Faculty of Medicine

University of Dhaka

PREVALENCE OF COMMON WORK RELATED MUSCULOSKELETAL DISORDERS AMONG THE BANKERS AT SAVAR

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Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Physiotherapy

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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for acceptance of this thesis entitled, "**Prevalence of common work related musculoskeletal disorders among the bankers at Savar",** submitted by Md. Shafiqul Islam, for the partial fulfillment of the requirements for the degree of Master of Science in Physiotherapy.

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As a supervisor of Md**. Shafiqul Islam**'s MSc Thesis work, I certify that his thesis "**Prevalence of common work related musculoskeletal disorders among the bankers at Savar"** is suitable for examination.

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Declaration Form

- This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidature for any degree.

- This dissertation is being submitted in partial fulfillment of the requirements for the degree of MSc in Physiotherapy.

- This dissertation is the result of my own independent work/investigation, except where otherwise stated. Other sources are acknowledged by giving explicit references.
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Acronyms

BHPI	Bangladesh Health Professions Institute.
CRP	Center for the Rehabilitation of the Paralyzed.
CTS	Carpal Tunnel Syndrome.
EU	European Union.
MSD	Musculoskeletal Disorder.
OODs	Occupational Overuse Disorders.
RMI	Repeated Motions Injury.
ROM	Range Of Motion.
RSI	Repetitive Strain Injury.
SPSS	Statistical Package for the Social Sciences.
UK	United Kingdom.
USA	United State of America.
WMSD	Work-related MusculoSkeletal Disorder.

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ABSTRACT

Purpose: The study was done to identify the prevalence of WMSDs among the bankers. ***Objective:*** To identify the common work related musculoskeletal disorders among the bankers. ***Method:*** The study design was cross-sectional. Total 120 samples were selected conveniently for this study from various bank in Savar area. Data was collected by using mixed type of questionnaire. Descriptive statistic was used for data analysis. ***Result:*** The result of the study shows that 78% participants had WMSDs and age range between 42-55 (27%) years is more vulnerable. Male (72%) was predominantly more affected than female (28%). Most of the education level was Masters or M. B.A (59%). The duration of job experience 6-10 years (43.6%) most commonly suffered by the WMSDs. In this research, the researcher found 78% of the participants had musculoskeletal disorders with higher prevalence of pain. The result indicates that most discomfort of the body regions is in the neck (22%), spine (38%) and knee (24%). Most common symptom of WMSDs was pain (82%) and the most affected body part was spine (38%). Among the 120 participants, 78% who had suffered from WRMD in this study, 26.70% suffered by mechanical back pain, 8.30% had tennis elbow, 7.50% had mechanical neck pain, 5.80% had shoulder causalities, 5.80% had upper back pain, 4.20% had knee OA, 2.50% had wrist pain, 3.30% had headache and 35.80% patient had no disorder, about 31.7% participants had leave in job due to work related musculoskeletal disorder and 68.3% participants were continue their job. The maximum severity of symptom was moderate (57.7%). The most common risk factors were working in same position for (38%) and doing the same task over and over (35%). Only (19.2%) participants had taken physiotherapy treatment for their condition. ***Conclusion:*** Work related musculoskeletal disorders represent a significant burden for bankers. The study was represents the strong evidence that WMSDs was common among bankers. In order to reduce musculoskeletal problems, correct postural practices, proper design of tools and equipment significantly can prevent MSDs.

Key words: **WMSDs, Bank**

CHAPTER-I INTRODUCTION

1.1 Background:

Prevalence of musculoskeletal disorders becomes increasingly common throughout the world during the past decades. Work related musculoskeletal disorders (WRMD) have deleterious effect that produce work related disability among the workers with considerable financial consequences due to workers compensation and medical expenses (Prins et al. 2000). Various work related factors have been identified as predisposing the disorders. (Alexopoulos et al., 2004)

Musculoskeletal disorders (MSD) are commonly affects the human support systems such as muscles, tendons, nerves, blood vessels, bones and joints. MSD can occur from a single event or repeated trauma. MSD are one of the most important occupational health problems for dental professionals, particularly dentists (Hayes et al. 2008).

Work-related Musculo-Skeletal Disorders (WMSDs) in the bankers have increased significantly over recent years (Guo, et al., 2004). MSDs are more common among waiters and helpers who usually bear load (Kokane & Tiwari, 2011). Risk factors of WMSDs include workplace activities such as heavy load lifting, repetitive tasks, and awkward working postures, demographic characteristics factors are also known to be important predictive variables (Linton & Kamwendo, 1989).

In present time, although many studies have dealt with MSDs among office workers, the exact nature and prevalence of this important health problem as WMSD has not been studied before at Savar, Bangladesh. Savar is an Upazila of Dhaka District in the Division of Dhaka, Bangladesh and located at a distance of

about 24 kilometers to the northwest of Dhaka city (Amal, 2012). The aims of the study were to assess the pattern of MSDs among bank workers and to identify the impact of demographic, occupational, psychological and social factors on MSDs.

Musculoskeletal disorders are common complaints that lead to a major impact on the health related quality of life as well as performance and productivity at work. Work related musculoskeletal disorders account for a large number of disabilities and worker compensation days in many countries (Wang et al. 2008). In the developed and industrially developing countries MSDs are a leading cause of occupational injury and disability (Shahnavaz, 1987). Among all diseases 37% have an impact on occupational risk factors globally, resulting in substantial disability (Johnos, 2011). The economic loss due to those disorders affects not only the individual but also the organization and the society as a whole (Choobineh & Tabatabaee, 2009). Poor working conditions and the absence of an effective work injury prevention program in industrially developing countries has resulted in a very high rate of MSDs (Jafry & Neill, 2000).

In terms of age, we found 1,991 cases (31.9%) in their 30s, 1,867 cases (29.9%) in their 40s, 1,294 cases (20.8%) in their 50s, 643 cases (10.3%) under 20, and 439 cases (7%) over age 60 (Kun et al., 2010). The prevalence of WMSD was highest among Vietnamese (57.1%), followed by Thai (33.9%) and Filipino (25.8%) (Lee et al., 2011). In UK One-year prevalence of musculoskeletal symptoms was 79% (Choobineh & Tabatabaee, 2009). In USA number of sufferers were increased from 50000 people in 1985 to 332000 in 1994 (Mirmohamadi, et al., 2004).

Among the WMSDs, highest prevalence was reported in knees (58.6%) and the lower back (54.3%). In 99.1% of the workers, the level exposure to MSD risk. Awkward

postures, manual material handling, and long hours of standing were the major ergonomics problems (Choobineh & Tabatabaee, 2009).

In India the prevalence of MSD was very high contributing to more than 76% the occupation-related discomfort mostly affecting the lower back (97%), knees (85%) and shoulders (77%). 67% of the subjects experienced discomfort in the hands and 58% of the subjects suffered from discomfort in the wrists (Gangopadhyay, et al., 2010). Among 905 bankers study showed in Taiwan, 785 (84%) reported experience of WMSD in the previous month with a high prevalence of shoulder (58%), neck (54%), lower back/waist (53%) and finger/wrist (46.5%) disorders (Chyuan, et al., 2004). In Spain work-related low back pain was reported by 32.9%, neck pain by 29.6%, pain in the upper back by 19.7%, legs by 11.7%, feet-ankles by 8%, shoulders by 7.2%, buttocks-hips by 6.9%, knees by 6.7%, arms by 6.2%, and hands by 5.4 (Srivastava & Vats, 2012).

According to the bankers' medical records, 22.75% of all occupational illnesses were related to the musculoskeletal system (Choobineh & Tabatabaee, 2009). In the USA, the Bureau of Labour Statistics estimated that in 1996, 64% of all new WMSDs lead to disability (Eltayeb, et al., 2007). In USA, the proportion of WMSDs by repetitive movements was 33.6% in 1992, it peaked at 34.7% in 2000 and in 2007, it decreased to 28.9% by various measures (Kun, et al., 2010).

Work related neck disorders are common problems in office workers, especially among those who are intensive computer users (Eltayeb, 2007). The worldwide trend is for people to use computers for longer periods daily, due to increased computer-based tasks at work as well as during leisure activities (Talwar, et al., 2009).

It is generally agreed that the etiology of work related neck disorders is multidimensional which is associated with, and influenced by, a complex array of individual, physical and psychosocial factors (Bongers, et al., 2013). Among these various risk factors, work-related psychosocial factors appear to play a major role. According to Bongers, et al. (2013), work-related psychosocial variables may include aspects of the work content, organization, and interpersonal relationships at work, finances and economics. Individual factors are considered as confounding factors that influence the relation between psychosocial demands and the occurrence of MSD (Bongers, et al., 2006). Furthermore, psychosocial demands may be highly correlated with physical demands, which also indicate a confounding effect of physical factors on the relation between work-related psychosocial variables and the occurrence of neck pain (Palmer and Smedley, 2007). In the case of Europe, WMSDs has occupied 49% of the causes of absenteeism, and 100 million workers suffered WMSDs (Kun et al., 2010).

In addition, MSDs account for 50% of all new cases of occupational disorders and 50% of all work-related health problems in Europe (Cagnie, et al.,2007). Moreover, the number of MSD cases is increasing over time. In 2001, around 19 workers in every 100,000 suffered from a new MSD. This number had almost doubled 32 per 100,000 workers by 2003 (Stover, et al., 2007).

In Britain 750,000 people working in the previous 12 months reported suffering from WMSD where around 335,000 had to take time off work as a result of their work-related condition (Jordan, et al., 2010). In Sweden, WMSDs took up more than 57% of occupational diseases (Kun et al., 2010). In Japan, more often among the bankers, increasing in musculoskeletal disorders between years 1960–1980 (Mirmohamadi et al., 2004). Especially, the rapid increase mainly occurred in workplaces with over

1,000 employees and the social issue of labor management disputes was on the rise. In addition, the expense of the compensation insurance was 5.9 billion was in 2000 that became 105.3 billion in 2004 and 163.3 billion in 2007 that shows the considerable social expenses of WMSDs (Kun et al., 2010).

A more recent report by the National Safety Council indicated that over exertion is the most common cause of occupational injury, accounting for 31 percent of all injuries (Srivastava & Vats, 2012). The efficiency of any activity varies according to the type of activity and the manner in which it is performed.

In USA nearly 20 percent of all injuries and illnesses in the work place and nearly 25 percent of the annual worker's compensation payment are attributed to back injuries (Maduagwu et al., 2014). These musculoskeletal disorders accounted for 29% of all lost time workplace injuries and illnesses in 2008(Kun et al., 2010). Repetitive motion injuries cost all employers about $2 billion and overexertion injuries cost an additional $ 12.7 billion in 2007 (Bureau of Labor Statistics, 2005). In Netherlands, sickness leave less than 1 year due to WMSD is estimated at around 13% of all sickness leave (Borghouts, 1999). In Denmark the WMSD is estimated at approximately 33% (Maduagwu, et al., 2014). In Finland the work-relatedness of MSD is estimated at approximately 33% in 1992 and 1996 (Wahlstrom, 2004).

WMSDs among the total approved occupational diseases increased from 49.6% in 2003 to 76.5% in 2007, and the total cost of WMSDs increased from 105.3 billion in 2004 to 163.3 billion in 2007. The approval rate of WMSDs by the Occupational Safety and Health Research Institute (OSHRI) accounted for 65.6% (Kim, et al., 2010). The ratio of MSD cases to WMSDs cases was approximately 10% in the 1990s and showed a sharp increased since 2000 which is currently 60%-70% (Stover et al., 2007). The total amount of the industrial accident compensation insurance expenses

was 105.3 billion won in 2004 and increased to 163.3 billion won in 2007 where compensated expenses reached 69.2% for occupational disease and 7.0% for the total compensation fund in 2008 and in 2009, the distribution of 6,234 cases of WMSDs was as follows: 2,472 cases of accidental low back pain (39.7%), 2,407 cases of non-accidental low back pain (38.6%), and 1,355 cases of musculoskeletal burden work (21.7%) (Kim, et al., 2010).

Several possible pathophysiological mechanisms of WMSD have been proposed in the literature. According to Viikari-Juntura, (2001) it is unlikely that a single comprehensive pathophysiological mechanism exists that is responsible for tissue damage where selective and sustained activation of type I motor units can be seen as the most influential hypothesis for the development of muscle damage due to sustained low-intensity tasks. This may lead to calcium accumulation in the active motor units and other homeostatic disturbances due to limitations in local blood supply and metabolite removal in muscle compartment with larger numbers of active motor units. Additional mechanisms, such as nociceptorsensitization due to intra-muscular shear forces are also assumed to play a role (Viru and Viru, 2001).

WMSDs are the most deleterious inflammatory and degenerative conditions that affect the joints, soft tissues, peripheral nerves and supporting blood vessels (Tinubu et al., 2010). Musculoskeletal injuries resulting from a work-related event is called work-related musculoskeletal disorder (Akrouf, et al. 2010; Maduagwu, et al., 2014). It can cause consequent pain and disability in the functions of neck, shoulders, elbow, arms, wrists and hands (Abledu and Abledu, 2012; Sadeghian, et al., 2012). These disorders occur when there is a mismatch between the physical requirements of the job and the physical capacity of the human body (Korhan, 2010). It affects all persons regardless of age and sex especially those who do repetitive movement or forceful

activity in poor or awkward working posture for long periods of time (Maduagwu, et al. 2014). Tenderness, aches and pains, tingling, swelling, stiffness, muscle spasms etc. are some signs of musculoskeletal disorders (Janwantanakul et al. 2008). These symptoms may arise in all body parts and the shoulders, arms, elbows, wrists, hand, backs, legs and feet are the most affected areas (Tver, 2012).

Rationale

WMSDs were one of the most important occupational health problems for bankers. The disorders cause long periods of work disability and treatment was often necessary. From this study banker will able to identify the risks that can control and review their activities. Bankers may provide proper recommendation for every single risk which will be helpful for them. Beside this it will help to established ergonomic guidelines for space, equipment, furniture and environmental conditions which are mandatory in the design of workplace. This study will also help to discover the lacking area of bankers, especially about their posture before doing any activities. Beside this it will help to professional development which is mandatory for current situation. From this study researcher can identify the risk factors of the workplace which are harmful. So, this study can help them to teach and give proper education about the posture the condition and prevention method.

MSDs may cause a great deal of pain and suffering among bank workers. These were the most common lost time injuries and most costly occupational problems. Job activities that may cause MSDs span diverse workplaces. MSDs may decrease productivity and the quality of products and services. Bankers experiencing aches and pains on the job may not be able to do quality work.

Research question

What is the prevalence of common worked related musculoskeletal disorder among the bankers at selected bank?

Objectives

General objective:

To identify the common WMSDs among the bankers.

Specific objectives

• To explore the socio-demographic characteristics of bankers with musculoskeletal disorders.

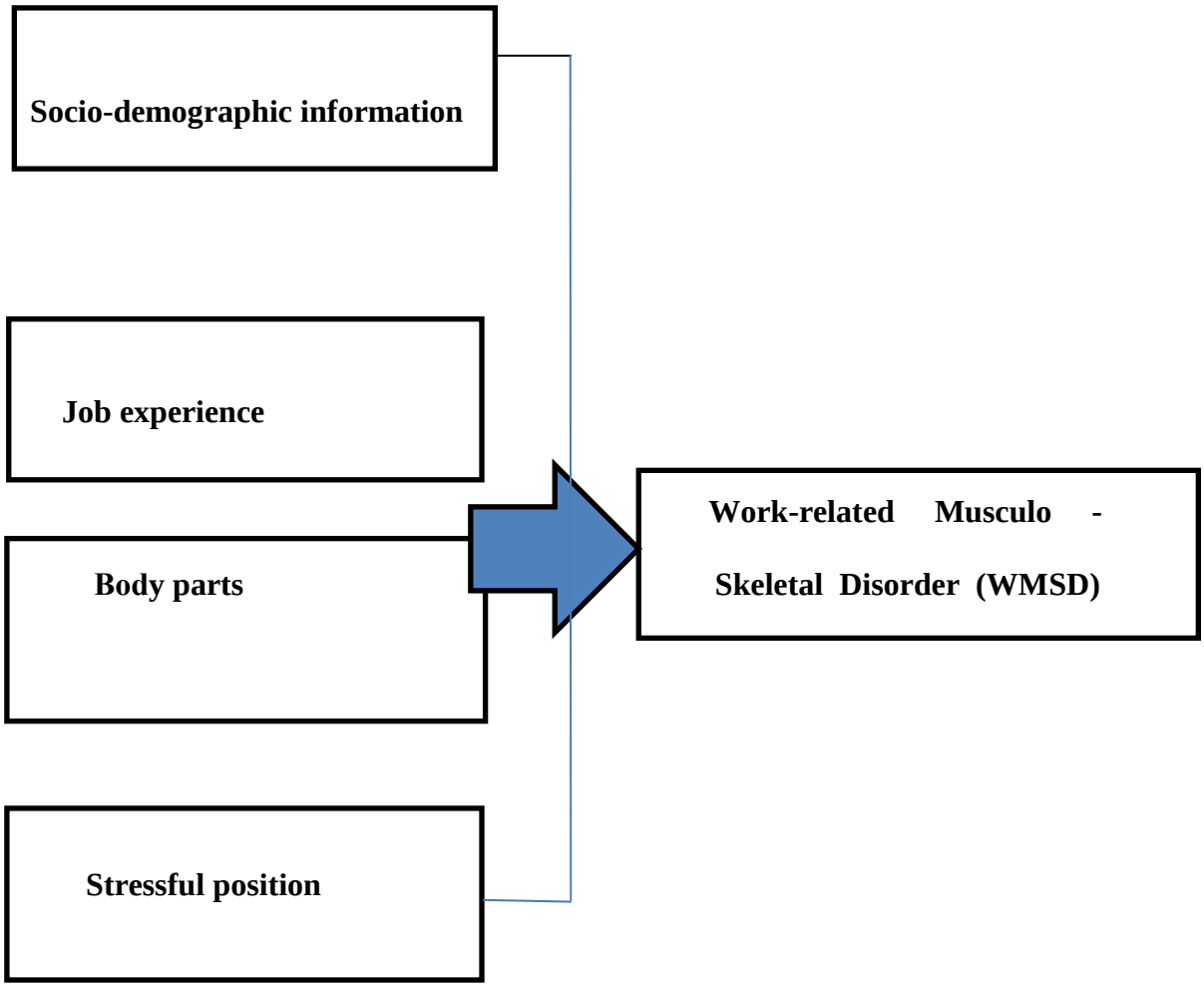
• To find out the number of experience and episode of WMSD among the bankers.

• To establish different body parts involved with musculoskeletal disorders and the risk associated with such disorders.

• To find out types of treatment receive & consequences.

Conceptual Framework

Independent variables **Dependent variable**



Operational definition

Musculoskeletal disorder

Musculoskeletal disorders affect the soft tissue of the body, such as the muscles, tendons, ligaments, nerves etc.

Work related musculoskeletal disorder

Work related musculoskeletal disorders develop when the same muscles are used over and over again, usually applying force, and with little recovery time away from the task. They also develop when bankers have to maintain a same position while working.

CHAPTER-II LITERATURE REVIEW

MSDs are disorders that affect the musculoskeletal system, resulting from a repetitive exposure to loading. Upper limbs, the neck and lower back are particularly vulnerable to MSDs. Lower limbs and the upper back may also be affected (European Agency for Safety and Health at Work, 1999). The MSDs are characterized by the presence of discomfort, disability or persistent pain in the joints, muscles, tendons, and other soft parts. They are caused or aggravated by repeated movements and prolonged awkward or forced body postures (Samat, et al., 2011). WMSDs are the most common self-reported, work related illness in many workplaces that is characterized by discomfort, impairment, disability, or persistent pain in joints, muscles, tendons or other soft tissues (Bongers et al., 2006).

Work-related Musculo-Skeletal Disorder (WMSDs) are injuries or disorders of musculoskeletal tissues associated with workplace risk factors and are known by a variety of terms, including cumulative trauma disorders, repetitive strain injuries, and overuse injuries (Borghouts, 1999). For people who spend a great deal of time using computers, WRMSDs of the neck are a common problem.

The risk factors for the development of MSDs are: repetitive work; painful positions, carrying or moving heavy loads, other risk factors such as, and prolonged standing or walking (Johnos, 2011). MSDs are sometimes called ergonomic injuries and illnesses. Ergonomics is the study of the worker's interaction with tools, equipment, environment, jobs, tasks, work methods, work rates etc. (Maier & Ross-Mota, 2000). Musculoskeletal disorders can developed when he same muscles are used over and over again or for a long time without taking time to rest. The chance of getting this type of injury increases if the force exerted is high and/or the job requires an awkward

posture. Some examples of musculoskeletal disorders include back pain, carpal tunnel syndrome, tendonitis and tenosynovitis (Department of Labor Statistics, 1992).

WMSD develops gradually as a result of repeated trauma- excessive stretching of muscles and tendons can cause injuries that only last a short time (Chyuan et al., 2002). But repeated episodes of stretching causing tissue inflammation can lead to long lasting injuries or WMSD (Department of Labor Statistics, 1992). When worker begin fatigue, it outruns their body's recovery system and develop a musculoskeletal imbalance, if fatigue help to outrun recovery and the musculoskeletal imbalance persists, it will cause to develop musculoskeletal disorder (Ergonomics, 2007). WMSDs include all MSDs that are induced or aggravated primarily by work and the circumstances of its performance. Most WMSDs are cumulative disorders, mainly affect the back, neck, shoulders and upper limbs, but can also affect the lower limbs. Some MSDs, such as carpal tunnel syndrome in the wrist, are specific because of their well-defined signs and symptoms (Johnos, 2011).

According to the WHO, there are 150 million computer users worldwide and for doing computer based activity a person needs to be more deskbound and required more mental attention than non-computerized service holders (Eltayeb et al., 2007) . Improper working posture and movement, forceful exertion, repetitive work, imbalanced temperature, inadequate breaks. According to the National institute for occupational safety and health, American conference of governmental industrial Hygienists and most researchers recognizes the following factors as physical risk factors like repetition, force, awkward posture, static posture, dynamic factors such as velocity of movement, mechanical compression, vibration and cool temperature etc. lead to WMSD (Podniece, 2008). The risk of developing musculoskeletal symptoms depends on which risk factor is working along with some characteristics such as

excessive intensity, long duration and extreme temperature. When more than one risk factors work the risk of developing MSD increased at a vast amount (Mirmohamadi, et al., 2004).

Force is the mechanical effort required to carry out a movement or to prevent movement. Force may be exerted against a work piece or tool, or against gravity, to stabilize body segments. The force that a worker exerts on an object is a primary risk factor. Muscles and tendons can be overloaded when a strong (high) force is applied against the object load (Pearce et al., 2004). The dynamic act of lifting a work piece and the static act holding that piece in position both require force, generated by muscles, transmitted through tendons and exerted by body segments on the work piece workers need force for doing their activity and excessive force can cause muscle fiber damage (Mirmohamadi et al., 2004). Performing job by doing forceful exertions of muscles will make them fatigue rapidly and if the more force is applied, the more frequently the muscle will be fatigue or strained (Kumar, 2001). Overuse of muscles through forceful exertions lead to strain or damage muscles, irritate tendons, joints and disks. The final result of excessive force leads to create inflammation, fluid build-up, and constriction of blood vessels and nerves in the area. Disorders of nervous system such as carpal tunnel syndrome and other nerve entrapment disorders can occur through increased compression on nerves (Fagarasanu & Kumar, 2003). Carpal tunnel syndrome (CTS), tendonitis, thoracic outlet syndrome, and tension neck syndrome are causes WMSDs. Work activities which are frequent and repetitive, or activities with awkward postures cause these disorders which may be painful during work or at rest and almost all work requires the use of the arms and hands (European Agency for Safety and Health at Work, 2007). Therefore, most WMSD affect the hands, wrists, elbows, neck, and shoulders. Work using the legs can lead to WMSD of

the legs, hips, ankles, and feet. Some back problems also result from repetitive activities (Canadian Centre for Occupational Health & Safety, 2005). Awkward postures, repetitive work or handling heavy loads are amongst the risk factors that may damage the bones, joints, muscles, tendons, ligaments, nerves and blood vessels, leading to fatigue, pain and musculoskeletal disorders (MSDs). WMSDs are mostly cumulative, resulting from repeated exposure to loads at work over a period of time. Upper limbs (the hand, wrist, elbow and shoulder), the neck and lower back are particularly vulnerable to MSDs (European Agency for Safety and Health at Work, 2007). There are ranges of different terminologies used to describe WMSDs problems such as cumulative trauma disorders (CTDs), repetitive strain injury (RSI), repeated motions injury (RMI) and occupational overuse disorders (OODs) (Guo et al., 2004).

Lifting and carrying are not the only task that requires high force but there are some jobs such as computer typing needs high force (Canadian Centre for Occupational Health & Safety, 2014). Different jobs that require employees to apply pinch forces with their fingers (picking up or placing small items on an assembly line with the fingers), static forces (applying a lot of physical effort to put the last turn on a screw, pulling hard on a 30-inch wrench to loosen a bolt), and dynamic forces (tossing objects into containers) (Chyuan, et al., 2004).

There is general agreement that the frequency of neck pain in various populations is quite high and this symptom greatly affects the person's quality of life and need for health care. Neck problems also account for a large proportion of occupational illness and disability and place a heavy load on the compensation insurance systems .The prospective studies on prevalence of neck pain are not entirely comparable because of differences in their designs (Bongers et al., 2006).

The epidemiology of neck pain is important for several reasons. More knowledge about the size and extent of this problem would facilitate accurate predictions of the need for physiotherapy direct resources. Moreover, the prevalence of neck pain in the bank workers is essential for determining the relation between age and occupation. Neck pain is common among adults in developed countries and contributes importantly to the demand for medical services and the economic burden of absence from work due to sickness. Population based studies suggest a lifetime prevalence of over 70% and a point prevalence of between 12% and 34% (Linton & Kamwendo, 1989).

There are mainly four different groups of factors may potentially contribute to WMSDs which are Physical or biomechanical work related factors, Organizational or psychosocial work related factors, Individual or personal factors and factors relating to social context (European Agency for Safety and Health at Work, 1993).

Physical factors include the work procedures, equipment and environment that lead to biomechanical stress in the muscles, tendons, spinal discs and nerves. Force, repetition, awkward postures or long-term static postures are considered the principal physical work-related risk factors in relation to MSDs (Grandjean, 1975).

Applying manual force with the intention of moving objects loads the muscles and tendons of the arms. Repetitive work using the same muscles and tendons for a considerable part of the working day may be responsible for fatigue and injuries. In awkward postures (with the hands above shoulder height or with the wrists noticeably bent*)* the joints are more susceptible to injuries and the muscles have less capacity for exerting force (Grandjean, 1975). Prolonged standing may result in fatigue and discomfort in the legs. It can lead to the development of musculoskeletal disorders (e.g. painful feet and other foot problems) and varicose veins. Manual handling refers

to the transfer, pushing, pulling and carrying of loads by one or more employees. When heavy manual handling is repetitive, and combined with awkward work postures (e.g. with the trunk bent forward, or bent and twisted at the same time) there may be a high risk of MSDs in the lumbar region. Repetitive, forceful work with the joints in an awkward position is one of the most important combinations of risk factors (European Agency for Safety and Health at work, 1993).

Organizational factors such as workloads & hours of work, overtime, duration of time spent using the keyboard and mouse, workplace design such as desktop & chair height, legroom, keyboard & mouse surface, monitor height etc. have significant association with musculoskeletal disorders if it have any miasmas with the appropriate dimensions (Guo et al., 2004).

Early stage is the aching and tiredness of the affected limb occurs during the work shift but disappear at night and during days off work. No reduction of work performance (Canadian Centre for Occupational Health & Safety, 2005). Intermediate stage is aching and tiredness occurs early in the work shift and persists at night. Reduced capacity for repetitive work. Late stage is aching, fatigue, and weakness persist at rest. Inability to sleep and to perform light duties. Not everyone goes through these stages in the same way. In fact, it may be difficult to say exactly when one stage ends and the next begins. The first pain is a signal that the muscles and tendons should rest and recover. Otherwise, an injury can become longstanding, and sometimes, irreversible. The earlier people recognize symptoms, the quicker they should respond to them. WMSDs do not happen as a result of a single accident or injury. Rather, they develop gradually as a result of repeated trauma. Excessive stretching of muscles and tendons can cause injuries that only last a short time.

But repeated episodes of stretching causing tissue inflammation can lead to long-lasting injury or WMSDs (Canadian Centre for Occupational Health & Safety, 2005).

Individuals differ in their susceptibility to MSDs. Factors such as prior medical history, physical capacity and age are very important. Obesity, pregnancy, rheumatoid arthritis, acute trauma and endocrinological disorders are other examples of individual non-occupational factors that may affect the occurrence of MSDs (European Agency for Safety and Health at work, 1993).

The musculoskeletal problems associated with repetitive work have become a concern to certain occupational groups such as computer users. Keyboard operators exert peak forces in the range of 2 to 3 N, approximately three to nine times more than the force required to activate the key. The use of this amount of force means that keyboard keys are moved downward to their limit. Long duration of keyboard and mouse use may result in repetitive motion & high force. Office workers with greater frequent and severity exerted higher levels of key force while typing than those who reported fewer and less severe symptoms (Gangopadhyay et al., 2010).

Social context provides some important non-work risk factors relating to MSDs. Some types of sports, leisure activities and housekeeping work at home can all increase susceptibility to MSDs. The relation between work activities and a particular musculoskeletal disorder is multi-factorial. This means that when different physical factors are present, coexisting with organizational factors (and also individual and social factors), a work situation may arise in which there is a high risk of developing MSDs (European Agency for Safety and Health at work, 1993).

The environmental risk factors refers to temperature, enough lighting, good work environment, type of ventilation (dry, cold, unwanted or fresh air), type of

environment of work (noisy, too bright) inside the office, location of screen or screen reflects the office light etc (Eltayeb et al. 2007).

A very essential environmental factor is Temperature. Workers become tired quickly in an office that is too warm. An increase in temperature may create excessive sweating, reduce efficiency in both physical and mental tasks, rise in heart rate and blood pressure, and reduce digestive organ activity (Canadian Centre for Occupational Health & Safety, 2014). Performance of the workers is also depended on cold temperature. In a cold environment blood vessels contract and posture becomes stiff. Workers may feel restless and become easily distracted in an office that is too cold. When there is significant change in temperature, workers become tired quickly which fall then in risk to injuries (Canadian Centre for Occupational Health & Safety, 2014).

The following work related psychosocial factors showed a positive association with MSDs: mental tiredness at the end of the workday, shortage of personnel, not being rested after break; no variation at work, doing the same work all day, getting annoyed about others. Women have an almost two-fold risk compared with men. Persons older than 30 years have more than two and one half times more chance of having neck pain than younger individuals (Ghosh & Das, 2010). Being physically active decreases the likelihood of having neck pain. Often holding the neck in a forward bent posture for a prolonged time, often sitting for a prolonged time and often making the same movements per minute are risk factors for neck pain. The risk of neck pain is about two-fold for those experiencing mental tiredness at the end of the workday in comparison to those who do not experience tiredness. Shortage of personnel increases the risk of neck pain (Bongers et al., 2006).

Different work related psychosocial factors showed a positive association with neck pain, but only mental tiredness at the end of the day and shortage of personnel were independently related. Reporting shortage of personnel may be an indirect reflection of work (over) load. There is consistent evidence that stress is associated with neck pain. The protective effect of rest breaks was also reported in other studies. Breaks allow a reduction in computer exposure, but more especially permit muscle relaxation (Eltayeb et al. 2007).

MSDs can be caused by numerous other spinal problems. MSDs may arise due to muscular tightness in both the neck and upper back and pinching of the nerves emanating from the cervical vertebrae. Joint disruption in the neck creates pain, as a joint disruption in the upper back (Hales & Bernard, B.P., 1996).

WMSDs cause considerable personal discomfort due to pain, disability, and impaired quality of life, and may affect work. The economic consequences of treating disabling MSDs are significant (Department of Labor Statistics, 1992). Jafry & Neill (2000) stated for people who spend a great deal of time using computers, pain is a common problem. There has been a great technological advance in computers along with an industrial shift to a more service oriented economy. This has led to more sedentary jobs as the downsizing of the number of employees is used to minimize losses in corporate profits and resulting increased demands in productivity.

Daily exposures to physical risk factors and insufficient rest or recovery time are among the principal organizational factors that can lead to MSDs (Kun et al., 2010). Providing knowledge, skills and information on working methods and techniques, and on working movements, postures and loads, can reduce the risk of MSDs. Mental strain can cause muscular tension, and increase existing physical strain. Work conditions that may increase mental strain include: Psychologically demanding

activities, in which the workers are exposed to high levels of work stress, work pressure and mental demands, as a consequence for example of tight deadlines and low levels of autonomy and Activities in which there is little support from colleagues, supervisors and managers (European Agency for Safety and Health at work, 1993).

Repetition refers to the performance of the same motions over and over within a given period of time. Repetition is reported as a risk factor in itself or as an exposure. A moderate level of repetition may be seen as proactive, since it can increase muscle strength and flexibility. It can also assist blood flow through muscles, thus relieving the stressful nature of static muscle contractions. Studies have demonstrated that high repetition of negligible force applied to the same muscle group, joint or tendon causes inflammation of soft tissues (Eltayeb et al. 2007).

Posture is one of the most frequent risk factor for developing musculoskeletal disorders. It is the position of the body including arms and legs while working. Bad or awkward postures mean that joints must be held beyond their comfortable, neutral position, and close to the extreme end of their maximum range of movement. Remaining in the same posture for too long is also inadvisable (Putz-Anderson et al., 1997).

Awkward posture is the primary ergonomic risk factor to which employees are exposed when the height of working surfaces is not correct. Awkward postures involve working in a position that is deviated from neutral position (Scherzer et al., 2005). It brings the body out of alignment and is less efficient and effective position than neutral posture. All joints move through a special range of motion. Postures in the middle of the range of motion are generally considered as neutral postures whereas postures at the end of the range can be considered as awkward posture.

A work station that is too high or low will involve the workers to work in an awkward posture. In different offices or banks, most of the employees work in the surfaces that are not adjustable. Employees who have average height may be able to work comfortably but others having different height have to face many difficulties (Mikael, 1999). Working surfaces that are too high usually affects the muscles of the upper limb specially muscles around the shoulder and elbow joint. On the other hand working surfaces that are too low usually affect the lower back and the neck. Although no one really knows when WMSDs will develop, workers performing forceful movements are at risk. Work involving forceful movements is very tiring again because there is not time for a full recovery between movements. Eventually it takes effort to perform the same task. When the work activity continues in spite of the developing fatigue, injuries occur (Canadian Centre for Occupational Health & Safety, 2014).

Working for long time in the same position will make the workers feel "stiff, sore and tired. Static postures are those postures that are held over a long period of time that resist the force of gravity or stabilize a work piece or body part. It involves a prolonged state of contraction during which no movements is being performed. During static contractions, the internal pressure of muscle tissue compresses blood vessels and reduces blood flow to the muscle so that the oxygen and energy supply to the exertion and duration of forces (Alexopoulos et al., 2004).

Working with computer in static posture has been identified as major occupational risk factor. Prolonged sitting requires the muscles to hold the trunk, neck and shoulders in a fixed position. This squeezes the blood vessels in the muscles, reducing the blood supply. An insufficient blood supply accelerates fatigue and makes the muscles prone to injury.

Bending or twisting while manual handling creates an awkward posture and changes the way forces are distributed in the (Chaffin & Ayoub, 1976). When the spine is in its natural position, forces are directed along the bony structure and distributed into the tissue as the spine curves. However, bending and twisting redirects the forces, placing more compressive and shear forces on the discs (Alexopoulos et al., 2004).

Initially, most research on work-related symptoms focused only on physical exposure (Bongers et al., 1993). However recent studies have demonstrated that complain arm, neck, shoulder, back & lower limb have a multi-factorial origin; possible risk factors are of a physical, psychosocial or personal origin (Bongers et al., 2006). Physical activities such as manual material handling (e.g., heavy load lifting) and awkward working postures are very common. In this situation, a high rate of WMSD is expected (Choobineh & Tabatabaee, 2009). Heavy, static or monotonous work, extreme or constrained postures, repetitive movements, unsuitable workplaces and equipment, forces etc. Lifting heavy objects that shouldn't be lifted by one person without the help of assist devices or helpers. Working in unnatural or awkward positions can lead to strains, sprains, muscle pain and nerve damage in the neck, upper and lower back, shoulders, elbows, forearms, wrists and fingers. Standing for long periods of time in one position on a hard surface can lead to muscle fatigue, back pain and soreness in legs and feet (Ebnezar, 2005).

Works categorized themselves as performing heavy work. Factors that Contributed to heavy workload as observed in the work place were that the joints were not in neutral position while performing the work. The workers maintained those abnormal postures for a long time, which contributed to their easy fatigability. Work was not close to the body of the bankers and they had to adopt awkward postures to perform such works. The other factors that added up to the strain were bending forward, twisting trunk and

straining the back along with sudden movements. These types of movements were always found to produce peak stress **(**Priya et al., 2010).

More risk factors in the workplace also contribute to MSDs (National Research Council, 2001). The psychosocial factors are work organization, interpersonal relationships, short cycle tasks, poor work control, poor management, unsatisfactory training, lack of breaks etc. (Bongers et al., 1993).

Personal factor are gender, age, seniority, exercise habits, life style, psychological characteristics and capacities) aspects into account as risk factors and work conducted by the National Institute for Occupational Safety and Health (NIOSH) that defined several broad components of the lifting task related to the risk of back injury (Chaffin & Ayoub, 1976). These components were classified into four categories: worker characteristics, characteristics of the material or object to be lifted, task characteristics, and work practices. Important worker characteristics include age, sex, and anthropometry, and coordination, degree of formal training in manual material handling, work experience, general health, and general level of physical activity **(**Priya et al., 2010).

Musculoskeletal impairments are among the most prevalent and symptomatic health problems of middle and old age. Another problem is that advancing age and increasing number of years on the job are usually highly correlated (Anderson, 1981).

Age is a true confounder with years of employment, so that these factors must be adjusted for when determining relationship to work. MSD problems are even more common among older workers (Ebnezar, 2005).

Some studies have found a higher prevalence of musculoskeletal symptoms in women than men (Anderson, 1981). Women are exposed to repetitive biomechanical stresses

on the upper limb more frequently than men as in Taiwan female workers 39.5% had a significantly higher overall prevalence than male workers 35.2% (Gou et al. 2004).

Signs and Symptoms of WMSDs are weakness in the hands or forearms that make it difficult to lift or carry as normal. Tingling, pins and needles, Clumsiness: dropping or having to concentrate on holding things, Difficulty using hands for ordinary activities, waking up at night with upper extremity pain Hands cold or tender, Chronic pain that gets worse Symptoms may appear in body parts distal to where stress or damage has occurred (Lenore, et al., 2004). Pain is the most common symptom associated with WMSDs. In some cases there may be joint stiffness, muscle tightness, redness and swelling of the affected area. Some workers may also experience sensations of "pins and needles," numbness, skin colour changes, and decreased sweating of the hands. WMSDs may progress in stages from mild to severe (Canadian Centre for Occupational Health & Safety, 2005).

Chronic low back pain is pain in the lower back, often referring into the hip, buttock or one leg. The cause may be muscle strains or trigger points, instability due to weak postural muscles, hypo mobile spinal facet joints, or degeneration or herniation of spinal disks (Quittan, 2002). Low back pain is one of the most common musculoskeletal disorders related to bank work. The connection between symptoms, disability and demonstrable pathology is often not clear or requires much focused investigation. A wide range of occupations, work tasks, workplace factors and psychological factors has been associated with low back pain, with heavy lifting the task most commonly associated. These include a study that investigated factors that affected the likelihood of the low back pain becoming chronic (Pearce et al., 2004). The tension neck syndrome is prolonged restricted posture then occur tension neck syndrome (Canadian Centre for Occupational Health & Safety, 2005). Irritation of the

levator scapulae and trapezium, all muscles of the neck which causes tightness of the muscle in the neck. Neck stiffness as well as headaches also presents. Headaches are often described as a pressure sensation around the head. Pain may build and intensify at the end of day (Safety & Health Assessment & Research for Prevention, 2001).

Among the WMSDs, epicondylitis (elbow tendonitis**)** are swelling of the tendon at the elbow (Washington state department of health, 2002). When repeated or forceful rotation of the forearm and bending of the wrist at the same time then occur this condition. Same symptoms as tendonitis (Canadian Centre for Occupational Health & Safety, 2005).

WMSDs like carpal tunnel syndrome is compression of the median nerve in the wrist (Washington state department of health, 2002). Repetitive wrist motions. Pain, numbness, tingling, burning sensations, wasting of muscles at base of thumb, dry palm. De-Quervain's disease condition is the common sheaths of abductor pollicis longus and extensor pollicis brevis tendons at the wrist are involve. Repetitive hand twisting and forceful gripping then occur this condition and present Pain at the base of thumb. Thoracic outlet syndrome is the prolonged shoulder flexion extending arms above shoulder height carrying loads on the shoulder. Pain, numbness, swelling of the hand is more common (Canadian Centre for Occupational Health & Safety, 2005).

Sciatic pain is the pain radiating from the lower back to below the knee. Rotator cuff disorder is swelling and tearing of the tendons around the shoulder (Washington state department of health, 2002). Abduction of the shoulder joint is mostly performed by the deltoid and supraspinatus. This is the basis for suspecting a high possibility of rotator cuff tendinitis or supraspinatus tendinitis and rupture when work involves abduction movement of the shoulder joint. In epidemiologic investigations, workers engaged in sewing work and similar workers who worked while repeatedly bending

their back forward with overhead viewing action, were reported to have a high possibility of the occurrence of myofacial pain syndrome and rotator cuff tendinitis (Kun et al., 2010). Myofascial pain in the neck and upper back are heavy feeling, aching pain, stiffness in upper back and neck, due to overhead activity of arms in extended position (Safety & Health Assessment & Research for Prevention, 2001).

WMSD's required various treatments as Physiotherapy plays an important role in the treatment of work related musculoskeletal disorders (Ebnezar, 2005). Physical therapists assess an individual's physical ability to do a specific job or activity and aids in developing a safe return to work program. A program of stretching, aerobic exercise and apply therapeutic modalities will improve your overall fitness level. Research has shown that people who are physically fit are more resistant to back injuries and pain and recover quicker when they do have injuries than those who are less physically fit. Physical therapy can reduce the recurrence of back pain and neck-shoulder pain (Andersson, 1981). In order to be effective, however, the exercise should include vigorous exercise. And be repeated at least three times a week (Podniece, 2008). The identification and measurement of the various risk factors for these complaints is an important initial step in recognizing high risk subgroups also for developing targeted and effective intervention plans (Eltayeb et al., 2007).

The treatment of WMSDs involves several approaches including the following: Restriction of movement, Application of heat or cold, Exercise (Stretching, Strengthing) (Canadian Centre for Occupational Health & Safety, 2005). The first approach to treatment of WMSDs is to avoid the activities causing the injury. This often requires work restrictions. In some cases, transfer to a different job should be considered. A splint can also be used to restrict movements or to immobilize the injured joint. However, the use of splints in occupational situations requires extreme

caution. If used inappropriately, splints can cause more damage than good. Splints are usually used for two reasons: to mechanically support a joint where an excessive load on the joint is anticipated, or to restrict the movement of the injured joint. In the occupational context, splints should not be used as a mechanical support for the joint. Instead, the job should be redesigned to avoid the extreme load on the worker's joint in the first place. To be effective, the use of splints to immobilize an affected joint also requires that the work activity that caused the injury be stopped or changed. If injurious work continues, then the worker is exposed to risk of injury to other joints that have to compensate for the one that is splinted (Canadian Centre for Occupational Health & Safety, 2005).

Applying heat or cold seems to relieve pain and may accelerate the repair process. Heat is recommended for pain relief of minor injuries. It is not recommended for injuries with significant inflammation and swelling. Heat increases the flow of blood and increases swelling. Ice reduces pain and swelling (Canadian Centre for Occupational Health & Safety, 2005). In the case of serious conditions involving nerve entrapment, like CTS, prescribe period of rest to allow recovery and prevent more permanent damage. Refer to a physical therapist if possible. Stretching may also be prescribed. Some patients benefit from complementary therapies such as acupuncture or movement therapies (yoga, Feldenkrais, Alexander Technique, Shiatsu, etc) (Lenore et al., 2004). Stretching is beneficial because it promotes circulation and reduces muscle tension. However, people suffering from WMSDs should consult a physical therapist before exercising. Stretching or exercise programs can aggravate the existing condition if not properly design (Canadian Centre for Occupational Health & Safety, 2005).

Strengthening exercises help increase muscle tone and improve the quality of muscles. Muscle strength and endurance provide energy and a feeling of wellness to help you perform daily, routine activities. Adequate core strength that comes from abdominal and back muscles helps stabilize the spine, allows proper spinal movement, and makes it easier to maintain correct posture. Strong hip and leg muscles are important to perform proper lifting techniques and body mechanics (Spineuniverse, 2011)

Preventive and control measures, in order to be truly effective, require significant involvement on the part of the workers, their representatives, and management to improve occupational health and safety. Therefore the main effort to protect workers from WMSDs should focus on avoiding repetitive patterns of work through job design which may include mechanization, job rotation, job enlargement and enrichment or teamwork. Where elimination of the repetitive patterns of work is not practical, prevention strategies involving workplace layout, tool and equipment design, and work practices should be considered. One way to eliminate repetitive tasks is to mechanize the job. Where mechanization is not feasible or appropriate, other alternatives are available (Canadian Centre for Occupational Health & Safety, 2005).

The guiding principle in workplace design is to fit the workplace to the worker. Evaluation of the workplace can identify the source or sources of WMSD. Proper design of the workstation decreases the effort required of the worker to maintain a working position. Ideally, the workstation should be fully adjustable, providing a worker with the options to work in standing, sitting or sitting-standing positions, as well as fitting the worker's body size and shape (Canadian Centre for Occupational Health & Safety, 2005).

Proper design of tools and equipment significantly decreases the force needed to complete the task. Providing the worker with the proper jigs or fixtures for tasks that require holding elements saves a lot of muscular effort in awkward positions. Good tools, maintained carefully and where necessary frequently changed, can also save a lot of muscle strain and preventing WMSD. A well-designed job, supported by a well-designed workplace and proper tools, allows the worker to avoid unnecessary motion of the neck, shoulders and upper limbs. However, the actual performance of the tasks depends on individuals (Canadian Centre for Occupational Health & Safety, 2005). To prevent recurrence or exacerbation of MSDs, office workstations should be assessed and modified. Insurance may cover workstation assessments performed by physiotherapists or ergonomists (Lenore et al., 2004).

Training should be provided for workers who are involved in jobs that include repetitive tasks. Workers need to know how to adjust workstations to fit the tasks and their individual needs. Training should also emphasize the importance of rest periods and teach how to take advantage of short periods of time between tasks to relax the muscles, and how to consciously control muscle tension throughout the whole work shift (Canadian Centre for Occupational Health & Safety, 2005). Weight training should focus on balance and symmetry that is left to right, front to back and upper body to lower body, deep and superficial. Our body is made up of many tissues which act synergistically to balance us. Don't worsen this by strengthening already shorted muscles, such as the pectorals, possibly making lengthened muscles, like trapezoids, weaker (Williams, et al., 2007).

CHAPTER-III METHODOLOGY

3.1 Study design

The aim of this study was to find out the prevalence of WMSDs among the bankers. For this reason, a cross sectional study was chosen because the cross sectional study is the best way to determine prevalence. The most important advantage of cross sectional study was it need not more time and also cheap as there was no follow up, fewer resources required running the study (Mann, 2003). Through the cross-sectional study it can be easily comparing results among those of different ages, gender or ethnicity. In other hand Quantitative research method helps to use a large number of participants and therefore collect the data objectively through this way data was reduced to numbers for statistical analysis in order to draw conclusion (Hicks 2000). A cross-sectional design provides a snapshot of the variables included in the study, at one particular point in time (Fraenkel, 1993).

3.2 Study site

The sites of the study were selected bank these followings-

- Islami Bank Bangladesh Limited.
- First Security Islami Bank Limited.
- Bangldesh Krishi Bank.
- National Bank Limited.
- Dutch Bangla Bank Limited.
- Social Islami Bank Limited.

- Natinal Commercial Cedit Bank Limited.
- Shaljalal Bank Limited.
- Janata Bank limited.

3.2 Study area

Work related Musculo-Skeletal Disorders among the Bankers at Savar.

3.4 Study population

Bailey (1997) claimed that a population is the total group or set of events to which hypothesis apply. The population shares a specific set of characteristics or criteria that have been established by the investigator. A population refers to the members of a clearly defined set or class of people, objects or events that was the focus of the investigation (Kun, et al., 2010). So, all of bankers of Savar area who fulfill the inclusion and exclusion criteria of this study were the population of this study. The criteria of study population are determined from a literature review and the goals for the study. Bailey (1997) claimed that a sample is a subset of the population that has been selected to participate in the project. Sample should represent the population as closely as possible. For survey research, it is better to get as many subjects as possible with the consideration of the size of the ideal population (Bowling 1997). But it was not possible to study the total population within the time of this study, so only 120 bankers were taken as sample that were selected conveniently from Savar according to the inclusion and exclusion criteria.

3.5 Sampling procedure

The study was conducted by using the convenience sampling methods because it was the easiest, cheapest and quicker method of sample selection. It will be easy to get those subjects according to the criteria concerned with the study purpose through the convenience sampling procedure.

3.6 Subject inclusion criteria

- Both male and female bankers will be selected- In this study, the investigator wanted to explore work related musculoskeletal disorders among the Bankers at Savar.
- Subjects were selected from the reputed bank at Savar, because this study focused on work related musculoskeletal disorders among the bankers at Savar.
- All age group are selected- as there is objective of the study to explore the relationship between age and work related musculoskeletal disorders, so samples are selected from all age group.
- Subject who are willing to participate in the study- Otherwise they will not give exact information that is helpful to the study.

3.7 Subject exclusion criteria

3.8 Subject who were not willing to participate in the study.

3.9 Subject who were medically unstable. Because medically unstable patient can be confused with the question that can mislead the result of the study.

3.10 Subjects who had cancer problem- this problem causes a general sense of discomfort, pain with different parts of the body Muscle twitches and cramps.

3.11 Subjects who had major accident or major surgery in any part of the body- it any major surgery or accident may cause pain or any discomfort in any part of the body which may be not WMSDs and this can mislead the result of the study.

3.8 Sampling technique

Samples were selected conveniently from all private and government bank at Savar, Dhaka. There are a lot of bank workers in Bangladesh, from this population it was selected 120 samples, according to the inclusion and exclusion criteria. Because it was not possible to study the total population within the time of this study.

3.9 Sample size

Sample is a group of subjects will be selected from population, who are used in a piece of research (Hicks, 1999). A sample is a smaller group taken from the population. Sometimes the sample size may be big and sometimes it may be small, depending on the population and the characteristics of the study (Bailey, 1997).

The equation of sample size calculation is given below

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

Here,

Z (1- $\frac{\alpha}{2}$) = 1.96

P= 0.166 (here, p = prevalence and p=16.6%) (Fasika, et al., 2013)

q = 1-P

= 1- 0.166

= 0.834

d= 0.05

The actual sample size for this study was calculated as 120, but as the study performed as a part of academic research project and there were some limitation, so that 120bankers was taken as the sample of this study from reputed government and private bank at Savar area.

3.10 Data collection method and tools

In this study data were collected by using structured type questionnaire. The questionnaire was made by the researcher. The questionnaire was developed only through searching sufficient literature but considering the context of the demography of the population a pilot study would substantial before developing questionnaire.

Firstly, introduced with each other and describe the project study as well its purpose and also provided consent form to the participant and explained that to build a trustful relationship. After obtaining consent by sign and asked pre-determine question to the participant and gave time to understand the questions fully so that they might be answered accurately. During the interview, the researcher wrote down field notes and observed the facial expression to collect accurate data from the participants because in grounded theory of qualitative research observation and interviewing both were commonly used for data collection(Hicks,1999). During the interview use pen, paper, written questionnaire, file and consent paper.

3.11 Data analysis

Data was analyzed with the software named Statistical Package for Social Sciences (SPSS) Version 20. Data resolve numerically coded and captured in Microsoft Excel, using an SPSS 20 version software program. Microsoft Office Excel 2010 used to decorate the table, bar graph and pie charts. In the result section all the value was formulated by standard deviation and mean value of the data.SPSS is a comprehensive and flexible statistical analysis and data management solution. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and conduct complex statistical analyses.

3.12 Inform consent

The aims and objectives of this study must be informed to the subjects verbally. So, gave the consent from to the subject and explained them. The subjects had the rights to withdraw themselves from the research at any time. It supposed to assured the participants that their name or address would not be used. The information of the subjects might be published in any normal presentation or seminar or writing but they would not be identified. The participants informed by the researcher that the result would not be harmful for them. Ensuring the confidentiality of participant's information, no information has been shared without the research supervisor. At any time the researcher available to answer any additional questions in regard to the study.

3.13 Ethical consideration

The proposal of the study was approved by IRB (Institutional Review Board) of BHPI (Bangladesh Health Professions Institute). The study had done by following the guide line given by local ethical review committee and also followed WHO and BMRC (Bangladesh Medical and Research Council) guidelines. Researcher maintained the confidentiality and all the interviews were taken in a confidential to maximize the participant's comfort and feelings of security.

Prevalence of common WMSDs

The result of the study revealed that 65% (n=78) participants out of 120 participants had suffered from WMSDs and 35% (n=42) reported no WMSDs (Figure 1).

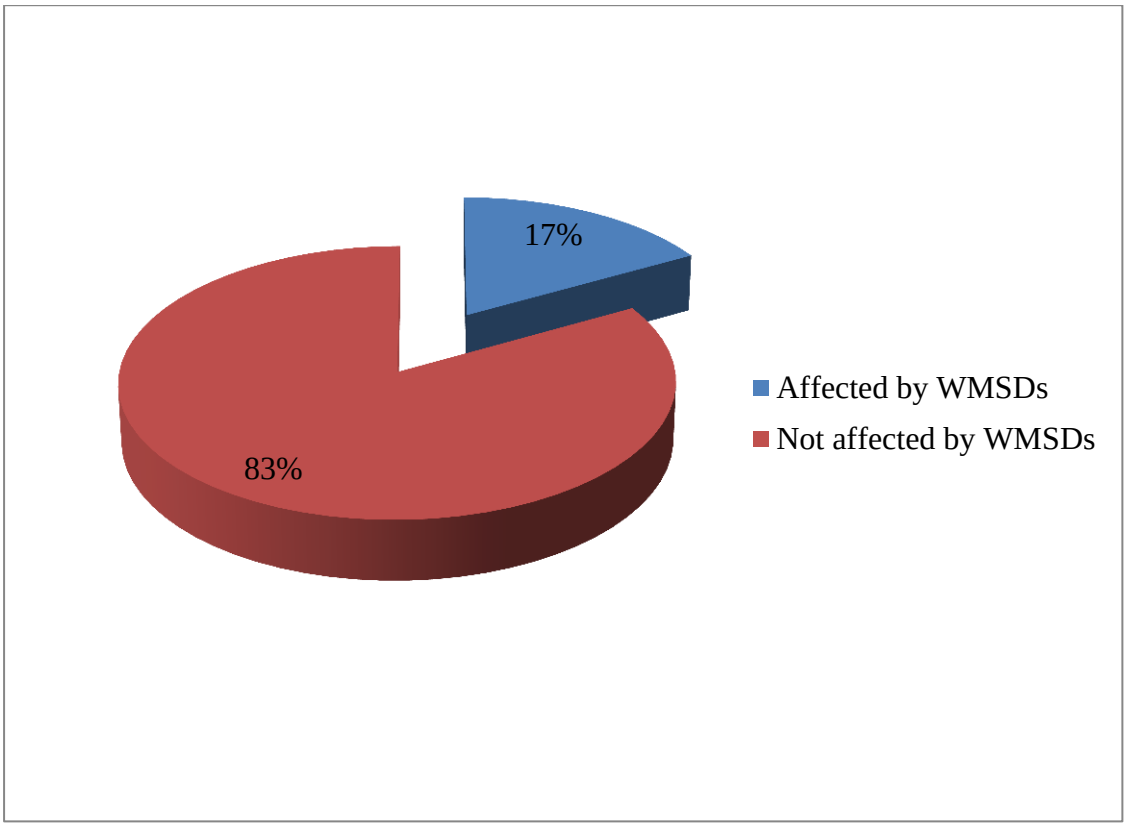


Figure-1: Prevalence of WMSDs.

Age & WMSD relationship

Analysis reveals that among the 78 participants who had suffered from WMSD lowest age was 26 years and highest age was 55 years. Their mean age was 35.05 (± 8.135) years and mean age of the unaffected group were 30.86 (± 5.130). Frequency of WMSD were 19% (n=14) participants in between 26-30 years, 28% (n=23) participants in between 31-35 years, 33% (n=26) participants in between 36-40 years, 15% (n=11) participants in between 41-45 years, 4% (n=3) participants in between 46-50 years and 1% (n=1) participants in between 51-55 years (Figure 2).

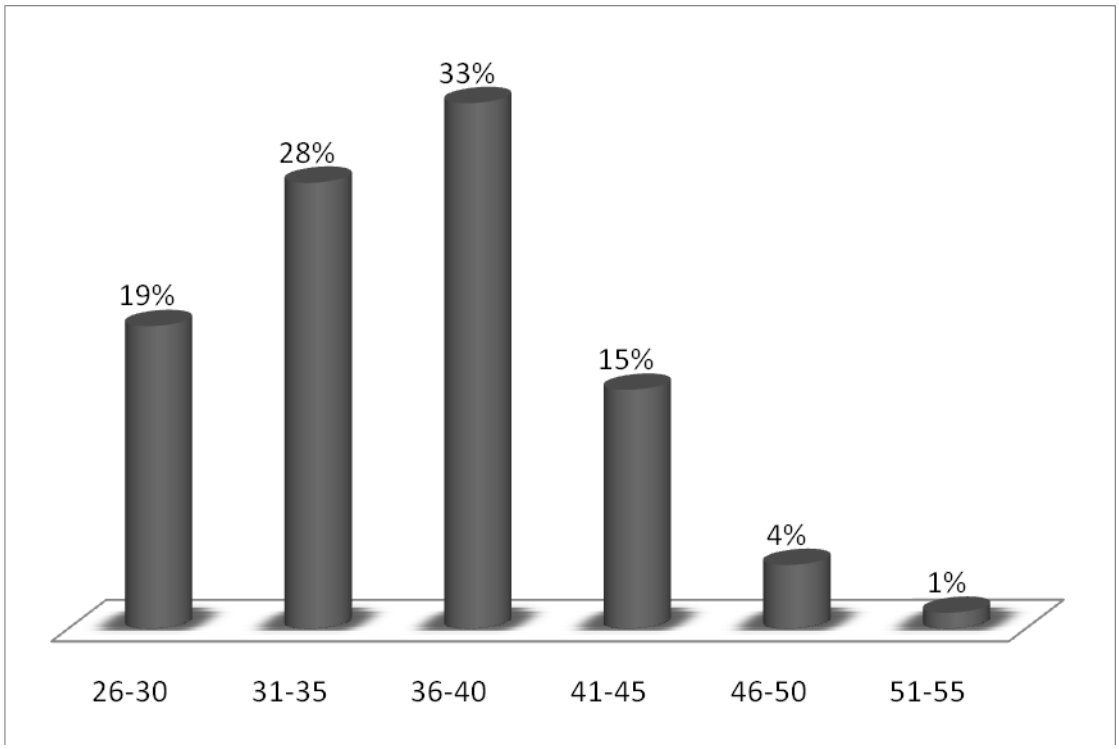


Figure-2: Age &WMSD relationship.

Among the 120 participants 61% (n=73) were between 22-35 years where 42% (n=50) participants had WMSDs and 19% (n=23) participants had not. 39% (n=47) participants were between 36-52 years where 36% (n=43) participants had WMSDs and 3% (n=4) participants had not (Table 1).

Table-1: Cross Tabulation between Age and WMSDs

Age group	**Work-related Musculoskeletal Disorders**		χ^2	***p*-value**
	Yes	No		
	n (%)	n (%)		
22-35 years	36 (46.1)	39 (53.9)	23.92	0.001
36-52 years	42 (90.9)	3 (9.1)		
Total	**78 (65%)**	**42 (35%)**		

Significant (*p*=0.001) age difference has been found for age group with work related musculo-skeletal disorder among the study subject as shown in table 1.

Gender and WMSD relationship

The result of the study showed that among the 120 participants 80 were male and 40 were female. And among the 78 participants who had suffered from WMSD 72% (n=56) were male and 28% (n=22) were female (Figure 3).

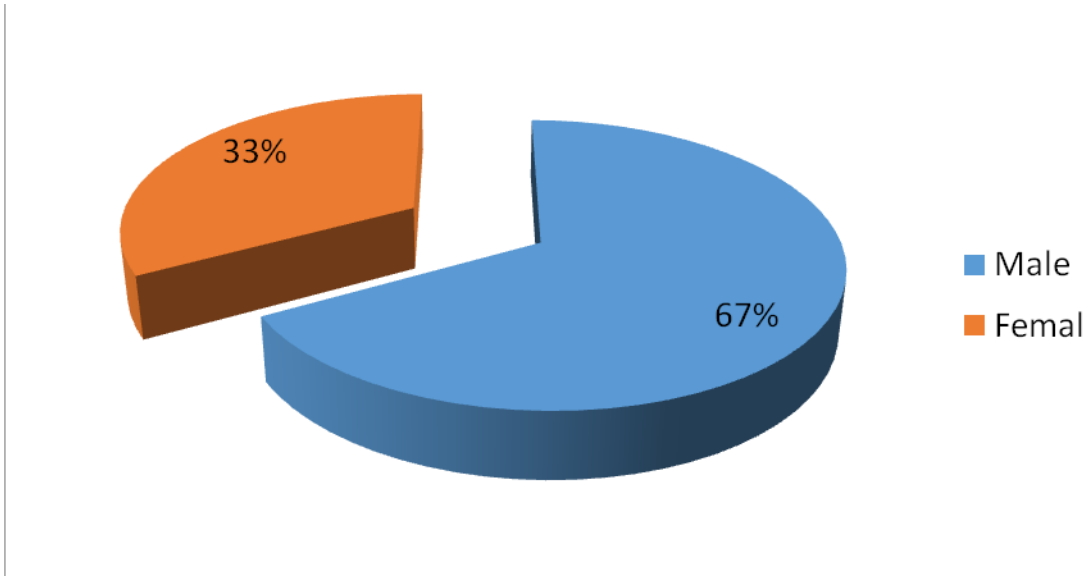


Figure-3: Male and female ratio.

Among the 120 participants 72% were male where 56% participants had work related musculoskeletal disorders and 16% participants had not. 28% participants were female where 22% participants had work related musculoskeletal disorders and 6% participants had not (Table 2).

Table-2: Cross Tabulation between Sex and Work Related Musculoskeletal Disorders

Sex of the respondents	**Work-related Musculoskeletal Disorders**		χ^2	***p*-value**
	Yes	No		
	n (%)	n(%)		
Male	56 (62.5)	29 (37.5)	0.00	1.00
Female	22 (62.5)	13 (37.5)		
Total	**78 (65%)**	**42 (35%)**		

No Significant (p=1.00) age difference has been found for age group with work related musculo-skeletal disorder among the study subject as shown in table 2

Education status

Among the 120 participants, 16% (n=19) participants had M.B.A, 80% (n=96) M.S.c, 4% (n=5) participants had PhD.

Among the affected 78 participants who had suffered from WMSD in this study, 16% (n=12) participants were H.S.C with short course, 59% (n=47) participants were diploma, 24 % (n=19) participants were graduate (Figure 4).

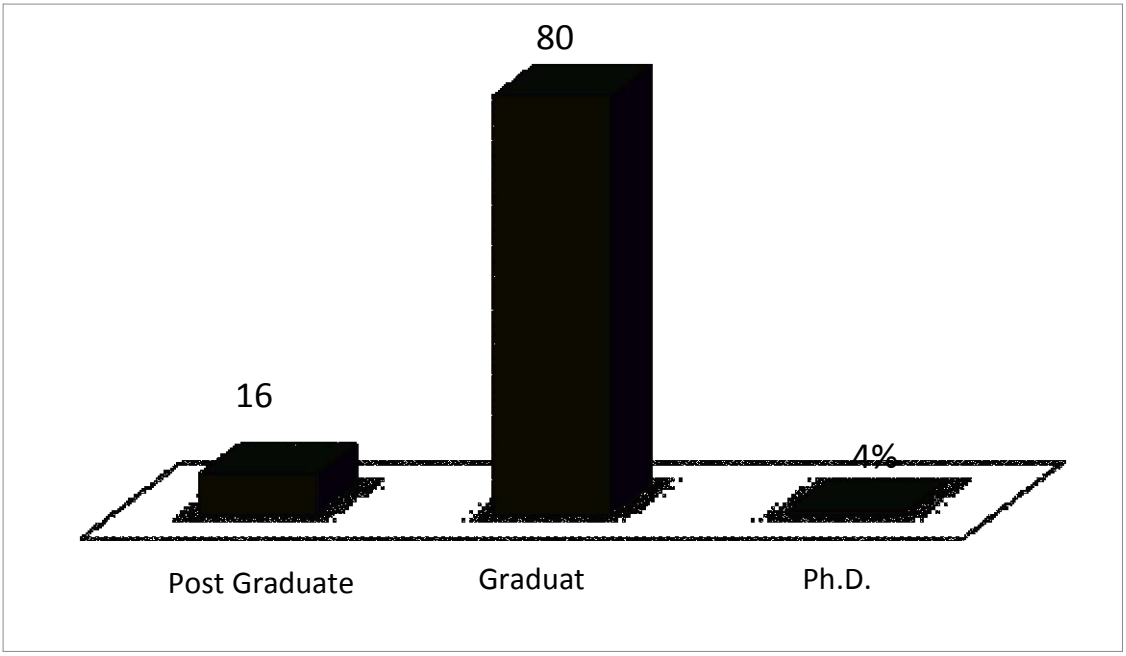


Figure-4: Education status of the participants.

Table 3: Cross Tabulation between Educational status and WMSDs

Educational status of the respondents	**Work-related Musculoskeletal Disorders**		χ^2	***p*-value**
	Yes	No		
Post Graduate	10 (30)	9 (700)		
Graduate	65 (68.5)	31 (31.5)	0.00	1.00
Post graduate (PhD)	3 (100)	2 (0)		
Total	**78 (65%)**	**42 (35%)**		

No Significant (p=1.00) age difference has been found for Educational status with work related musculo-skeletal disorder among the study subject as shown in table 3.

Job experience and WMSDs

Outcome reveals that among the 78 participants out of 120 participants 11.5% (n=9) participants had job experience 0-1 year, 20.5% (n=16) participants 1-5 years, 43.6% (n=34) participants 5-10 years, 24.4% (n=19) were more than 10 years. Their mean job experiences were more than 11 years. Their mean job experiences were 2.81 (± .941). Mean job experience of the unaffected group was 2.27 (± .827). So, bankers suffered from WMSD were in between (6-10) years and more than 11 years (Figure 5).

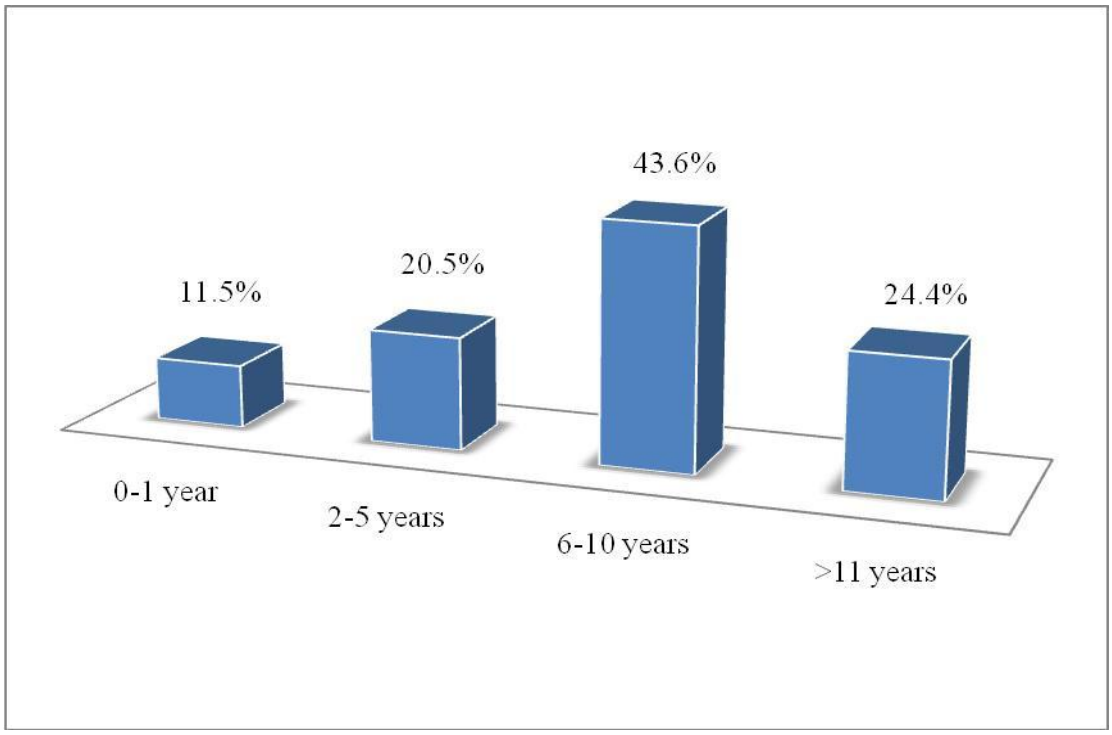


Figure-5: Job experience and WMSD relationship.

Among the 120 participants 13% were between 0-1 year job experience where 9% participants had work related musculoskeletal disorders and 4% participants had not. 25% participants were between 1-5 years job experience where 16% participants had work related WMSDs and 9% participants had not. 42% participants were between 5-10 years job experience where 34% participants had work related musculoskeletal disorders and 8% participants had not. 20% participants were between >10 years job experience where 19% participants had work related musculoskeletal disorders and 1% participants had not (Table 3).

Job experience of the respondents	**Experience of the WMSDs of the participants**		χ^2	***p*-value**
	Yes	**No**		
	n (%)	**n (%)**		
0-1 year	0(0)	9 (100)		
1-5 years	28 (52.8)	25 (47.2)		
5-10 years	46 (80.7)	11 (19.3)	25.77	0.001
> 10 years	1 (100)	0 (0)		

Table-4: Cross Tabulation between Job experience and Work Related Musculoskeletal Disorders.

Significant (p=0.001) Job experience difference has been found for Job experience with work related musculo-skeletal disorder among the study subject as shown in table 4.

Number of episode of WMSD

Analysis showed that among 78 participants out of 120 participants who suffered from WRMD 35% (n=27) participants suffered from 1 episode of WRMD, 31% (n=24) participants suffered from 2 episodes of WMSD, 28% (n=22) participants suffered from 3 episode of WRMD, 6% (n=5) participants suffered from 4 episode of WRMD (Figure 6).

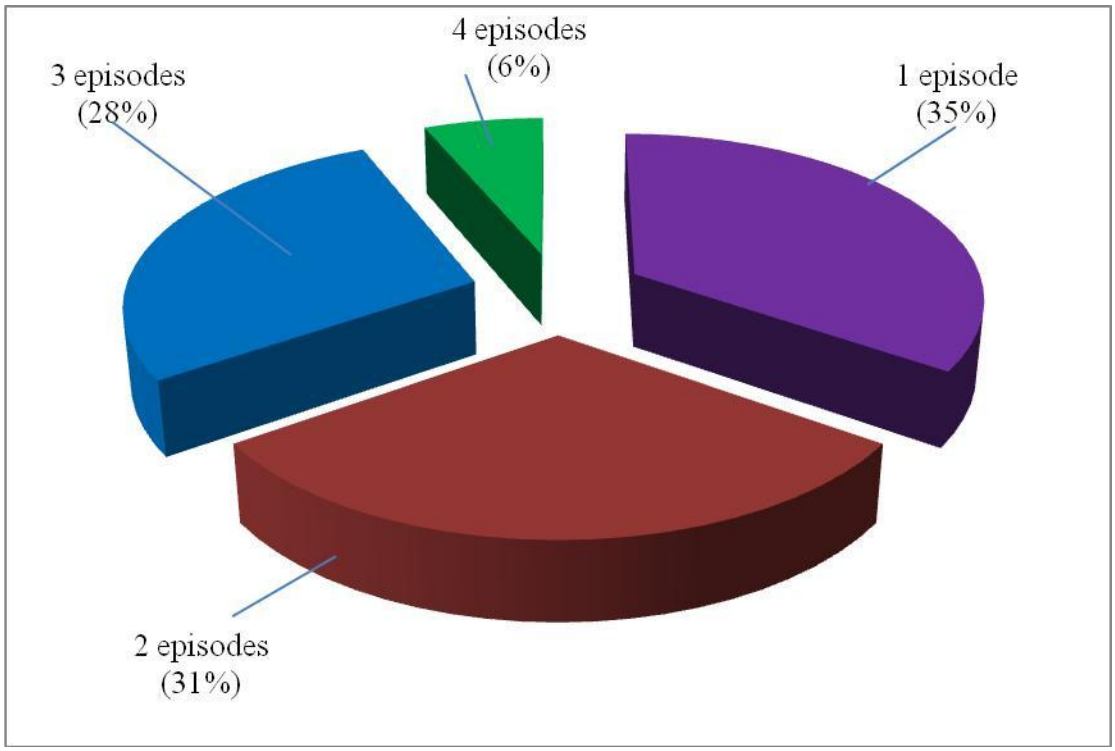


Figure-6: Number of episode of WMSDs.

Table-5: Cross Tabulation between Number of episode and Work Related Musculoskeletal Disorders.

Episode category	**Experience of the WRMDs of the participants**		χ^2	***p*-value**
	Yes	**No**		
	n (%)	**n (%)**		
1 to 3 episode	43 (97.7)	1 (2.3)		
			36.79	0.001
4 to 7 episode	32 (42.1)	44 (57.9)		

Significant (p=0.001) difference has been found for Number of episode with work related musculo-skeletal disorder among the study subject as shown in table 5

Work interruption

Analysis showed that 20.5% (n=16) participants out of 78 participants had work interruption due to WMSD (Figure 11).

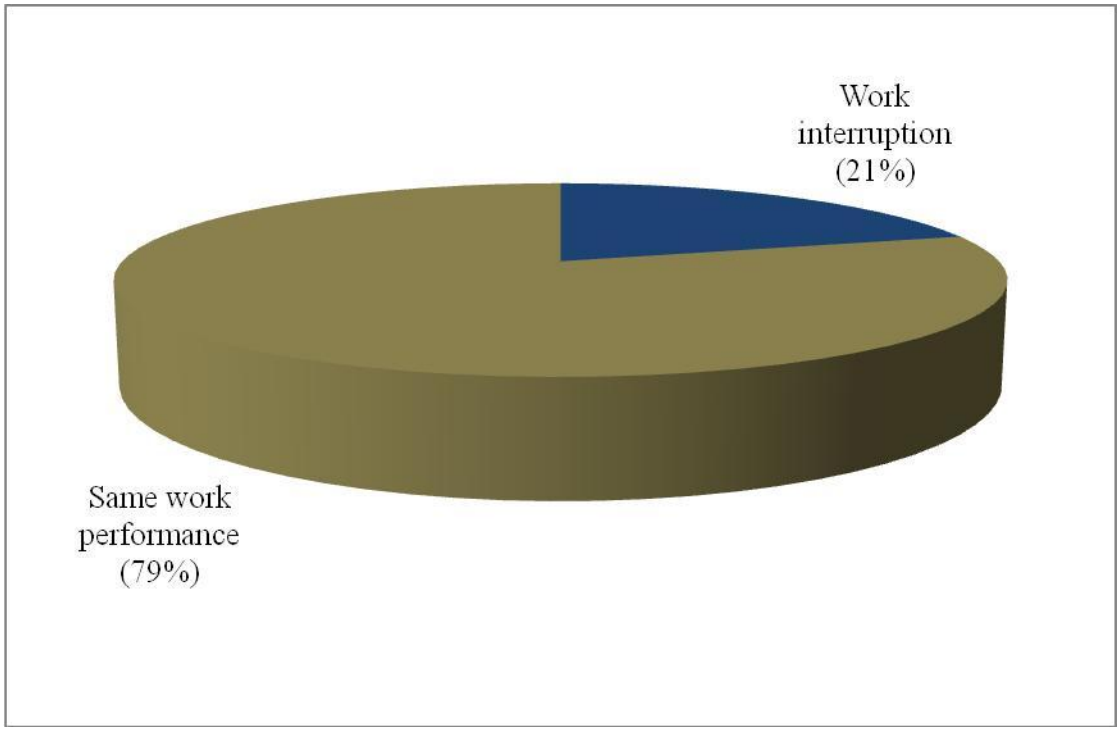


Figure-7: Work interruption.

Stay away from work due to pain	**Experience of the WMSDs of the participants**		χ^2	***p*-value**
	Yes	**No**		
	n (%)	**n (%)**		
Yes	38 (100)	0 (0)	33.36	0.001
No	37 (45.1)	45 (54.9)		

Table-6: Cross Tabulation between Work interruption and Work Related Musculoskeletal Disorders.

Reduce work performance

Outcome reveals that 57.7% (n=45) participants out of 78 participants working performance had reduced due to WMSD (Figure 12).

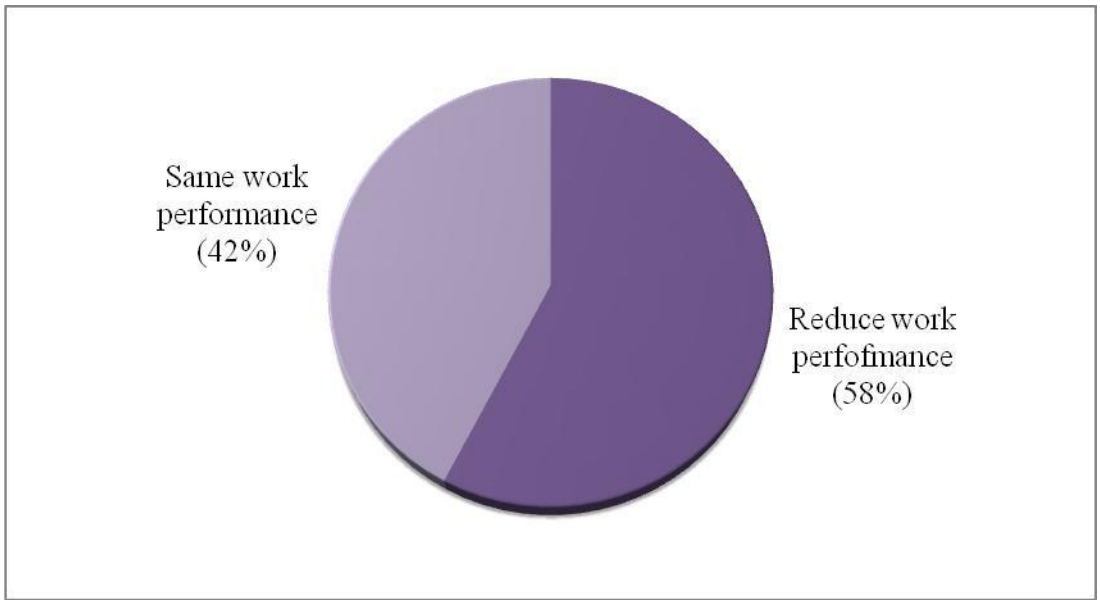


Figure-8: Reduce work performance.

Reduced working performance	**Experience of the WMSDs of the participants**		χ^2	***p*-value**
	Yes	**No**		
	n (%)	**n (%)**		
Yes	42 (100)	0 (0)	38.76	0.001
No	33 (42.3)	45 (57.7)		

Table-7: Cross Tabulation between Reduce work performance and Work Related Musculoskeletal Disorders.

Safety equipment use

Analysis demonstrated that 83% (n=65) participants out of 78 participants had use Safety equipment (Figure 13).

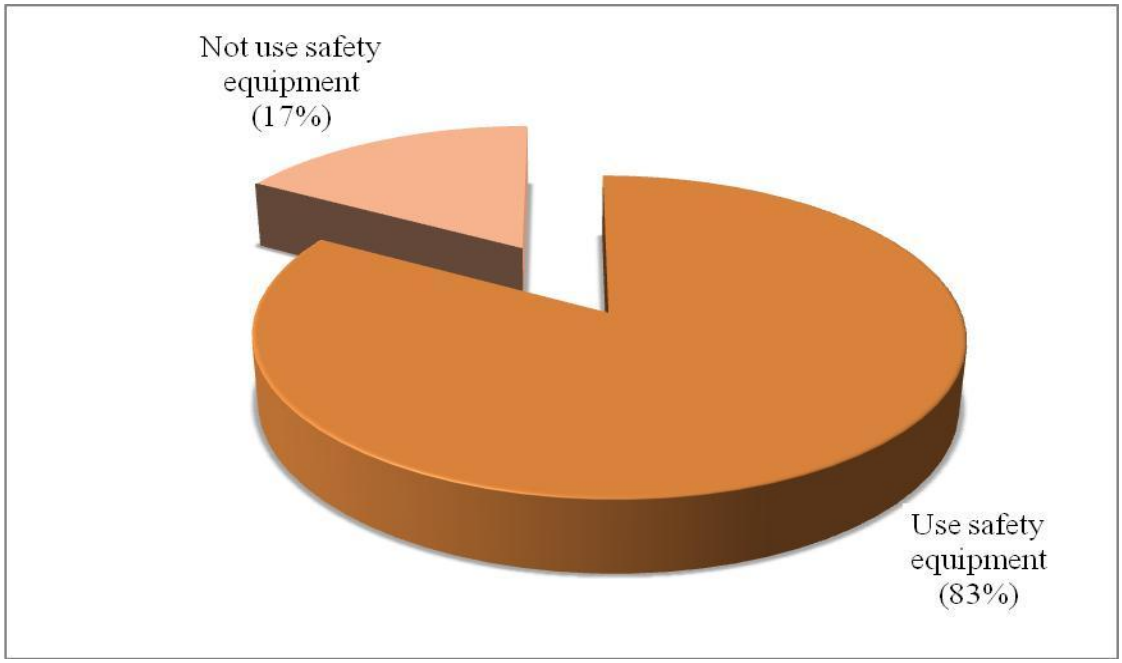


Figure-9: Safety equipment use.

Table-8: Cross Tabulation between Safety equipment use and Work Related Musculoskeletal Disorders.

Used safety equipment	**Experience of the WMSDs of the participants**		χ^2	***p*-value**
	Yes	**No**		
	n(%)	**n(%)**		
Yes	29 (100)	0 (0)	22.94	0.001
No	46 (50.5)	45 (49.5)		

Symptoms

Analysis demonstrated that 78 participants out of 120 participants who suffered from WMSD 6.41% (n=5) participants suffered from aching, 1.28% (n=1) participants had cramp, 1.28% (n=1) had numbness, 82.05% (n=64) had pain, 3.84% (n=3) had weakness, 5.12% (n=4) had restricted ROM. So, most bank workers suffered from WMSD symptoms was pain (Table 4).

Symptoms of the participants	**Number (n)**	**Percentage (%)**
Aching	5	6.41%
Cramp	1	1.28%
Numbness	1	1.28%
Pain	64	82.05%
Weakness	3	3.84%
Restricted ROM	4	5.12%
Total	**78**	**100%**

Table-9**:** Symptoms of WMSD.

Condition suffers due to WMSDs:

Among the 120 participants, 78% who had suffered from WMSD in this study, 26.70% suffered by mechanical back pain, 8.30% had tennis elbow, 7.50% had mechanical neck pain, 5.80% had shoulder causalities, 5.80% had upper back pain, 4.20% had knee OA, 2.50% had wrist pain, 3.30% had headache and 35.80% patient had no disorder (Figure-7).

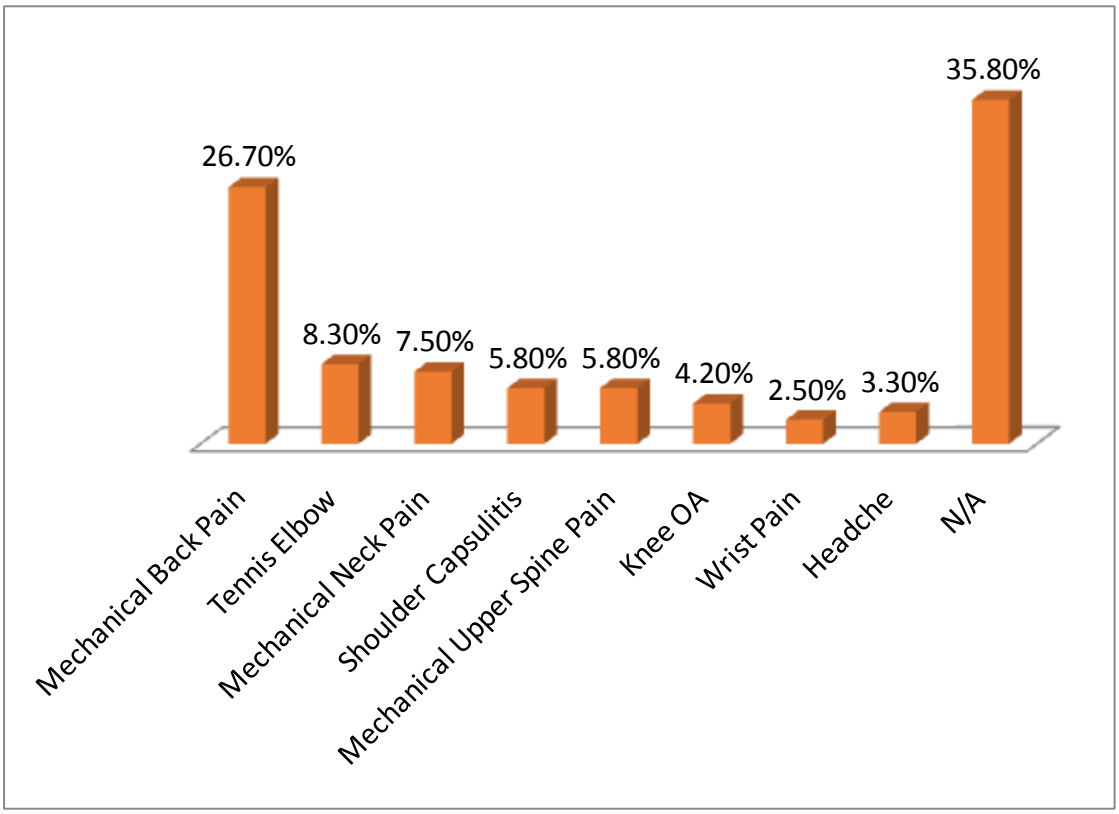


Figure-10: Condition suffers due to WMSDs.

Left away from Job/ leave in job:

Among the 120 participants, 65% who had suffered from WMSD in this study, about 31.7% participants had leave in job due to work related musculoskeletal disorder and 68.3% participants were continue their job (Figure-8)

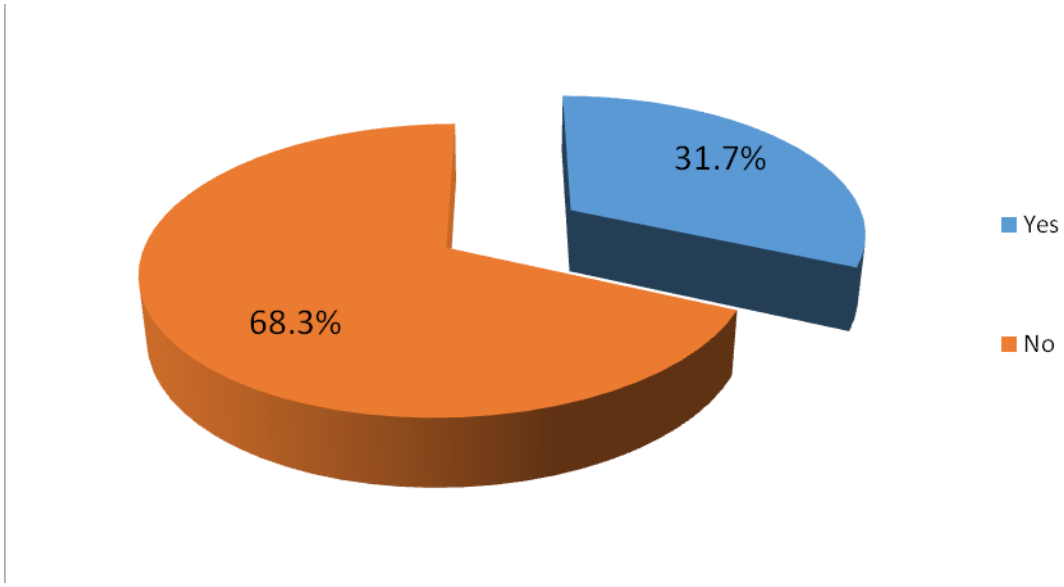


Figure-11: Leave in job due to WMSDs.

Affected body parts

After analysis researcher found that among 78 participants out of 120 who suffered from WRMD most affected body parts were neck in 20.51% (n=16) participants, shoulder in 10.25% (n=8) participants, upper spine in 8.97% (n=7) participants & lower spine in 29.48% (n=23) participants, elbow in 1.28% (n=1) participants, wrist in 5.12% (n=4) participants and knee in 24.35% (n=19) participants (Table 7 and Figure 9).

Table-10: Affected body parts.

Affected body parts	**Number (n)**	**Percentage (%)**
Neck	16	20.51%
Shoulder	8	10.25%
Upper Spine	7	8.97%
Lower Spine	23	29.48%
Elbow	1	1.28%
Wrist	4	5.12%
Knee	19	24.35%
Total	**78**	**100%**

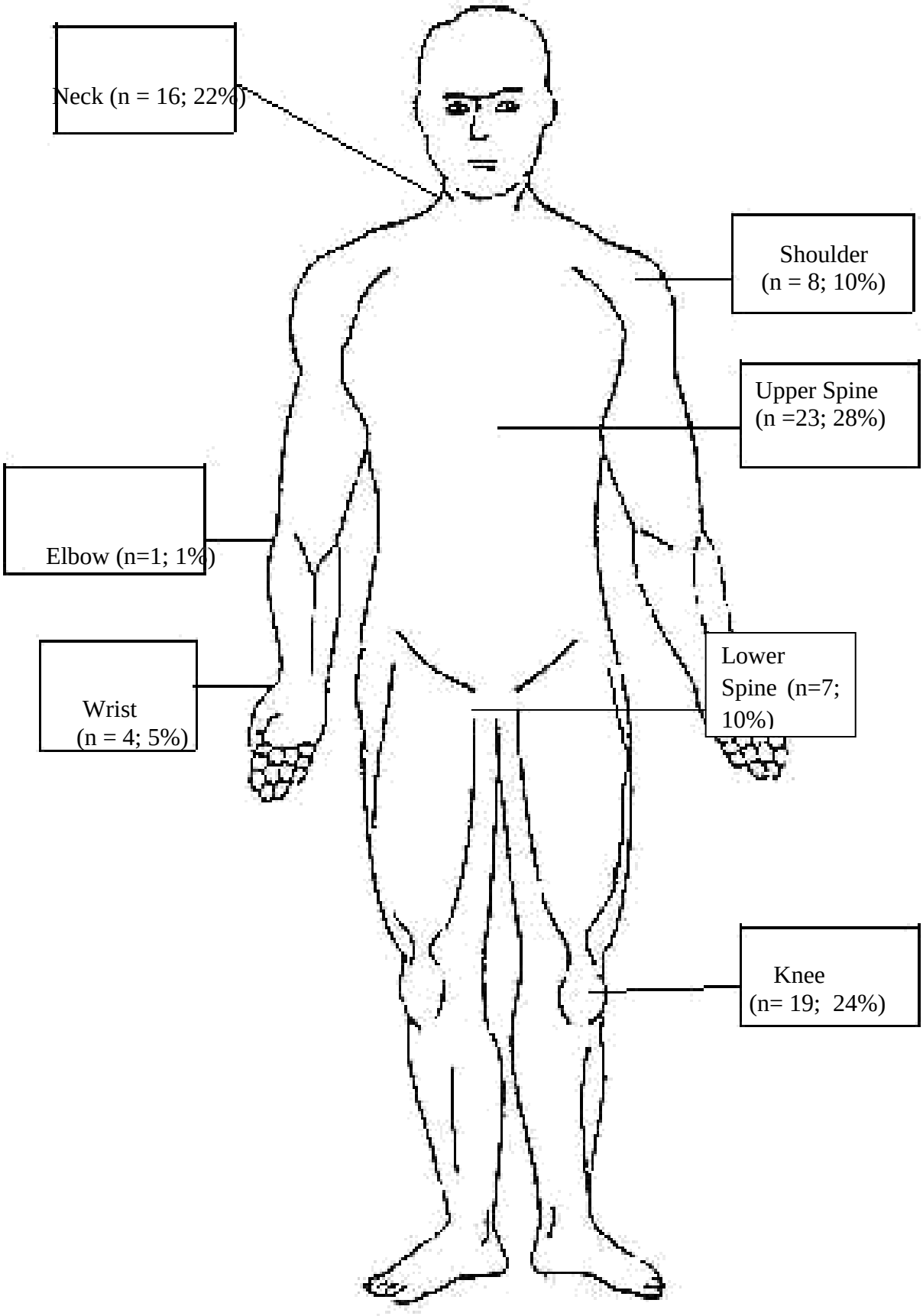


Figure-12: Affected body parts (Health advisors, 2012).

Severity of symptoms

Answers the 78 participants out of 120 analysis demonstrated that 42.3% (n=33) participants had mild symptoms and 57.7% (n=45) participants had moderate symptoms out of 78 participants (Figure 10).

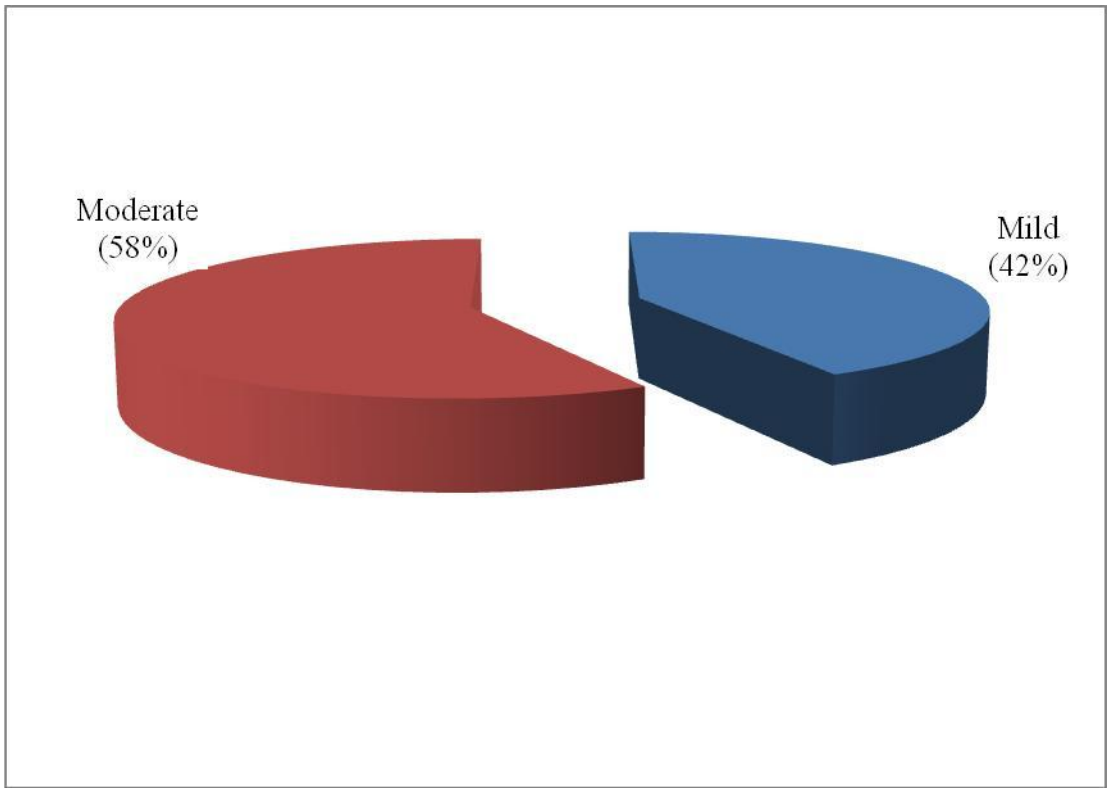


Figure-13: Severity of symptoms.

Stressful positions

Analysis showed that among the 78 participants who had suffered from WMSD stressful position were working in same position for long periods for 38.46% (n=30) participants, performing same task over and over for 17.95% (n=14) participants, bending or twisting back or neck in an awkward way for 19.23% (n=15) participants, repetitive movement of upper limb for 15.39% (n=12) participants, unilateral rotational movement 8.97% (n=7) participants. So, most common risk factors were working in same position for: (38%) and carry heavy load for: (10%) (Table- 11).

Table-11: Stressful positions of WMSDs.

Stressful positions	**Number (n)**	**Percentage (%)**
Working in same position	30	38.46%
Performing same task	14	17.95%
Bending or twisting in awkward way	15	19.23%
Repetitive movement of upper limb	12	15.39%
unilateral rotational movement	7	8.97%
Total	**78**	**100%**

Receiving physiotherapy treatment

Analysis showed that among 78 participants who suffered from WMSD only 19.2% (n=15) participants had taken physiotherapy treatment for their condition (Figure 14).

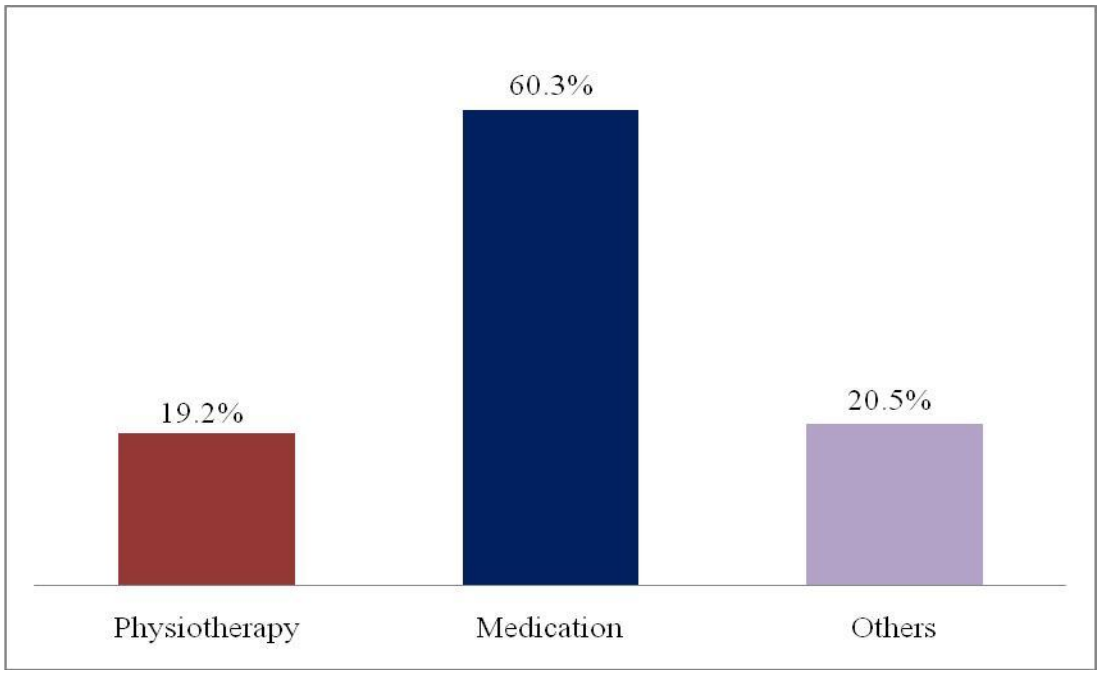


Figure-14: Receiving physiotherapy treatment.

Table-12: Cross Tabulation between Safety equipment use and Work Related Musculoskeletal Disorders.

Types of treatment received by the respondents	**Experience of the WMSDs of the participants**		χ^2	***p*-value**
	Yes	**No**		
	n (%)	**n (%)**		
Physiotherapy	22 (100)	0 (0)		
Medicine	45 (97.8)	1 (2.2)	86.9	0.001
N/A	8 (15.4)	44 (84.6)		

Treatment Consequences

Among the 15 participants who had taken physiotherapy for their condition all of the participants had a good prognosis. The percentages of prognosis were improving in 83% (n=65), no result in 17% (n=13) participants (Figure 15).

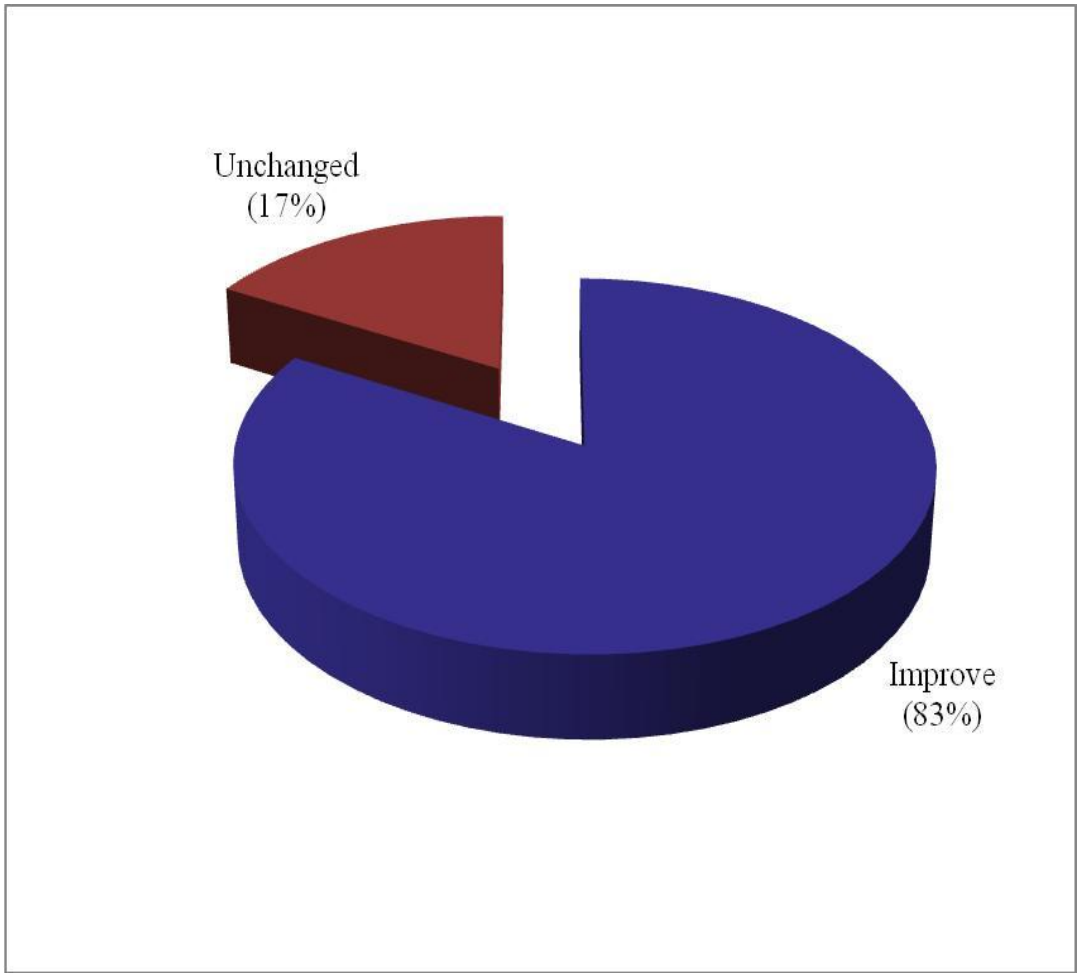


Figure-15: Treatment Consequences.

CHAPTER- VI DISCUSSION

This study examined the prevalence of Work-related Musculo-Skeletal Disorder (WMSD) among the banker at Savar. This study found that approximately two third (65%) suffered from WMSD and 35% (n=45) reported no WMSDs (Figure 1). This result was comparable as the study done at Taiwan reported (84%) experience of WMSD (Chyuan, et al., 2004). In India musculoskeletal problems were reported by 76.5% (Talwar, et al., 2009). The European Agency for Safety and Health at Work (2007) found that 84% WMSD reported in Europe countries. Priya, et al. (2010) found that with MSD 76.25 % and without MSD 23.75 %. In Iran 87.1% experienced some form of MSD symptoms (Choobineh and Tabatabaee, 2009). In America Work-related pain was experienced by 75% (Scherzer, et al., 2005).

Among 62.5% of total affected 90% of the higher number of age ranges of participants had suffered from WMSDs between 36-52 years and lower number of age ranges of participants 36% had suffered from WMSDs in between 22-35 years. European Agency for Safety and Health at Work (1999) the higher number of age ranges suffered from WMSDs between 55-64 years and lower number of age ranges suffered from WMSDs between 25-34 years. The mean age was 35.05(SD ± 8.135) years. Chyuan, et al. (2002) the mean Age was 33.3 ± (SD ± 11.3) years. Choobineh and Tabatabaee, (2009) the mean age was 34.63(SD ± 11.07) years. The bankers in the age range of 41-50 years had the height prevalence of WMSDs (90%) whereas 21-30 years had the lowest 66.66%. In a study with Nigerian bankers aged range of 20-29 years had the highest prevalence of WMSDs 87.12% while those in the oldest age group (40 years and above) had the least 37.50% (Maduagwu, et al., 2014). Although

the sample size was similar but the prevalence rate of musculoskeletal symptoms was totally different. In the present study it is published that the prevalence rate of musculoskeletal symptoms are increasing gradually from younger to older age group.

Near about two third (72%) were male and (38%) were female suffered from WMSD. Literature says that men are more vulnerable to WMSDs then female. In Chennai, India 77.5% male and 22.5% suffered from WMSD (Priya, et al., 2010). In Korea Kun, et al. (2010) found that 74.2% male and 25.8% female suffered from WMSD.

The symptoms of WMSDs were 7% (n=5) participants suffered from aching, 1% (n=1) participants has cramp, 1% (n=1) has numbness, 82% (n=64) had pain, 4% (n=3) had weakness, 5% (n=4) had restricted ROM. So, most Bank workers suffered from WMSD symptoms was pain.

No Significant (p=1.00) difference has been found for Educational status with work related musculo-skeletal disorder among the study subject as shown in table 3.

Significant (p=0.001) Job experience difference has been found for Job experience with work related musculo-skeletaldisorder among the study subject as shown in table 4.

Significant (p=0.001) difference has been found for Number of episode with work related musculo-skeletaldisorder among the study subject as shown in table 5.

This research found that, near about one fourth 21.% (n=16) of the participants had work interruption due to WRMD. Al wazzan et al. found in his research at Riyadh in 2001 that only 21.62% missed work due to neck pain and only 24.66% due to back pain. Leggat and Smith surveyed 285 Australian dentists more than one third (37.5%) requiring medical care for musculoskeletal disorder and 9% requiring extended leave

from practice. Alexopoulos et al. also found a high prevalence of MSD problems that required medical attention or leave that is 10% of dentists for low back pain, 4% for hand or wrist and 3% for shoulder pain in Greek dentists in Thessaloniki. (Cherniacka, Dussetschleger and Bjor 2008) .

Significant (p=0.001) difference has been found for work performence with work related musculo-skeletaldisorder among the study subject as shown in table 7.

Significant (p=0.001) difference has been found for safety equipment users with work related musculo-skeletaldisorder among the study subject as shown in table 8.

Findings of the study suggested that among the 78 participants out of 120 participants who suffered from WMSD 82% had experienced pain while 7% had experienced aching, 4% experienced weakness, 5% had restricted ROM, 1% experienced cramp and 1% had numbness.

Musculoskeletal pain has been found to be a major work related musculoskeletal disorder among the bankers where 8.30% had tennis elbow, 7.50% had mechanical neck pain, 5.80% had shoulder causalities, 5.80% had upper back pain, 4.20% had knee OA, 2.50% had wrist pain, 3.30% had headache and 35.80% patient had no disorder (Figure-7). In India most of the workers were affected body parts were neck (40%), shoulder (20%), wrist (15%), and low back (25%) (Ghosh and Das, 2010). Alexopoulos, et al. (2004) found that prevalence of affected body parts were head/neck (42%), low back (34%), upper back (28%), wrists/hands (20%), shoulders (16%), ankles/feet (13%), knees (12%), hips (6%) and elbows (5%). WMSDs mostly affecting the lower back (97%), knees (85%) and shoulders (77%) (Gangopadhyay, et al., 2010). A cross-sectional study among 230 bank workers in Kumasi, Ghana, most (83.5%) of the workers suffered at least one MSD resulting in 15.7% disability rate

the 12-month period. The most common reported symptoms were lower back pain 64.8% upper back pain 61.7%, neck pain 47.4% and shoulder pain 37.4% (Abledu and Abledu, 2012). This prevalence rate lies totally different from the study of Bangladesh. Through this study, we can see that the mostly affected body parts were neck 58.4%, lower back 60.4%, shoulders 56.6%.

Study found that, most affected body parts were neck in 16 (22%) participants, shoulders 8 (10%) participants, upper spine 7 (10%) participants, lower spine 23 (28%) participants , elbow in 1 (1%) participant, wrist in 4 (5%) participant and knee in 19 (24%) participants. Several studies have reported about prevalence of musculoskeletal disorders (MSD) amongst dentists. In a survey of Danish dentists for example, 50% and 65% reported a one year prevalence of low back pain and neck/shoulder pain, respectively. A survey of dentists in Israel, similarly reported that 55% and 38% of them had experienced musculoskeletal symptoms in the lower back and neck, respectively. A study from New South Wales (NSW), Australia, found an even higher prevalence of MSD among dentists, with 82% reporting at least one musculoskeletal symptom in the past month and 64% reporting backache during the previous month. Similarly, a 12 month period prevalence of 54% for low back pain was recently reported amongst dentists in Queensland, Australia. A Saudi study, however, reported a slightly higher rate of MSD among their subjects (74%). In a cross-sectional survey of bank employees of both genders in Saudi Arabia, found that the prevalence of pain due to WMSDs was neck pain 71.1%, wrist pain 50.0%, 30.5% headache. The 12 month period-prevalence of neck-related pain among Queensland dentists (58%), was similar to that reported by dentists in many other countries, such as Denmark (65%) and Saudi Arabia (65%), but higher than a survey of Israeli dentists (38%). (Leggat et al. 2007). A study was done in Kuwait with 750 bank

workers by using the Nordic musculoskeletal questionnaire and 12-item general health questionnaire (GHQ12)in which the most affected body parts were the neck 53.5%, lower back 51.1%, shoulders 49.2% and upper back 38.4% (Akrouf, et al., 2010) which was close to the result of this present study.

Findings of the study suggested that among the 78 participants out of 120 participants who suffered from WMSD 42.3% (n=33) participants had mild symptoms and 57.7% (n=45) participants had moderate symptoms out of 78 participants (Figure 10).

Study found that, more than one third (38%) of the participants who suffered from WMSD common stressful positions were working in same position for a long period followed by performing same task over and over for 17% (n=14) participants, bending or twisting back or neck in an awkward way for 20% (n=15) participants, repetitive movement of upper limb for 3%(n=2) participants, unilateral rotational movement for 10% (n=7) participants. So, most common risk factors were working in same position for: (38%) and unilateral rotational movement for: (10%) (Table- 11). Babatunde, (2008) showed in his research that among the all risk factor performing excessive surgery in one day (83.5%), working in same position for long period (71.3%), performing manual techniques (67.8%), working in awkward or cramped position (64.6%), bending or twisting back in awkward way (62.6%), not having enough rest break during the day (61.7%), continuing to work when injured (52.2%), performing same task over (52.2%) and inadequate training in injury prevention (29.6%). Palmer, (2007) claimed that repetitive work, static loading are responsible for most of the WRMD. Warren, (2005) found in his research the common risk factors were performing the same tasks over and over, working in the same position for long periods' and performing excessive surgery of patients in 1 day. The biomechanical risk factors in dental practice associated with musculoskeletal injuries have been

identified as high prehension forces during instrumentation, repetitive use of small muscle groups, awkward and static postures, vibration from ultrasonic instruments and dental hand pieces, ill-fitting glove, and limited time for recovery (Finsen et al. 1998). A positive relationship between fixed postures and musculoskeletal disorders (including pain, weakness, and paraesthesia) has been documented for a number of occupations (Akesson et al. 2000).

Study found that Among the 120 participants, 65% who had suffered from WMSD in this study, about 31.7% participants had leave in job due to work related musculoskeletal disorder and 68.3% participants were continue their job (Figure-8)**.** Al-wazzan, et al. found in his research at Riyadh in 2001 that only 21.62% missed work due to neck pain and only 24.66% due to back pain. 57.7%(n=45) of the participants had work performance reduce due to WMSDs. According to European Agency for Safety and Health at Work (1999) 61% of work performance reduces due to WMSDs.

Most of the common risk factors were working in same position for (38%) participants and doing the same task over and over for (35%) participants, performing same task over and over for 18% participants, bending or twisting back or neck in an awkward way for 6% participants, repetitive movement of upper limb for 3% participants, carry heavy load for 35% participants. Working in same position for long period (71.3%), bending or twisting back or neck in an awkward way (62.6%), performing same task over and over (52.2%). Palmer (2007) claimed that repetitive work, static loading are responsible for most of the WMSDs. A positive relationship between fixed postures and musculoskeletal disorders (including pain, weakness, and paresthesia) had documented for a number of occupations (Akesson, et al., 1995). In a study of bank workers in Hong Kong, it was found that frequent bending at work,

fixed keyboard height and distance, fixed screen height, unfavorable and static posture for long time were the most contributing risk factor of having musculoskeletal symptoms (Yu and Wong, 1996). In another study of bank workers in Nigeria, it identified that over work, insufficient rest time during whole working day, moving heavy objects, working in same position are the most prevalent risk factors (Maduagwu, et al., 2014). In many studies, it was reported that light computer users complain less musculoskeletal symptoms than heavy users (Yu and Wong, 1996). Among them 90.56% bank workers do not satisfied at their break time as most of get 10-15 min break time which were not sufficient. Many investigators suggested that limiting the number of daily computer work to less than 4 hours will protect the body to occur musculoskeletal symptoms (Yu and Wong, 1996).

In this study 19.2% participants had taken physiotherapy treatment for their condition. 60% participants had taken medical treatment for their condition. Krause, et al. (1999) found that 73% taken medical treatment for WMSDs. Leggat et al. (2007) said that 38% dentists seeking medical attention for MSD in the Queensland, which were very similar (37%) dental personnel in Saudi Arabia. Alexopoulos, Stathi & Charizani (2004) found that one hundred thirty six dentists sought for medical care from orthopedists (60% in cases of back and shoulder complaints and 50% for neck and hand/wrist complaints) followed by physical therapists. On the other hand, they visited less than two times for any problem an orthopedist while they visited more than six times a physical therapist (10 times for shoulder complaints). In total they paid more than 800 visits mainly in physical therapists (503) and orthopedists (272).

CHAPTER-VI CONCULATION & RECOMANDATIONS

6.1 Conclusion

This study was aimed to find out the common work related musculoskeletal disorders among bankers. For the fulfillment of the study the researcher was designed a quantitative study design (cross-sectional study) and collected 120 data from the samples through a standard questionnaire. From the data base, it was found that 78 participants had WMSDs and age range between 42-55 (27%) years is more vulnerable. Male (72%) were predominantly more affected than female (28%). Most of the education level was Masters/M.B.A (59%). The duration of job experience 6-10 years (43.6%) most commonly suffered by the WMSDs. In this research, the researcher found 78% of the participants had musculoskeletal disorders with higher prevalence of pain. The result indicates that most discomfort of the body regions was in the neck (22%), spine (38%) and knee (24%). Most common symptom of WMSDs was pain (82%) and the most affected body part was spine (39%). The maximum severity of symptom was moderate (57.7%). The most common risk factors were working in same position for (38%) and unilateral rotational movement for (35%) participants. Only (19.2%) participants had taken physiotherapy treatment for their condition. Among the 15 participants who had taken physiotherapy for their condition all of the participants had a good prognosis. The percentages of prognosis were improved in (83%). In conclusion, WMSDs represent a significant burden for bankers. The study was representing the strong evidence that WMSDs was common among bankers. In order to reduce musculoskeletal problems, correct postural practices, proper design of tools and equipment can prevent MSDs.

6.2 Recommendations

The purpose of the study was to estimate the WMSDs among bankers. Though, the research had some limitations but some further step that might help for the better accomplishment of further research. For the ensuring of the generalization of the research it is recommended to investigate a large sample. In this study only investigate the bankers from some selected bank from Savar area. But due to time limitation there was not able to gather huge amount of participants and for this result cannot be generalized in all over the Bangladesh. So, for further study it is strongly recommended to increase sample size to generalize the result in all of the bankers in Bangladesh.

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APPENDIX

Verbal Consent Statement
(Please read out to the participants)

Assalamualaikum/Namasker,

My name is Md. Shafiqul Islam, I am conducting this study as a part of my academic work of Masters. in Physiotherapy under Bangladesh Health Professions Institute (BHPI), which is affiliated to University of Dhaka. My study title is **"Prevalance of Common Work Related Musculoskeletal Disorders among the Bankers in Savar "**

I would like to know about some personal and other related information regarding musculoskeletal disorders among bankers. I will need to answer some questions which are mentioned in this form. It will take approximately 20-25 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. The researcher is not directly related with this bank, so your participation in the research will have no impact on your present or future training session. All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous.

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

If you have any query about the study or your right as a participant, you may contact with me, and/or Dr. Kamal Ahmed, MBBS. MPH. Mphil.

Do you have any questions before I start? Yes / No

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

Yes: …… No: ……..

Signature of the participant……..Date ……..

Signature of the Interviewer ……Date ……..

Signature of the Researcher……..Date……..

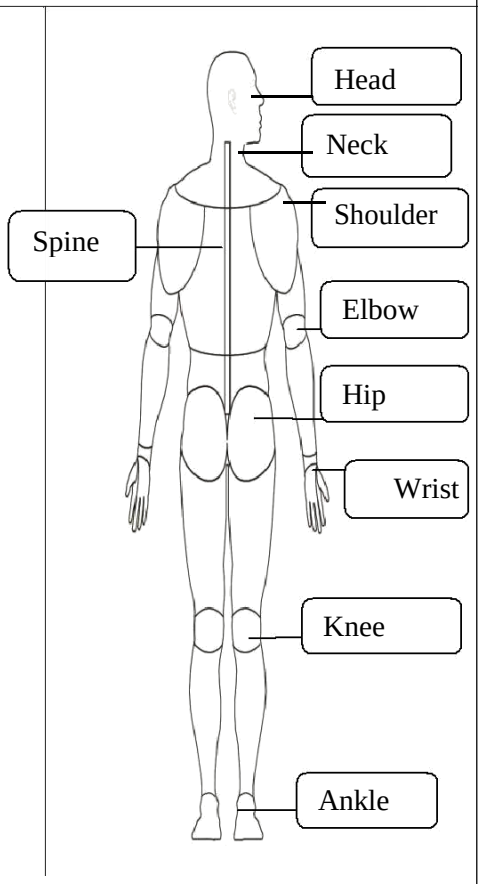
Signature of the witness ……..…....Date ……..

PREVALENCE OF COMMON WORK RELATED MUSCULOSKELETAL DISORDERS AMONG THE BANKERS in Savar

Questionnaire

Part-A: Socio-demographic Information

1.1 Name:	Contact no:
1.2 Age:	
1.3 Sex:	1=Male 2=Female
1.4 Body weight:	Kg
1.5 What is your educational status?	1=S.S.C 2=H.S.C with short course 3=Diploma 4=Graduate 5=Post graduate(Masters) 6=Post graduate (PhD) 7=other(specify)
1.6 Job experience:	1= 0-1 years 2= 1-5 years 3= 5-15 years 4= > 15 years
1.7 Working time:	
1.8 Residence distance:	

Part-B: Symptoms & Risk indicator related questions		
QN	**Questions and filters**	**Responses**
2.1	Have you ever experience work-related musculoskeletal disorders in any part of your body?	1=Yes 2=No
2.2	If yes, what number of episode you suffer due to work-related musculoskeletal disorder?	1=1 episode 2=2 episode 3=3 episode 4=4 episode 5=5 episode 6=>5 episode
2.3	Please fill the affected body part where the symptoms arise? (Aching, Cramp, Numbness, Tingling, Pain, Parasthesia, Swelling, Stiffness, Weakness, Restricted range of motion)	
2.4	What is the severity of your pain?	1=Mild 2=Moderate 3=Sever
2.5	Did you stay away from work due to pain?	1=Yes 2= No

2.6	Had your working performance Reduced due to pain?	1=Yes 2=No
2.7	Do you use any adequate safety equipment during work?	1=Yes 2=No
2.8	What types of factor at work could Contribute to work related musculoskeletal disorder?	1=Working in the same position for long time (Standing, bend over, sitting etc) 2=Performing the same task over and over 3=Bending or twisting you're in an awkward way 4=Repetitive movement of upper Limb 5=Work scheduling (over time, irregular shift, length of work day 6=Unilateral rotational movement
2.9	Did you go physician Or physiotherapist due to any musculoskeletal problem?	1=Yes 2=No
2.10	What kind of treatment did you receive?	1=Physiotherapy 2=Medication 3=Others
2.11	If yes, then what was the result?	1=Improve 2=Worse 3=Unchanged