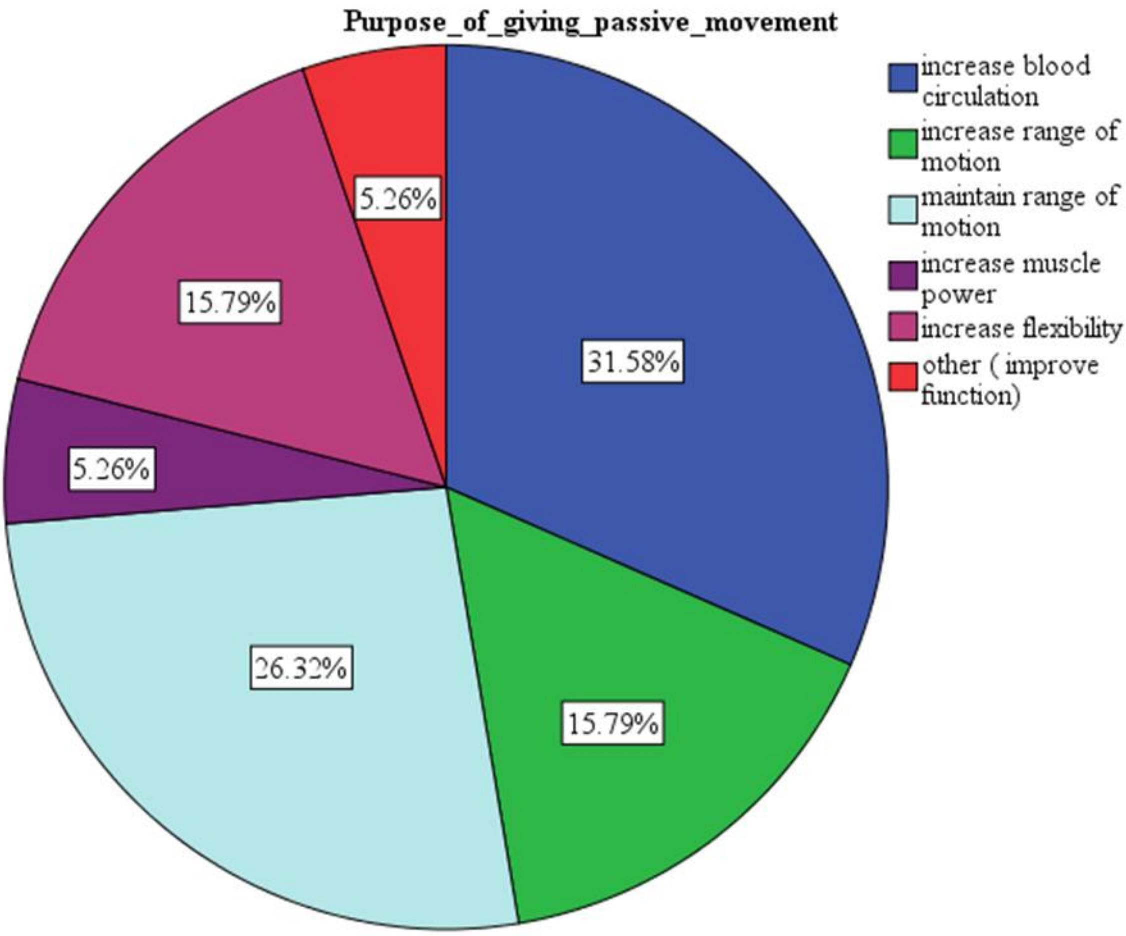

Figure-10: Purpose of giving passive movement

4.11 Purpose of giving static stretching exercise

In this study, 42.1% (n=8) participant's practiced static stretching exercise to maintain joint range of motion, 21.05% (n = 4) participants to increase flexibility, 10.5% (n=2) to increase blood circulation, 10.5% (n=2) to increase strength, 5.3% (n = 1) to increase range of motion, 5.3% (n = 1) to increase muscle power and 5.3% (n = 1) to improve function.

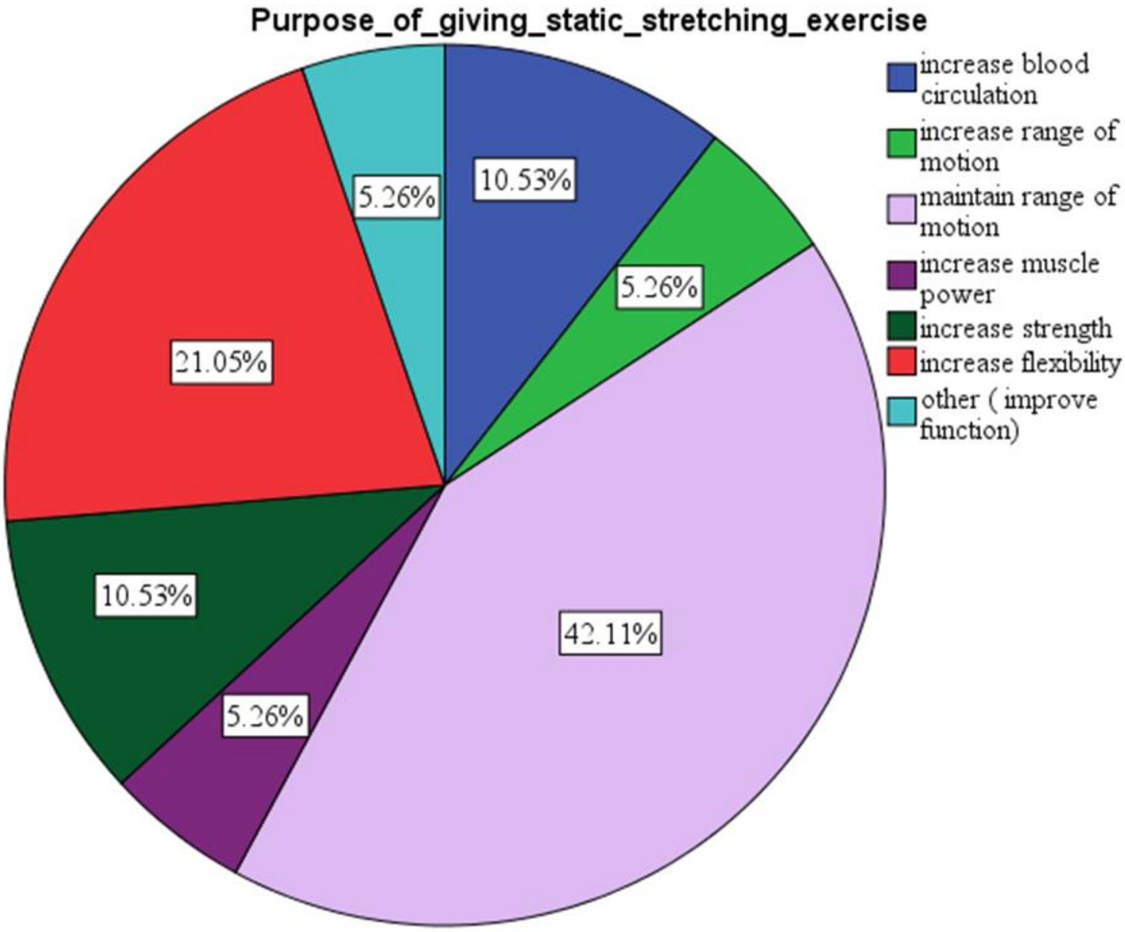

Figure 11: Purpose of giving static stretching exercise

4.12 Tabulation of repetition number for passive movement

Type of paralysis	Joints	Minimum	Maximum	Mean	Median	Standard deviation(±SD)
Paraplegia	Shoulder	0	0	0	0	0
	Elbow	0	0	0	0	0
	Wrist	0	0	0	0	0
	Finger	0	0	0	0	0
	Hip	10	30	14.7	10	±0.8570
	Knee	10	30	14.7	10	±0.9871
	Ankle	10	30	14.44	10	±0.9133
	Finger	10	30	14.44	10	±0.567
Tetraplegia	Shoulder	10	30	15	12.5	±0.0553
	Elbow	10	30	15	10	±1.696
	Wrist	10	30	15	10	±1.2678
	Finger	10	30	15	10	±0.2678
	Hip	10	30	15	10	±0.2678
	Knee	10	30	15	10	±0.2678
	Ankle	10	30	14.7	10	±0.1830
	Finger	10	30	15.25	12.5	±0.13732

The above table showed that in paraplegia shoulder, elbow, and wrist and finger repetition were minimum 0, maximum 0, mean 0 and SD is $\pm$ 0, the median is 0. But hip, knee, ankle and finger repetition minimum were 10, maximum 30, mean and SD were 14.7$\pm$0.857, 14.7 $\pm$0.987, 14.44 $\pm$0.913, 14.44 $\pm$0.567, median was 10. In tetraplegia shoulder, elbow, wrist, finger, hip, knee minimum were 10, maximum 30, mean and SD were 15 $\pm$0.05, 15 $\pm$1.696, 15 $\pm$1.267, 15 $\pm$0.2678, 15 $\pm$0.2678, 15 $\pm$0.2678, mean was 10, where shoulder mean was 12.5. And repetition number for ankle and finger were minimum 10, maximum 30, mean and SD were 14.7 $\pm$ 0.1830, 15.25$\pm$0.1373, median was 10, 12.5.

4.13 Tabulation of set number for passive movement

Type of paralysis	Joints	Minimum	Maximum	Mean	Median	Standard deviation(±SD)
Paraplegia	Shoulder	0	0	0	0	0
	Elbow	0	0	0	0	0
	Wrist	0	0	0	0	0
	Finger	0	0	0	0	0
	Hip	1	3	1.19	1	±0.544
	Knee	1	6	1.47	1	±1.281
	Ankle	1	6	1.44	1	±1.247
	Finger	1	6	1.44	1	±1.247
Tetraplegia	Shoulder	1	6	1.44	1	±1.314
	Elbow	1	3	1.433	1	±.5164
	Wrist	1	3	1.133	1	±.5164
	Finger	1	3	1.133	1	±.5164
	Hip	1	3	1.133	1	±.5164
	Knee	1	3	1.133	1	±.5164
	Ankle	1	3	1.125	1	±.500
	Finger	1	3	1.125	1	±.500

The above table showed that in paraplegia shoulder, elbow, wrist and finger set number were minimum 0, maximum 0, mean 0 and SD were ± 0, median was 0. But hip, knee, ankle and finger set number minimum were 1,1,1,1, maximum 3,6,6,6, mean and SD were 1.19±0.544, 1.47 ±1.281, 1.44 ±1.247, 1.44 ±1.247, median were 1,1,1,1. In tetraplegia shoulder, elbow, wrist, finger, hip, knee, ankle, finger minimum were 1,1,1,1,1,1,1,1, maximum 6,3,3,3,3,3,3,3,3, mean and SD were 1.44 ±1.314, 1.433 ±1.516, 1.133 ±1.516, 1.133 ±1.516, 1.133±1.516, 1.133±1.516, 1.125±0.500, 1.125 ±0.500, median were 1,1,1,1,1,1,1,1.

4.14 Tabulation of total repetition number for passive movement

Type of paralysis	Joints	Minimum	Maximum	Mean	Median	Standard deviation(±SD)
Paraplegia	Shoulder	0	0	0	0	0
	Elbow	0	0	0	0	0
	Wrist	0	0	0	0	0
	Finger	0	0	0	0	0
	Hip	10	45	17.06	15	±.235
	Knee	10	45	17.06	15	±.235
	Ankle	10	45	16.67	12.50	±.96422
	Finger	10	45	16.67	12.50	±.96422
Tetraplegia	Shoulder	10	45	17	14	±.96422
	Elbow	10	45	17	14	±.96422
	Wrist	10	45	17	14	±.96422
	Finger	10	45	17	14	±.96422
	Hip	10	45	17	14	±.96422
	Knee	10	45	17	14	±.96422
	Ankle	10	45	16.56	12	±.87413
	Finger	10	45	16.56	12	±.78413

Above table showed that in paraplegia shoulder, elbow, wrist and finger total repetition number were minimum 0, maximum 0, mean 0 and SD were ± 0, median were 0. But hip, knee, ankle and finger total repetition number minimum were 10,10,10,10 maximum 45,45,45,45, mean and SD were 17.06±0.235, 17.06 ±0.235, 16.67±0.964, 16.67 ±0.964, median were 15, 15, 12.50, 12.50. In tetraplegia shoulder, elbow, wrist, finger, hip, knee, ankle, finger minimum were 10,10,10,10,10,10,10,10, maximum 45,45,45,45,45,45,45,45, mean and SD were 17±0.964, 17±0.964, 17±0.964, 17±0.964, 17±0.964, 17±0.964, 16.56±0.874, 16.56±0.964, median were 14,14,14,14,14,14,12,12.

4.15 Tabulation of required time for passive movement

Type of paralysis	**Joints**	**Minimum**	**Maximum**	**Mean**	**Median**	**Standard deviation(±SD)**
Paraplegia	Shoulder	0	0	0	0	0
	Elbow	0	0	0	0	0
	Wrist	0	0	0	0	0
	Finger	0	0	0	0	0
	Hip	1	11	4.29	3	±1.889
	Knee	1	11	4.29	3	±.887
	Ankle	1	11	4.67	3	±1.218
	Finger	1	11	4.67	3	±1.218
Tetraplegia	Shoulder	2	11	4.60	3	±.9228
	Elbow	2	11	4.60	3	±.9228
	Wrist	2	11	4.60	3	±.9228

	Finger	2	11	4.60	3	±.9228
	Hip	2	11	4.60	3	±.9228
	Knee	2	11	4.60	3	±.9228
	Ankle	2	11	5.00	3	±1.245
	Finger	2	11	5.00	3	±1.245

The above table showed that in paraplegia shoulder, elbow, wrist and finger required time minimum were, maximum 0, mean and SD were 0 ± 0, median was 0. But hip, knee, ankle and finger required time minimum were 1,1,1,1 maximum 11,11,11,11, mean and SD were 4.29±1.889, 4.29±1.889, 4.67±1.218, 4.67±1.218, median were 3,3,3,3. In tetraplegia shoulder, elbow, wrist, finger, hip, knee, ankle, finger minimum were 2,2,2,2,2,2,2,2, maximum 11,11,11,11,11,11,11,11, mean and SD were 4.60±0.922, 4.60±0.922, 4.60±0.922, 4.60±0.922, 4.60±0.922, 4.60±0.922, 5.00±1.245, 5.00±1.245, median were 3,3,3,3,3,3,3,3.

4.16 Tabulation of Repetition number for static stretching exercise

Type of paralysis	**Joints**	**Minimum**	**Maximum**	**Mean**	**Median**	**Standard deviation(± SD)**
Paraplegia	Shoulder	0	0	0	0	0
	Elbow	0	0	0	0	0
	Wrist	0	0	0	0	0
	Finger	0	0	0	0	0
	Hip	10	30	13.72	10	±.581

	Knee	10	30	13.72	10	±.581
	Ankle	10	30	13.52	10	±.491
	Finger	10	30	13.52	10	±.491
Tetraplegia	Shoulder	10	30	14.18	10	±.764
	Elbow	10	30	14.18	10	±.764
	Wrist	10	30	14.18	10	±.764
	Finger	10	30	14.18	10	±.764
	Hip	10	30	14.18	10	±.764
	Knee	10	30	14.18	10	±.764
	Ankle	10	30	13.94	10	±.673
	Finger	10	30	13.94	10	±.673

The above table showed that in paraplegia shoulder, elbow, wrist and finger repetition number were minimum 0, maximum 0, mean and SD were 0 ± 0, median was 0. But hip, knee, ankle and finger repetition number minimum were 10,10,10,10 maximum 30,30,30,30, mean and SD were 13.72±0.581, 13.72±0.581, 13.52±0.491, 13.52±0.491, median were 10,10,10,10. In tetraplegia shoulder, elbow, wrist, finger, hip, knee, ankle, finger minimum were 10,10,10,10,10,10,10,10, maximum 30,30,30,30,30,30,30,30, mean and SD were 14.18±0.764, 14.18±0.764, 14.18±0.764, 14.18±0.764, 14.18±0.764, 14.18±0.764, 13.94±0.673, 13.94±0.673, median were 10,10,10,10,10,10,10,10.

4.17 Tabulation of set number for static stretching exercise

Type of paralysis	Joints	Minimum	Maximum	Mean	Median	Standard deviation(±SD)
Paraplegia	Shoulder	0	0	0	0	0
	Elbow	0	0	0	0	0
	Wrist	0	0	0	0	0
	Finger	0	0	0	0	0
	Hip	1	2	1.167	1	±.383
	Knee	1	2	1.167	1	±.383
	Ankle	1	2	1.157	1	±.374
	Finger	1	2	1.157	1	±.374
Tetraplegia	Shoulder	1	2	1.125	1	±.341
	Elbow	1	2	1.125	1	±.341
	Wrist	1	2	1.125	1	±.341
	Finger	1	2	1.125	1	±.341
	Hip	1	2	1.125	1	±.341
	Knee	1	2	1.125	1	±.341
	Ankle	1	2	1.117	1	±.332
	Finger	1	2	1.117	1	±.332

The above table showed that in paraplegia shoulder, elbow, wrist and finger set number were minimum 0, maximum 0, mean and SD was 0 ± 0, median was 0. But hip, knee, ankle and finger total set number minimum were 1,1,1,1 maximum 2,2,2,2, mean and SD were 1.167±0.383, 1.167±0.383, 1.157 ±0.354, 1.157±0.354, median were 1,1,1,1. In tetraplegia shoulder, elbow, wrist, finger, hip, knee, ankle, finger minimum were 1,1,1,1,1,1,1,1, maximum 2,2,2,2,2,2,2,2, mean and SD were 1.125±0.341, 1.125±0.341, 1.125±0.341, 1.125±0.341, 1.125±0.341, 1.125±0.341, 1.117±0.332, 1.117±0.332, median were 1,1,1,1,1,1,1,1.

4.18 Tabulation of total repetition number for static stretching exercise

Type of paralysis	**Joints**	**Minimum**	**Maximum**	**Mean**	**Median**	**Standard deviation(± SD)**
Paraplegia	Shoulder	0	0	0	0	0
	Elbow	0	0	0	0	0
	Wrist	0	0	0	0	0
	Finger	0	0	0	0	0
	Hip	10	60	16.61	12.50	±1.84
	Knee	10	60	16.61	12.50	±1.84
	Ankle	10	60	16.26	10	±1.60
	Finger	10	60	16.26	10	±1.60
Tetraplegia	Shoulder	10	60	16.81	12.50	±1.45
	Elbow	10	60	16.81	12.50	±1.45
	Wrist	10	60	16.81	12.50	±1.45

Type of paralysis	**Joints**	**Minimum**	**Maximum**	**Mean**	**Median**	**Standard deviation($\pm$ SD)**
Paraplegia	Shoulder	0	0	0	0	0
	Elbow	0	0	0	0	0
	Wrist	0	0	0	0	0
	Finger	0	0	0	0	0
	Hip	10	60	16.61	12.50	$\pm$1.84
	Knee	10	60	16.61	12.50	$\pm$1.84
	Ankle	10	60	16.26	10	$\pm$1.60
	Finger	10	60	16.26	10	$\pm$1.60
	Finger	10	60	16.81	12.50	$\pm$1.45
	Hip	10	60	16.81	12.50	$\pm$1.45
	Knee	10	60	16.81	12.50	$\pm$1.45
	Ankle	10	60	16.41	10	$\pm$1.176
	Finger	10	60	16.41	10	$\pm$1.176

The above table showed that in paraplegia shoulder, elbow, wrist and finger total repetition number were minimum 0, maximum 0, mean and SD were 0 $\pm$ 0, median was 0. But hip, knee, ankle and finger total repetition number minimum were 10,10,10,10 maximum 60,60,60,60, mean and SD were 16.61$\pm$1.84, 16.61$\pm$1.84, 16.26$\pm$1.60, 16.26$\pm$1.60, median were 12.50, 12.50,10,10. In tetraplegia shoulder, elbow, wrist, finger, hip, knee, ankle, finger minimum were 10,10,10,10,10,10,10,10, maximum 60,60,60,60,60,60,60,60, mean and SD were 16.81$\pm$1.45, 16.81$\pm$1.45, 16.81±1.45, 16.81±1.45, 16.81±1.45, 16.81±1.45, 16.41±1.176, 16.41±1.176, median were 12.50, 12.50,12.50,12.50,12.50,12.50,10,10.

4.19 Tabulation of required time for static stretching exercise

Type of paralysis	Joints	Minimum	Maximum	Mean	Median	Standard deviation(±SD)
Paraplegia	Shoulder	0	0	0	0	0
	Elbow	0	0	0	0	0
	Wrist	0	0	0	0	0
	Finger	0	0	0	0	0
	Hip	3	16	6.94	6	±.872
	Knee	3	16	6.94	6	±.872
	Ankle	3	16	7.15	6	±.876
	Finger	3	16	7.15	6	±.876
Tetraplegia	Shoulder	3	11	6.62	6	±.222
	Elbow	3	11	6.62	6	±.222
	Wrist	3	11	6.62	6	±.222
	Finger	3	11	6.62	6	±.222
	Hip	3	11	6.62	6	±.222
	Knee	3	11	6.62	6	±.222
	Ankle	3	11	6.88	6	±.295
	Finger	3	11	6.88	6	±.295

The above table showed that in paraplegia shoulder, elbow, wrist and finger required time were minimum 0, maximum 0, mean and SD were 0 ± 0, median were 0. But hip, knee, ankle and finger required time minimum were 3,3,3,3, maximum 16,16,16,16, mean and SD were 6.94 ± 0.872, 6.94 ± 0.872, 7.15 ± 0.876, 7.15 ± 0.876, median were 6,6,6,6. In tetraplegia shoulder, elbow, wrist, finger, hip, knee, ankle, finger minimum were 3,3,3,3,3,3,3,3, maximum 11,11,11,11,11,11,11,11, mean and SD were 6.62 ± 0.222, 6.62 ± 0.222, 6.62 ± 0.222, 6.62 ± 0.222, 6.62 ± 0.222, 6.62 ± 0.222, 6.88 ± 0.295, 6.88 ± 0.295median were 6,6,6,6,6,6,6,6.

Inferential statistical analysis

4.20 Correlation between participant's age group and their purpose of practicing passive movement:

Ho: There is no correlation between participants' age group and their purpose of giving passive movement.

Ha: There is a correlation between participants' age group and their purpose of giving passive movement.

Test assumptions:

- Two categorical variables
- 0 cells (0.0%) have been expected to count less than 5.
- Level of significance ($p<0.05$)

Purpose of giving passive movement	Participants age group			Chi-square value	P-value	Remark
	21-30	31-40	41-50	22.603	0.012	Significant
Increase blood circulation	4	2	0			
Increase range of motion	1	2	0			
Maintain range of motion	1	4	0			
Increase muscle power	0	0	1			
Increase flexibility	1	2	0			
Other (improve function	0	1	0			

Above table showed correlation between participants' age group and their purpose of giving passive movement. A chi-square test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were <0.05 and the null hypothesis was rejected. So, a statistically significant correlation was found between participants' age group and their purpose of giving passive movement.

Participants' reasoning to practice passive movement is vary with their age group.

4.21 Correlation between the participant's age group and their purpose of practicing static stretching exercise:

Ho: There is no correlation between participants' age group and their purpose of giving static stretching exercise.

Ha: There is a correlation between participants' age group and their purpose of giving static stretching exercise.

Test assumptions:

- Two categorical variables
- 0 cells (0.0%) have been expected to count less than 5.
- Level of significance (p<0.05)

Purpose of giving static stretching exercise	Participants age group			Chi-square value	P-value	Remark
	21-30	31-40	41-50	5.058	.956	Not significant
Increase blood circulation	1	1	0			
Increase range of motion	1	0	0			
Maintain range of motion	3	4	1			
Increase muscle power	0	1	0			
Increase strength	1	1	0			

Increase flexibility	1	3	0			
Other (improve function	0	1	0			

Above table showed correlation between participants' age group and their purpose of giving static stretching exercise. A chi-square test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were >0.05 and the null hypothesis was accepted. So, a statistically no significant correlation was found between participants' age group and their purpose of giving static stretching exercise.

Participants' reasoning to practice static stretching exercise does not vary with their age group.

4.22 Correlation between occupational therapist participant's designation and purpose of giving static stretching exercise:

Ho: There is no correlation between occupational therapist participant's designation and purpose of giving static stretching exercise.

Ha: There is a correlation between occupational therapist participant's designation and purpose of giving static stretching exercise.

Test assumptions:

- Two categorical variables
- 0 cells (0.0%) have been expected to count less than 5.
- Level of significance (p<0.05)

Designation of occupational therapist	**Purpose of giving static stretching exercise**		**Chi-square value**	**P-value**	**Significance**
	Maintain range of motion	Increase strength			
Junior consultant occupational therapist	1	0	.833	.569	Not significant
Clinical occupational therapist	2	1			
Diploma occupational therapist	1	0			

Above table showed correlation between occupational therapist participant's designation and purpose of giving static stretching exercise. A chi-square test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were >0.05 and the null hypothesis was accepted. So, a statistically no significant correlation was found between occupational therapist participant's designation and their purpose of giving static stretching exercise.

Occupational therapist participants' reasoning to perform static stretching exercise is not correlated with their designations.

4.23 Correlation between occupational therapist participant's designation and purpose of giving passive movement:

Ho: There is no correlation between occupational therapist participant's designation and purpose of giving passive movement.

Ha: There is a correlation between occupational therapist participant's designation and purpose of giving passive movement.

Test assumptions:

- Two categorical variables
- 0 cells (0.0%) have been expected to count less than 5.
- Level of significance ($p<0.05$)

Designation of occupational therapist	**Purpose of giving passive movement**	**Chi-square value**	**P-value**	**Significance**
	Increase blood circulation			
Junior consultant occupational therapist	1	00	0.000	Significant
Clinical occupational therapist	3			
Diploma occupational therapist	1			

Above table shows correlation between occupational therapist participant's designation and purpose of giving passive movement. A chi-square test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were equal to 0.00 and the null hypothesis was rejected. So, a statistically significant correlation was found between occupational therapist participant's designation and purpose of giving passive movement.

Occupational therapist's reasoning to perform passive movement is correlated with their designations.

4.24 Correlation between physiotherapist participant's designation and purpose of giving passive movement:

Ho: There is no correlation between physiotherapist participant's designation and purpose of giving passive movement.

Ha: There is a correlation between physiotherapist participants' designation and purpose of giving passive movement.

Test assumptions:

- Two categorical variables
- 0 cells (0.0%) have been expected to count less than 5.
- Level of significance ($p<0.05$)

Designation of physio-therapists	**Purpose of giving passive movement**			**Chi-square value**	**P-value**	**Significance**
	Clinical physio-therapist	Diploma physio-therapist	Assistant Physio-Therapist			
Increase blood circulation	0	1	0	19.60	.033	Significant
Increase range of motion	2	1	0			

Maintain range of motion	0	0	5			
Increase muscle power	0	1	0			
Increase flexibility	2	0	1			
Improve function	1	0	0			

Above table shows correlation between physiotherapist participants' designation and purpose of giving passive movement. A chi-square test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were <0.05 and the null hypothesis was rejected. So, a statistically significant correlation was found between physiotherapist participants' designation and purpose of giving passive movement.
Physiotherapist participants' reasoning to perform passive movement is correlated with their designation.

4.25 Correlation between physiotherapist participant's designation and purpose of giving static stretching exercise:

Ho: There is no correlation between physiotherapist participant's designation and purpose of giving static stretching exercise.
Ha: There is a correlation between physiotherapist participants' designation and purpose of giving static stretching exercise.
Test assumptions:

- Two categorical variables
- 0 cells (0.0%) have been expected to count less than 5.

- Level of significance ($p<0.05$)

Designation of physio-therapists	**Purpose of giving static stretching exercise**			**Chi-square value**	**P-value**	**Significance**
	Clinical physio-therapist	Diploma physio-therapist	Assistant Physio-therapist			
Increase blood circulation	0	1	1	12.133	.044	
Increase range of motion	0	0	1			
Maintain range of motion	1	2	1			
Increase muscle power	1	0	0			
Increase strength	0	0	1			
Increase flexibility	3	0	1			
Improve function	0	0	1			

Above table showed correlation between physiotherapist participants' designation and purpose of giving static stretching exercise. A chi-square test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were <0.05 and the null hypothesis was rejected. So, a statistically significant correlation was found between physiotherapist participants' designation and purpose of giving static stretching exercise.

Physiotherapist participants' reasoning to perform static stretching exercise is correlated with their designation.

4.26 Correlation between participant’s designation and their sex:

Ho: There is no correlation between participant’s designation and their sex.

Ha: There is a correlation between participant’s designation and their sex.

Test assumptions:

- Two categorical variables
- 0 cells (0.0%) have been expected to count less than 5.
- Level of significance (p<0.05).

Participants sex	Designation		Chi-square value	P-value	Remark
	Physiotherapist	Occupational-therapist	7.540	.006	Significant
Male	10	0			
Female	4	5			

Above table showed correlation between participant's designation and their sex. A chi-square test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were <0.05 and the null hypothesis was rejected. So, a statistically significant correlation was found between participant's designation and their sex. Participant's designation vary with their sex.

4.27 Correlation between participant's sex and their purpose of giving passive movement:

Ho: There is no correlation between participant's sex and their purpose of giving passive movement.

Ha: There is a correlation between participant's sex and their purpose of giving passive movement.

Test assumptions:

- Two categorical variables
- 0 cells (0.0%) have been expected to count less than 5.
- Level of significance (p<0.05)

Purpose of giving passive movement	**Participants sex**		**Chi-square value**	**P-value**	**Remark**
	Male	Female	10.309	0.067	Not significant
Increase blood circulation	1	5			
Increase range of motion	1	2			
Maintain range of motion	5	0			
Increase muscle power	0	1			
Increase flexibility	2	1			
improve function	1	0			

Above table showed correlation between participant’s sex and their purpose of giving passive movement. A chi-square test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were >0.05 and the null hypothesis was accepted. So, a statistically no significant correlation was found between participants sex their purpose of giving passive movement.

Participants' reasoning to practice passive movement is not correlated with their gender.

4.28 Correlation between participant's sex and purpose of giving static stretching exercise:

Ho: There is no correlation between participant's sex and their purpose of giving static stretching exercise.

Ha: There is a correlation between participant's sex and their purpose of giving static stretching exercise.

Test assumptions:

- Two categorical variables
- 0 cells (0.0%) have been expected to count less than 5.
- Level of significance ($p<0.05$)

Purpose of giving static stretching exercise	**Participants sex**		**Chi-square value**	**P-value**	**Remark**
	Male	Female	10.476	0.106	Not significant
Increase blood circulation	2	0			
Increase range of motion	1	0			
Maintain range of motion	1	7			
Increase muscle power	1	0			
Increase strength	1	1			
Increase flexibility	3	1			
improve function	1	0			

Above table showed correlation between participant's sex and their purpose of giving static stretching exercise. A chi-square test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were >0.05 and the null hypothesis was accepted. So, a statistically no significant correlation was found between participants sex their purpose of giving static stretching exercise.

Participants' reasoning to practice static stretching exercise is not correlated with their gender.

4.29 Correlation between the participant's age and their job experience:

Ho: There is no correlation between participants' age and their job experience.

Ha: There is a correlation between participants' age and their job experience.

Test assumptions:

- Two continuous variables.
- Normally distributed
- Presence of linear relationship
- P-value for significance (<.05)

Variables	Coefficient value (r)	P-value	Remark
Age*job experience	.800	.000	Significant Perfect positive Very strong correlation

Above table showed correlation between participants' age and their job experience. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

The P-values were <0.05 and the null hypothesis was rejected. And Pearson's correlation coefficient value was .800, which means perfect positive and very strong relationship. So, statistically significant correlation was found between participants' age and their job experience which was a perfect positive and very strong relationship. Participants' job experience is correlated with their age.

4.30 Correlation between participant's age and repetition number of passive movement:

H0: There is no correlation between participants' age and number of repetitions of passive movement.

Ha: There is a correlation between participants' age and the repetition number of passive movement.

Test assumption

- Two continuous variables.
- Normally distributed
- Presence of linear relationship
- P-value for significance (<.05)

Variables		Coefficient value (r)	P- value	Remark
Paraplegia	Hip	0.070	.797	Positive Not significant
	Knee	0.071	.787	
	Ankle	.125	.671	
	Finger	.125	.671	
Tetraplegia	Shoulder	0.00	1	Positive Not significant
	Elbow	0.00	1	
	Wrist	0.00	1	
	Finger	0.00	1	
	Hip	0.00	1	

	Knee	0.00	1	
	Ankle	.070	.797	
	Finger	.113	.677	

The above table showed the correlation between participant's age and repetition number of passive movements. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=0.070, p=0.797), knee (r=0.071, p=0.787), ankle (r=0.125, p=0.671), finger (r=0.125, p=0.671) and in tetraplegia shoulder (r=000, p=1), elbow (r= 000, p=1), wrist (r= 000, p=1), finger (r=000, p=1), hip (r=000, p=1), knee (r=000, p=1), ankle (r=0.070, p=0.797), finger (r=0.113, p=0.677). All the P-values were>0.05 that accepts null hypothesis and there was a positive co-relationship.

So, the number of repetitions for different upper and lower limb joints is not correlated with the participant's age.

4.31 Correlation between participant's age and set number of passive movement:

Ho: There is no correlation between participant's age and set number of passive movement.

Ha: There is a relationship between the participant's age and the set number of passive movements.

Test assumption

- Two continuous variables.
- Normally distributed
- Presence of linear relationship
- P-value for significance (P<.05)

Variables		Coefficient value(r)	P- value	Remark
Paraplegia	Hip	-.478	.061	Not significant
	Knee	-.097	.771	
	Ankle	-.064	.801	
	Finger	-.064	.801	
Tetraplegia	Shoulder	-.064	.801	Not significant
	Elbow	-.395	.145	
	Wrist	-.395	.145	
	Finger	-.395	.145	
	Hip	-.395	.145	
	Knee	-.395	.145	
	Ankle	-.346	.189	
	Finger	-.346	.189	

The above table showed the correlation between participant's age and set number of passive movements. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=-0.478, p=0.061), knee (r=-0.097, p=0.771), ankle (r=-0.064, p=0.801), finger (r=-0.064, p=0.801) and in tetraplegia shoulder (r=-0.064, p=0.801), elbow (r=-0.064, p=0.801), wrist (r=-0.064, p=0.801), finger(r=-0.064, p=0.801), hip (r=-0.064, p=0.801), knee (r=-0.064, p=0.801), ankle (r=-0.346, p=0.189), finger (r=-0.346, p=0.189). And all the P-values were>0.05 that accepts the null hypothesis and there was a negative correlationship.

So, the number of sets for different upper and lower limb joints is not correlated with the participant's age.

4.32 Correlation between participant's age and required time of passive movement:

H0: There is no correlation between participant's age and required time of passive movement.

Ha: There is a relationship between participant's age and required time of passive movement.

Test assumption:

- Two continuous variables.
- Normally distributed
- Presence of linear relationship
- Level of significance (<.05)

Variables		Coefficient value(r)	P- value	Remark
Paraplegia	Hip	.045	.863	Not significant
	Knee	.045	.863	
	Ankle	-.117	.645	
	Finger	-.117	.645	
Tetraplegia	Shoulder	.035	.902	Not significant
	Elbow	.035	.902	
	Wrist	.035	.902	
	Finger	.035	.902	
	Hip	.035	.902	
	Knee	.035	.902	
	Ankle	-.142	.599	
	Finger	-.142	.599	

The above table showed the correlation between participant's age and required time of passive movement. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=0.045, p=0.863), knee (r=0.045, p=0.863), ankle (r=-0.117, p=0.645), finger (r=-0.117, p=0.645) and in tetraplegia shoulder (r=0.035, p=0.902), elbow (r=0.035, p=0.902), wrist (r=0.035, p=0.902), finger (r=0.035, p=0.902), hip (r=0.035, p=0.902), knee (r=0.035, p=0.902), ankle (r=-0.142, p=0.599), finger (r=-0.142, p=0.599). And all the P-values were >0.05 that accepts null hypothesis

So, the required time for giving passive movement in different upper and lower limb joints is not correlated with the participant's age.

4.33 Correlation between participant's age and repetition number of static stretching exercise:

H0: There is no correlation between participant's age and repetition number of static stretching exercise.

Ha: There is a correlation between the participant's age and repetition number of static stretching exercises.

Test assumption:

- Two continuous variables.
- Normally distributed
- Presence of linear relationship
- Level of significance (<0.05)

Variables		**Coefficient value(r)**	**P- value**	**Remark**
Paraplegia	Hip	.121	.632	Not significant
	Knee	.121	.632	
	Ankle	.159	.515	

	Finger	.159	.515	
Tetraplegia	Shoulder	.095	.726	Not significant
	Elbow	.095	.726	
	Wrist	.095	.726	
	Finger	.095	.726	
	Hip	.095	.726	
	Knee	.095	.726	
	Ankle	.144	.580	
	Finger	.144	.580	

The above table showed the correlation between participant's age and repetition number of static stretching exercises. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=0.121, p=0.632), knee (r=0.121, p=0.632), ankle (r=0.159, p=0.515), finger (r= 0.159, p=0.515) and in tetraplegia shoulder (r=0.095, p=0.726), elbow (r=0.095, p=0.726), wrist (r=0.095, p=0.726), finger (r=0.095, p=0.726), hip (r=0.095, p=0.726), knee (r= 0.095, p=0.726), ankle (r=0.144, p=0.580), finger (r=0.144, p=0.580). And all the P-values were >0.05 that accepts null hypothesis.

So, the number of repetitions for different upper and lower limb joints is not correlated with the participant's age.

4.34 Correlation between participant’s age and set number of static stretching exercises:

H0: There is no correlation between participant’s age and set number of static stretching exercises.

Ha: There is a correlation between the participant's age and the set number of static stretching exercises.

Test assumption:

- Two continuous variables.
- Normally distributed
- Presence of linear relationship
- Level of significance (<.05)

Variables		**Coefficient value(r)**	**P- value**	**Remark**
Paraplegia	Hip	-.311	.208	Not significant
	Knee	-.311	.208	
	Ankle	-.268	.267	
	Finger	-.268	.267	
	Shoulder	-.169	.531	
	Elbow	-.169	.531	
	Wrist	-.169	.531	
	Finger	-.169	.531	
	Hip	-.169	.531	

Tetraplegia	Knee	-.169	.531	Not significant
	Ankle	-.132	.614	
	Finger	-.132	.614	

The above table showed the correlation between participant's age and set number of static stretching exercises. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=-0.311, p=0.208), knee (r=-0.311, p=0.208), ankle (r=-0.268, p=0.267), finger (r=-0.268, p=0.267) and in tetraplegia shoulder (r=-0.169, p=0.531), elbow (r=-0.169, p=0.531), wrist (r=-0.169, p=0.531), finger (r=-0.169, p=0.531), hip (r=-0.169, p=0.531), knee (r=-0.169, p=0.531), ankle (r=-0.132, p=0.614), finger (r=-0.132, p=0.614). And all the P-values were >0.05 that accepts null hypothesis.

So, the number of sets for different upper and lower limb joints is not correlated with the participant's age.

4.35 Correlation between participant's age and required time of static stretching exercise:

H0: There is no correlation between participant's age and required time of static stretching exercise.

Ha: There is a correlation between participant's age and required time of static stretching exercise.

Test assumption:

- Two continuous variables
- Normally distributed
- Presence of linear relationship
- Level of significance (<.05)

Variables		Coefficient value(r)	P- value	Remark
Paraplegia	Hip	-.113	.655	Not significant
	Knee	-.113	.655	
	Ankle	-.174	.477	
	Finger	-.174	.477	
Tetraplegia	Shoulder	-.340	.197	Not significant
	Elbow	-.340	.197	
	Wrist	-.340	.197	
	Finger	-.340	.197	
	Hip	-.340	.197	
	Knee	-.340	.197	
	Ankle	-.406	.106	
	Finger	-.406	.106	

The above table showed the correlation between participant's age and required time of static stretching exercises. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=-0.113, p=0.655), knee (r=-0.113, p=0.655), ankle (r= -0.174, p=0.477), finger (r= -0.174, p=0.477) and in tetraplegia shoulder (r=-0.340, p=0.197), elbow (r= -0.340, p=0.197), wrist (r= -0.340, p=0.197), finger (r= -0.340, p=0.197), hip (r=-0.340, p=0.197), knee (r=-0.340, p=0.197), ankle (r= -0.406, p=0.106), finger (r=-0.406, p=0.106). And all the P-values were >0.05 that accepts null hypothesis. So, the time for giving static stretching exercises to different upper and lower limb joints is not correlated with the participant's age.

4.36 Correlation between participant's job experience and repetition number of passive movement:

H0: There is no correlation between the participant's job experience and repetition number of passive movement.

Ha: There is a correlation between the participant's job experience and the repetition number of passive movement.

Test assumption:

- Two continuous variables
- Normally distributed
- Presence of linear relationship
- Level of significance (P-value<.05)

Variables		**Coefficient value**	**P- value**	**Remark**
Paraplegia	Hip	-.029	.915	Not significant
	Knee	-.028	.916	
	Ankle	.015	.952	
	Finger	.015	.952	
Tetraplegia	Shoulder	-.059	.827	Not significant
	Elbow	-.060	.833	
	Wrist	-.060	.833	
	Finger	-.060	.833	
	Hip	-.060	.833	
	Knee	-.060	.833	
	Ankle	-.011	.969	

Variables		Coefficient value	P- value	Remark
	Finger	-.060	.825	

The above table showed the correlation between participant's job experience and repetition number of passive movement. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=-0.29, p=0.916), knee (r=-.0.28, p=0.915), ankle (r=0.15, p=0.952), finger (r=0.15, p=0.952) and in tetraplegia shoulder (r=-.059, p=.827), elbow (r=-.059, p=.827),wrist (r=-.059, p=.827), finger (r=-.059, p=.827), hip (r=-.059, p=.827), knee (r=-.059, p=.827), ankle (r=-.011, p=0.969), finger (r=-.060, p=0.825). And all the P-values were >0.05 that accepts null hypothesis.

So, the number of repetitions for different upper and lower limb joints is not correlated with participants' job experience.

4.37 Correlation between participant's job experience and set number of passive movement:

H0: There is no correlation between the participant's job experience and set number of passive movements.
Ha: There is a correlation between the participant's job experience and set number of passive movements.
Test assumption:

- Two continuous variables
- Normally distributed
- Presence of linear relationship
- Level of significance (P-value<.05)

Variables		Coefficient value	P- value	Remark
Paraplegia	Hip	-.285	.285	Not significant
	Knee	-.035	.893	
	Ankle	-.015	.954	
	Finger	-.015	.954	
Tetraplegia	Shoulder	-.020	.942	Not significant
	Elbow	-.251	.367	
	Wrist	-.251	.367	
	Finger	-.251	.367	
	Hip	-.251	.367	
	Knee	-.251	.367	
	Ankle	-.228	.395	
	Finger	-.228	.395	

The above table showed the correlation between the participant's job experience and set number of passive movement. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=-.285, p=0.285), knee (r= -.035, p=0.893), ankle (r=-.015, p=0.954), finger (r=-.015, p=0.954) and in tetraplegia shoulder (r=-.020, p=0.942), elbow (r=-.251, p=0.367), wrist (r=-.251, p=0.367), finger (r=-.251, p=0.367), hip (r=-.251, p=0.367) , knee (r=-.251, p=0.367), ankle (r=-.228, p=0.395), finger (r=-.228, p=0.395). And all the P-values were >0.05 that accepts null hypothesis.

So, the number of sets for different upper and lower limb joints is not correlated with participants' job experience.

4.38 Correlation between participant's job experience and required time of passive movement:

H0: There is no correlation between participant's job experience and required time of passive movement.

Ha: There is a correlation between participant's job experience and required time of passive movement.

Test assumption:

- Two continuous variables.
- Normally distributed
- Presence of linear relationship
- Level of significance (P-value<.05)

Variables		Coefficient value	P- value	Remark
Paraplegia	Hip	.053	.839	Not significant
	Knee	.053	.839	
	Ankle	-.064	.800	
	Finger	-.064	.800	
Tetraplegia	Shoulder	.065	.819	Not significant
	Elbow	.065	.819	
	Wrist	.065	.819	
	Finger	.065	.819	
	Hip	.065	.819	
	Knee	.065	.819	
	Ankle	-.058	.832	

	Finger	-.058	.832	

The above table showed the correlation between participant's job experience and required time of passive movement. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: (r=0.053, p=0.839), knee (r= 0.053, p=0.839), ankle (r=-.064, p=0.800), finger (r=-.064, p=0.800) and in tetraplegia shoulder (r=0.065, p=0.819), elbow (r=0.065, p=0.819), wrist (r=0.065, p=0.819), finger (r=0.065, p=0.819), hip (r=0.065, p=0.819), knee (r=0.065, p=0.819), ankle (r=-.058, p=0.832), finger (r=-.058, p=0.832). And all the P-values are >0.05 that accepts null hypothesis.

So, the required time to give passive movement in different upper and lower limb joints is not correlated with participants' job experience.

4.39 Correlation between participant's job experience and repetition number of static stretching exercise:

H0: There is no correlation between participant's job experience and repetition number of static stretching exercises.

Ha: There is a correlation between the participant's job experience and repetition number of static stretching exercises.

Test assumption:

- Two continuous variables.
- Normally distributed
- Presence of linear relationship
- Level of significance (P-value<.05)

Variables		**Coefficient value**	**P- value**	**Remark**
	Hip	-.064	.801	

Paraplegia	Knee	-.064	.801	Not significant
	Ankle	-.029	.906	
	Finger	-.029	.906	
Tetraplegia	Shoulder	-.073	.787	Not significant
	Elbow	-.073	.787	
	Wrist	-.073	.787	
	Finger	-.073	.787	
	Hip	-.073	.787	
	Knee	-.073	.787	
	Ankle	-.032	.902	
	Finger	-.032	.902	

The above table showed the correlation between participant's job experience and repetition number of static stretching exercises. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: (r=-.064, p=0.801), knee (r=-.064, p=0.801), ankle (r=-.029, p=0.906), finger (r=-.029, p=0.906) and in tetraplegia shoulder (r=-.073, p=0.787), elbow (r=-.073, p=0.787), wrist (r=-.073, p=0.787), finger (r=-.073, p=0.787), hip (r=-.073, p=0.787), knee (r=-.073, p=0.787), ankle (r=-.032, p=0.902), finger (r=-.032, p=0.902). And all the P-values are >0.05 that accepts null hypothesis.

So, the repetition number of static stretching exercises in different upper and lower limb joints is not correlated with participants' job experience.

4.40 Correlation between participant's job experience and set number of static stretching exercise:

H0: There is no correlation between the participant's job experience and set number of static stretching exercises.

Ha: There is a correlation between the participant's job experience and set number of static stretching exercises.

Test assumption:

- Two continuous variables.
- Normally distributed
- Presence of linear relationship
- Level of significance (P-value<.05)

Variables		**Coefficient value**	**P- value**	**Remark**
Paraplegia	Hip	-.391	.109	Not significant
	Knee	-.391	.109	
	Ankle	-.358	.132	
	Finger	-.358	.132	
Tetraplegia	Shoulder	-.376	.151	Not significant
	Elbow	-.376	.151	
	Wrist	-.376	.151	
	Finger	-.376	.151	
	Hip	-.376	.151	
	Knee	-.376	.151	
	Ankle	-.347	.173	

	Finger	-.347	.173	

The above table showed the correlation between the participant's job experience and set number of static stretching exercises. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=-.391, p=0.109), knee (r= -.391, p=0.109), ankle (r=-.358, p=0.132), finger (r=-.358, p=0.132) and in tetraplegia shoulder (r=-.376, p=0,151), elbow (r=-.376, p=0,151), wrist (r= -.376, p=0,151), finger (r= -.376, p=0,151), hip (r= -.376, p=0,151), knee (r=-.376, p=0,151), ankle (r=-.347, p=0.173), finger (r=-.347, p=0.173). And all the P-values are >0.05 that accepts null hypothesis.

So, the set number for different upper and lower limb joints is not correlated with participants' job experience.

4.41 Correlation between participant's job experience and required time of static stretching exercise:

H0: There is no correlation between participant's job experience and required time of static stretching exercise.

Ha: There is a correlation between the participant's job experience and required time of static stretching exercise.

Test assumption:

- Two continuous variables
- Normally distributed
- Presence of linear relationship
- Level of significance (P-value<.05)

Variables		**Coefficient value**	**P- value**	**Remark**
	Hip	-.097	.703	

Paraplegia	Knee	-.097	.703	Not significant
	Ankle	-.142	.562	
	Finger	-.142	.562	
Tetraplegia	Shoulder	-.236	.378	Not significant
	Elbow	-.236	.378	
	Wrist	-.236	.378	
	Finger	-.236	.378	
	Hip	-.236	.378	
	Knee	-.236	.378	
	Ankle	-.287	.263	
	Finger	-.287	.263	

The above table shows the correlation between participant's job experience and required time of static stretching exercise. A Pearson's correlation test was conducted where the assumptions of the test were met. A P-value was determined (p=0.05).

In paraplegia, for different joints values were: hip (r=-.097, p=0.703), knee (r= -.097, p=0.703), ankle (r=-.147, p=0.562), finger (r=-.147, p=0.562) and in tetraplegia shoulder (r=-.236, p=0.378), elbow (r= -.236, p=0.378), wrist (r= -.236, p=0.378), finger (r= -.236, p=0.378), hip (r=-.236, p=0.378), knee (r=-.236, p=0.378), ankle (r=-.287, p=0.263), finger (r=-.287, p=0.263). And all the P-values are >0.05 that accepts null hypothesis.

So, the required time to give static stretching exercises for different upper and lower limb joints is not correlated with participants' job experience.

CHAPTER-V DISCUSSION

The present study aims to identify the practices of rehabilitation professionals who practice passive movement and static stretching exercises as a treatment for patients with spinal cord injury at CRP. Rehabilitation professionals answered the questionnaire for those patients who were admitted with spinal cord injuries at the SCI unit, CRP, Savar from February 2022 to March 2020.

In my study there were 19 participants. Among them, 52.6% were male (n = 10) and 47.37% (n = 9) were female. So, there were almost equal rehabilitation professionals and the majority 57.89% (n = 11) participants' were middle aged adults, aged between 31 to 40 years. In Rwanda, between 102 participants 70% (n=64) were male and 30% were female (n=28) (Frantz and Ngambare, 2013). But another study showed that in Colombia, out of 1064 participants, 77.2% (n=821) were female and 22.8% (n=243) male. Major portions 79.4% (n=845) were aged between 31 to 40 years (Ramírez-Vélez et al., 2015). In Nigeria, females were dominated by men; 72% of the physiotherapists were men. This finding was discordant with the situation in the USA where physiotherapy, both in the clinical (68.1%) and academic (84%) settings were dominated by women (Balogun et al., 2016).

In my study, the majority were physiotherapists 73.68% (n = 14). In 2000 the ratio of physiotherapists to the local population was estimated at 1:550000 in Africa (Gona et al., 2013).

In my study, out of 14 physiotherapists, the majority 42.86% (n=6) were assistant physiotherapists, 35.71% (n=5) were clinical physiotherapists and 21.43% (n=3) were diploma physiotherapists. In Bangladesh, among the physiotherapists, 67% (n=77) were clinical physiotherapists, 7.8% (n=9) were lecturers, 7% (n=8) were senior consultant, 4.3% (n=5) were sports physiotherapists, 2.6% (n=3) were assistant physiotherapists, 1.7% (n=2) were junior consultant, 0.9% (n = 1)were senior physiotherapists and 0.9% were consultants (n =1) (Balogun et al., 2016).

In this study, out of 5 occupational therapists the majority were 60% (n=3) clinical occupational therapists.

My study found that 21.1% (n = 4) worked for 11 years, which was a major portion. This study Showed, among the professionals of Bangladesh, duration of practice, 23.5% (n=27) were 2 years, 15.7% (n = 18) were 5-10 years, 50.4% (n = 58) were 2–5 years and 10.4% (n = 12) were >10 years. Another study in Pakistan discovered that 36% (n = 36) had 1 to 2 years of experience, 48% (n = 48) had 3 to 4 years and 16% (n = 16) had more than 5 years' experience (Babur et al., 2014).

My study showed that no physiotherapist or occupational therapist practices or follows any guideline protocol or treatment approach to give passive movement and static stretching exercises. And in this study, everyone, 100% (n=114), stated that they don't follow any treatment approach or protocol. The study also showed that there is no actual guideline protocol or treatment approach for performing static stretching exercises (Chan et al., 2001).

In this study, 84.2% (n=16) participants treated both paraplegia and tetraplegia patients.

Out of 19 participants, 31.6% (n=6) participants or the majority practiced passive movement as a treatment intervention to increase blood circulation. In this study, among 33 participants 63.6% (n=19) stated that maintaining joint range of motion was their main reason for performing passive movement (Alaparthi et al., 2021). Another study study showed that among 150 participants with spinal cord injury, passive movement increased blood circulation 50% (n=75), increased joint range of motion 26% (n=38), increased strength by 10% (n=12) and flexibility 15% (n=25) (Prabhu et al., 2013).

My study found that the majority of rehabilitation professionals 42.1% (n = 8) practiced static stretching exercises as a treatment intervention to maintain joint range of motion. Study showed static stretching exercises maintained joint range of motion by 60% (n=60) and improved function by 20% (n = 12) among 80 spinal cord injury patients (Harvey, 2016).

This study showed that participants usually don't give passive movement and static stretching exercises to upper limb joints for paraplegic patients.

My study found that Professionals gave passive movement and static stretching exercise by maintaining repetition, set and time. In paraplegic patients, for the hip joint, they gave 14.7 repetitions of 1.19 set of 17.06 total repetitions for 4.29 minutes, for the knee joint 14.7 repetitions of 1.47 set of 17.06 total repetitions for 4.29 minutes, for the ankle joint they gave 14.44 repetitions of 1.44 set of 16.67 total repetitions for 4.67 minutes and for the finger joint they gave 14.4 repetitions of 1.44 set of 16.67 total repetitions for 4.67 minutes of passive movement. In tetraplegic patients, for the shoulder joint they gave 15 repetitions of 1.44 sets of 17 total repetitions for 4.60 minutes, for elbow joint they gave 15 repetitions of 1.43 sets of 17 total repetitions for 4.60 minutes, for wrist joint they gave 15 repetitions of 1.13 sets of 17 total repetitions for 4.60 minutes, for knee joint they gave 15 repetitions of 1.13 sets of 17 total repetitions for 4.60 minutes, for ankle joint they gave 14.7 repetitions of 1.125 sets of 16.56 total repetitions for 5 minutes, for ankle joint they gave 14.7 repetitions of 1.125 sets of 16.56 total repetitions for 5 minutes, for finger joint they gave 15.25 repetitions of 1.125 sets of 16.56 total repetitions for 5 minutes of passive movement. 1 set of 14.44 to 15.25 repetitions in 4 to 5 minutes of passive movement was performed. According to research, passive movement becomes more effective when performed 1-6 sets of 3 to 30 repetitions (Alaparthi et al., 2021). And it should be given for 20 to 30 minutes to achieve great outcomes (Prabhu et al., 2013).

This study showed that participants gave paraplegic patients static stretching exercises 13.72 repetitions of 1.167 sets of 16.61 total repetitions for 6.94 minutes for hip joint, 13.72 repetitions of 1.167 sets of 16.61 total repetitions of 6.94 minutes for knee joint, 13.52 repetition of 1.157 sets of 16.26 total repetition of 7.15 minutes for ankle joint, 13.52 repetition of 1.157 sets of 16.26 total repetition of 7.15 minutes for finger joint for pa5aplegic patients. They gave tetraplegic patients 14.18 repetitions of 1.125 sets of 16.81 total repetitions of 6.62 minutes for shoulder joint, 14.18 repetitions of 1.125 sets of 16.81 total repetitions of 6.62 minutes for elbow joint, 14.18 repetitions of 1.125 sets of 16.81 total repetitions of 6.62 minutes for wrist joint, 14.18 repetitions of 1.125 sets of 16.81 total repetitions of 6.62 minutes for finger joint, 14.18 repetitions of 1.125 sets of 16.81 total repetitions of 6.62 minutes for hip joint, 14.18 repetitions of 1.125

sets of 16.81 total repetitions of 6.62 minutes for knee joint, 13.94 repetitions of 1.117 sets of 16.41 total repetitions of 6.88 minutes for ankle joint, 13.94 repetitions of 1.117 sets of 16.41 total repetitions of 6.88 minutes for finger joint. 1 set of 13.52 to 14.18 repetitions in 6.62 to 7.15 minutes of static stretching was performed. Matsuo et al. (2013) showed that long-duration static stretching exercises (3 to 5 min) were more effective. These authors reported significant decreases in stiffness in the 3 to 5 min occurred. Page, (2012) showed that the greatest change in ROM with a static stretch occurred between 15 to 30 seconds and no increase in muscle elongation occurred after 2 to 4 repetitions. Fowles et al. (2000) showed that 13 repetitions of 135s each improved joint mobility 1%, improved the quality of life 1%, decreased pain 2%, improved mobility 1% and maintained range of motion 10%.

In my study, it was found that participant's practice of passive movement and static stretching exercise (repetition number, set number or timing) didn't vary based on their age and job experience. But the reasoning to perform those interventions varied only with physiotherapist's designation. This study also showed that participant's designation varied with their sex as male participants were highly designated than females. Purpose of interventions usually not related with participants' gender but related with their age group only for passive movement, where job experience depends on age.

5.1 Limitation of the study

Some limitations were noted in this study. The researcher was a 4th year, B.Sc. in physiotherapy student and this was her first research project. So, she had limited experience with techniques and strategies in terms of the practical aspects of research. Another limitation of this study was sample size. There were only 19 rehabilitation professionals, including physiotherapists and occupational therapists. And this study was not done among other rehabilitation professionals who might practice passive movement and static stretching exercises as interventions for spinal cord injury patients.

CHAPTER-VI CONCLUSION and RECOMMENDATION

6.1 CONCLUSION

Out of 19 rehabilitation professionals, the majority were physiotherapists. Male and female participants were almost equal but male participants were highly designated. Most of the professionals were middle aged. Participants' age and job experience did not have any influence on their method of practice passive movement and static stretching exercises as interventions for spinal cord injury patients. 1 set of 14.44 to 15.25 repetitions in 4 to 5 minutes of passive movement was performed and 1 set of 13.52 to 14.18 repetitions in 6.62 to 7.15 minutes of static stretching was performed. Purpose of giving passive movement varied with participants' designation but static stretching was not.

6.2 Recommendation

The study aimed to identify the practice of performing passive movement and static stretching exercises as a treatment intervention for spinal cord injury patients by physiotherapists and occupational therapists at the CRP, Savar. The study had some limitations but researchers identified some further steps that might be taken for the better accomplishment of further research. The main recommendations would be as follows:

- In this study, researchers found that some modifications are required for the practice of passive movement and static stretching exercises as interventions for spinal cord injury patients at CRP.
- This study was done among physiotherapists and occupational therapists only, excluding other rehabilitation professionals. So, the next study will be done involving all rehabilitation professionals.
- The next study will be on the practice of a range of motion exercises and strengthening exercises as interventions for spinal cord injury patients by rehabilitation professionals.

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Appendix

সম্মতিপত্র (বাংলা)

(অংশগ্রহনকারিকে পড়ে শোনাতে হবে)

আসসালামু আলাইকুম /আদাব, আমার নাম রোকসানা আফরিন, আমি এই গবেষণাটি বাংলাদেশ হেলথ্ প্রফেশনাল ইন্সটিউটে (বি এইচ পি আই), ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধীনে করছি যা আমার ফিজিওথেরাপি স্নাতক কোরসের আংশিক অধিভুক্ত যার শিরোনাম " থেরাপিষ্টদের দ্বারা সি আর পির মেরুদণ্ডের আঘাত জনিত ইউনিটে শরীরের বিভিন্ন জয়েন্টে প্যাসিভ আন্দোলন এবং স্ট্যাটিক স্ট্রেচিং ব্যায়াম অনুশীলন"।

ফরমে উল্লেখিত কিছু প্রশ্নের উত্তর দেয়ার জন্য আন্তরিকভাবে অনুরোধ জানাচ্ছি যা আনুমানিক ২০-৩০ মিনিট সময় নিবে।

আমি আপনাকে অবগত করছি যে, এটা কেবলমাত্র আমার অধ্যয়নের সাথে সম্পর্কযুক্ত এবং অন্য কোন উদ্দেশ্যে ব্যবহার হবে না। আমি আপনাকে আরো নিশ্চয়েতা প্রদান করছি, যে সকল তথ্য প্রদান করবেন তার গোপনিয়তা বজায় থাকবে এবং এই তথ্যের উৎস অপ্রকাশিত থাকবে।এমনকি গবেষণাটির শেষে এই সকল তথ্য নষ্ট করে ফেলা হবে। এই অধ্যয়নে আপনার অৎশগ্রহণ স্বেচ্ছাপ্রনোদিত এবং আপনি যে কোনো সময় এই অধ্যয়ন থেকে কোনো নেতিবাচক এবং ফলাফল কোন বিব্রতবোধ ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন। এছাড়াও কোন নিদিষ্ট প্রশ্ন অপছন্দ হলে উত্তর না দেয়ার এবং সাক্ষাৎকারের সময় কোন উত্তর না দিতে চাওয়ার অধিকার আপনার আছে।

যদি আপনার এই গবেষণা সম্পর্কে কিছু প্রশ্ন করার থাকে অথবা অংশগ্রহণকারি হিসেবে এটা আপানার অধিকার, তাহলে আপনি গবেষকের সাথে যোগাযোগ করতে পারেন।

এই সাক্ষাৎকার শুরু করার আগে আপনার কি কোন প্রশ্ন আছে ?

আমি আপনার অনুমতি নিয়ে এই সাক্ষাৎকার শুরু করতে যাচ্ছি? হ্যাঁ ☐ না ☐

সাক্ষাৎকার প্রদানকারীর স্বাক্ষর.. তারিখ ....

সাক্ষাৎকার গ্রহনকারির স্বাক্ষর.. তারিখ ....

প্রশ্নপত্র (Bangla)

অংশ ক (সামাজিক সম্পরক্রিত):

ক্রমিক	প্রশ্নপত্র	বিভাগ	
১	বর্তমান বয়স	………..বছর	
2	লিঙ্গ	১।পুরুষ ২।মহিলা	
৩	পেশা	১। ফিজিওথেরাপিস্ট ২। অকুপেশনাল থেরাপিস্ট	
৪	উপাধি	**ক. ফিজিওথেরাপিস্ট** ১.সিনিয়র কনসালটেন্ট ফিজিওথেরাপিস্ট ২.জুনিয়র কনসালটেন্ট ফিজিওথেরাপিস্ট ৩. ক্লিনিক্যাল ফিজিওথেরাপিস্ট ৪. ক্লিনিক্যাল ফিজিওথেরাপিস্ট	**খ.অকুপেশনাল-থেরাপিস্ট** ১.সিনিয়র কনসালটেন্ট অকুপেশনাল-থেরাপিস্ট ২.জুনিয়র কনসালটেন্ট অকুপেশনাল-থেরাপিস্ট ৩. ক্লিনিক্যাল অকুপেশনাল-থেরাপিস্ট

		৫.ডিপ্লোমা ফিজিওথেরাপিস্ট ৬.সহকারী ফিজিওথেরাপিস্ট ৭.মেডিকেল টেকনোলজিস্ট ফিজিওথেরাপিস্ট ৮.ইন্টার্ন ফিজিওথেরাপিস্ট ৯.অন্যান্য..................	৪. ক্লিনিকাল অকুপেশনাল-থেরাপিস্ট ৫.ডিপ্লোমা অকুপেশনাল-থেরাপিস্ট ৬.সহকারী অকুপেশনাল-থেরাপিস্ট ৭. মেডিকেল টেকনোলজিস্ট অকুপেশনাল-থেরাপিস্ট ৮.ইন্টার্ন অকুপেশনাল-থেরাপিস্ট ৯. অন্যান্য...........
৪	কাজের অভিজ্ঞতা	১. বছর........... ২. মাস.............. ৩. দিন............	

পার্ট খ - ব্যবহারিক তথ্য: আজ এসসিআই রোগীদের জন্য আপনার প্যাসিভ মুভমেন্ট এবং স্ট্যাটিক স্ট্রেচিং এক্সারসাইজ এর বর্ণনা দিতে অনুগ্রহ করে নিম্নলিখিত ঘরগুলি **পূরণ করুন**

খ অংশ (১):

আপনার কি কোনো গাইডলাইন প্রোটোকল আছে বা প্যাসিভ মুভমেন্ট দেওয়ার জন্য কোনো চিকিৎসা পদ্ধতি অনুসরণ করেন?	১.না ২.হ্যাঁ........... (দয়া করে প্রোটোকল/চিকিৎসার পদ্ধতি লিখুন)

স্ট্যাটিক স্ট্রেচিং এক্সারসাইজ দেওয়ার জন্য আপনার কি কোনো গাইডলাইন প্রোটোকল আছে বা কোনো চিকিৎসা পদ্ধতি অনুসরণ করেন?	১.না ২.হ্যাঁ.......... (দয়া করে প্রোটোকল/চিকিত্সা পদ্ধতি লিখুন

পার্ট খ (২): প্যাসিভ মুভমেন্ট এবং স্ট্যাটিক স্ট্রেচিং এক্সারসাইজ করা রোগীর সংখ্যা

চিকিৎসা করা রোগীদের প্রকার	চিকিৎসা করা রোগীর সংখ্যা	প্যাসিভ মুভমেন্ট দেওয়া রোগীর সংখ্যা	স্ট্যাটিক স্ট্রেচিং ব্যায়াম দেওয়া রোগীর সংখ্যা
প্যারাপ্লেজিয়া			
টেট্রাপ্লেজিয়া			

অংশ: খ(৩): প্যাসিভ মুভমেন্টের বর্ণনা

রোগীর ধরন	রোগীর কোড	প্রান্ত	জয়েন্ট	পুনরাবৃত্তির সংখ্যা (ক)	সেটের সংখ্যা (খ)	মোট পুনরাবৃত্তি (কXখ)	প্যাসিভ মুভমেন্ট দেওয়ার জন্য মোট প্রয়োজনীয় সময়	অনুগ্রহ করে নিচের প্যাসিভ মুভমেন্ট দেওয়ার আপনার উদ্দেশ্য নির্বাচন করুন এবং ক/খ/গ/ঘ আকারে আপনার সঠিক উত্তরটি লিখুন এবং আপনার একাধিক উত্তর থাকলে অনুগ্রহ করে সবচেয়ে

								গুরুত্বপূর্ণটি প্রথমে অনুসরণ করে লিখুন: ক. রক্ত সঞ্চালন বাড়ায় খ. ROM বৃদ্ধি/রক্ষণাবেক্ষণ গ. পেশী শক্তি/শক্তি/সহনশীলতা/নমনীয়তা বাড়ান ঘ. অন্য কোন.......(দয়া করে উল্লেখ করুন)
প্যারাপ্লে জিয়া	১	উর্ধ্ব অঙ্গ	কাঁধ					
			কনুই					
			কব্জি					
			আঙুল					
		নিম্ন অঙ্গ	নিতম্ব					

			হাঁটু				
			গোড়ালি				
			আঙুল				
	২	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্ন অঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
প্যারাপ্লেজিয়া			আঙুল				
			কাঁধ				

৩	উর্ধ্ব অঙ্গ	কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
৪	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				

		হাঁটু					
		গোড়ালি					
		আঙুল					
৫	উর্ধ্ব অঙ্গ	কাঁধ					
		কনুই					
		কব্জি					
		আঙুল					
	নিম্ন অঙ্গ	নিতম্ব					
		হাঁটু					
		গোড়ালি					
		আঙুল					

	৬	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
প্যারাপ্লেজিয়া			গোড়ালি				
			আঙুল				
	৭	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				

	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
৮	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				

		গোড়ালি				
		আঙুল				
৯	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
১০	উর্ধ্ব অঙ্গ	কাঁধ				

			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
			আঙুল				
টেট্রা প্লেজ িয়া	১	ঊর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				

			হাঁটু				
			গোড়ালি				
			আঙুল				
	২	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
			আঙুল				
	৩	উর্ধ্ব অঙ্গ	কাঁধ				

		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
৪	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				

		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
			আঙুল				
	৫	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				

		আঙুল				
৬	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
	নিম্ন অঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				

৭		আঙুল				
	নিম্ন অঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
৮	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
	নিম্ন অঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				

			আঙুল				
	৯	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
			আঙুল				
	১০	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				

			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
			আঙুল				

অংশ: খ (৪): স্ট্যাটিক স্ট্রেচিং অনুশীলনের বর্ণনা

রোগীর ধরন	**রোগীর কোড**	**প্রান্ত**	**জয়েন্ট**	**পুনরাবৃত্তির সংখ্যা(ক)**	**সেটের সংখ্যা (খ)**	**মোট পুনরাবৃত্তি**	**স্ট্যাটিক স্ট্রেচিং অনুশীলনের জন্য মোট প্রয়োজনীয় সময়**	**অনুগ্রহ করে নিচের থেকে স্ট্যাটিক স্ট্রেচিং এক্সারসাইজ দেওয়ার আপনার উদ্দেশ্য নির্বাচন করুন এবং ক/খ/গ/ঘ আকারে আপনার সঠিক উত্তরটি লিখুন এবং আপনার যদি একাধিক উত্তর থাকে তাহলে অনুগ্রহ করে**

								সবচেয়ে গুরুত্বপূর্ণটি প্রথমে অনুসরণ করে লিখুন: **ক. রক্ত সঞ্চালন বাড়ায়** **খ. ROM বৃদ্ধি/রক্ষণাবেক্ষণ** **গ. পেশী শক্তি/শক্তি/সহনশীলতা/নমনীয়তা বাড়ান** **ঘ. অন্য যেকোন..........(অনুগ্রহ করে উল্লেখ করুন)**
প্যারাপ্লেজিয়া	১	উর্ধ্ব অঙ্গ	কাঁধ					
			কনুই					
			কব্জি					
			আঙুল					

	নিম্নঅঙ্গ	নিতম্ব					
		হাঁটু					
		গোড়ালি					
		আঙুল					
২	উর্ধ্ব অঙ্গ	কাঁধ					
		কনুই					
		কব্জি					
		আঙুল					
	নিম্নঅঙ্গ	নিতম্ব					
		হাঁটু					
		গোড়ালি					

প্যারাপ্লেজিয়া			আঙুল				
	৩	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
			আঙুল				
	৪	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				

		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
৫	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				

			আঙুল				
	৬	ঊর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
প্যারাপ্লেজিয়া			গোড়ালি				
			আঙুল				
	৭	ঊর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				

		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
	ঊর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
৮		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				

		গোড়ালি				
		আঙুল				
	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
৯	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
১০	উর্ধ্ব অঙ্গ	কাঁধ				

			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
			আঙুল				
টেট্রাপ্লেজিয়া	১	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				

			হাঁটু				
			গোড়ালি				
			আঙুল				
	২	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
			আঙুল				
	৩	উর্ধ্ব অঙ্গ	কাঁধ				

		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
৪	ঊর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				

		হাঁটু				
		গোড়ালি				
		আঙুল				
৫	উর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
	উর্ধ্ব অঙ্গ	কাঁধ				

৬		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				
		হাঁটু				
		গোড়ালি				
		আঙুল				
৭	ঊর্ধ্ব অঙ্গ	কাঁধ				
		কনুই				
		কব্জি				
		আঙুল				
	নিম্নঅঙ্গ	নিতম্ব				

			হাঁটু					
			গোড়ালি					
			আঙুল					
	৮	ঊর্ধ্ব অঙ্গ	কাঁধ					
			কনুই					
			কব্জি					
			আঙুল					
		নিম্নঅঙ্গ	নিতম্ব					
			হাঁটু					
			গোড়ালি					
			আঙুল					
		ঊর্ধ্ব অঙ্গ	কাঁধ					

	৯		কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				
			হাঁটু				
			গোড়ালি				
			আঙুল				
	১০	উর্ধ্ব অঙ্গ	কাঁধ				
			কনুই				
			কব্জি				
			আঙুল				
		নিম্নঅঙ্গ	নিতম্ব				

			হাঁটু					
			গোড়ালি					
			আঙুল					

Consent Form (English)

(Please read out to the participant)

Hello, I am Roksana Afrin, a student of B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI), an academic institute of CRP. I shall have to conduct research, which is a part of my study. The participants are requested to participate in the study after reading the following.

My research title is **— "Practice of passive movement and stretching exercise of the limbs by the rehabilitation professionals for spinal cord injury patients at CRP"**. If I can complete the study successfully, I can gain more knowledge about physical activity which is helpful for my profession. To fulfill my research project, I need to collect data. That's why I would like to know the answers to some questions, which take about 20-30 minutes. I would like to inform you that this is a purely academic study and will not be used for any other purpose. I assure you that all data will be kept confidential. This will not harm you.

Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you don't like or do not want to answer during the interview. If you have any queries about the study or your right as a participant, you may contact me.

Do you have any questions before I start?

So, may I have your consent to proceed with the interview? Yes ☐No ☐

Signature of the Participant and date ______________________________

Signature of the Interviewer and date _____________________________

Questionnaire (English)

Part A (Socio demographic):

Serial	Questionnaire	Coding category	
1	Current age	………..year	
2	Sex	I. Male II. Female	
3	Profession	I. Physiotherapist II. Occupational therapist	
4	Designation	A. Physiotherapist I. Senior Consultant Physiotherapist II. Junior Consultant Physiotherapist III. Senior Clinical Physiotherapist IV. Junior Clinical Physiotherapist V. Diploma Physiotherapist VI. Assistance physiotherapist VII. Medical technologist physiotherapist VIII. Intern Physiotherapist IX. Other…………..	B. Occupational-therapist I. Senior Consultant Occupational-therapist II. Junior Consultant Occupational-therapist III. Senior Clinical Occupational-therapist IV. Junior Clinical Occupational-therapist V. Diploma Occupational-therapist VI. Assistance Occupational-therapist VII. Medical technologist Occupational-therapist VIII. Intern Occupational-therapist IX. Other………..
5	Job experience	I Year…………. II. Month………….. III. Day…………	

Part B – practical information: please fill in the following gaps to describe your administration of Passive Movement (PM) and Static Stretching Exercise (SSE) for SCI patients today

Part B (1):

Do you have any guideline protocol or follow any treatment approach to give Passive Movement?	I. No II. Yes……….. (please write down the guidance protocol/treatment approach)
Do you have any guideline protocol or follow any treatment approach to give Static Stretching Exercise?	I. No II. Yes……….. (please write down the guidance protocol/treatment approach

Part B (2): Number of patients given to Passive Movement and Static Stretching Exercise

Types of patients treated	**Number of patients treated**	**Number of patients given passive movements**	**Number of patients given static stretching exercise**
Paraplegia			
Tetraplegia			

Part: B (3): Description of Passive Movement

Type of patient	**Patient Code**	**Extremity**	**Joint**	**Number of repetition (A)**	**Number of sets (B)**	**Total repetition (AXB)**	**Total time required for giving passive movement**	**Please select your purpose of giving Passive Movement from the following and write down your correct answer in the form of A/B/C/D and if**

								you have multiple answer please write down the most important one first followed by others: **A. Increase blood circulation** **B. Increase/maintain ROM** **C. Increase muscle power/strength/endurance/flexibility** **D. Any other.......(please mention)**
Paraplegia	1	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					

			Ankle					
			Finger					
			Shoulder					
		Upper limbs	Elbow					
			Wrist					
	2		Finger					
		Lower limbs	Hip					
			Knee					
Paraplegia			Ankle					
			Finger					
		Upper limbs	Shoulder					
			Elbow					
	3		Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					

			Finger					
	4	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
	5	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					

Paraplegia	6	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	7	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
		Upper limb	Shoulder					
			Elbow					

	8		Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	9	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	10	Upper limb	Shoulder					
			Elbow					
			Wrist					

			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
Tetraplegia	1	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	2	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					

		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	3	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	4	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					

		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
	5	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
	6	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					

		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
	7	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
	8	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower Limbs	Hip					
			Knee					

			Ankle					
			Finger					
	9	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	10	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					

Part: B (4): Description of Static Stretching Exercise

Type of patient	**Patient Code**	**Extremity**	**Joint**	**Number of repetition (A)**	**Number of sets (B)**	**Total repetition (AXB)**	**Total time required for giving passive movement**	**Please select your purpose of giving Static Stretching Exercise from the following and write down your correct answer in the form of A/B/C/D and if you have multiple answer please write down the most important one first followed by others:** **A. Increase blood circulation** **B. Increase/maintain ROM** **C. Increase muscle power/strength/endurance/flexibility** **D. Any other...........(please mention)**
Paraplegia	1	Upper limbs	Shoulder					
			Elbow					
			Wrist					

			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
	2	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
Paraplegia	3	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					

			Ankle					
			Finger					
	4	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
	5	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					

Paraplegia	6	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	7	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
		Upper limb	Shoulder					
			Elbow					

	8		Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	9	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	10	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					

		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
Tetraplegia	1	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
	2	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
			Hip					

			Knee					
		Lower limb	Ankle					
			Finger					
	3	Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
		Upper limbs	Shoulder					
	4		Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					

			Ankle					
			Finger					
	5	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
	6	Upper limbs	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					

			Finger					
			Shoulder					
		Upper limbs	Elbow					
	7		Wrist					
			Finger					
		Lower limbs	Hip					
			Knee					
			Ankle					
			Finger					
		Upper limbs	Shoulder					
			Elbow					
	8		Wrist					
			Finger					
		Lower Limbs	Hip					
			Knee					
			ankle					
			Finger					
			Shoulder					

	9	Upper limb	Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					
10		Upper limb	Shoulder					
			Elbow					
			Wrist					
			Finger					
		Lower limb	Hip					
			Knee					
			Ankle					
			Finger					

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)

Bangladesh Health Professions Institute (BHPI)

(The Academic Institute of CRP)

Ref: CRP/BHPI/IRB/02/2022/559

Date: 22/02/2022

Roksana Afrin
4th Year B.Sc. in Physiotherapy
Session: 2016 – 2017
BHPI, CRP, Savar, Dhaka- 1343, Bangladesh

Subject: Approval of the research project proposal **"Practice of Passive Movement and Stretching Exercise of the Limbs by the Rehabilitation Professionals for Spinal Cord Injury Patients at CRP"** by ethics committee.

Dear Roksana Afrin,

Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator and Muhammad Millat Hossain as thesis supervisor. The Following documents have been reviewed and approved:

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

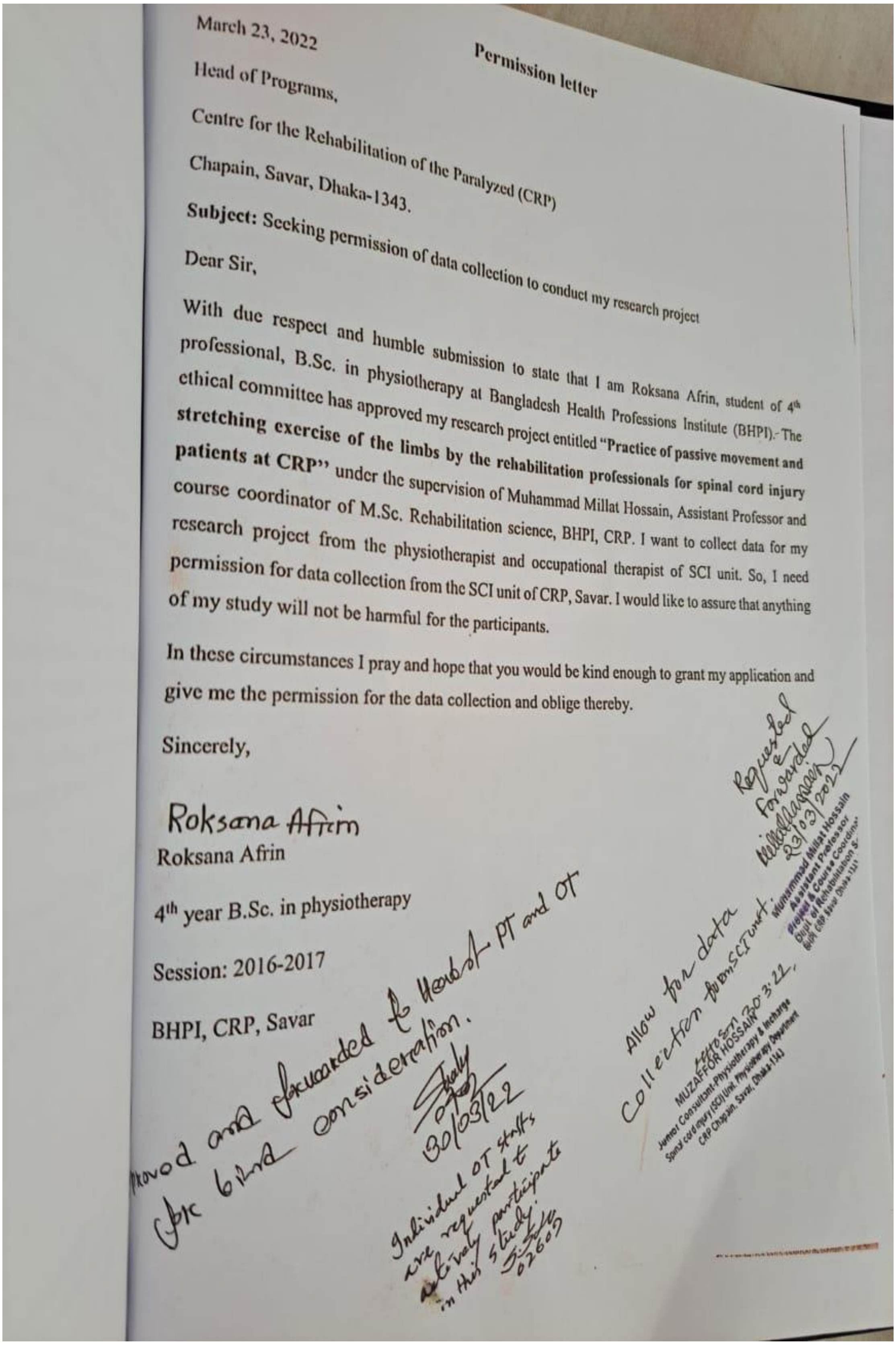
The purpose of the study is to grain in-depth insight and understandings of people with spinal cord injury in order to understand the practice of passive movement and stretching exercises by rehabilitation professionals. Since the study involves questionnaire that takes maximum 20-30minutes and have no likelihood of any harm to the participants, the members of the Ethics committee approved the study to be conducted in the presented form at the meeting held at 09:00 AM on 12 October, 2021 at BHPI (30th IRB Meeting).

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

Best regards,

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

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404
E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd, www.crp-bangladesh.org



March 23, 2022

Permission letter

Head of Programs,

Centre for the Rehabilitation of the Paralyzed (CRP)

Chapain, Savar, Dhaka-1343.

Subject: Seeking permission of data collection to conduct my research project

Dear Sir,

With due respect and humble submission to state that I am Roksana Afrin, student of 4th professional, B.Sc. in physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project entitled "**Practice of passive movement and stretching exercise of the limbs by the rehabilitation professionals for spinal cord injury patients at CRP**" under the supervision of Muhammad Millat Hossain, Assistant Professor and course coordinator of M.Sc. Rehabilitation science, BHPI, CRP. I want to collect data for my research project from the physiotherapist and occupational therapist of SCI unit. So, I need permission for data collection from the SCI unit of CRP, Savar. I would like to assure that anything of my study will not be harmful for the participants.

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

Sincerely,

Roksana Afrin

Roksana Afrin

4th year B.Sc. in physiotherapy

Session: 2016-2017

BHPI, CRP, Savar

Approved and forwarded to Head of PT and OT for kind consideration.
30/03/22

Individual OT staffs are requested to actively participate in this study.

Allow for data collection from SCI unit.
30.3.22
MUZAFFOR HOSSAIN
Senior Consultant-Physiotherapy & Incharge
Spinal Cord Injury (SCI) Unit, Physiotherapy Department
CRP Chapain, Savar, Dhaka-1343

Requested & forwarded
23/03/2022
Muhammad Millat Hossain
Assistant Professor
Project & Course Coordinator
Dept of Rehabilitation Sc.
BHPI, CRP, Savar, Dhaka-1343