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MUSCULOSKELETAL DISORDERS AMONG CAREGIVERS OF STROKE PATIENTS

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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

"MUSCULOSKELETAL DISORDERS AMONG CAREGIVERS OF STROKE PATIENST"

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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 of the study. I would be bound to take written consent from the department of physiotherapy of Bangladesh Health Professions Institute (BHPI).

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Contents

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ACRONYMS

ADL	Activities of Daily Living
BHPI	Bangladesh Heath Professions Institute
CRP	Center for the Rehabilitation of the Paralyzed
IRB	Institutional Review Board
WHO	World Health Organization
ICH	Intra Cerebral Hemorrhage
SAH	Sub Arachnoid hemorrhage
MSDs	Musculoskeletal disorders
WRMSDs	Work-related musculoskeletal disorder
DALY	Disability-adjusted life years
SPSS	Statistical Package for the Social Sciences
NPRS	Numeric Pain Rating Scale

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ABSTRACT

Purpose: The study was done to identify the common musculoskeletal disorders among caregivers of stroke patients.

Objective: To determine the socio-demographic information of the caregivers. To investigate the number of caregivers experienced musculoskeletal disorder and know the severity of symptoms. To explore the types and commonly experienced musculoskeletal disorder among caregivers. To identify the association between affected body parts with age, gender, caregiving duration, caregiving hours. To find out the vulnerable working posture influencing to musculoskeletal disorder.

Methods: The study was conducted by using of cross-sectional method. 123 participants were selected from Neurology unit, CRP, Savar, Dhaka by following the inclusion and exclusion criteria. All data were collected through face-to face interview by using a semi structured questionnaire.

Results: About 64% (n=83) participants were female and rest of them33% (n=40) were male. Most of the participants faced musculoskeletal disorder 97% (n=120). Among them 59% faced musculoskeletal disorder at2-5 months ago and in most case 37% were caregiving from 6-11 months. The most participants were of 20-30years. 29% faced musculoskeletal disorder on lower back, 17% on knee, 14.5% on upper back, 13.3% on shoulder(s), 9.7% on Neck ,8% on Ankle/Feet(s), 3.9% on Elbows, Hip/Thigh(s) and 3.1% on wrist. And most of the participants were wife (37%) and daughter (18%).

Conclusion: The study was representing the strong evidence that musculoskeletal disorders are common in caregivers of stroke patient. Care givers are the part and parcel of intervention program. They need to care for their own health in order to reduce musculoskeletal problems, corrective posture and ergonomics concern from Physiotherapist regarding caring for their patients and managing their everyday life, reduction of prolonged working hours can prevent musculoskeletal disorders. Thus, the stroke survivors as well as the caregivers may get their fruitful intervention.

Key words: MSDs, Caregivers, Stroke patient**.**

CHAPTER-I INTRODUCTION

1.1 Background

Worldwide, cerebrovascular accidents (CVA) are the second leading cause of adult mortality and the third leading cause of short-and long-term disability (WHO, 2012). In Bangladesh, after coronary heart disease and infectious disease, stroke has been ranked as the 3rd main reason of loss of life. The World Health Organization ranks Bangladesh's mortality rate due to stroke as number 84 in the world (Islam et al., 2012). Now-a-days, after first stroke more than 75% of patients survive, among those 40% feel moderate to severe disabilities, 25% have minor disability (Ovbiagele et al., 2014). Large amount of stroke survivors rely on formal or informal caregivers. Caregivers may experience a wide range of changes in lifestyle and quality of life (Ebrahimzadeh et al., 2014). Caregivers may face many musculoskeletal complaints due to handle their patient (Yalcinkaya et al., 2010).

Medically, a stroke is a focal neurological disorder involving decreased blood flow to the brain as a consequence of a pathological process in the blood vessels, thus making it vascular in origin (Lezak, 2004). Globally, 70% and 87% of strokes and both stroke-related deaths and disability-adjusted life years occur in low and middle-income countries. The incidence has more than doubled in low-and middle-income countries over the last four decades, the stroke has reduced 42% in high-income countries. On average, stroke occurs 15 years earlier in low and middle-income countries than high-income countries (Feigin et al.,2010). In our nation the predominance of stroke over the age of 40 is 370/100000 (Mohammad, 2013).

In the United States in 2005 stroke caused about one of every 17 deaths. Stroke mortality for 2005 was 143,579 (56,586 males, 86,993 females). Every seven minutes, a Canadian dies of heart diseases or stroke. Europe averages approximately 650,000 stroke deaths each year (Braunwald et al., 2003). There are 2 types of stroke: Ischemic and Hemorrhagic. Hemorrhagic additionally 2 types intra cerebral hemorrhage (ICH) and subarachnoid hemorrhage (SAH). 85% strokes are ischemic, 10% are intracranial hemorrhages (ICH) and 5% are subarachnoid hemorrhages (SAH) (Iqbal et al., 2010). The burden of stroke was increased 19% between 1990 and 2010 and it estimated that globally the mortality will raise to 7.8 million in 2030 (Organized inpatient (stroke unit) care for stroke, 2013).

According to the World Health Organization, every year worldwide 15 million people suffer from stroke. Of this 5 million die and 5 million are disabled permanently (Aydin et al., 2016). The disability rates among stroke survivor is between 24–54% (Srivastava et al., 2010). It is predicted that the number of stroke related burdens will be raised over the next two decades, but expected that the impressive improvement in the medical management of stroke will lessen the crisis (Langhorne et al., 2011). The mortality rate was 6·00% (in 2006) which elevated to 8·57% (in 2011) with an age-adjusted mortality rate of 108·31 per 100 000 people (in 2011). 5·8% were reported crude death per 1000 people in Bangladesh (Islam et al., 2012).

The number of stroke patients will probably increase in huge amount by 2050 and of those about 50% patients may require assistance in their ADL within 12 months (Van et al., 2015). Functional independence and the basic skills of daily life are hampered as stroke survivors often face physical, mental, and/or social limitations. Though the numbers of post-stroke survivors increased due to improvement in health care, but the level of disability remains high in this population (Moreira et al.,2018). Stroke survivors can experience long-term problems at different points in their recovery, and these will affect their quality of life for up to 5 years poststroke and possibly longer (Philp et al.,2013).

In stroke rehabilitation team family caregivers of stroke survivors are recognized as essential members. Following the devitalizing consequences of stroke, especially the impairments of body functions, and activity limitations, stroke survivors are often emotionally and physically dependent on caregivers to carry out activities of daily living, especially family caregivers. This makes the burden of caregiving to fall a single individual of family (Vincent et al.,2018). Spouses are the most probable caregivers as stroke is more prevalent in the elderly. Family members are usually informal caregiver. Other caregivers are paid professionals. (Hartke & King., 2003). According to the Thai National Statistical Office's 2007 Survey of Thai elderly, 10% of Thai elderly require caregivers (40% received care from daughters, 28% from spouses and 12% from sons) (Yiengprugsawan et al., 2012).

Caregivers may face many musculoskeletal complaints (Menon et al.,2017). Musculoskeletal Disorders (MSD) such as pain in back, shoulder, knee etc. are common in fulltime caregivers. The causes were found to be repetitive heavy lifting and carrying,

maintaining awkward posture for long duration, ignorance of own health issues, less reporting of musculoskeletal injury and attaining many patients in a single day. Architectural barriers in the home environment or the presence of inappropriate furniture can alter the post-stroke individual's independence and overload caregivers. Studies have highlighted the importance of ergonomic adaptations in the home to facilitate the day-to-day activities of post-stroke patients and their caregivers (Tan et al., 2020).

Caregiver has to do variable amounts of physical work such as assist with mobility, positioning or transfers, bathing, dressing, eating, toileting etc (Geere et al., 2011). This added responsibility gives excessive stress on caregiver leading to negative symptoms such as depression, anxiety, muscular fatigue, social isolation, relationship issues, and poor quality of life (Menon et al., 2017). The physical factors including forward bending, rotating, lifting and techniques used during lifting, carrying, the intensity of the load on the spine and related muscles during dynamic and static postures, pulling and pushing during bathroom activities, dressing, transferring, feeding; while caring with disabilities are all which increase stress on the musculoskeletal structures of the back (Düger et al., 2003).

Gaugler (2010) mentioned that many caregivers report considerable burdens and display poor mental and physical health than the general population during the months or years following the onset of their family member's stroke. The prevalence of caregiver burden ranged from 25% to 54% worldwide. Informal caregivers have been found to have a higher prevalence of depression, as well as the negative effects of their physical, psychological, and social health. The burden faced by caregivers has been associated with various negative toward patient's life, such as increased post-stroke depression, cognitive decline, physical disability, and general quality of life (Tan et al.,2020).

Musculoskeletal disorders include sprains, strains, tears, soreness, pain, carpal tunnel syndrome, hernias, and connective tissue injuries of the affecting muscles, bones, nerves, tendons, ligaments, joints, cartilages, and spinal discs (da Costa et al.,2010). Work-related musculoskeletal disorders (WRMSDs) is an umbrella term for symptoms caused or worsened by work. These disorders are defined as discomfort,

impairment, disability or persistent pain in the locomotor system (Martinelli et al.,2004). MSD can cause pain in the neck, shoulder, arm, wrist, hands, upper and lower back, hips, knees and feet. The 12-month period prevalence for nurses was recently reported at 85.5% though they are paid professional caregiver (Hayes et al.,2009).

Among Musculoskeletal disorders (MSDs) prevalence of low back pain (LBP) is 40% to 60% in Asiatic countries and around 46-47% in USA. In Europe prevalence of 16% in Europe and increased to 32% in the middle of the lumbar area. In Italy the prevalence was higher ranging from 36% to 86%. These disorders can interfere with work and daily life activities. Furthermore, the LBP can be responsible of absence from work, reducing productivity and decreasing the capacity to carry out daily activities, with heavy economic and social repercussions, in terms of diagnosis and therapeutics (Latina et al.,2020).

Now it is the most remarkable problem of the medical care of Bangladesh. Many patients visit out patient's physiotherapy service for their low back pain problem. Evidence based health care received increased attention during the last decade and is important to monitor and improve quality of health care. Physiotherapy management of low back pain also needs to move forward in the mainstream of evidence-based healthcare (Bekkering et al., 2003). Work-related musculoskeletal disorders (WMSDs) are responsible for morbidity in many working populations along with the work of caregiving. This lowers the quality of life and reduce the productivity, WMSDs are the most expensive form of work disability, attributing to about 40% of all costs toward the treatment of work-related injuries (Yasobant et al.,2014).

Caregivers need basic caregiving knowledge and skills. These include helping the patients in basic daily living activities such as feeding, dressing mobilizing, bathing, and toileting. They also require higher-level skills such as supervision and administration of medications, handling medical equipment), managing the healthcare system, arranging transportation (Tan et al.,2020). Therefore, families need assistance in learning how to maintain their own health whilst dealing with a new and difficult life situation. This is particularly relevant for older caregivers and for caregivers who are less educated. A well-designed discharge plan with continuity of care may benefit both patients and caregivers in the long-term caregiving process (Chow et al.,2006).

Health professionals can assist informal caregivers from various clinical aspects, such as preventive or rehabilitative actions, or health maintenance or compensatory strategies These approaches may address aspects such as ergonomics, biomechanics, or kinesiotherapy (Correa et a.,2015). In various developed countries, transition care programs have been developed to meet the need for caregiver training and support. Structured caregiver training and post-discharge support and follow up are provided to ensure patient and caregiver safety during the transition process. The implementation of transition care is highly variable as they are tailored to the available social and community health services at respective locations (Tan et al.,2020).

1.2 Rationale

Stroke is a common neurological condition, mostly seen in developing country. Day by day the number of stroke patient is increasing and the disability rate due to stroke are increasing proportionally. Stroke affects an estimated 17 million people each year globally. Caregivers constitute an important informal workforce, often undervalued, facing challenges to maintain their caring role, health and wellbeing. Information on the health and wellbeing of caregivers in middle-income economies is quite limited. Some studies on caregivers have been reported from Asia but most of these have been conducted in more affluent countries. Caregivers face musculoskeletal disorders that cause pain in the neck, shoulder, arm, wrist, hands, upper and lower back, hips, knees and feet. Muscle tissue can be damaged with the wear and tear of daily activities. Trauma, postural strain, repetitive movements, overuse can be cause of pain. Pain is the most common symptom. In some cases, there may be joint stiffness, muscle tightness, redness and swelling of the affected area. Some may also experience sensations of "pins and needles" numbness.

The study is an initiative to find out the musculoskeletal disorders among caregivers of stroke patient. Literature showed that prolong static posture like stooping, bending, sitting, standing as well as prolong squatting can be associated with musculoskeletal disorder. Caregivers assist in personal care, mobility and other basic ADLs. They regularly do heavy weight lifting and heavy physical work. So the caregivers are the more vulnerable to develop musculoskeletal disorder in our country. But this topic does not come into focus because most of the time they ignore this problem. They only disclose the problem when it becomes intolerable to them and they cannot continue the work anymore. They lack knowledge about their appropriate treatment but most of this disorder can be prevented or even curable only by following some agronomical advice during their practices and ADLs. From this study investigator will able to identify the musculoskeletal disorders and the most common factors which are responsible for developing musculoskeletal disorders which can help to develop appropriate measures to prevent the musculoskeletal disorders among the caregivers. Caregivers may provide proper guideline which will be helpful for them.

There are few studies regarding musculoskeletal disorder among caregivers of stroke patient but there is no study in Bangladesh. The daily life of caregivers are not only hampered but also negatively impact on caregivers' ability to care for their patient. Caregivers have an important role in rehabilitation process of stroke patient. Therefore, it is very important to conduct this regarding caregivers as their health impacts on the health of their patients. This study is a resource for evidence.

1.3 Research Question

What are the musculoskeletal disorders among caregivers of stroke patients?

1.4 Objective

1.4.1 General Objective

To determine the musculoskeletal disorders among caregivers of stroke patients.

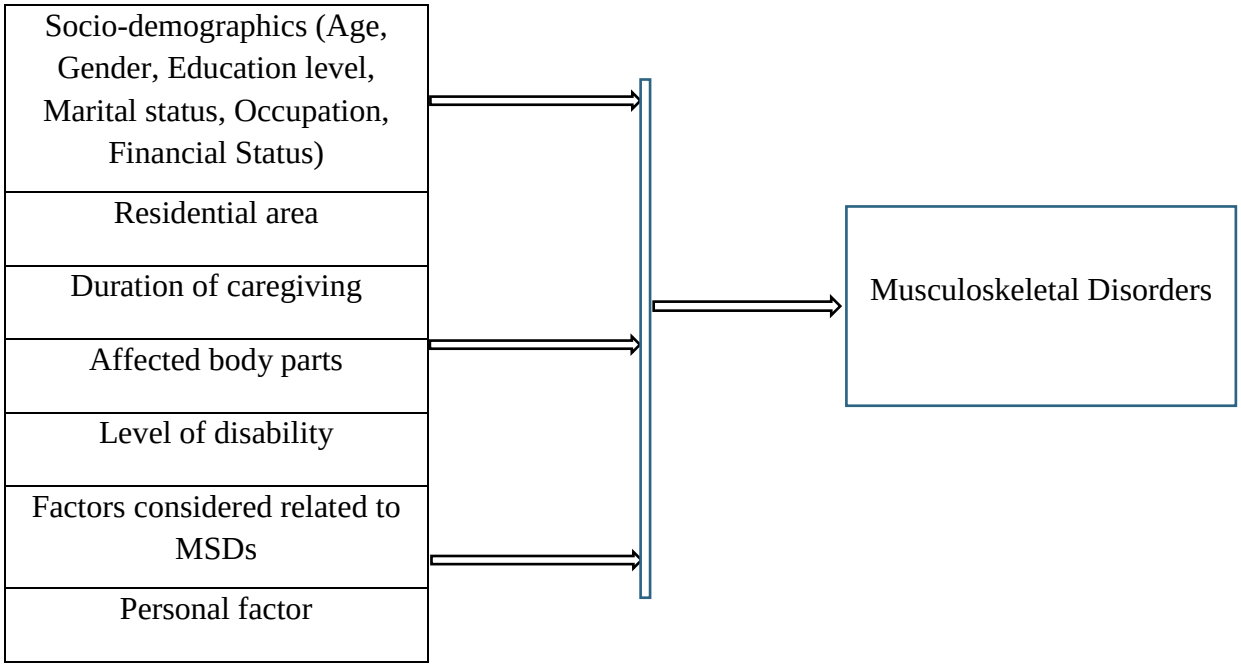
1.4.2 Specific Objective

- To determine the socio-demographic information of the caregivers.
- To investigate the number of caregivers experienced musculoskeletal disorder and know the severity of symptoms.
- To explore the types and commonly experienced musculoskeletal disorder among caregivers.
- To identify the association between affected body parts with age, gender, caregiving duration, caregiving hours.
- To find out the vulnerable working posture influencing to musculoskeletal disorder.

1.5 Conceptual Framework

List of variables:

Independent variables	Dependent Variables



1.6 Operational definition

Stroke:

WHO defines stroke as rapidly developed clinical signs of focal disturbance of cerebral function lasting for more than 24 hours or leading to death without any apparent cause other than vascular origin.

Musculoskeletal disorder:

Musculoskeletal disorders are injuries or dysfunctions affecting muscles, bones, nerves, tendons, ligaments, joints, cartilages, and spinal discs. Musculoskeletal disorders include sprains, strains, tears, soreness, pain, connective tissue injuries in the neck, shoulder, arm, wrist, hands, upper and lower back, hips, knees and feet with symptoms of pain, aches, paresthesia, tingling, numbness and stiffness etc.

Caregiver:

Caregivers provide care to people who need some degree of ongoing assistance with everyday tasks on a regular or daily basis. The recipients of care can live either in residential or institutional settings, range from children to older adults, and have chronic illnesses or disabling conditions.

CHAPTER II LITERATURE REVIEW

The federal Bureau of Labor Statistics (BLS) (2011) has defined musculoskeletal disorders (MSDs) as injuries and disorders to muscles, nerves, tendons, ligaments, joints, cartilage, and spinal discs. Musculoskeletal disorders are occasionally called ergonomic injuries. Musculoskeletal disorders include many kinds of sprain and strain, sciatica, low back pain carpal tunnel syndrome, tendinitis. Injuries causing from slips, trips, falls, or similar accidents are not included. Musculoskeletal disorders result from bodily reactions due to bending, crawling, reaching, or twisting, and from overexertion and repetitive motion (Maier & Ross-Mota, 2009).

Medical terms used to describe musculoskeletal disorders to various parts of the body include low back pain, tendinitis, bursitis, carpal tunnel syndrome, epicondylitis, trigger finger, thoracic outlet syndrome, carpet layers knee and degenerative disc disease (Peter, 2006). Work-related musculoskeletal disorders (WRMSDs) is an umbrella term for symptoms caused or worsened by work. These disorders are defined as discomfort, impairment, disability or persistent pain in the locomotor system (Martinelli et al,.2004).

MSDs are a social and economic issue due to their impact on mental and physical health. In fact, they are reported to significantly influence the quality of life, resulting in different degrees of disability, long-term diseases, work restrictions, high treatment costs, even if the general population also experience musculoskeletal disorders, some working groups are more encountered with those diseases. Recent studies have shown that physical factors, such as bending and twisting, manual handling, forceful movements are cardinal determinants of musculoskeletal disorders (Clari et al.,2020) .

The WHO reported that the number of disability-adjusted life years (DALY) lost (per 1000 people) because of stroke was 485, while the age-standardized DALY rate (per 100 000 people) for stroke was 864. These numbers indicate that stroke will have a great economic burden in Bangladesh in the future. The situation is compounded by the fact that 40·30% of Bangladeshi are already reported to be living in poverty (Islam et al.,2012).

Bangladesh is one of the least developed and low-income countries in the world, with a population of 162·2 million people, an approximate per capita gross domestic product (GDP) of $544. However, less than 2·70% of the GDP is spent on health care. The

mortality rate of stroke increased from 6·00% (in 2006) to 8·57%, (in 2011) with an age-adjusted mortality rate of 108·31 per 100 000 people (in 2011). The crude death rate per 1000 people in Bangladesh is reported at 5·8%; the female and male life expectancies are reported as 64·4 years old and 65·1 years old, respectively (Islam et al.,2012).

There are two types of stroke: Ischemic stroke Hemorrhagic stroke .A transient ischemic attack (TIA) is sometimes called a "mini-stroke." It is different from the major types of stroke, because blood flow to the brain is blocked for only a short time usually no more than 5 minutes. The data from MMCH (Mymensingh Medical College Hospital) study indicated that Ischemic Stroke patients had a higher likelihood of recovery (68%) compared to Hemorrhagic Stroke patients (32%). In the, there were 50 stroke patients. The majority of the cases (60%) were IS and the rest were HS (40%). Again, the majority of the patients were males; the ratio of male: female patients was 1·27: 1·00. Risk factors were hypertension in the patient or in family members, smoking, DM, ischemic heart disease in the patient or in family members, alcohol consumption, and family history of stroke (Miah et al.,2008).

A study from 100 stroke patients admitted to CMCH found 74% males and 26% females, with 61% suffering from ischemic stroke (IS) and 39% suffering from hemorrhagic stroke (HS). Hypertension (63%) was the main risk factor for stroke. At admission, hospitalized patients presented with hemiparesis, dysarthria, motor and sensory dysphasia, impaired consciousness, headache, vomiting, and nystagmus. According to the study, the most common brain area affected by stroke was the cortical region, followed by the basal ganglia, internal capsule, insula, thalamus, cerebellum, and multifocal areas (Hossain et al.,2011).

From a study stroke prevalence were reported as 0·20%, 0·30%, 0·20%, 1·00%, and 1·00% for the age groups 40–49 years, 50–59 years, 60–69 years, 70–79 years, and 80 years and above, respectively. The overall prevalence for stroke was 0·30%, and the ratio of male: female patients was 3·44:2·41(Mohammad et al.,2011). A study investigated the association between metabolic syndrome and stroke occurrences among 50 stroke patients in DMCH. The data indicated that the majority (64%) of stroke patients had high TG levels and 68% had low HDL levels. In their study, the

majority of the stroke patients (64%) were also reported to have high blood pressure, 69·60% were HS patients and 59·3% were IS patients (Arenillaset al.,2007).

Stroke survivors often present limitations, which interfere with functional independence and the basic skills of daily life. Improvements in health care have led to an increase in the numbers of post-stroke survivors, but disability levels remain high in this population. The support provided by family caregivers is very important at this time. Informal caregivers should be valued and assisted by the health system, they usually receive little guidance from healthcare personnel. Health professionals can assist informal caregivers addressing aspects such as ergonomics, biomechanics, or kinesiotherapy (Moreira et al.,2018).

Architectural barriers in the home environment or the presence of inappropriate furniture can decrease the independence of post-stroke individuals and overload caregivers. Then, studies have also highlighted the importance of ergonomic adaptations in the home to facilitate the day-to-day activities of post-stroke patients and their caregivers. Health strategies for patients with chronic stroke should be complemented with interventions focused on their informal caregivers. Accordingly, programs designed to prevent overload and the negative emotional impact that can affect the health and quality of life of the caregiver population should be developed (Fernandes et al.,2013).

The majority of stroke caregivers in Malaysia are informal caregivers, comprising family members. Family caregivers shoulder the responsibilities of providing direct care, emotional support, coordinating care, financial support, and advocacy for the patient. The prevalence of caregiver burden ranged from 25% to 54% worldwide. Informal caregivers have been found to have a higher prevalence of depression, as well as the negative effects of their physical, psychological, and social health. The burden faced by caregivers has been associated with various negative impact toward patients' well-being, such as increased post-stroke depression, cognitive decline, physical disability, and general quality of life (Tan et al.,2020).

Caregiver training may reduce the burden and improve caregivers' quality of life and confidence in providing care to the patient. In various developed countries, transition care programs have been developed to meet the need for caregiver training and support. Structured caregiver training and post-discharge support and follow-up are

provided to ensure patient and caregiver safety. A study conducted among informal caregivers in the Klang Valley showed that 78% wanted to have more information to solve their problems, as well as 67% who wanted more information and advice from medical specialists. Caregivers need basic caregiving knowledge such as patient positioning, feeding, patient transfer, and pressure ulcer prevention to prevent complications or adverse events both to patients and caregivers alike. Caregiver training may also help improve the self-efficacy of caregivers, reduce anxiety in providing care, promote better outcomes and quality of life for the stroke patient (Tan et al.,2020).

Many caregivers are affected by caregiver stress. This is the stress that comes from the emotional and physical strain of caregiving. The signs include: Feeling overwhelmed, Feeling alone, isolated, or deserted by others, Sleeping too much or too little, Gaining or losing a lot of weight, Feeling tired most of the time, Losing interest in activities you used to enjoy, Becoming easily irritated or angered, Feeling worried or sad often, Having headaches or body aches often, turning to unhealthy behaviors like smoking or drinking too much alcohol (Mediplus).

Several factors have been associated with WMSD such as repetitive motion, awkward and/or sustained postures, prolonged sitting and standing. A review published by NIOSH in 1997 included studies of risk factors for WMSD affecting the neck, the upper limbs, and the low back (Bernard et al., 1997). The NIOSH report provides information on WMSD risk factors regarding potential causal relationships between exposure to risk factors and WMSD. Other reviews have also investigated a potential causal relationship between risk factors and WMSD affecting specific body parts such as the low back and the upper limbs (Hoogendoorn et al., 1999).

Fifty-three (82.8%) caregivers had LBP. The pain started after giving care in 20 (37.74%) of them. Twenty-two (41.51%) of them had pain before giving care, but it increased after giving care. Eleven (20.76%) had pain before caregiving. Patients whose caregivers had LBP had significantly lower FIMTM scores than patients whose caregivers did not have LBP (Yalcinkaya et al.,2010). Three risk factors including manual transfer of patients between bed/wheelchair and bath cart, perceived physical exertion, and psychological demands, were often associated with different measures of LBP(Feng et al.,2007).

Transferring and handling patients and repetitive lifting were among the most common risk factors for low back WMSD. Molumphy et al., (2012) found that 83% of the low back WMSD were associated with patient handling. Another study found that low back WMSD occurred nearly three times as often who frequently deal with dependent patients (37%) compared to a group that rarely worked with dependent patients (13%). Similarly, Kumar et al. found that the 31% of the low back WMSD happened while handling patients. McMahon et al. found that 86% of the repetitive work as the leading cause of thumb WMSD.

For wrist /hand: The biomechanical risk factors identified for the development of musculoskeletal disorder including carpal tunnel syndrome were heavy physical work, awkward static and dynamic working postures, repetitive work, and prolonged computer work. Individual risk factors identified were older age, female gender, smoking, high BMI, and co-morbidity. A previous systematic review reported that the combination of heavy physical work, repetitive work and vibration is a risk factor for wrist/hand WMSD (NRC/IOM, 2001).

For lower limb: Individual risk factor were concurrent chronic disease, smoking, and high BMI. For knee: The biomechanical risk factors identified for the development musculoskeletal disorder were heavy physical work, prolonged kneeling or squatting, prolonged standing, frequent climbing, and frequent heavy loads lifting and carrying. Individual risk factors identified were previous knee injury, smoking, and high BMI (Vieira et al.,2016).

With the large amount of information related to the stroke itself, caregivers might not have been educated regarding the importance of proper positioning methods. Again, patient positioning is not routinely taught in hospitals before the patient is discharged home. Caregivers of stroke patients has poor knowledge of patient positioning. The self-efficacy of caregivers were influenced by their age as well as provision of caregiver training (Tan et al.,2020).

From a study, an association was found between occupation and prevalence of WMSDs. Prevalence was 26.4%and it is much lesser than a previous study by Emmanuel et al.,(2012). in which it was reported as 68.7%. Among all, low back pain (45.7%) was the predominant complaint, followed by neck pain (28.5%), shoulder pain (23.5%), and knee and ankle pain (20%). The least of complaints were reported at wrist

(12%), hip/thigh (7.1%), and elbow (5%), which supports the study results of Emmanuel et al,. (2012).

Prevalence of musculoskeletal disorders varies across occupational groups and over national boundaries. Many previous studies reported a female predominance in the prevalence of musculoskeletal disorders in both the general population and working population. In a study, it was found that female have 1.9 times higher risk for developing musculoskeletal disorder than male (Yasobant et al.,2014). It was also found that overweight, obese professionals have a greater chance of developing musculoskeletal disorder. Work-related musculoskeletal disorders (WMSDs) are responsible for morbidity in many working populations. Apart from lowering the quality of workers' life and reducing the productivity, musculoskeletal disorder are the most expensive form of work disability, attributing to about 40% of all costs toward the treatment of work-related injuries (Karwowski et al.,2003).

CHAPTER-III METHODOLOGY

3.1. Study Design

The researcher selected cross-sectional survey research design to generalize the information on the musculoskeletal disorders among caregivers of stroke patients. To conduct this survey the researcher used cross sectional study to carry out the research aim and objectives. The cross-sectional study is called "prevalence study" and this can also be used to identify the associations. Data can also be collected on individual characteristics including exposure to risk factors, along with information about the outcome. The most important advantage of cross-sectional study is it need not more time and also cheap. As there is no follow up, fewer resources are required to run the study. Through the cross-sectional study easily comparing results among those of different ages, gender, or ethnicity.

The investigator wanted to find out the musculoskeletal disorders among caregivers of stroke patient at a point of time. For this reason, the cross-sectional study was more appropriate deign to fulfill the aim and objectives of the study.

3.2 Study area:

Data was collected from the Neurology Unit, Centre for the Rehabilitation of the Paralyzed (CRP), Savar, Dhaka. At first researcher developed a standard questionnaire and then selected the caregivers as sample for data collection. Caregivers of stroke patients who are receiving treatment were selected.

3.3 Study population:

Study populations were the caregivers of stroke survivors who came to receive rehabilitation treatment at Centre for The Rehabilitation of the Paralyzed (CRP) within the data collection period and also who met the inclusion and exclusion criteria.

3.4 Sample selection:

Study sample was selected in convenient sampling. 123 participants were selected as study sample for the study. The investigator used the convenience sampling technique due to the time limitation and also for the small size of population and as it is the one of the easiest, cheapest and quicker method of sample selection.

3.5 Sample size:

For this study it was determinate to focus his study by 322 samples following the calculation. But as the study was done as a part of fourth professional academic research project and there were some limitations, so in this study it was limited with 123 caregivers as sample.

Sampling procedure for cross sectional study:

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

Here, $z\left(1-\frac{\alpha}{2}\right) = 1.96$

p= 0.82 (Vincent et al.,2018)

q= 1-p

d= 0.05

Where n = sample size

$z\left(1-\frac{\alpha}{2}\right)$ = linked to 95% confidence interval (use 1.96)

p = expected prevalence (as fraction of 1)

q = 1- p (expected non-prevalence)

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

So, n= 226

Due to limited time during COVID-19 pandemic situation, researcher collected 123 data from CRP.

3.6 Inclusion criteria of the study

1. Both male and female caregivers are included (Menon et al.,2017).
2. Primary caregivers of stroke patients (Thomas et al.,2008).
3. 20 to 60 aged caregivers are selected (Vincent et al.,2018).
4. Subjects who are willing to participate in the study (Hekmatpou et al.,2019).

3.7 Exclusion criteria of the study

1. Caregivers who have any pathological condition (Eminel et al.,2020).
2. Pregnant women (Eminel et al.,2020).
3. Subjects who are not willing to participate in the study (Hekmatpou et al.,2019).
4. Mentally ill and medically unstable caregiver (Thomas et al.,2008).

3.8 Data collection method and tools

Data were collected by conducting face to face interviews providing a semi-structured questionnaire form. The tools that were needed for the study were –

1. Consent form,
2. Questionnaire,
3. NPRS scale,
4. Nordic Musculoskeletal Questionnaire,
5. Paper, pencil and eraser,
6. File, calculator
7. Computer.

In this study data were collected by semi-structured questionnaire. Following that the investigator went to neurology unit to take permission if the participants were interested in this study or not. Firstly, the investigator introduced her and the research project as well its purpose. They were allowed to ask questions and once they were satisfied they were requested to sign in the consent form. For data collection, the investigator used English and Bangla questionnaire in the easiest meaning.

Nordic Musculoskeletal Questionnaire: The Nordic Musculoskeletal Questionnaire (NMQ) was developed from a project funded by the Nordic Council of Ministers. The aim was to develop and test a standardized questionnaire methodology

allowing comparison of low back, neck, shoulder and general complaints for use in epidemiological studies. The tool was not developed for clinical diagnosis.

The NMQ can be used as a questionnaire or as a structured interview. However, significantly higher frequencies of musculoskeletal problems were reported when the questionnaire was administrated as part of a periodic general health examination (Crawford,2007).

3.9 Data analysis

The results of this survey were consisted of quantitative data. By this survey a lot of information were collected. All these results gave a basic idea about the musculoskeletal disorders among the caregivers of stroke patients. The investigator used the raw data in SPSS to find out the percentage of sociodemographic and musculoskeletal symptoms in different body region and associated risk factor. The results were calculated in percentages and descriptive statistics were presented. The data entry and analysis were done by using **Statistical Package for Social Science (SPSS 20)** and **Microsoft Excel 2013** was used. A descriptive statistic was used to attain research objectives and represented through tables, histograms, bar graphs, pie charts and cross tables and required tests were performed accordingly. Correlation coefficients of different variables were conducted accordingly along with chi-square test for categorical variables.

Chi-Square (x2) test: Chi-Square (x2) test is the most popular discrete data hypothesis testing method. It is a nonparametric test of statistical significance for bivariate tabular analysis with a contingency table. Chi-Square test helps to analyze data come in the form of counts. This test can be applied to nominal or categorical data which can't be analyzed using the ranking technique.

3.10 Ethical Consideration:

Research proposal was submitted to the Institutional Review Board (IRB) of Bangladesh Health Professions Institute (BHPI) and approval was taken before the beginning of the data collection. Individual informed consent was taken from participants before starting data collection and propose of the research and the consent form were explained to them verbally. They were informed that their participation was fully voluntary and they had the right to withdraw or discontinue from the research at any time. Participants were not forced to answer the questions if they were not willing

to. Appropriate informed consent was taken from the department heads respectively before conducting the study. Confidentiality and anonymity of the information provided by them was maintained. It is protected by the law “right to privacy” which prevents the researcher from disclosing any direct information about the participants of the research.

CHAPTER-IV RESULTS

For this study 123 caregivers were taken as a sample from Neurology Unit, Center for Rehabilitation of Paralyzed (CRP), Savar to explore the caregivers experiencing musculoskeletal disorders dealing with stroke patient. Data were numerically coded and analyzed the data by using an SPSS 20.0 version software program and the result captured in Microsoft Excel. In this study the results which were found have been showed in different bar diagrams, pie charts and in tables.

Age of the participants

Among the 123 participants, 31% (n=38) participants are ranged 20-30 years, 21%(n=26) participants are ranged between 31-40 years, 19% (n=23) participants are ranged between 41-50 years, 29% (n=36) participants are ranged between 51-60 years.

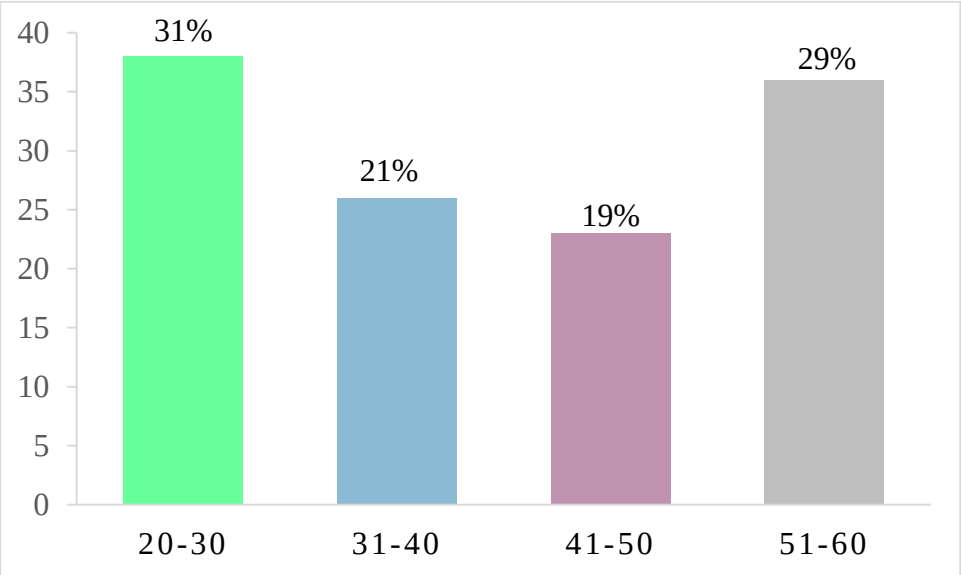


Figure 01: Age of the participants

Gender of the participants:

In my study females were more than males. Among the 123 participants 68% (n=83) were female and 32% (n=40) were male.

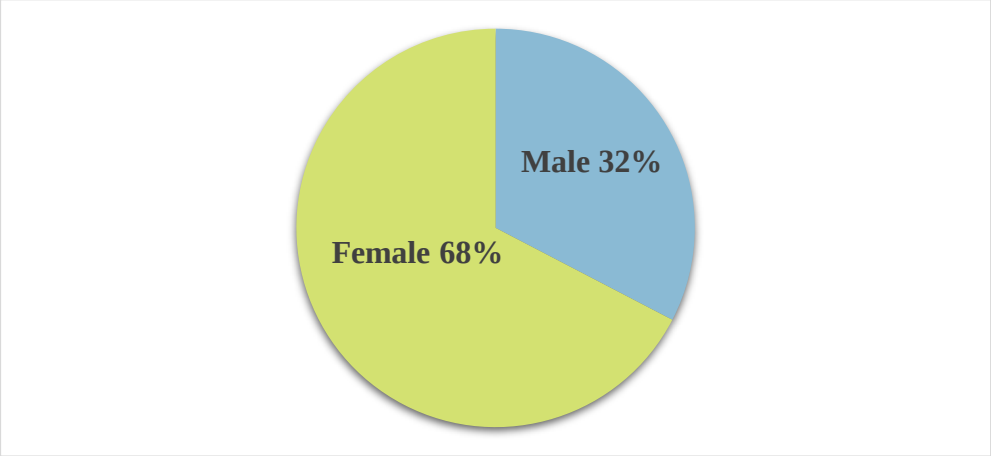


Figure 02: Gender of the participants

Living area

Among the 123 participants it was found that 38% (n=47) live in rural area , 29% (n=36) live in urban area and 33% (n=40) live in semi-urban area .

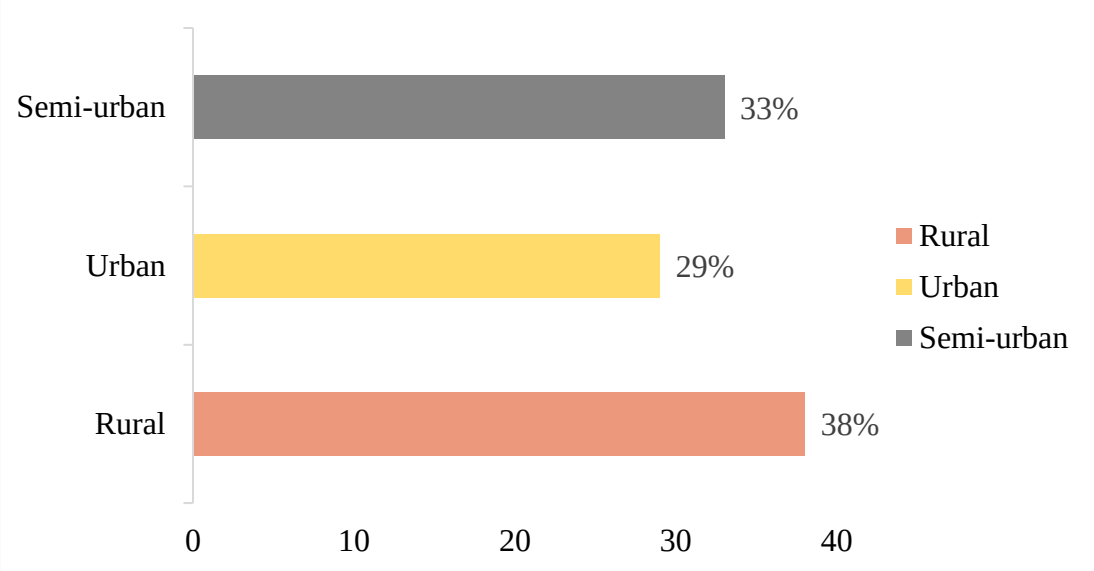


Figure 03: Living area of the participants

Marital Status

In this study among the 123 participants 76% (n=93) participants were married, 24%(n=30) participants were unmarried and no participants were widowed or divorced.

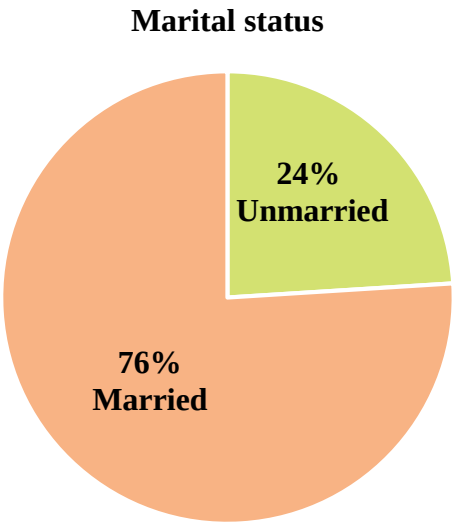


Figure 04: Marital status of the participants

Educational Status:

Among the 123 participants it is calculated that 11% (n=14) participants had no academic educational background, 15% (n=19) participants competed Primary level ,20% (n=24) participants completed secondary education, 24% (n=30) participants completed higher secondary level, 22% (n=27) participants were completed bachelor degree and 8% (n=9) completed master's degree.

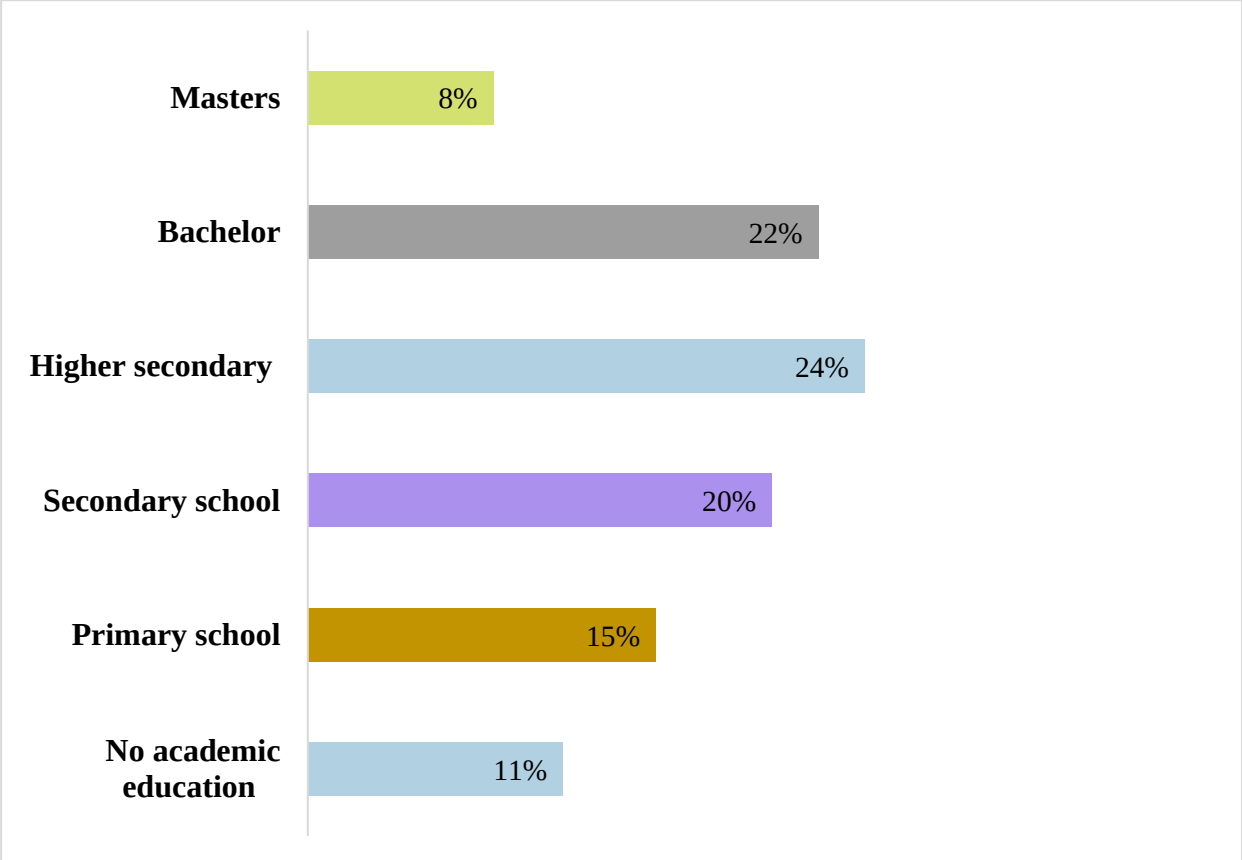


Figure 05: Educational level of the participants.

Occupation

Among the participants 123 participants 18% (n=22) were student, 43%(n=53) were housewife, 5% (n=6) were government employee; 19%(n=24) participants were Non-government employee , 4% (n=5) were retired,7% (n=8) participants were businessman , 4%(n=5) were unemployed. The mean is 2.85 and the standard deviation is 1.66.

Occupation	Frequency	Percentage (%)
Student	22	18
Housewife	53	43
Government Employee	6	5
Non-Government Employee	24	19
Retired	5	4
Business	8	7
Unemployed	5	4
Total	123	100.0

Table no 01 : Occupation of the participants.

Relation with patient:

Among the 123 participants of this study 32% (n=11) were wife, 20%(n=25) were daughter, 9% (n=11) were husband, 8% (n=10) were brother, 5% (n=6) were sister, 6% (n=7) were mother, 14% (n=14) were son and 6% (n=7) were relative caregiver of the stroke patients .

Relation with patient	**Frequency(n)**	**Percentage (%)**
Husband	11	9
Wife	45	37
Brother	10	8
Sister	4	3
Mother	7	6
Daughter	22	18
Son	18	14
Relative	6	5
Total	123	100

Table 02: Relation with the patient.

Number of earning member

In this study among 123 participants, there are 4% (n=5) have no earning member in family, 56%(n=69) have 1 earning member in family , 34% (n=42) have 2 earning member, 4% (n=5) have 3 earning member, 2%(n=2) have 4 family members in family.

Earning member	Frequency(n)	**Percentage (%)**	**Mean**	**SD**
0	5	4		
1	69	56		
2	42	34	1.43	0.714
3	5	4		
4	2	2		
Total	123	100		

Table 03: Number of earning member

Caregiving duration:

In this study among 123 participants, 24(n=30) % reported caregiving time of 1-5 months, 37%(n=46) reported caregiving time of 6-11 months, 18%(n=22) reported caregiving time of 12-36 months, 19% (n=23)reported caregiving time of 37-72 months, 2%(n=2) reported caregiving time of 73-120+ months.

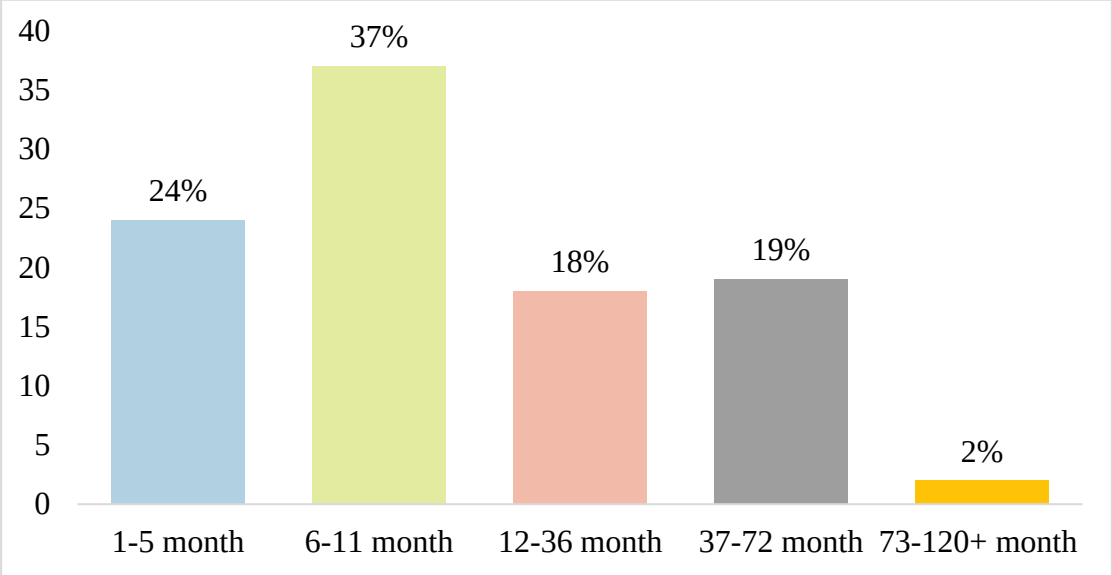


Figure 06: Caregiving duration

Daily caregiving time:

In this study among 123 caregivers 34%(n=41) reported their caregiving time 1-6hours , 35%(n=44) participants give 7-12 hours, 23%(n=28) participants give 13-18 hours and 8%(n=10) participants give >18 hours in caregiving .

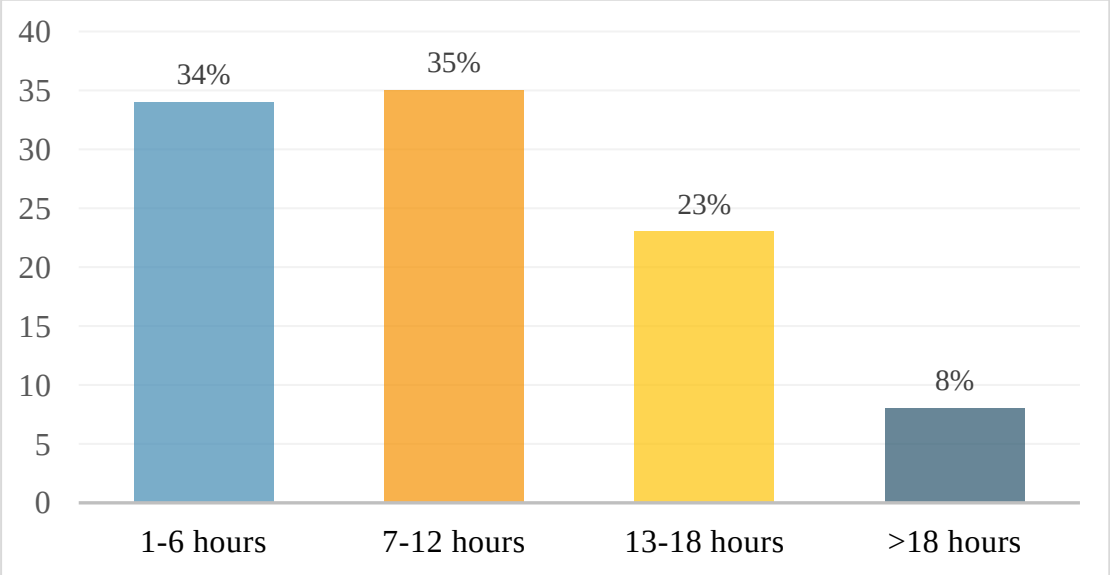


Figure 07: Daily Caregiving Time

Experience of Musculoskeletal disorders:

This study shows that among 123 participants 97%(n=120) caregivers reported that they have experienced musculoskeletal disorder and only 3%(n=3) had not experienced any musculoskeletal disorder.

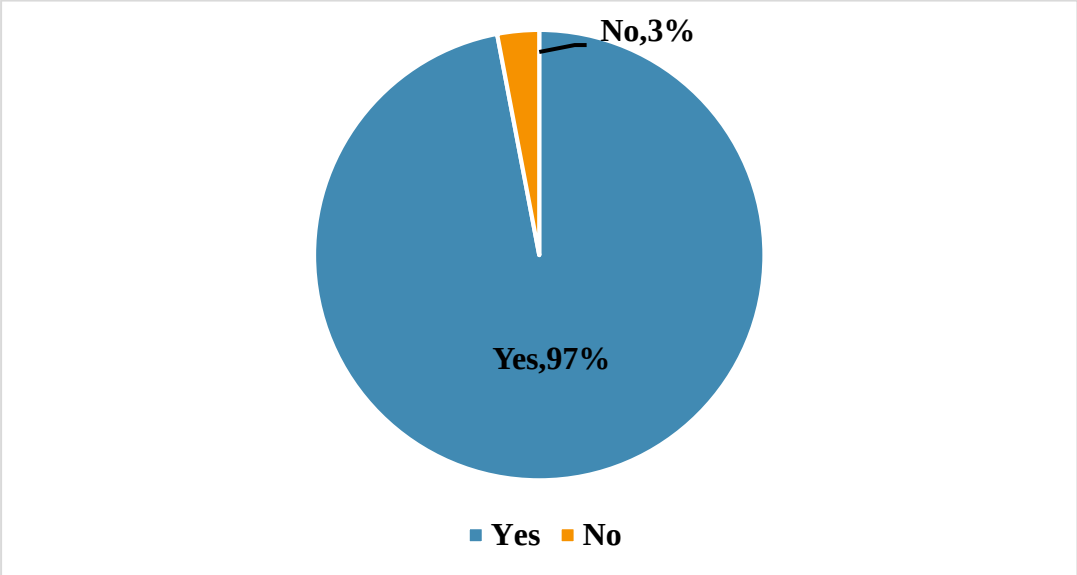


Figure 8 : Experience of musculoskeletal symptoms among participants .

Type of musculoskeletal disorder experienced by participants

Among the 120 participants experienced with musculoskeletal disorder 89% (n=107) reported of having pain, 3%(n=4) had cramp, 2%(n=3) participants have joint stiffness, 3%(n=3) faced sprain and 3% (n=3) have arthritis.

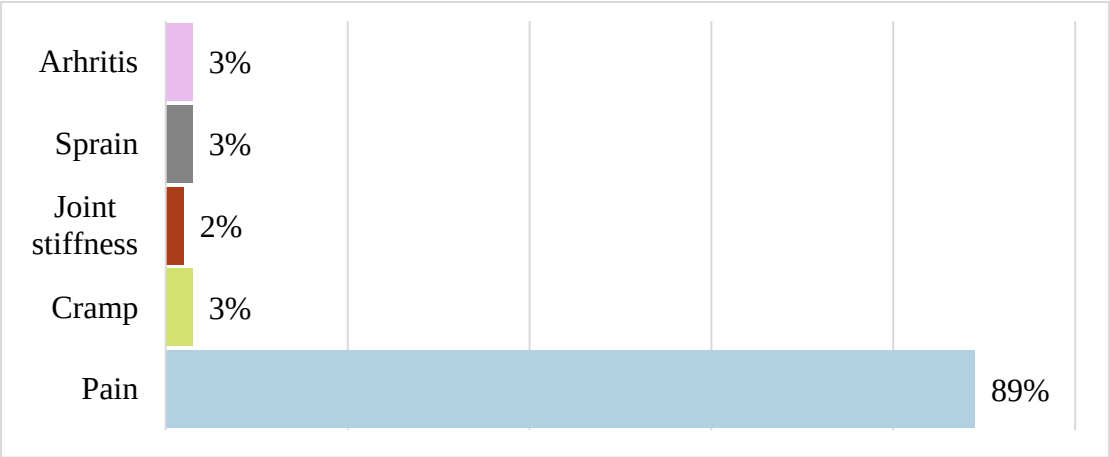


Figure 9: Types of Musculoskeletal disorder participants have.

First experiencing time of musculoskeletal disorder

Among 120 participants 59%(n=72) experienced musculoskeletal disorder 2-5 months ago, 32%(n=39) experienced musculoskeletal disorder 6-10 months ago, 6%(n=6) experienced musculoskeletal disorder 11-15 months ago, 3%(n=3) experienced musculoskeletal disorder 0-1 months ago.

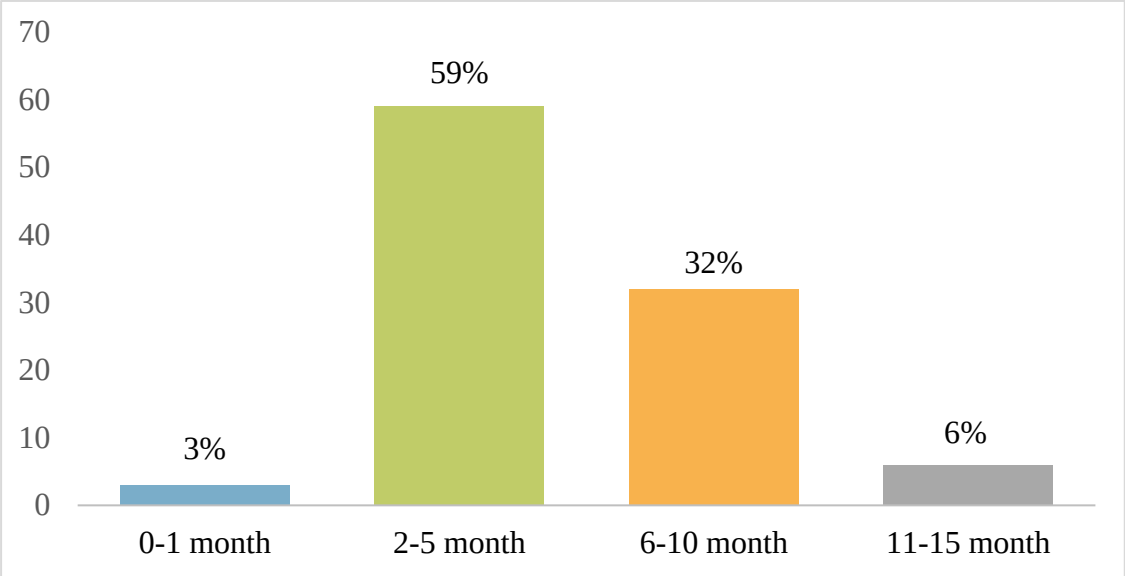


Figure10: First time when experienced musculoskeletal disorder

Area involved in musculoskeletal disorder(n=120) :

Location of pain	Disorders in the last 12 months.	Impact of pain in normal daily life.	Consulting with a physician for the condition.	Disorders in the last 7 days
	(%)	(%)	(%)	(%)
Neck	9.7%	9.7%	7%	6.3%
Shoulder(s)	13.3%	13.3%	10.2%	11%
Upper Back	14.5%	14.5%	5.6%	7.0%
Elbow(s)	3.9%	3.9%	.8%	3.1%
Wrist/Hand(s)	3.1%	2.3%	1.6%	1.6%
Lower Back	29%	29%	18%	21.8%
Hip/Thigh(s)	3.9%	3.9%	2.3%	2.3%
Knee(s)	17.2%	17.2%	13.2%	15%
Ankle/feet(s)	8%	8%	5%	6%

Table 4: Area involved in musculoskeletal disorder

The frequency table represents the distribution of characteristics of the Nordic Musculoskeletal Questionnaire. The table shows that there are 29% (36) participants with disorders in Lower Back , 17.2% (22) participants with Knee Disorders, 14.5% (18) participants with Upper Back Disorders , 13.3% (17) participants with Shoulder Disorders , 9.7% (12) participants with Neck Disorders , 8% (10) participants with Ankle Disorder are mostly affected . Others 3.9% (5) participants with Elbow Disorders,3.1% (4) participants with Wrist/Hand Disorders, 3.9% (5) participants with Hip Disorders.

Table-5. Distribution of musculoskeletal disorder by nature and severity of symptoms:

Regarding the table shows that in constant pattern of musculoskeletal disorder, Caregivers suffered from lumber region pain 14.5% were constant according to knees, cervical spine , shoulders, thoracic region, ankles, hip, ,elbows . Intermittent Nature of complaints were 12.9% in lumber region intermittent according to knees, shoulders, ankles, thoracic region ,neck ,hip, wrist, elbow .maximum severity of complains were moderate. N=120

Symptoms in body part	Nature of complain (%)		Severity of complain (%)	
Neck (n=12)	Constant	5.6	No pain	0
			Mild	2.4
	Intermittent	4.8	Moderate	4.8
			Severe	3.2
Shoulder (n=17)	Constant	5.5	No pain	0
			Mild	5
	Intermittent	8.6	Moderate	6.3
			Severe	3.1
Thoracic Region (n=18)	Constant	4.8	No pain	0.8
			Mild	3.2
	Intermittent	5.6	Moderate	4.8
			Severe	1.6
Lumber Region(n=36)	Constant	14.5	No pain	0
			Mild	5.6
	Intermittent	12.9	Moderate	13.7
			Severe	8.1
Elbow (n=5)	Constant	1.6	No pain	0
			Mild	1.6
	Intermittent	2.4	Moderate	0.8
			Severe	1.6
Wrist (n=4)	Constant	0	No pain	0
			Mild	2.4
	Intermittent	4	Moderate	0.8
			Severe	0
Hip/Thigh(n=5)	Constant	1.6	No pain	0
			Mild	1.6
	Intermittent	4.0	Moderate	3.2
			Severe	.8
Knees(22)	Constant	7	No pain	0
			Mild	4.7
	Intermittent	10.2	Moderate	8.6
			Severe	4.0
Ankles/Feet(n=14)	Constant	1.6	No pain	0
			Mild	4.0
	Intermittent	7.0	Moderate	4.0
			Severe	1

Pattern of pain

Among 120 participants 49% (n=59)has aching pain ,20%(n=24) has burning pain,10%(n=12) has pins and needles sensation,4%(n=5) has throbbing pain ,3%(n=4) has shooting pain,6%(n=7) has stabbing pain ,8%(n=9) has numbness.

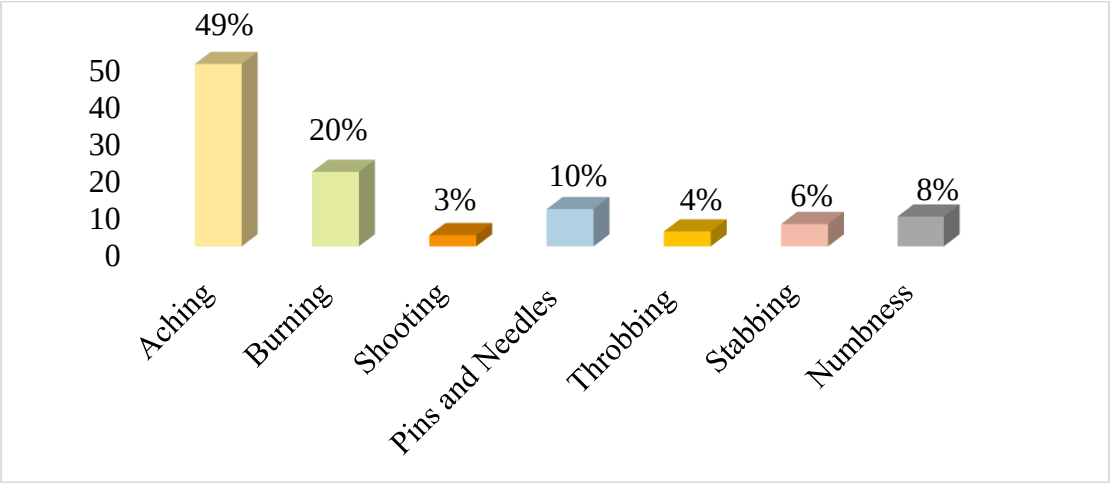


Figure 11: Pattern of pain

Staying away from work due to pain:

From this study among 120 participants 66% (n=41) reported that they stayed away from due to pain and 66% (n=79) continues to work.

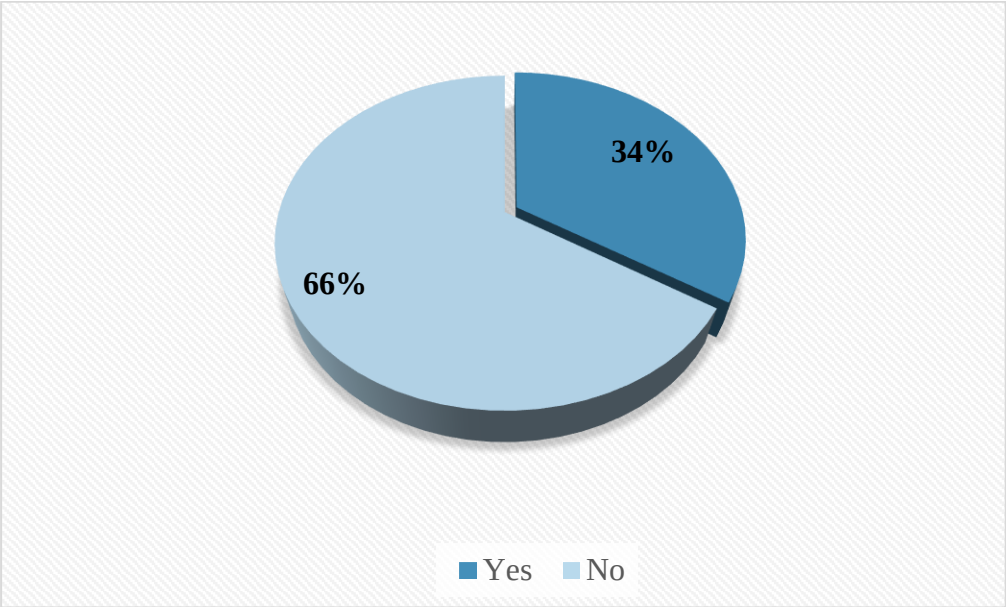


Figure 12: Staying away from work due to pain

Reduction of work performance due to pain

Among 123 participants 85%(n=102) reported that their work performance has been reduced due to pain from musculoskeletal disorder and 15%(n=18) reported their working performance remained same.

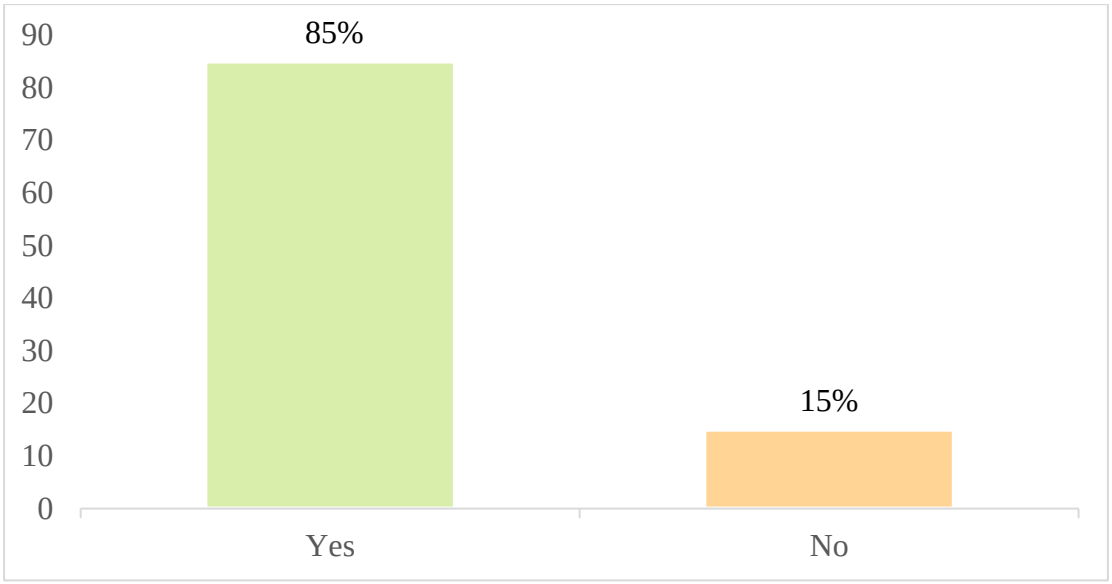


Figure 13: Reduction of work performance due to pain

Posture during activity

Among 120 participants 39% (n=47) reported that the stay in sitting posture while working; 35%(n=42) in forward bending and 26% (n=31)in standing position (Figure 16).

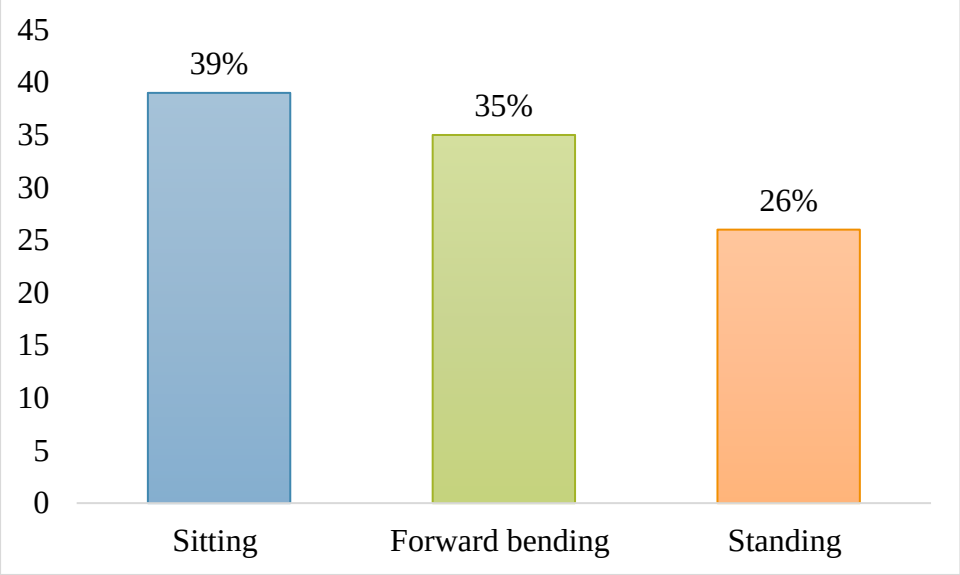


Figure 14: Posture during activity.

Pain Worsening activity

Of 120 participants 33%(n=39) reported that their pain worsens in standing position;43%(n=2) in bending position;8%(n=9) in sitting position;15% (n=18) in walking position and 1%(n=2) in lying (Figure 17).

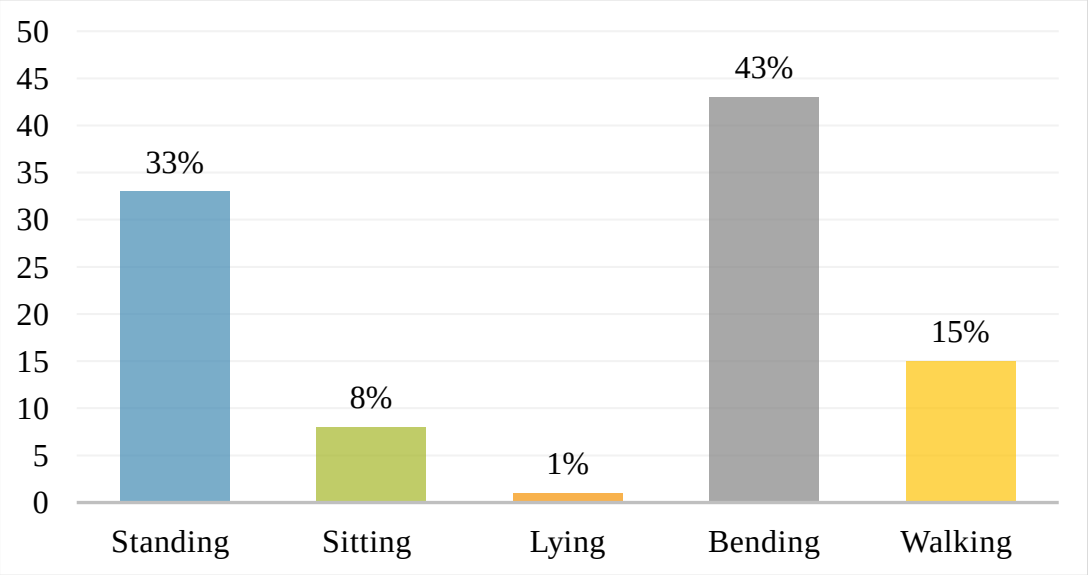


Figure 15: Pain Worsening activity.

Pain relieving activity

Of 120 participants 75% reported that they feel relieved of pain while lying , 21%(n=25) in sitting, 3%(n=4) in standing , 1%(n=1) in walking .

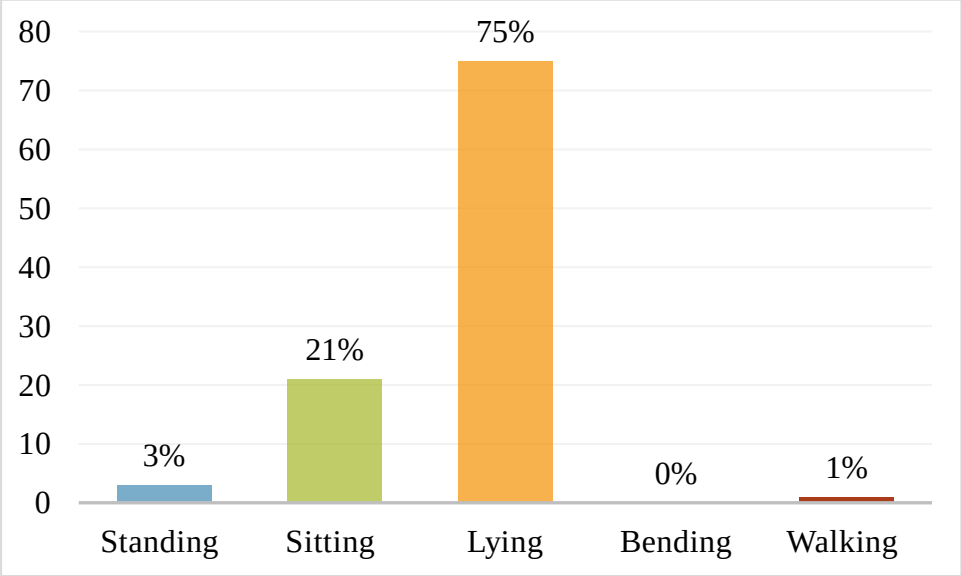


Figure 16: Pain relieving activity.

Management

Among 120 participants 28%(n=34) reported that they did not take any treatment for musculoskeletal disorder they faced.7%(n=8) went to traditional healer , 5%(n=6) took homeopathy, 32%(n=38) has taken physiotherapy and 28%(n=34) were in conservative treatment.

Management	Frequency(n)	Percentage (%)
No treatment	34	28
Traditional healer	8	7
Homeopathy	6	5
Physiotherapy	38	32
Conservative	34	28
Total	120	100

Table 6: Management taken of musculoskeletal disorder.

Result of Management

Of 120 participants 64% improved after management; 29% Unchanged and 7% worsened.

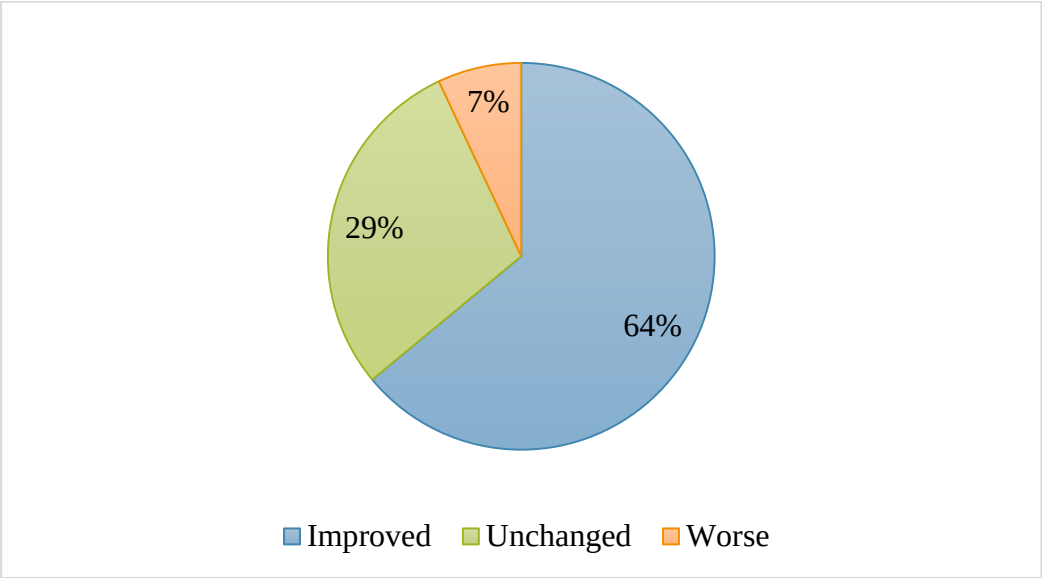


Figure 17: Result of management.

Risk factors for developing musculoskeletal disorder

Lifting or transferring patient (31%), Working in the same position for long period (11%), working in awkward and cramped positions (18%), Repetitive movement of the limbs(13%) were reported as the highest risk factors among all participants. Additionally, working in the same position for long period (11%), performing the same task over and over again (7%), Working over physical activity (5%) and Not enough rest during the day (5%) were reported.

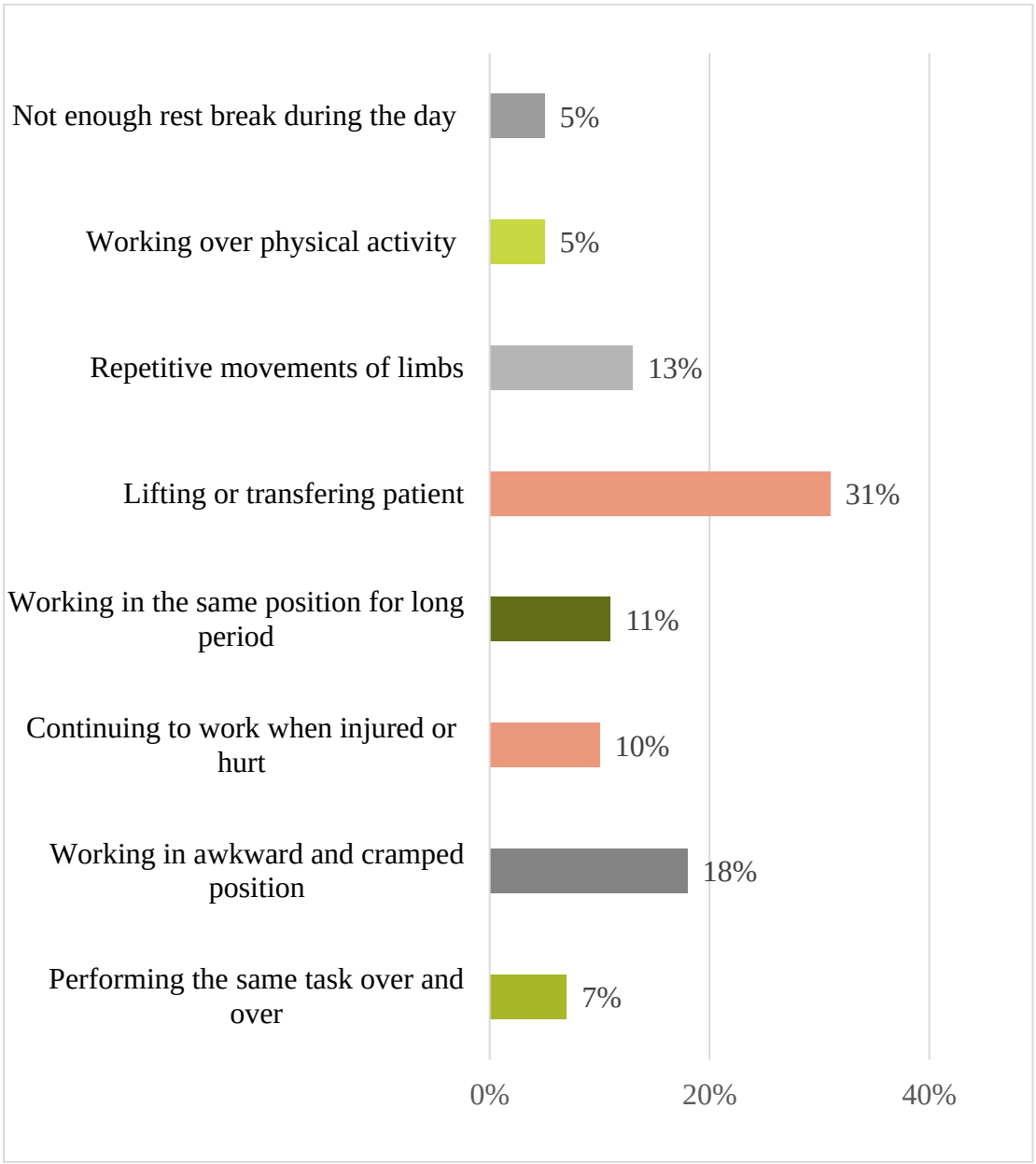


Figure 18: Risk factors

Table 7. Association between most affected body parts and age, gender, Caregiving experience and caregiving hours :

In chi-square test we see the association. If the p value is < 0.05 result is significant.

In association between age and symptoms in shoulder, p value is 0.37. So, the result is not significant that indicate there is no association between age and symptoms in shoulder.

In case of age and symptoms in lumber, p value is 0.91. So, the result is not significant that indicate there is no association between age and symptoms in lumber.

In between age and symptoms in knee, p value is 0.355. So, the result is not significant that indicate there is no association between age and symptoms in knee.

In case of gender and symptoms in shoulder, p value is 0.81. So, the result is not significant that indicate there is no association between gender and symptoms in shoulder.

In between gender and symptoms in wrists/hands, p value is 0.06. So, the result is not significant that indicate there is no association between gender and symptoms in wrists/hands.

In association between gender and symptoms in lumber, p value is 0.005. Which is less than 0.05. So, the result is significant that indicate there is association between gender and symptoms in lumber.

In case of gender and symptoms in knee, p value is 0.821. So, the result is not significant that indicate there is no association between gender and symptoms in knee.

In association between caregiving duration and symptoms in lumber, p value is 0.39. So, the result is not significant that indicate there is no association between gender and symptoms in lumber.

In association between caregiving duration and symptoms in knee, p value is 0.34. So, the result is not significant that indicate there is no association between gender and symptoms in knee.

In case of daily caregiving time and symptoms in shoulder**,** p value is 0.44. So, the result is not significant that indicate there is no association between caregiving time and symptoms in shoulder.

In between daily caregiving time and symptoms in lumber, p value is 0.37. So, the result is not significant that indicate there is no association between daily caregiving time and symptoms in lumber.

In case of daily caregiving time and symptoms in knee**,** p value is 0.02. Which is less than 0.05. So, the result is significant that indicate there is association between caregiving time and symptoms in shoulder.

Cross tabulation of age and symptoms in shoulder		
Age and symptoms in shoulder	Chi-square	P value
	3.08	0.378

Cross tabulation of age and symptoms in lumber		
Age and symptoms in lumber	Chi-square	P value
	0.53	0.912

Cross tabulation of age and symptoms in knee		
Age and symptoms in knee	Chi-square	P value
	3.24	0.355

Cross tabulation of gender and symptoms in shoulder		
Gender and symptoms in shoulder	Chi-square	P value
	0.056	0.812

Cross tabulation of gender and symptoms in wrist/hands		
Gender and symptoms in wrist/hands	Chi-square	P value
	3.40	0.065

Cross tabulation of gender and symptoms in lumber		
Gender and symptoms in lumber area	Chi-square	P value
	8.05	0.005

Cross tabulation of gender and symptoms in knee		
Gender and symptoms in knee	Chi-square	P value
	0.051	0.821

Cross tabulation of caregiving duration and symptoms in lumber		
Caregiving duration and symptoms in lumber	Chi-square	P value
	4.12	0.390

Cross tabulation of caregiving duration and symptoms in knee		
Caregiving duration and symptoms in knee	Chi-square	P value
	4.452	0.348

Cross tabulation of daily caregiving time and symptoms in shoulder		
Daily caregiving time and symptoms in shoulder	Chi-square	P value
	2.67	0.445

Cross tabulation of daily caregiving time and symptoms in lumber		
Daily caregiving time and symptoms in lumber	Chi-square	P value
	3.110	0.375

Cross tabulation of daily caregiving time and symptoms in knee		
Daily caregiving time and symptoms in knee	Chi-square	P value
	9.03	0.029

Table 8: Relationship between age of caregiver with musculoskeletal disorder

From the table relationship between age of respondents with musculoskeletal disorder shows that most 83 respondents had musculoskeletal disorder of >30 years, 37 respondents had musculoskeletal disorder ≤ 30 years. Whereas 1 respondents had no

musculoskeletal disorder ≤ 30 respectively. The findings are not statistically significant $\chi 2 = 0.009$; P-value = 0.674).

Age group	Musculoskeletal disorder		Total	$\chi 2$	P-value
	Yes	No			
≤30 years	37	1	38		
>30 years	83	2	85	0.009	.674
Total	120	3	123		

Table 9: Relationship between gender of caregiver with musculoskeletal disorder.

From the table, relationship between gender of respondents with musculoskeletal disorder shows that most 82 respondents were female having musculoskeletal disorder, 38 respondents were male having musculoskeletal disorder. The findings are not statistically significant $\chi 2 = 1.634$; P-value = 0.201).

Gender	Musculoskeletal disorder		Total	$\chi 2$	P-value
	Yes	No			
Male	38	2	40		
Female	82	1	83	1.634	0.201
Total	120	3	123		

Table 10: Relationship between Daily Caregiving Hour and musculoskeletal disorder

The relationship between daily caregiving hour and participants with musculoskeletal disorder. Among them majority of 74 respondents had musculoskeletal disorder with

daily caregiving hour of ≥7 hours . The findings are not statistically significant $\chi 2$ =0.031; P-value = 0.675).

Marital Status	Musculoskeletal disorder		Total	$\chi 2$	P-value
	Yes	No			
≥7 hours	74	2	93		
<7hours	46	1	30	.031	.675
Total	120	3	123		

Table 11: Relationship between age and caregiving duration

From the table , relationship between marital status with musculoskeletal disorder shows that among them majority of 27 respondents of >30 years age developed musculoskeletal disorder after caregiving of 6-11 months. 19 respondents of ≤30 years age developed musculoskeletal disorder after caregiving of 6-11 months. The findings are statistically significant $\chi 2$ = 12.377; P-value = 0.015)

Age	1-5 months	6-11 months	12-36 month	37-72 moths	73-120+months	Total	$\chi 2$	P-value
≤30 years	13	19	4	2	0	38		
>30 years	17	27	18	21	2	85	12.377	0.015
Total						123		

CHAPYER-V DISCUSSION

In this chapter the results of the study are discussed in relation to the research questions and objectives of the study identifying published papers & determining the relevance with the acquired data.

Among 123 patients . musculoskeletal symptoms was higher among female caregivers (68%) compared to their male counterparts (32%) and Vincient et al.,2018 on their study found musculoskeletal symptoms were significantly higher among female caregivers (96.4%) compared to their male counterparts (60%)

The objectives of the study were to find out the socio-demographic factor of the caregiver stroke patients who received treatment at the neurology unit physiotherapy department of CRP, Savar. Stroke is one of the most dominant causes of morbidity and mortality worldwide and poses a major global healthcare challenge. Stroke survivors are often affected by neurological impairments causing functional disability and need of assistance, which may lead to institutionalization in nursing or residential care setting. The World Health Organization (WHO) predicts that disability adjusted life years lost to stroke will rise from 38 million in 1990 to 51 million in 2020.

Among the 123 participants, 31% (n=38) participants are ranged 20-30 years; 21%(n=26) participants are ranged between 31-40 years, 19% (n=23) participants are ranged between 41-50 years; 29% (n=36) participants are ranged between 51-60 years. Where Islam et al. (2012) reported that 0·20%, 0·30%, 0·20%, 1·00%, and 1·00% for the age groups 40–49 years, 50–59 years, 60– 69 years,70–79 years, and 80 years and above respectively. Other study in France mean age was 53.3 with SD 13.7 (Pradon et al., 2013).

In my study females were more than males. Among the 123 participants 64% (n=83) were female and 31% (n=40) were male. In one Indian study, out of 162 participants 69.8%(n=113) were male and 30.2% (n= 49) were female (Raju et al., 2010).

Among 123 participants it was found that 38% (n=47) living in rural area and 29% (n=36) were live in urban area and 33%(n=40) live in semi-urban area. In Bangladesh, another study showed that 54% urban patient and 46% rural patient (Hossain et al., 2011).

In this 123 participants76% (n=93) are married and 24%(n=30) are female. In one study from Nigerian hospital among the 70 participants, 80% (n=56) are married and remaining 20% (n=14) are unmarried (Oni et al., 2018).

In this study, it is calculated that 11% (n=14) participants had no academic educational background, 15% (n=19) participants competed Primary level ,20% (n=24) participants completed secondary education, 24% (n=30) participants completed higher secondary level, 22% (n=27) participants were completed bachelor degree and 8%(n=9) completed master's degree.

In this study 55 participants were spouses (37% (n=45) were wife , 9%(n=11) were husband) , 18%(n=22) were daughter ; 8%(n=10) were brother ;3%(n=4) were sister ;6%(n=7) were mother 14%(n=18) were son and 5%(n=6) were relative caregiver of the stroke patients. In a study of Menon et al.,2017 112 were spouses (wife 91; husband 21), 30 were daughters, 25 were sons, 15 were daughter-in-law, 6 were grandchildren and rest were father, mother, brother, sister, in-laws.

This study shows that 97%(n=120) caregivers reported that they have experienced musculoskeletal disorder with frequency of neck symptoms was 12, Shoulder 17, Upper back 18, Elbow 5, Wrist/hand 4, Lower back 36, Hip/thigh 5 , Knee 22,ankle/feet 10 in last 12 months and only 3%(n=3) had not experienced any musculoskeletal disorder. On the other hand, Vincent et al.,2018 it was found prevalence of musculoskeletal symptoms 82.2%. The low back was the most affected body region (72.2%) followed by the upper back (40%) while musculoskeletal symptoms in the wrist was least prevalent (3.3%).

In this study, most participants among 90 faced musculoskeletal symptoms in last 7 days, the lower back was the most affected (21.8%) followed by the knee (15%) and the shoulder (14%) while the least affected body region was the wrist (1.6%) . and in study of Vincent et al.,2018 in 7-day prevalence of musculoskeletal symptoms the lower back was the most affected (72.2%) followed by the upper back (40%) and the shoulder (24.4%) while the least affected body region was the wrist (3.3%).

Most (59%) after 2-5 month of caregiving, in 6-10 months 32%, in 11-15 months 6% and in 0-1 month 3% caregivers experienced musculoskeletal symptoms. In the study of Vincent et al.,2018 Seventy-four caregivers reported that they experienced musculoskeletal symptoms within seven days prior to the study. Majority 68

experienced onset within 3 months of caregiving, one (1.4%) caregiver reported onset in the 6th month of caregiving while five (6.8%) could not recall the exact time of onset.

In this study 35% participant experienced musculoskeletal symptoms who caregiver 7-12 hours ,34% caregiving of 1- hours while Vasoontara et al.,(2012) 27.5% reported being part-time and 6.6% reported being full-time caregivers .

This study conducted another chi-square analysis with $p<.05$ to show the significant association between presence of different types of Musculoskeletal disorders in the participants depending upon the age, gender, duration of caregiving, caregiving hours. gender of the participant had significant ($P<0.05$) association with musculoskeletal disorder on lumber area (Male =5 and female= 31) . This analysis showed that daily caregiving hours of the participants had a significant ($P<0.05$) association with musculoskeletal symptoms on knee. This study assured that long working hour leaded to Musculoskeletal disorder. Yalcinkaya et al. (2010) worked on their study and showed that there was a significantly higher symptoms on low back presence in females than males in the study (46 female caregivers vs. 7 male caregivers).

In this study it was found that the severity of pain which was measured by using NPRS scale. According to NPRS scale, among the all participants most of the participants experience pain within score (0-10). The frequency of moderate pain were higher at Shoulder, Lumber, Thoracic and Knee area and 3.2% responded severe pain on neck ,3.1% on shoulder,8.1% on lumber region. Bardak et al. (2012) evaluated the severity of pain, using VAS scale. The VAS score were significantly higher on lower back among caregivers. Which was similar to the result of this study and most important causes of were poor socio-economical condition, poor life style, paying less concentration on their back pain. So, the investigator could say that the literature supports the result of this study. The high prevalence of musculoskeletal symptoms among the caregivers in this study coupled with the almost complete lack of training and information on how to safely care for stroke survivors indicate the urgent need for necessary interventions. In line with stroke clinical guidelines, training and education of stroke caregivers should be routinely incorporated into stroke rehabilitation

Limitation of the study:

There were a number of limitations and barriers in this research project which had affect the accuracy of the study, these are as follow:

The main limitation of the study was its short duration that may have affected the result of the study. For better it would take more time.

Sample selected from Neurology outdoor of CRP due to limitation of time and accessibility. But it needed to collect samples from different places and organizations in Bangladesh to make it generalized.

Total number of samples was 123 which were very small in number to generalize the result.

Lack of similar researches on the similar topics.

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

Conclusion:

In the world, stroke is considered as the 3rd leading cause of death and it is becoming a major threat of Neurological disability in population of Bangladesh. Bangladesh is a developing country with low socio-economic condition where people are not enough concerned about health. Health services are not sufficient in the Government and nongovernment sector. There are so many complications arise among the stroke patient like as pressure sore, bronchopneumonia, spasticity, shoulder pain, abnormal reaction etc. In most of case the shoulder and wrist joint are more affected by pain. Development of pain is more common complication in stroke patients

Identifying the common musculoskeletal disorders among caregivers at CRP were highest in the low back, shoulder, upper back, lower back and neck. The factors-perform same task over and over, working in awkward or cramped position, repetitive movement of upper & lower limb, Bending or twisting in neck & back in an awkward way, not enough rest breaks during the day, inadequate training in injury prevention. Specific strategies should be developed to reduce WMD The results of this study indicate that particular attention should be given to techniques for handling of patients. Further investigation is needed to develop preventive measures that presume the health of workers in an occupation devoted to the promotion and restoration of health. Nor Azlin M. et al. (2010) showed that Work-related injuries are significantly higher in Malaysia compared with many other countries. Females reported a higher incidence of work-related musculoskeletal disorders in this study, and work-related musculoskeletal disorders were more common. This study contributes to the understanding of work-related disorders among caregivers of stroke patient. A recommendation evolves out of the context in which the study was conducted. The purpose of the study was to estimate the work-related musculoskeletal disorders among the caregiver of stroke patient at CRP. Though the research has some limitations but researcher identified some further step that might be taken for the better accomplishment of further research.

Recommendation:

For the ensuring of the generalization of the research it is recommended to investigate with large number of sample.

In this study researcher only took the caregivers at CRP. But it needed to collect samples from different places and organizations in Bangladesh to make it generalized.

In this study investigator only identified the common musculoskeletal disorders among caregiver at CRP, so it is recommended for further study to identify the all types of work-related musculoskeletal disorders among the caregivers.

Prevention, intervention and outcome regarding musculoskeletal symptoms should be considered for future studies.

Due to limitation of time investigator was not able to do pilot study. But pilot study is very much important for the validity of questionnaire. For this it is strongly recommended that if any further study will be done in this area then pilot study should be done to format the questionnaire.

Beside this in this study the ratio of male and female participants were unequal. So it is recommended for further study to take the participants equally for comparison of gender and work related musculoskeletal disorders.

The authority of government and non-government organizations must come forward to sort out the necessity and take effective measures. Both the government and non-government organizations like hospitals, clinics, rehabilitation centers, research institutes, organizations working on disability etc. have to take initiatives to conduct further studies at a large scale and take preventive measure.

REFFERENCES

- Aydin, T., Taspinar, O., Kepekci, M., Keskin, Y., Erten, B., Gunel, M., Gok, M., Bektas, E., Sarac, M. and Mutluer, A.S., (2016). Functional independence measure scores of patients with hemiplegia followed up at home and in university hospitals. Journal of physical therapy science, 28(2):553-557.
- Chow, SK, Wong, FK & Poon, CY 2006, 'Coping and caring: support for family caregivers of stroke survivors', Journal of Clinical Nursing, vol.16, pp.133-143.
- da Costa BR, Vieira ER. Risk factors for work-related musculoskeletal disorders: A systematic review of recent longitudinal studies. Am J Ind Med. 2010 Mar;53(3):285-323.
- da Costa, B. and Vieira, E., 2009. Risk factors for work-related musculoskeletal disorders: a systematic review of recent longitudinal studies. American Journal of Industrial Medicine
- de Araújo Freitas Moreira, K., Ábalos-Medina, G., Villaverde-Gutiérrez, C., Gomes de Lucena, N., Belmont Correia de Oliveira, A. and Pérez-Mármol, J., 2018. Effectiveness of two home ergonomic programs in reducing pain and enhancing quality of life in informal caregivers of post-stroke patients: A pilot randomized controlled clinical trial. Disability and Health Journal, 11(3), pp.471-477.
- Delis, D., 1995. Evaluating the Brain's Mind - Neuropsychological Assessment, 3rd Edition, Muriel D. Lezak (Ed.). 1995. New York: Oxford University Press. 1,026 pp., Journal of the International Neuropsychological Society, 1(6), pp.597-598.
- Emmanuel C, Obembe AO, Bamidele S. Work-Related Musculoskeletal Disorders among Health Workers in a Nigerian Teaching Hospital. TAF Prev Med Bull. 2012;11:583–8.
- Feigin, V., Forouzanfar, M., Krishnamurthi, R., Mensah, G., Connor, M., Bennett, D., Moran, A., Sacco, R., Anderson, L., Truelsen, T., O'Donnell, M., Venketasubramanian, N., Barker-Collo, S., Lawes, C., Wang, W., Shinohara, Y., Witt, E., Ezzati, M., Naghavi, M. and Murray, C., 2014. Global and regional

burden of stroke during 1990–2010: findings from the Global Burden of Disease Study 2010. The Lancet, 383(9913), pp.245-255.

- Feigin, V., Forouzanfar, M., Krishnamurthi, R., Mensah, G., Connor, M., Bennett, D., Moran, A., Sacco, R., Anderson, L., Truelsen, T., O'Donnell, M., Venketasubramanian, N., Barker-Collo, S., Lawes, C., Wang, W., Shinohara, Y., Witt, E., Ezzati, M., Naghavi, M. and Murray, C., 2014. Global and regional burden of stroke during 1990–2010: findings from the Global Burden of Disease Study 2010. The Lancet, 383(9913), pp.245-255.Lancet. 2014 Jan 18; 383(9913):245-54.
- Fernandes BC, Ferreira KC, Marodin MF, do Val MO,2 013 Frez AR,.Influence of physiotherapeutic guidelines in the caregiver's quality of life and overloadFisioter Mov. ;26(1)
- Gaugler, JE 2010, 'The Longitudinal Ramifications of Stroke Caregiving: A Systematic Review', Rehabilitation Psychology, vol.55, Pp.108-125
- Gokcin Eminel, A., Kahraman, T. and Genc, A., 2022. Physical workload during caregiving activities and related factors among the caregivers of children with cerebral palsy.
- Harrison, T., 1951. Principles of Internal Medicine. Southern Medical Journal, 44(1), p.79.
- Hartke, R. and King, R., 2003. Telephone Group Intervention for Older Stroke Caregivers. Topics in Stroke Rehabilitation, 9(4), pp.65-81.
- Hayes, M., Cockrell, D. and Smith, D., 2009. A systematic review of musculoskeletal disorders among dental professionals. International Journal of Dental Hygiene, 7(3), pp.159-165.
- Hekmatpou D, Mohammad Baghban E, Mardanian Dehkordi L, 2019.The effect of patient care education on burden of care and the quality of life of caregivers of stroke patients.12:211-217.
- Hossain AM, Ahmed NU, Rahman M, Islam MR, Sadhya G, Fatema K. Analysis of sociodemographic and clinical factors associated with hospitalized stroke patients of Bangladesh. Faridpur Med Coll J 2011; 6:19–23.
- Iqbal, M.J., Siddiqui, M.M.R., Islam, Q.T., Hossain, A., Mustafa, E., Shipa, M.R.A., Rahman, M.Y.U. and Sina, H., (2010). Association between acute stroke and metabolic syndrome. Journal of Medicine, 11(2):124-127.

- Islam, M., Moniruzzaman, M., Khalil, M., Basri, R., Alam, M., Loo, K. and Gan, S., 2012. Burden of Stroke in Bangladesh. International Journal of Stroke, 8(3), pp.211-213.
- JF, Moro MA, Dávalos A. The metabolic syndrome and stroke: potential treatment approaches. Stroke 2007; 38:2196–203.
- Joanne O. Crawford, The Nordic Musculoskeletal Questionnaire, Occupational Medicine, Volume 57, Issue 4, June 2007, Pages 300–301.
- Karwowski W, Marras WS,. 2003Occupational ergonomics: Principles of work design. Florida: CRC Press.
- Langhorne, P., Bernhardt, J. and Kwakkel, G., 2011. Stroke rehabilitation. The Lancet, 377(9778), pp.1693-1702.
- Latina R, Petruzzo A, Vignally P, et al. The prevalence of musculoskeletal disorders and low back pain among Italian nurses: An observational study. Acta Biomed. 2020;91(12-S)
- Latina R, Petruzzo A, Vignally P, et al. The prevalence of musculoskeletal disorders and low back pain among Italian nurses: An observational study. Acta Biomed. 2020;91(12-S):e2020003. Published 2020 Nov 30. doi:10.23750/abm.v91i12-S.10306
- Mahbubani, K., 2012. The World Health Organization (WHO). Global Public Health, 7(3), pp.312-314.
- Marco Clari, Alessandro Godono, Giacomo Garzaro et al., 18 September 2020, Prevalence of musculoskeletal disorders among perioperative nurses: a systematic review and meta-analysis
- Martinelli S ,Artioli G,Vinceti M ,Bergomi M, Bussolanti N, Camellini R,et al .Low back pain risk in nurses its prevention2004;57(4);238-4
- Menon, B., Salini, P., Habeeba, K., Conjeevaram, J. and Munisusmitha, K., 2017. Female caregivers and stroke severity determines caregiver stress in stroke patients. Annals of Indian Academy of Neurology, 20(4), p.418.
- Miah MT, Hoque AKMA, Tarafder BK, Romel SMA, Hassan MK. Stroke in young age – study of 50 cases. J Med 2008; 9:10–15.
- Mohammad QD, Habib M, Hoque A et al., 2011 Prevalence of stroke above forty years. Mymensingh Med J ; 20:640–4.

- Mohammad, Q.D., (2014). Management of stroke-Bangladesh perspective. Bangladesh Medical Journal, 42(1):34-35.
- Organised inpatient (stroke unit) care for stroke. (2013). Cochrane Database of Systematic Reviews.
- Ovbiagele, B., Kautz, S., Feng, W. and Adkins, D., (2014). Poststroke Outcomes. Stroke Research and Treatment, 2014:1-2
- Philp, I., Brainin, M., Walker, M., Ward, A., Gillard, P., Shields, A. and Norrving, B., 2013. Development of a Poststroke Checklist to Standardize Follow-up Care for Stroke Survivors. Journal of Stroke and Cerebrovascular Diseases, 22(7), pp.e173-e180.
- Srivastava, A., Taly, A. B., Gupta, A., & Murali, T. (2010). Post-stroke depression: Stroke in China: epidemiology, prevention, and management strategies. The Lancet stroke, 8(3): 211-213.
- Tan, C., Hi, M., Azmi, N., Ishak, N., Mohd Farid, F. and Abdul Aziz, A., 2020. Caregiving Self-efficacy and Knowledge Regarding Patient Positioning Among Malaysian Caregivers of Stroke Patients. Cureus,.
- Thomas, M. and Greenop, K., 2008. Caregiver experiences and perceptions of stroke,13(1):255
- Topics, H., 2022. Caregivers: MedlinePlus. [online] Medlineplus.gov. Available at: <https://medlineplus.gov/caregivers.html> [Accessed 26 March 2022].
- Van der Riet, P., Maguire, J., Dedkhard, S. and Sibbritt, D., (2015). Are traditional Thai therapies better than conventional treatment for stroke rehabilitation? A quasi- experimental study. European Journal of Integrative Medicine, 7(1):16-22.
- Vincent-Onabajo GO, Daniel H, Lawan A, Ali M U, Masta MA, Modu A. Musculoskeletal symptoms among family caregivers of communitydwelling stroke survivors in Nigeria. J Car Sci 2018; 7 (2): 59-66
- Vincent-Onabajo, G., Daniel, H., Lawan, A., Usman Ali, M., Ali Masta, M. and Modu, A., 2018. Musculoskeletal Symptoms among Family Caregivers of Community-Dwelling Stroke Survivors in Nigeria. Journal of Caring Sciences, 7(2), pp.59-66.

- Vincent-Onabajo, G., Daniel, H., Lawan, A., Usman Ali, M., Ali Masta, M. and Modu, A., 2018. Musculoskeletal Symptoms among Family Caregivers of Community-Dwelling Stroke Survivors in Nigeria. Journal of Caring Sciences, 7(2), pp.59-66.
- Yalcinkaya, Y, E, Önes, K, Ayna, A, B, Turkyilmaz, A, K, & Erden, N, (2010). Low Back Pain Prevalence and Characteristics in Caregivers of Stroke Patients: A Pilot Study, Topics in Stroke Rehabilitation, 17, pp. 389 –393.
- Yasobant, S. and Rajkumar, P., 2014. Work-related musculoskeletal disorders among health care professionals: A cross-sectional assessment of risk factors in a tertiary hospital, India. Indian Journal of Occupational and Environmental Medicine, 18(2), p.75.
- Yiengprugsawan, V., Harley, D., Seubsman, S. and Sleigh, A., 2012. Physical and mental health among caregivers: findings from a cross-sectional study of Open University students in Thailand. BMC Public Health, 12(1).
- Yilmaz Yalcinkaya, E., Önes, K., Bora Ayna, A., Kucukali Turkyilmaz, A., & Erden, N. (2010). Low Back Pain Prevalence and Characteristics in Caregivers of Stroke Patients: A Pilot Study. Topics in Stroke Rehabilitation, 17(5), 389–393.

The Chairman
Institutional Review Board (IRB)
Bangladesh Health Professions Institute (BHPI),CRP
Savar, Dhaka-1343.Bangladesh

Subject: Application for review and ethical approval.

Dear Sir,

With due respect, I am Sanjida Rasheed, student of final year B.Sc. in Physiotherapy program at Bangladesh Health Professional Institute (BHPI),the academic institute of Centre for the Rehabilitation of the Paralysed (CRP) under the Faculty of Medicine, University of Dhaka. As per the course curriculum, I have to conduct a research project entitled "**Musculoskeletal disorders among caregivers of stroke patients**"under the supervision of Farjana Sharmin,Lecturer of BHPI, Consultant&OPD In-charge, Department of Physiotherapy, BHPI,CRP,Savar,Dhaka.

The purpose of the study is to gain in-depth insight and understandings from people with musculoskeletal disorders of caregivers of stroke patients in order to understand their own experiences and perspectives on musculoskeletal problems due to long time care giving . The study involves face-to-face and/ or by over phone interview by using questionnaire to explore the perception of people with musculoskeletal disorders due to long time care giving of stroke patients attended at CRP hospital in Savar that may take 20 to 30 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. Related information will be collected from the patients' guidebooks. Data collectors will receive informed consent from all participants and the collected data will be kept confidential.

Therefore, I look forward to having your kind approval for the research project and to start data collection. I can also assure you that I will maintain all the requirements for study.

Sincerely,

Sanjida Rasheed
Sanjida Rasheed
Final Year B.Sc. in Physiotherapy
Session: 2016 – 2017,
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Recommendation from the Supervisor

Farjana Sharmin
Farjana Sharmin
Lecturer of BHPI
Consultant & OPD In-charge
Department of Physiotherapy
BHPI,CRP, Savar, Dhaka-1343, Bangladesh

Thesis presentation date: 17th October 2021

Shofiq
Head of Department
B.Sc. in Physiotherapy, BHPI.

Md. Shofiqul Islam
Associate Professor & Head
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

BANGLADESH HEALTH PROFESSIONS INSTITUTE

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

Ref: CRP/BHPI/IRB/03/2022/574

Date: 02/03/2022

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

Subject: Approval of the research project proposal **"Musculoskeletal disorders among caregivers of stroke patients"** by the Ethics Committee.

Dear Sanjida Rasheed,
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 Farzana Sharmin as thesis supervisor. The Following documents have been reviewed and approved:

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

The purpose of the study is to find out musculoskeletal disorders among caregivers of stroke patients. Since the study involves questionnaire that takes maximum 20-30 minutes 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 12th 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

Permission letter

April 4 , 2022

Head of the Physiotherapy Department

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343.

Through: Head, Department of Physiotherapy, BHPI

Subject: Seeking permission for data collection of 4th year Physiotherapy Research Project.

Sir,

With due respect and humble submission to state that I am Sanjida Rasheed, a student of 4th year B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). In 4th year course curriculum, I have to conduct a research project. The ethical committee has approved my research project entitled on "Musculoskeletal disorders among caregivers of stroke patients" under the supervision of Farjana Sharmin, Lecturer of BHPI, Consultant & OPD In-charge , Department of Physiotherapy, BHPI, CRP, Savar.
I would like to collect data, for which I need your kind approval. I assure that anything of my study will not be harmful for my participants.
I therefore, pray and hope that you would be kind enough to grant my application and give me permission for data collection and oblige thereby.

Yours faithfully

Sanjida Rasheed

Sanjida Rasheed

4th year, B.Sc. in Physiotherapy

Roll: 31, Session: 2016-2017, ID No: 112160357

Bangladesh Health Professions Institute (BHPI)

CRP, Chapain, Savar, Dhaka-1343.

Recommended
Shofiq
05.04.22
Md. Shofiqul Islam
Associate Professor & Head
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

Approved
06/04/22
MOHAMMAD ANWAR HOSSAIN
Senior Consultant &
Head of Physiotherapy Dept
Associate Professor, BHPI
CRP Savar, Dhaka-1343

Rumana (717)
Consultant PT
04.04.2022

Consent Form (English)

(Please read out the participants)

Assalamu-alaikum. My name is Sanjida Rasheed, student of B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI), the academic institute of Centre for the Rehabilitation the Paralysed (CRP). I am conducting this research study which is a part of of Bachelor of Science in Physiotherapy program and my research title is, "Musculoskeletal disorders among caregivers of stroke patients''. For this regard, I would like to know about some personal and other related information about musculoskeletal disorders among caregivers of stroke patients. You will need to answer some questions which are mentioned in attached form. It will take approximately 20-30 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. All information provided by you will keep in a locker as confidential and it will be ensured that the source of information remains anonymous and also all information will be destroyed after completion of the study.

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

If you have any query about the study or your right as a participant, you may contact with, researcher Sanjida Rasheed or my supervisor Farjana Sharmin, Lecturer of BHPI, Consultant & OPD In-charge ,Department of Physiotherapy, BHPI, CRP, Savar, Dhaka-1343.

Do you have any questions before I start?

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

Yes: ☐ No: ☐

Signature of the Interviewer…… Date ……

Signature of the participant …… Date …….

QUESTIONNAIRE FOR MUSCULOSKELETAL DISORDERS AMONG CAREGIVERS OF STROKE PATIENTS

Socio-demographic Questionnaire (English)

Code:

Patient's identification		
1.1	Identification Number	
1.2	Name	
1.3	Age & Sex	**…… ; Male/Female**

A. Caregiver's Information:

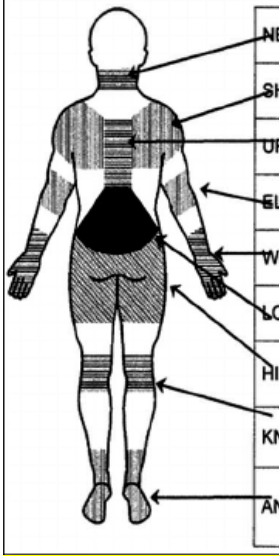
Question No	Question	Option
2.1	Name	
2.2	Age (In Years)	
2.3	Gender	i. Male ii. Female
2.4	Living area	i. Rural ii. Urban iii. Semi-urban
2.5	Marital status	i. Married ii. Unmarried iii. Widow iv. Divorced
2.6	Educational status	i. No academic education ii. Primary school iii. Secondary school iv. Higher secondary school v. Bachelor vi. Masters vii. Others _____
2.8	Occupation	i. Student ii. Housewife iii. Government employee iv. Non-government employee v. Retired vi. Business vii. Unemployed viii. Others…
2.9	Relation with patient	i. Husband

		ii. Wife iii. Brother iv. Sister v. Father vi. Mother vii. Daughter viii. Son ix. Relative
2.12	Number of earning member in family?	
2.13	Caregiving duration	i. 1-5 months ii. 6-11 months iii. 12-36 months iv. 37-72 months v. 73-120+ months
2.14	Daily caregiving time (hours)	i. 1-6 ii. 7-12 iii. 13-18 iv. More than 18 hours

B. Musculoskeletal related information:

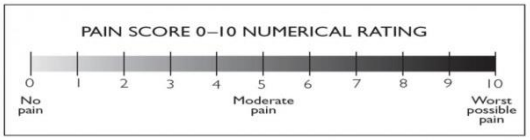
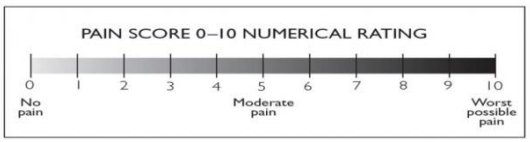
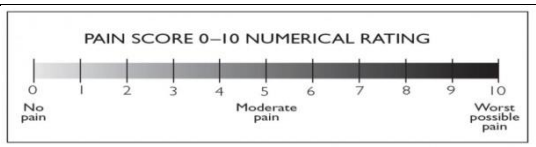
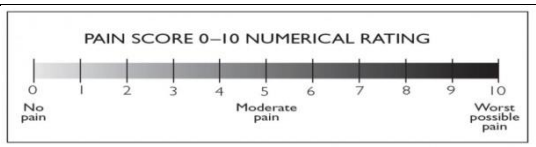
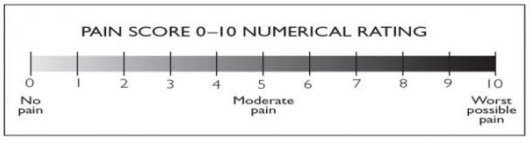
3.1	Have you ever experienced work- related musculoskeletal disorders in any part of your body?	i. Yes ii. No	
3.2	Do you have?		
	Pain	Yes	No
	Ache	Yes	No
	Cramp	Yes	No
	Joint stiffness	Yes	No
	Movement difficulty	Yes	No
	Strain	Yes	No
	Sprain	Yes	No
	Arthritis	Yes	No
3.2	If yes, when did you first experience this work-related musculoskeletal disorder?	i. 0-1 month ii. 2-5 month iii. 6-10 month iv. 11-15 month	

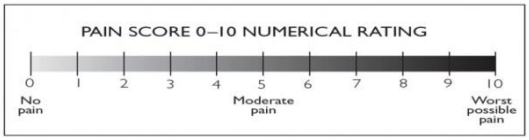
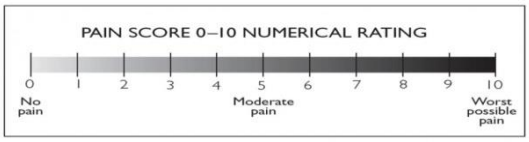
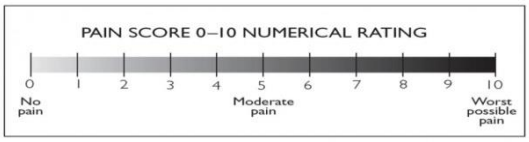
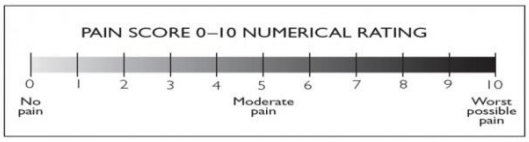
3.3 Nordic musculoskeletal questionnaire:



	Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness) in:	During the last 12 months have you been prevented from carrying out normal activities (e.g. job, housework, hobbies) because of this trouble in:	During the last 12 months have you seen a physician for this condition:	During the last 7 days have you had trouble in:
NECK	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
SHOULDERS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
UPPER BACK	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
ELBOWS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
WRISTS/ HANDS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
LOWER BACK	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
HIPS/ THIGHS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
KNEES	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
ANKLES/ FEET	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes

3.4 How did you have musculoskeletal disorder by pain, nature and severity of complaints?

Complaints (Pain in body parts)	Nature of complaints	Mark the severity of your pain on the following scale (NPRS)	Severity of complaints
Neck	1. Constant 2. Intermittent		1.No pain 2.Mild 3.Moderate 4 Severe
Shoulders	1. Constant 2. Intermittent		1.No pain 2.Mild 3.Moderate 4 Severe
Thoracic region	1. Constant 2. Intermittent		1.No pain 2.Mild 3.Moderate 4 Severe
Lumbar region	1. Constant 2. Intermittent		1.No pain 2.Mild 3.Moderate 4 Severe
Elbow	1. Constant 2. Intermittent		1.No pain 2.Mild 3.Moderate 4 Severe

Wrist	1. Constant 2. Intermittent		1.No pain 2.Mild 3.Moderate 4 Severe
Hip/thighs	1. Constant 2. Intermittent		1.No pain 2.Mild 3.Moderate 4 Severe
Knees	1. Constant 2. Intermittent		1.No pain 2.Mild 3.Moderate 4 Severe
Ankles/feet	1. Constant 2. Intermittent		1.No pain 2.Mild 3.Moderate 4 Severe

3.5	Pattern of pain?	i. Aching ii. Burning iii. Shooting iv. Pins and needles v. Throbbing vi. Stabbing vii. Numbness
3.6	Did you stay away from work because of pain?	i. Yes ii. No
3.7	Had your Working Performance reduced due to pain?	i. Yes ii. No
3.10	Which posture do you work most of the time in your work?	i. Sitting ii. Forward Bending iii. Standing
3.11	Which activity makes your pain worse?	i. Standing ii. Sitting iii. Lying iv. Bending v. Walking
3.12	Which activity relieves your pain?	i. Standing ii. Sitting iii. Lying iv. Bending v. Walking
3.13	Did you go to physician or physiotherapist due to any musculoskeletal problem ?	i. Yes ii. No

3.16	What kind of treatment did you receive?	i. Conservative ii. Physiotherapy iii. Homeopathy iv. Surgery v. Traditional Healer vi. No treatment vii. Others
3.17	What was the ?	i. Improved ii. Unchanged iii. Worse
3.18	Do you have any other condition?	

3.19 This list describes factors that could contribute to musculoskeletal disorder. In your opinion, how have the following factors contributed to your work-related musculoskeletal disorder? (Please give a tick on your answer)

a. Performing the same task over and over
b. Working in awkward or cramped position
c. Continuing to work when injured or hurt
d. Working in the same position for long period
e. Lifting or transferring patient
f. Repetitive movement of limbs
g. Working over your physical activity
h. Not enough rest break during the day