OCCUPATION RELATED DISCOMFORT AMONG THE BUILDING CONSTRUCTION WORKERS IN   BANGLADESH

Faculty of Medicine

University of Dhaka

Submitted

By

MD. Nasir Uddin

DU Roll no: 1261

Reg. no: 10229

Session: 2017-2018

Department of Physiotherapy

Saic College of Medical Science and Technology

Saic Tower, M-1/6, Mirpur-14, Dhaka-1216,

Bangladesh

August 2023

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

OCCUPATION RELATED DISCOMFORT AMONG THE BUILDING CONSTRUCTION WORKERS IN   BANGLADESH.

Submitted by **MD. NASIR UDDIN**, for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT).

....

Zahid Bin Sultan Nahid
Assistant Professor & Head
Department of Physiotherpy
SCMST,Mirpur-14, Dhaka.
Supervisor

…………………………

Md. Shahidul Islam
Assistant Professor & Head
Outpatient Physiotherapy Services
SCMST, Mirpur-14, Dhaka.

………………………………

Abid Hasan Khan
Lecturer
Department of Physiotherapy
SCMST, Mirpur-14, Dhaka.

…………………………...

Md. Furatul Haque
Lecturer
Department of Physiotherapy
SCMST, Mirpur-14, Dhaka.

…………………………..   ………………………………………………

Zakia Rahman   **Dr. Abul Kasem Mohammad Enamul Haque**
Lecturer   Principle
Department of Physiotherapy   Saic Collage of Medical Science and Technology
SCMST, Mirpur-14, Dhaka.   SCMST,Mirpur-14,Dhaka

This study with the title **" Occupation Related Musculoskeletal Discomfort among the Building Construction workers in Bangladesh''** by Md. Nasir Uddin, Department of physiotherapy, Saic College of Medical Science and Technology, was done in my close supervision and direct guidance. I have gone through the papers. This is up to my full satisfaction.

Supervisor,

…………………………

Zahid Bin Sultan Nahid

Assistant Professor

Department of Physiotherapy

SCMST, Mirpur-14, Dhaka.

Declaration

This work has not previously been accepted in substance for any degree and isn't concurrently submitted in candidature for any degree. This dissertation is being submitted in partial fulfillment of the requirements for the degree of B.Sc. in Physiotherapy. I confirm that if anything identified in my work that I have done plagiarism or any form of cheating that will directly awarded me fail and I am subject to disciplinary actions of authority. I confirm that the electronic copy is identical to the bound copy of the Thesis. In case of dissemination the finding of this project for future publication, research supervisor will highly concern, it will be duly acknowledged as graduate thesis and consent will consent taken from the physiotherapy department of Bangladesh Health Professions Institute (BHPI).

Signature: **Date:**

Md. Nasir Uddin

Bachelor of Science in Physiotherapy (B.Sc. PT)

DU Roll no: 1261

Reg.no: 10229

Session: 2017-2018

CONTENTS

Acknowledgement

Acronyms

B.Sc	:	Bachelor of Science
DU	:	University of Dhaka
SCMST	:	Saic College of Medical Science and Technology
SPSS	:	Statistical Package of Social Science
REHAB	:	Real Estate and Housing Association of Bangladesh
ILO	:	International Labor Organization
OMPQ	:	Orebro Musculoskeletal Pain Questionnaire
MSDs	:	Musculoskeletal Disorders
WMSDs	:	Work-related musculoskeletal disorders
WRIIs	:	work-related illnesses and injuries
PPE	:	Personal Protective Euipment
WHO	:	World Health Organization
BDT	:	Bangladesh taka

List of Tables

List of Figures

Abstract

Purpose: Aim of the study to Occupation related Musculoskeletal Discomfort among the building Constraction Workers in Bangladesh.

Objective: This study's objective was to describe socio demographic characteristics, To measurement severity of pain among the building construction workers. To identify pain in any body part among the building construction workers. To Association between duration of working hours and back pain among the construction workers. To Association between age and severity of pain among the among the construction workers.

Methodology: This study was performed in a description type of cross-sectional study design. His study was conducted to determine the. This study's sample was collected through a convenience sampling procedure and total sample of 322. I was collected data 186 ,The data was collected from Bangladesh. The data collection process was a questionnaire with a face-to-face interview. Data was analyzed with Microsoft Office, using SPSS 25 version software program and test use of study chi-square test.

Result: This study's mean age of participants where were mean (29.81±11.417). This study showed that severity of the pain of the participants was mild pain 35% (n=65), moderate pain 63% (n=117) and severe pain 2% (n=4). This Study's among total 186 participant, There is a strong significant (P = 0.005) relation between age and severity of the pain of the participants , chi-value was 17.504 and the p-value was 0.008 and aslo there is no significant p-value was 3.138 and chi-value was 0.208 relation between Age of the participants and Severity of pain of the participants.

Conclusion: Finding shows that maximum MSDs in low back pain and minimum in the upper back pain. The socio-demographic factors such as age, work experiences, working time and types of works were associated with musculoskeletal disorders (MSDs). These results indicated construction workers in Bangladesh worked in a risky zone .Only by designing new or redesigning the existing process, tools and equipment can help to reduce or eliminate these problems.

Keywords: Occupation, Musculoskeletal, discomfort, Construction, workers, Bangladesh

| CHAPTER -I | INTRODUCTION |

1.1 Background:

In Bangladesh, which is still developing, there are more and more high-rise structures and construction enterprises. The Real Estate and Housing Association of Bangladesh (REHAB) and the construction workers union estimate that 3.5 million people work in Bangladesh's construction sector (Masum ,o., 2017). Construction is a very profitable and forward-thinking sector of the economy. It is one of the most important industries for a nation's economy. This sector promotes economic growth and job possibilities, particularly in developing nations like China, India, Indonesia,and Malaysia (Abas et al., 2011).

The development of a nation depends significantly on the construction industry. The majority of construction tasks reward physical work. Lifting, carrying (mud slurry, cement, and tiles), bricklaying, plastering, ironing and structuring, layering concrete, etc. are some of these tasks. These tasks are carried out by employees in a dangerous setting. Consequently, the construction business has gained a reputation as one of the most dangerous in the world (Chong et al., 2014). According to the International Labor Organization (ILO), all types of occupational diseases cause roughly 24,500 worker deaths in Bangladesh each year. Additionally, it was predicted that 8 million workers experienced work-related injuries. More than 40% of them are construction employees (ILO, 2019).

A study by Udoinyang Clement Inyang and Christopher Edet Ekpenyong included 1200 Nigerian construction employees. They discovered that 39.3% of people worldwide have musculoskeletal diseases. The employees claimed to have issues with their neck (48.2%), trunk (25.3%), lower body (26.5%), and 36.85% for the other body areas. The largest risk was based by physical variables (41.6%), which were then followed by psychological (29.5%) and individual (28.9%) components in MSDs (Ekpenyong et al., 2014). A study by Rahman included 450 Bangladeshi construction workers Their primary tasks were mixing sand and cement, ironwork, lifting and hauling mortar, placing bricks, plastering, pouring concrete, and installing tiles. Overall, the findings showed that 70.2% of employees said they had been disorder in at least one body area in the previous 12 months. The lower back (49.80%) received the most damage out of the nine body segments.a

thigh (9.60%) was the least injured body are (Rahman s.m., 2019). According to Leung et al., the majority of Taiwanese construction workers (76.2%) have musculoskeletal diseases. Among them, 47% of the workers said they experienced severe shoulder work-related discomfort. Only 38.1% of the workers claimed to have low back symptoms, leaving the overall neck discomfort rate at 43.8%. Workplaces in the construction industry have a reputation for being extremely stressful and dangerous for the workers. As a result, construction workers experience a high rate of injury incidents and levels of stress (leung et al., 2012).

Construction is an industry with particularly distinct risks,such as working at heights,using power tools, and more thana single site with one trade and multiple employers/contractors working in uncoordinated fashionthe outdoors, using power tools, working on a contract basis rather than on a permanent basis, standards or regulations among employees about their level of training and trade knowledge, and less regulation and enforcement than in other sectors. Research revealsthat occupational injury is greatly influenced by a number of different circumstances. These elements consist of maleemployees underage, no procedures for health and safetysex (Zewdie A., 2009).Building construction workers are victims of occupational health hazards and are exposed to a variety of health risks on the job. Exposure to dust, gases, and heavy lifting postures when working in the construction business are some of these that may cause-several musculoskeletal conditions. Additionally, exposure to demanding environmental conditions compromises the health of the worker, results in a variety of physiological, physical, and psychosocial strains, and makes workers susceptible to occupationally linked musculoskeletal illnesses (Tiwary et al., 2011).

The workers who have high work experiences for a specific task maintain the same posture for several years. These postures may natural or awkward (twisting, bending, tension, etc.). The long-term execute the postures contribute to develop the Work-related Musculoskeletal Disorders (WMSDs). A total of 150 construction workers were chosen by Saedpanah et al. to do three different tasks: wall plastering, bricklaying, and concrete lying. They discovered that 92% of wall plasterers had back pain. Pain in the shoulders (84%) was the second most common symptom after pain in the hands, neck, legs, and wrists. The majority of bricklayers (83%) experienced pain in their backs, which extended to their shoulders, necks, hands, and elbows. Ninety-four percent of the workers who laid concrete also said they had

back pain. They concluded that these work-related musculoskeletal issues are linked to high pressures, vibration, contact stress, and working hours. Bricklaying, in general, is the process of placing and laying bricks to create walls. Bricks and mortar are picked up by workers from lower positions. They stoop to gather the bricks, then stand back up to place the bricks where they need to be. Body discomfort results from continuing to operate in an inconvenient position below the knees. Bricklayers typically have problems with their lower back, knee, shoulders, wrist, and upper back. 33.6% of bricklayers overall reported having musculoskeletal ailments related to their jobs, according to research findings (Ekpenyong et al., 2014).

Plastering is the laying the mortar on the wall, floor, and roof. To perform this work, the workers need to move the body upper level and downwards continuously. Workers bend and twist the body to lift the mortar from below knee level to above shoulder height or to reach the overhead position. Repetition of this postures leads to MSDs symptom on the shoulder, upper arm, neck, and knee of the workers. A study showed 92% of floor and wall plastering workers were felt body discomfort . The ironworkers construct columns, beams, and roofs out of steel or rod. They also used reinforced concrete to position and protect these structures. Ironworkers typically labor outside in a variety of weather conditions and under the open sky. They either start from a kneeling position or straighten and bend the rod in really uncomfortable ways inside of prohibited areas. Heavy weight loads are routinely lifted and carried by ironworkers from the floor to their work areas. They employ bulky vibrating instruments and apparatus that may be uncomfortable. To create the structures while they are in fixed places, they also exert a lot of stress on the rod. The back, hand, shoulders, knees, and fingers are the body areas most frequently impacted by musculoskeletal problems associated to the workplace (Choi et al ., 2016).

Owing to the demanding nature of construction work, which involves a lot of physical labor and manual handling, workers in this field use a variety of technology and equipment. Poor machinery features and operating tools might result in a variety of injuries. In the construction sector, vibration from the engine, machine, and equipment, the requirement for excessive force to operate the equipment, improperly designed hand tools and equipment, and PPE (Personal Protective Equipment) account for the majority of equipment and machine-related risks.

Hand tools and equipment are typically considered non-powered tools. Hammers, floats, headpans, hoes, putty knives, spades, trowels, and so forth are among the most frequently used hand tools in the construction sector. Well-made hand tools and equipment facilitate easy work. There is a risk to worker safety when hand tools and equipment are used improperly. The arrangement and design of equipment might accentuate any discomfort and cause more severe symptoms or other problems. When using hand tools on a daily basis, workers frequently neglect to take safety precautions. As a result, people commonly sustain injuries from using tools. Construction has a reputation for being an especially harmful business because it has one of the highest rates of work-related sickness among all occupational categories, according to the Health and Safety Executive (HSE-2002). Skin conditions brought on by prolonged contact with materials that cause irritation or sensitization, respiratory conditions brought on by dust, fumes, and gases, and the emergence of more severe lung conditions linked to asbestos and other fibrogenic materials To build floors, roofs, walls, and other structures, workers lay or pour concrete into the building. They carry out labor-intensive manual material handling duties. It involves bending, carrying, climbing, lifting, and awkwardly kneeling. Summertime labor in a hot setting puts employees at risk for a variety of heat-related illnesses. Back, knee, wrist, shoulders, and foot are among the body areas linked to musculoskeletal disorders (WMSDs) related to the workplace (Sultana et al., 2014).

A key factor in the nation's progress is industrialization. Construction of buildings is one of the fundamental requirements for overall progress. In most Indian cities, modernization, industrialization, and land development are expanding quickly. The majority of towns and even small cities are growing, which has given workers access to a variety of activities and job prospects in the construction industry. Compared to other industries, construction in the building and civil engineering sectors carries higher risks since workers' health is gradually being affected to a greater or lesser extent, leading to illness. Due to their vulnerability to a variety of physical, chemical, and biological components, they may experience respiratory issues, rashes, musculoskeletal ailments, and digestive system diseases, among other health issues (Jaiswal et al., 2016).

1.2 Rationale :

Now a day's occupational work related disorder among the building construction workers are becoming epidemic in situation. A lot of study were done world- wide regarding this topic to determine the occupational work related disorder among the building construction workers. Among the few studies that were found locally not sufficient to present the real picture of the situation due to shortage of information and study were conducted some of year back which does not represent the present situation on this regard. So it is very urgent to know the situation. For this reasons, one study is necessary to conduct on this topic to take the preventive measures and minimized the gap of the knowledge on this regard. According to Boschman et al., individuals in the building construction business complained of back, knee, and shoulder/upper arm pain, and the majority of the workers said that their ailments were related to their jobs. The most common work-related complaints among employees were back and elbow pain, whereas the most common complaints among supervisors were lower arm/wrist and upper leg pain (Boschman et al., 2012).

Physiotherapy is a developing health profession in Bangladesh. AS a specialized health profession in musculoskeletal disorder. Physiotherapy is one of the responsible health profession for treating and managing work related disorder such as musculoskeletal disorder, mental disorder, respiratory disorder etc. Physiotherapists work in large spectrum including musculoskeletal phenomenon. Physiotherapy treatment is of immense importance in the modern research to eliminate all musculoskeletal pain. physiotherapists can strive to promote programs that reduce risk factors for construction workers. A new area to establish and promote professional competence and growth is occupational health and safety with reference to musculoskeletal disorders associated with the workplace. In Bangladesh, it is a developing field where physiotherapists can collaborate to compile data on the prevalence, percentage, and severity of work-related musculoskeletal problems. Physiotherapists' skills can serve as a foundation for the profession's expansion in Bangladesh, according to this research. For this reason, the researcher is eager to carry out the research in this field (Saedpanah et al., 2018).

1.3 Research Question:

What are the Occupation related Musculoskeletal discomfort among the building construction Workers in Bangladesh ?

1.4 Objectives of the study:

1.4.1 General objective:

- To determine occupation related Musculoskeletal discomfort among the building construction workers in Bangladesh.

1.4.2 Specific Objectives:

- To describe the socio demographic factors among the building construction workers in Bangladesh.
- To identify the types of muscle discomfort among the construction workers at Orebro Musculoskeletal Pain scale (OMPQ).
- To measurement severity of pain among the construction workers at Orebro Musculoskeletal Pain scale (OMPQ).
- To observe Association between Working experience and lower back pain among the construction workers.
- To find out Association between age and severity of pain among the construction workers.

1.5 List of Variables:

Conceptual framework:

Independent variable

Dependent variable

Socio-demographic factors:
Age, Gender,Religion,
Education ,Living area, Marital
status, Religion, Income etc

Physical factors:
Heavy weight lifting,
Repetitive motion,
Awakward posture

Organizational factors:
Use of PPEs,
Working hours,
Wages.

Occupation
related
musculoskeletal
discomfort
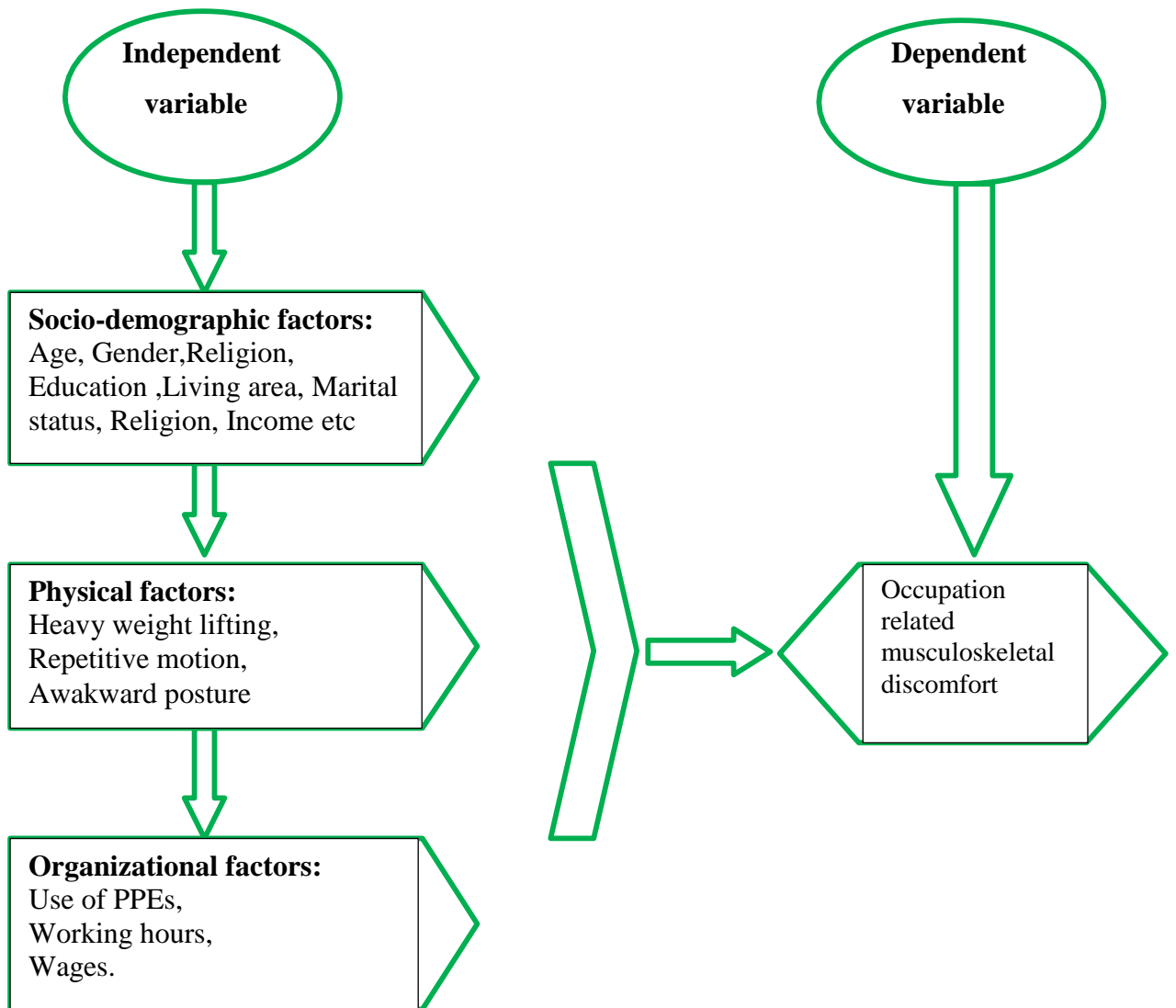
1.6 Operational definition:

Occupation:

Occupation is a general term that refers to the field or industry you are a part of or the work you are interested in. It can also refer to your role within an organization.

Musculoskeletal:

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

Discomfort:

Discomfort can be physical or psychological and is characterized by an unpleasant feeling of irritation, soreness, or pain that, though not severe, is annoying.

Construction:

It means the process of building, altering, repairing, remodeling, improving, or demolishing a public infrastructure facility, including any public structure, public building, or other public improvements of any kind to real property.

Construction worker:

A construction worker is a worker employed in the physical construction of the built environment and its infrastructure.

Building construction workers are exposed to a variety of health risks on the job and suffer from occupational health risks. These may include work in awkward positions, exposure to dust and fumes, lifting big objects, and severe physical labor, all of which can lead to musculoskeletal diseases.In addition, exposure to challenging environmental conditions degrades worker health and results in a variety of physiological, physical, and psychosocial strains, as well as occupationally linked musculoskeletal illnesses (Tiwary et al., 2011). The occupational risks, hazards, and negative health effects linked with the construction business are well-known (Stocks et al.,2010). Masons, carpenters, electricians, sheet metal workers, roofers, ironworkers, and plumbers are some of the trades or occupations that are involved in this industry. Since it is well known that the construction sector has been categorized as one of the most hazardous industries in the world, these trades are exposed to the hazardous environment in their everyday job (Chiong et al., 2014).

The global community, particularly those living in developing nations, are at an increased risk for developing a number of systemic diseases as a result of exposure to various occupational and industrial sectors (Meo et al., 2013). However, workers in different construction occupations are at risk for different work-related MSDs (Boschman et al., 2011). MSDs are the primary reason that employees who build homes experience productivity loss, functional impairments, and permanent disability globally (Boschman et al., 2012). More than half of the population of construction workers experience musculoskeletal issues occasionally or frequently (Oude et al., 2011).According to reports, ergonomic risk factors are more prevalent among construction workers globally, and their rates of MSDs are 16% higher than those of workers in other industries (Stattin et al., 2005).

Musculoskeletal Disorders (MSDs) are the most common health problems among the construction workers as well as other workers. These problems are known as injuries or pain in the various body parts like tendons, muscles, ligaments, blood vessels, nerves, body limb, back, neck, etc.. The main causes of Musculoskeletal Disorders are working in awkward and static postures, repetitively body movement, exposure to forces and vibration. Heavy loads handling also causes to Musculoskeletal Disorders (MSDs). The intensity of musculoskeletal disorders

(MSDs) among construction workers is increasing day by day. Musculoskeletal Disorders among construction workers affect on following body parts like hand, shoulders, neck, arms, wrist, and legs (Santos et al.,2014).The term "musculoskeletal disorders" (MSDs) refers to a class of inflammatory and degenerative illnesses that affect the muscles, tendons, ligaments, joints, or peripheral nerves and are typically accompanied by pain or discomfort (Chung et al., 2013).The most common causes of MSDs are overexertion, vibration, heavy lifting, extended static work, repeated manual labor, and uncomfortable postures while working (Hossain et al., 2018).

Musculoskeletal diseases (MSDs) are conditions that affect the human body's muscles, tendons, nerves, and supporting structure. One of the main issues construction workers deal with is MSD. The occurrence of MSDs in various body locations is much higher in workers who are performing hard physical labor. MSDs are significant contributors to work-related impairment and time missed due to sickness in many different occupational groups. Human factor risks are inherent to the nature of construction work, and these risks are present in their daily tasks (Chang et al., 2009).Work-related musculoskeletal disorders (WMSDs) are a group of excruciating diseases that affect the muscles, tendons, nerves, ligaments, joints, and other body parts. Examples of musculoskeletal disorders associated with the workplace include tension neck syndrome,Thoracic outlet syndrome, carpal tunnel syndrome, and so forth. Tension neck syndrome is brought on by an extended, constrained posture. Arms and hands are used in almost all types of work. As a result, the hands, wrists, elbows, neck, and shoulders are most commonly affected by WMSD. Work that involves using the legs might result in WMSD of the hips, ankles, and feet. Repetitive tasks might also cause certain back issues (CCOHS., 2014).

Musculoskeletal disorders at work are a significant problem with wide-ranging effects. Depending on the forms of these ailments, these disorders affect people in work. In both industrialized and developing nations, these problems are frequently to blame for occupational illnesses and disabilities. Numerous studies on illnesses and their methods of evaluation have resulted as a result of this (Motamedzade et al., 2014).Discomfort, pain, swelling, sensory problems, tingling, mobility restriction, and loss of movement control are some of the symptoms. It is known as a work-related musculoskeletal disorder when work conditions, working environments, and jobs lead to the musculoskeletal disorder. This condition is the main cause of lost productivity, rising costs, and harm to human resources, and it is regarded as the

biggest occupational health issue in developed nations (Soltanigerdfaramarzi et al., 2011).When a person is in an uncomfortable position, their muscles work less effectively and require more force to finish the task. Maintaining uncomfortable postures for an extended period of time wears down a worker's muscles and makes them uncomfortable; as a result, the prolonged non-neutral (awkward) posture raises the risk of work-related musculoskeletal illnesses (WMSDs). Similar to how back bending forward postures involve greater waist rotations, neck bending postures have a straight body (Ahankoob et al., 2013).

The majority of construction work in Bangladesh is done by manual laborers. Work-related musculoskeletal disorders are caused by the forceful, repeated movements the worker makes while doing these jobs. The construction industry is one of the most dangerous and harmful industries to work in. More than 8 times as much risk exists on construction sites as in other production sectors. Construction labor typically involves uncomfortable postures, lifting and transporting big objects, handling heavy objects by hand, repetitive body bending and twisting, working above shoulder height, working below knee level, and remaining in one position for an extended amount of time. The personnel perform all of these tasks in a challenging setting. So, among construction workers, work-related musculoskeletal disorders (WMSDs) are a common health issue (Neerja et al., 2016).

The term "WMSDs" refers to a wide range of disease phenomena that include a number of clinical entities with well-defined clinical characteristics, such as disorders of the muscles, tendons/sheaths, nerve entrapment disorders, joint disorders, and vascular illnesses. The characteristics of risky and dangerous physical tasks, such as movement, force exertion, joint positions and postures, compression of body parts, and exposure to whole or partial body vibrations, are the ones that are most frequently recognized as WMSD hazards (Safty et al., 2006). Multiple research have shown that MSDs are diverse and may result from prolonged unchanged posture, performing the same task repeatedly, poor body positions, improper work skills, various physical conditions, genetic factors, age, and weight (Zeb et al., 2016). A study by Neeraja et al Indian women construction workers they find out The prevalence of WRMSDs over a 12-month period was highest in the low back(44.1%), followed by the neck(28.0%), the knees (22.4%), and the hips/thighs (3.4%) (Neeraja et al., 2013). 268 Indian construction workers were the subjects of a cross-sectional study by Chakraborty et al. to assess work-related stress levels, the prevalence of MSDs, and

quality of life They gathered the information from six different job categories, including masons and concrete workers (21.64%), reinforcing (9.7%), carpenters (23.13%), loading-unloading (17.9%), laborers (17.9%), and others (fitters, plumbers, electricians, crane operators, roofers) (9.7%).They discovered that prolonged work hours and intense stress cause musculoskeletal pain in several body areas (Chakraborty et al., 2018). According to Ahmad et al find out Saudi Arabia construction worker musculoskeletal pain is common among responses. 80 (48.5%) of the 165 construction employees reported experiencing musculoskeletal pain. a large majority of Ankle/foot (6.3%), elbow (2.5%), hand (2.5%), neck (8%), shoulder (8%), low back (50%) and upper back (1.6%) were the most common areas of pain for responders. More than 70% of responders with musculoskeletal discomfort fell within the 30–50 age range(Ahmad et al., 2015).

A sample of employees from medium-sized enterprises in Shenzhen, China, saw a 50% prevalence of WMSDs during the course of a 12-month research (Yu et al., 2012). In a study by Milad et al, 850 randomly chosen workers from 2450 construction sites filled out a self-statement questionnaire about the frequency of self-reported work-related illnesses and injuries (WRIIs). Study was done on the relationship between WRII and demographic factors. The prevalence of occupational injuries was 31% overall. The three conditions that affect construction workers most frequently at work are musculoskeletal problems (53.3%), eye diseases (34.1%), and skin diseases (30.1%) (Milad et al., 2018).

In Malaysia, 60 male construction workers participated in a study done by Baba et al. Housekeeping, plastering, bricklaying, and skim coating were their primary daily chores (Darus et al., 2014). Their research revealed that the majority of construction employees (66.7%) said they have a high prevalence of muscular-skeletal conditions (MSDs). They also stated that there was a significant connection between the length of employment and MSDs (P = 0.023). Musculoskeletal problems are most common in the neck (16.7%), shoulder (28.3%), elbow (10%), wrist or hand (15%), upper back (13.3%), lower back (45%), hip or thigh (8.3%), knee (13.3%), and ankle or feet (5%).According to Yang et al.,(2020). the shoulder is the body location where musculoskeletal symptoms are reported the most frequently (47.6%). This result, however, does not fully match those of other research studies that showed low back symptoms to be the most common musculoskeletal complaints among construction workers.

The musculoskeletal conditions that affect construction workers at work have been researched by numerous researchers from various nations. According to what I know, some studies have investigated these conditions in Bangladeshi construction workers. In light of this perspective, the study looked into occupational musculoskeletal problems and unintentional accidents among Bangladeshi construction workers. Additionally, this study sought to identify the contributing factors to work-related musculoskeletal problems (WMSDs). A cross-sectional investigation was carried out for this reason using a structured and orebro musculoskeletal pain questionnaire (OMPQ). The sociodemographic information, physical risk factors, environmental risk factors, and equipment risk factors were all included in the structured questionnaire. To determine the musculoskeletal pains experienced by various body parts throughout the preceding year, the orebro musculoskeletal pain questionnaire (OMPQ) is used. The sites of MSDs were determined using the orebro Musculoskeletal Pain Questionnaire (MOPQ), which was also used to evaluate the effects of chronic MSDs on various body functions, daily activities, and working capacity (16–20). The questionnaire's overall score was calculated by adding the 21 individual scores for each of the 21 items. The range of the final score was 3-210 points. The probability of developing chronic MSDs and the effects of musculoskeletal discomfort on body functioning, everyday activities, and labor increase with higher overall scores. Low risk of developing chronic MSDs is indicated by a cut-off score of 105.

The frequencies of work-related musculoskeletal disorders (WMSDs) among the construction workers in neighboring countries of Bangladesh are Among the mentioned countries, Malaysian construction workers (80.1%) are most sufferers from WMSDs. On the other hand, the workers (41%) of the Hong Kong are the least suffer from WMSDs. The documentation on work-related musculoskeletal disorders (WMSDs) among the construction workers in Bangladesh is rare. It may present in the literature but unfortunately, the author did not find in the electronic databases.

Saedpanah et al selected total 150 of construction workers from three tasks as wall plastering, bricklaying, and concrete lying. They found 92% of wall plastering workers suffered from back pain. Shoulders pain (84%) was the second-highest symptoms over hand, neck, leg, and wrists pain. Most of the bricklaying workers (83%) suffered from back pain over shoulders, neck, hand, elbows pain. The concrete laying workers (94%) also reported they had back pain. They concluded that

excessive forces, vibration, contact stress and working time are associated with these work-related musculoskeletal problems. The construction activities also causes to ergonomic risk and injuries among the workers. These activities are carrying the loads, repetitive body movement, work in awkward positions and contact stress vibration (Kulkalni et al., 2017). Hari and Apsari applied REBA to analysis the posture of Indonesian construction workers. They found REBA score for cement mixing and tiles fitting as 8 and 11 respectively. Based on REBA risk level sheet, which is high and very high-risk zone separately. Consequence the workers need the change the posture as much as possible (Kathiravan et al., 2018).

Kathiravan and Gunarani revealed the poor body posture as risk factors for Work-Related Musculoskeletal Disorder among Indian construction workers. They reported 85% of workers (construction) are in medium risk zone and 15% of workers are in high-risk zone based on REBA sheet. They also appeared with the concreters are the highest risk of MSD over masonry and material handling workers. On the other hand, plastering workers were in the lowest risk zone (Kilbom et al., 1987).

Christopher Edet Ekpenyong and Udoinyang Clement Inyang conducted a study among 1200 construction workers in Nigeria. They found the overall prevalence of musculoskeletal disorders were 39.3%. The workers reported that they suffered from different body parts as neck (48.2%), trunk (25.3%), lower body (26.5%) and 36.85% for the multiple body locations. Meanwhile, the reasons as physical factors (41.6%) founded the greatest risk; followed by psychosocial (29.5%) and individual (28.9%) factors are associated with the MSDs (Ekpenyong et al., 2014).

The morbidity profile showed the typical health issues that employees had both now and in the past. The most prevalent medical condition that was discovered in workers most commonly (53.06%) was musculoskeletal issues. This could be the result of the repetitive tasks performed at the workplace, which generate aches, pains, and discomfort in the body. Musculoskeletal issues are a major contributor to labor inefficiency and absenteeism due to illness. It is followed by respiratory health difficulties (15.65%) and GI disorders (18.37%). 10.20% of construction workers sustained injuries at work, ranging from wire pricks and nails to more serious injuries that prevent them from doing their jobs. Some workers (9.52%) also reported having skin infections and allergies; these conditions were most frequently observed in female workers and may have originated from a variety of The morbidity profile showed the typical health issues that employees had both now and in the past. The

most prevalent medical condition that was discovered in workers most commonly (53.06%) was musculoskeletal issues. This could be the result of the repetitive tasks performed at the workplace, which generate aches, pains, and discomfort in the body. at addition to reducing worker productivity, musculoskeletal disorders are the root cause of many materials used at construction sites. Significant numbers of workers experienced hypertension (6.12%) and urinary tract infections (8.16%) during the research. Workers also reported an accident (2.04%), eye issue (4.08%), and hearing issue (2.72%) (Patil et al., 2021). Our study (15.65%) also included the reporting of respiratory issues among construction workers; these may be related to the dusty working environment in and around the building site due to the construction process and materials, as well as environmental changes and allergens. It is increased by tobacco use and smoking. Analyses of respiratory morbidity on construction workers were conducted in similar studies (Nirmala et al., 2019).

Find out how common musculoskeletal complaints are among those who work in building construction. The results showed that 57.7% of workers had musculoskeletal complaints, with the shoulders and low back being the most frequently affected body areas (46.0%). An examination of multiple logistic regressions showed a strong correlation between musculoskeletal diseases and extended job duration. In the current investigation, we also discovered a duration-response association, with longer exposures associated with a rise in musculoskeletal symptoms (Guo et at., 2004).

Thirty ergonomic factors affecting the performance of construction workers in India were discovered by Paridaa and Kumar. The following three main categories were used to group these factors: (i) Depending on the different age groups and jobs of the construction workers, (ii) factors relating to humans and labor, (iii) factors linked to tasks, and (iv) factors related to equipment and tools. The majority of injuries related to the workplace are caused by these variables. They recommended putting ergonomics treatments into practice on building sites to reduce worker accidents and injuries (Parida et al., 2016). Of the individuals, 82.6% reported no pain and 17.4% reported having neck pain. Just 23.3% of workers reported having shoulder pain, while 76.7% reported no shoulder pain at all. Of the participants, about 25.5% (119) claimed to experience upper back pain during work. Approximately 73.5 percent of employees reported not having upper back pain. Elbow pain was reported by workers in 17.3% of cases, where as 82.7% reported no elbow pain. One

of the body regions that gets the greatest contact at work is the wrist. Consequently, 32.7% of employees reported wrist pain at work. The majority of employees (49.8%) said they experienced lower back pain. They also claimed that the primary cause of this pain is kneeling. However, 50.2% of employees reported not having any lower back pain. 9.6% of workers reported having soreness in their thighs. Ninety-four percent of the subjects reported no thigh soreness. 22.4% of workers reported having knee pain as a result of kneeling. Conversely, 77.6% of workers reported no knee pain. 83.1 percent of the workforce reported not having any ankle pain. However, 16.9% of workers had ankle pain as a result of working barefoot (Rahman et al., 2019) Our baseline response rate of 37% is quite poor, even with our best efforts to boost it with incentives and reminders. As a result, the study's sample represents a subset of the general population. It is necessary to draw the conclusion that the younger population of construction supervisors is underrepresented in our current study given the finding that more older supervisors replied. Therefore, future studies should aim to include this population, maybe by thinking of other survey methods or more appealing incentives. Nevertheless, we had a comparatively high response rate (80%) at the follow-up.

The quantity of physical jobs and activities performed during a typical workday varies throughout "construction supervisors," which may have an impact on the generalizability of our findings about the factors that cause or exacerbate MSDs for supervisors. Certain supervisors—primarily those overseeing smaller construction projects—participate in manual chores on a regular or frequent basis, while other supervisors exclusively engage in managerial duties and never engage in manual labor. We are unable to distinguish between the two categories of supervisors based on our data. Our results on perceived aggravating and causative activities are consistent with earlier findings on demands and health impacts related to those employment. For instance, we discovered in a systematic review that regular and deep Bricklayers frequently bend, lift, carry, and operate with their arms raised over 60 degrees (Arndt et al., 1996).

The prevention of MSDs among construction workers is crucial, as evidenced by the high prevalence of MSDs discovered in this study and by other research. However, further understanding of the kind and severity of MSDs is needed in order to tailor workplace treatments. Based on a sufficiently large and random sample of workers, this study offers a better knowledge of MSDs in the construction industry (

Boschman et al., 2012).

These examples show that different vocations may have different risk factors for different MSDs. Therefore, it will be useful to know the risk factors; however, at this time, our knowledge is insufficient to guide the selection of the most effective intervention methods, and it is not practical to eliminate all risk variables at once. Prioritizing the preventive measures linked to the duties or activities that either exacerbate or cause the complaint appears suitable (Cook et al., 1996).

It is important to acknowledge certain limitations concerning the representativeness of the workers involved in this study. First, compared to the Dutch population supervisors, the construction supervisors who answered were older. Second, the age distribution of the bricklayers may have contributed to the greater than expected occurrence of MSDs. Third, the finding that older workers are more likely to participate in the follow-up could taint the follow-up data. However, we also looked at the possibility that the follow-up reaction could have been impacted by the presence or absence of MSDs at baseline, but we found no evidence of this. Therefore, it is unlikely that our follow-up data were tainted by the screening procedure because of MSDs alone.Our response percentage at First, compared to the Dutch population supervisors, the construction supervisors who answered were older. Second, the response rates among baseline are comparable to those in other polls (village et al., 2010).

According to the results of the current investigation, these demands are thought to be contributing to or exacerbating MSDs. However, the current study revealed that a sizable portion of bricklayers believed that stooping and kneeling contributed to or aggravated their MSD, despite the fact that this activity did not seem to be very widespread in the literature. Although physical demands were not well-known to supervisors, the current study shows that they shouldn't be disregarded.We employed a self-reporting measure of (work-related) MSDs in the current investigation. Consequently, the prevalence of diagnosed MSDs linked to the workplace may be higher than our six-month prevalence estimate (Lenderink et al., 2012).

3.1 Study design:

A Descriptive type of cross sectional study.

3.2 Study area:

Data was collected from Dhaka, Chittagong, Rangpur and Rajshahi division in Bangladesh.

3.3 Study population:

The study population was consist of male and female building construction workers in Bangladesh.

3.4 Study period:

July 2022 to June 2023

3.5 Purposive sampling:

Construction workers was my study population.

3.6 Sample size:

Sample size of this study are calculated by this following equation.

We know that;

$n = z^2pq/d^2$

$= (1.96)^2 \times 0.702 \times 0.298 / (0.05)^2$

$= 322$

Here,

n= Required sample size

z= (Standard value of 1.96)

d=Margin of error at

5%(Standard value of 0.05)

p=70.2%(Rahman,M.S 2019).

  =0.702

q= (1-p)

  =1-0.702

  =0.298

3.7 Sampling Technique:

Convenience sampling technique for collecting sample.

3.8 Data Collection Procedure:

Data collection procedure was involve face to face interview of construction workers with help of interviewer administered structured questionnaire.

3.9 Data Analysis:

The data were analyzed with the Microsoft Office Excel 2019 with SPSS 25 version software program.

3.10 Data collection technique:

Tools: Data was collected by using-
- ❖ Questionnaire
- ❖ OMPQ scale

3.11 Method:

Both open ended and close ended questionnaire and face to face interview.

3.12 Data editing:

SPSS-25 version and Microsoft office Excel 2019.

3.13 Data entry:

Statistical packages for social sciences (SPSS-25 version).

3.14 Sample selection:

3.14.1 Inclusion Criteria:

a. Age group is from 18 to 60 years
b. Age group is from 18 years to 60 years.(Because in Bangladesh the working age is ranging from 18- 60 years. Below the age of 18 years will break the law and over years are the retirement age.
c. Construction workers who have more than 1years experience.

3.14.2 Exclusion Criteria:

a. Unwillingness
b. Mentally unstable

3.15 Ethical consideration:

Before data collection, permission for the ethical review board of Saic College of Medical Science and Technology (SCMST). Prior to data collection, the objective of the study explained in understandable language to the study participant and their written informed consent were taken. The prospective participants gave free opportunity to receive summary information of the study in writing before giving consent and take part in the interview of the study. The participant's right to refuse and withdraw from the study was accepted.

3.16 Budget :

This study was conducted by using my own fund. I didn't receive any funds from others or was not try to collect funds from any 2nd person.

CHAPTER -IV	RESULT

The study aimed to identify occupation related discomfort among the building construction workers in Bangladesh. The data was collected by the researcher himself. Structured questions were used with both open ended and close ended questions in the questionnaire. The data were analyzed with the Microsoft Office Excel 2019 with SPSS 25 version software program. In this study researcher use Bar, Colum, Figure, Pie chart to show the result of the study. Because it is easier to make sense of a set of data.

4.1 Socio-demographic Condition:

4.1.1: Age of participants:

Table no 1: Distribution of the respondents by age of the participants .

Age	Frequency	Percentage (%)	Mean	Standard Deviation
<30 years	126	67.7%		
31-40 years	29	15.6%		
41-50 years	17	9.1%	29.81	11.417
51-60 years	14	7.5%		
Total	186	100%		

This study showed that age of the participant Means and Standard deviation of where are Mean ± SD = 29.81 ± 11.417 about 67.7% participants Age <35 years old, 15.6% age 36-45 years, 9.1% age 46-55 years old and 7.5% age 56-65 years old.

4.1.2: Gender of the participants:

Table no 2: Gender of the participants

Gender	Frequency	Percentage (%)
Male	184	98.9%
Female	2	1.1%
Total	186	100%

This study male of the participants 98.9% (n=184) and female 1.1% (n=2).

4.1.3: Religion of the participants:

About (186) 89% of the participants were Islam and Followed by Hindu 11%

Figure no 01: Religion of the participants
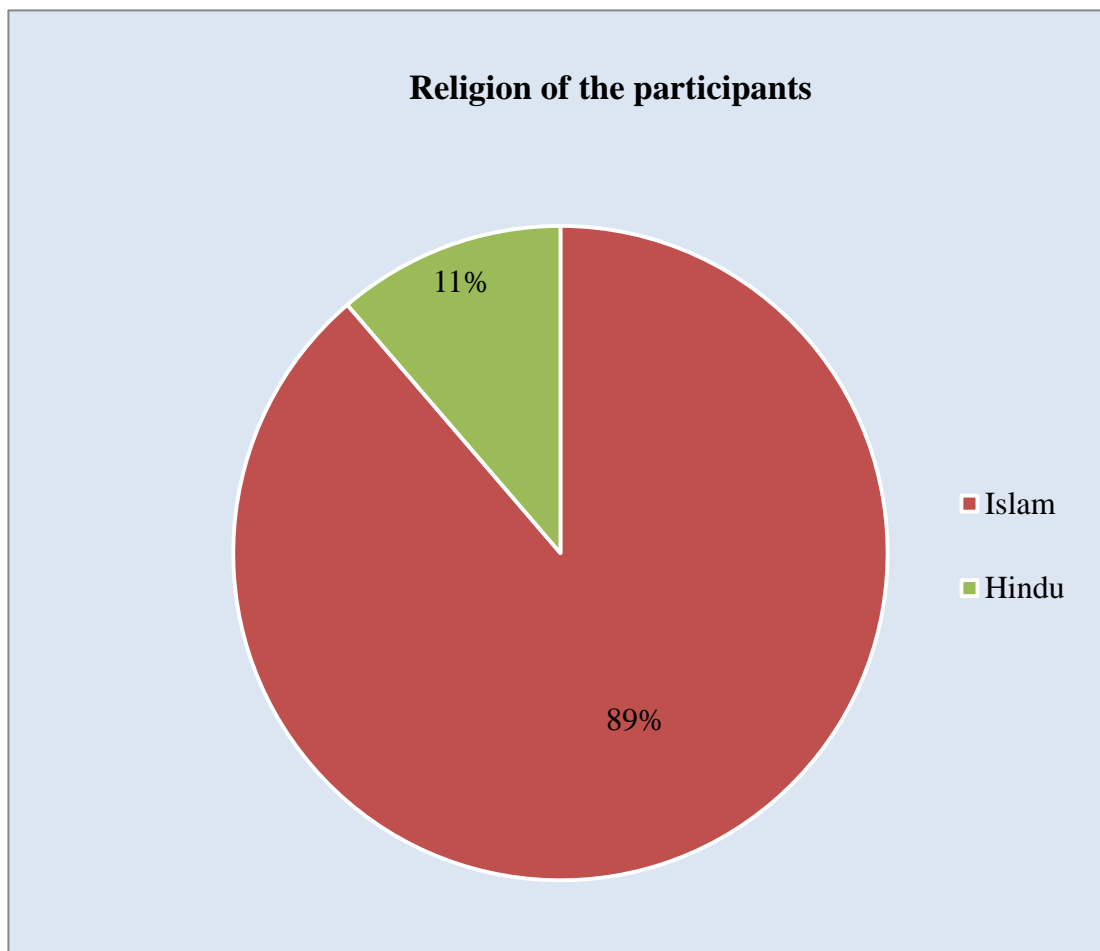
4.2.4: Living area of the participants:

This study living area of the participants urban 38% (n=70), Rural 33% (n= 62) and Semi-urban 29% (n=54).

Figure no 02: Living area of the participants

Living area of the participants

29%

38%

33%

■ Urban

■ Rural

■ Semi-Urban
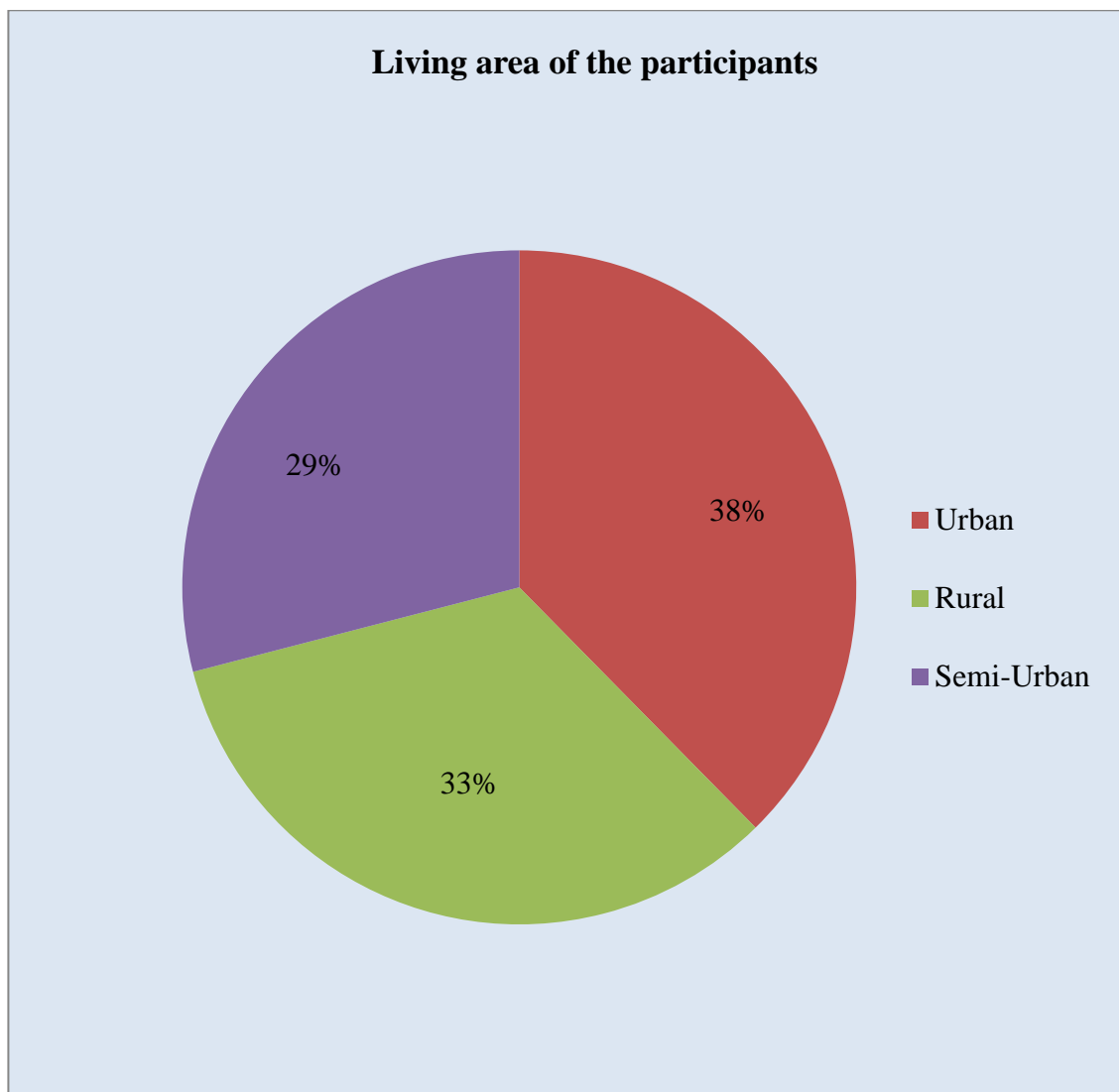
4.2.5: Educational level of the participants.

This figure showed that education level of the participants PSC participants was 54%, SSCparticipants was 33%, HSC participants was 7% and Illiterate participants was 6%.

Figure no 03: Educational level of the participants
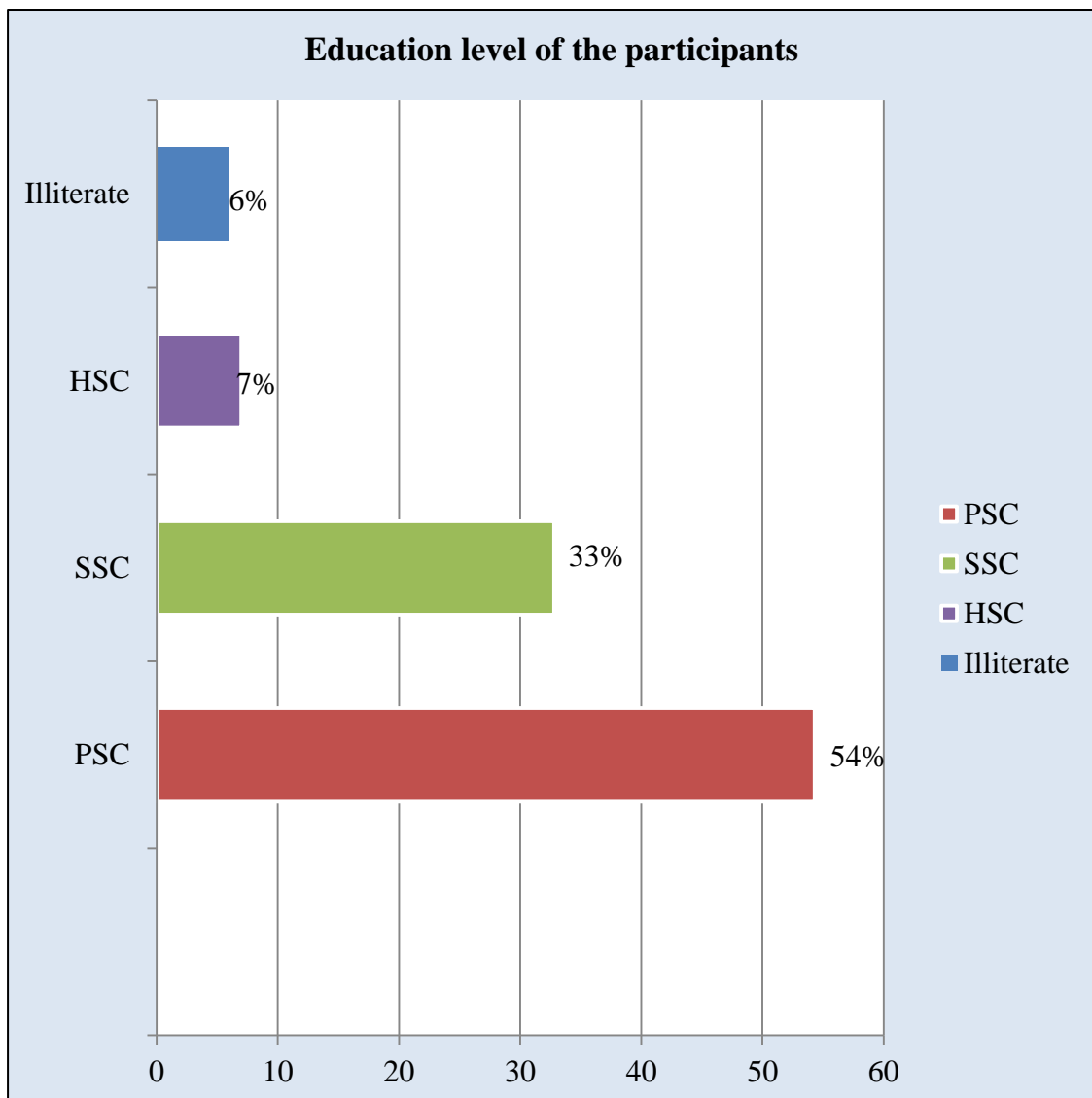
4.2.6: Marital status of the participants:

This figure showed that most of the participants married was 64% and single was 30% .

Figure no 04: Marital status of the participants

Marital status of the participants
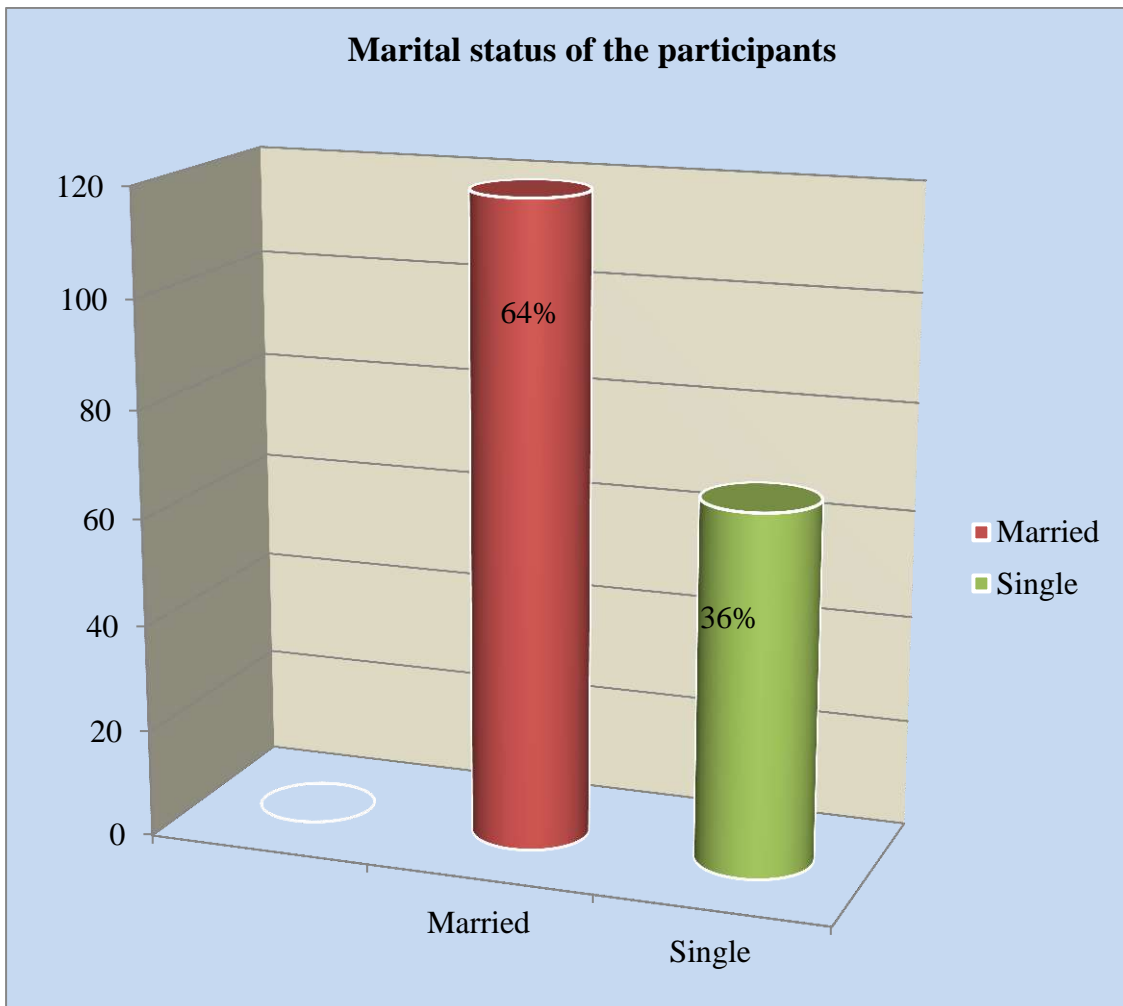
4.2.7: Smoking habit of the participants:

This study showed that the smoking habit of the participants smoker was 47% (n=87) and non-smoker was 53% (n=99).

Figure no 05: Smoking habit of the participants:
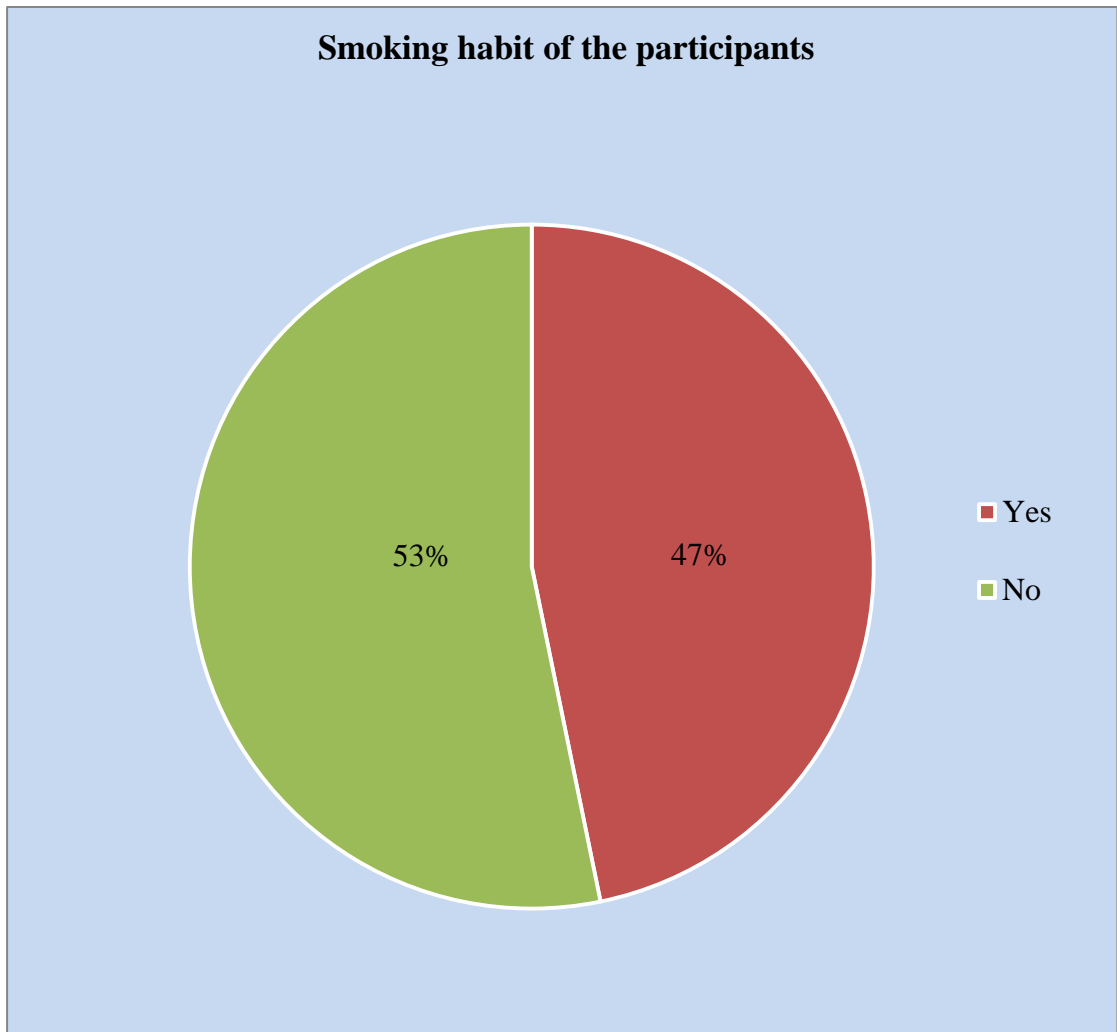
4.1.8: Family type of the participants:

This study showed the family type of the participants Extended family was 60% (n=113)and nuclear family was 40% (n=73).

Figure no 06: Family type of the participants

Types of your family
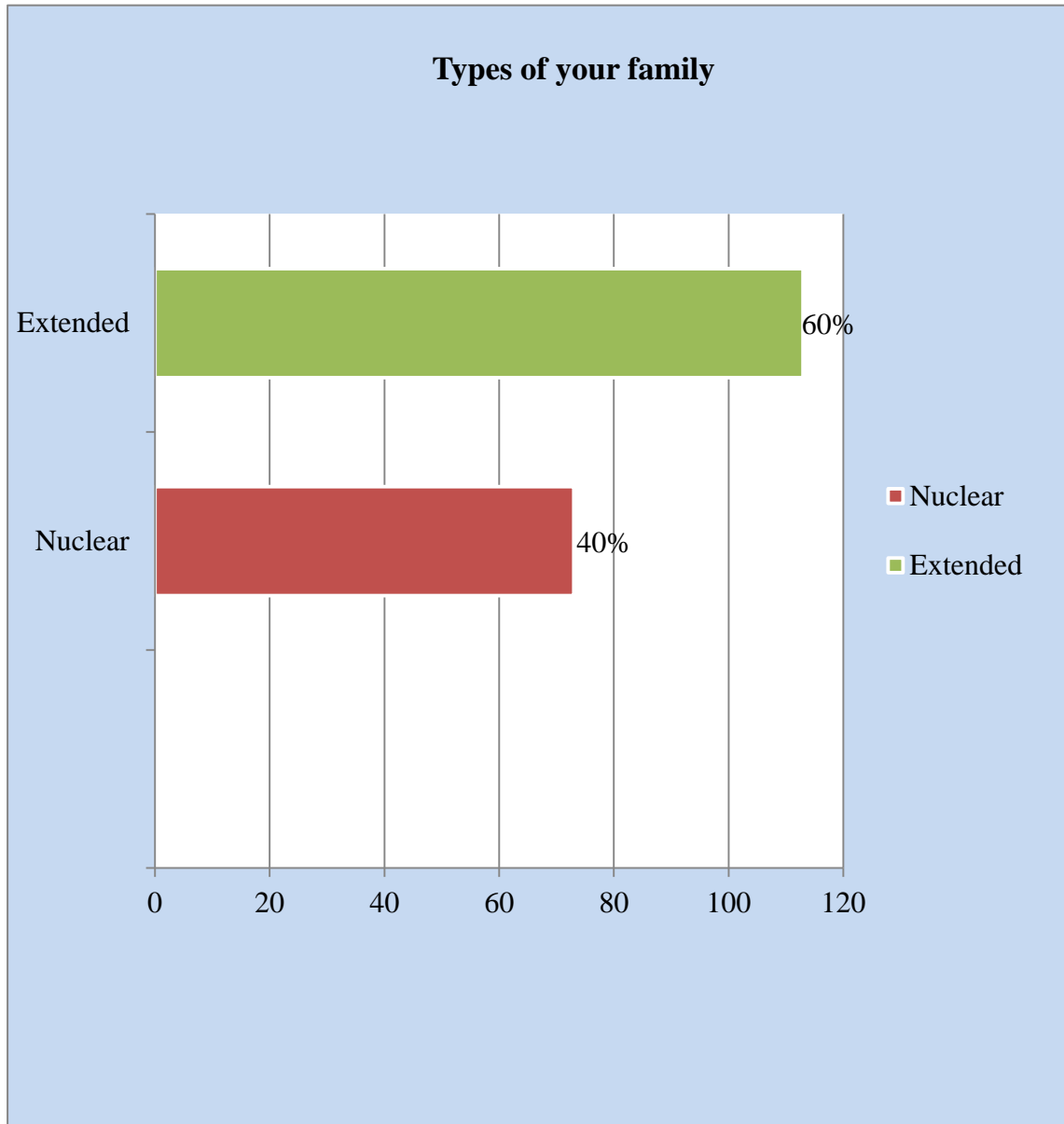
4.1.9: Monthly income of the participants:

Table no 03: Monthly income of the participants

Monthly income	Frequency	Percentage (%)	Mean	Standard Deviation
10000-20000	129	70%		
21000-30000	47	25%		
>31000	10	6%	19709.68	6674.001
Total	n=186	100%		

This study showed that most of the participants 70% (n=129) had monthly income taka 10000- 20000, 25% (n=47) had monthly income taka 21000-30000 and 6% (n=10) had monthly income taka >31000. mean and Standard Deviation 19709± 6674.001.

4.2.1: Working experience of the participants:

Table no 04: Working experience of the participants

Working experience	Frequency	Percentage (%)	Mean	Standard Deviation
<10 years	119	64%		
11-19 years	34	18%		
>20-30 years	33	18%	10.51	9.5260
Total	186	100%		

This study showed that working experience <10 years old of the participants was 64% (n=119), working experience 11-19 years old of the participants was 18% (n=34) ,working experience >20-30 years old 18%% (n=33) and mean and Standard Deviation working hours was 10.51 ± 9.5260.

4.2.2: Working hours of the participants:

Table no 05: working hours of the participants

Working hours	Frequency	Percent (%)	Mean	Standard Deviation
1-8 years	3	1.6%		
>9 years	183	98.4%	8.47	0.971
Total	186	100%		

This study showed that working hours (1-8) years old of the participants was 1.6% (n=3), working hours >9 years old of the participants was 98.4% (n=183) and mean and standard deviation 8.47±0.971.

4.2.3: Types of work of the participants :

Table no 06: Types of work of the participants.

Types of work	Frequency	Percentage (%)
Plaster	45	24.2%
Ceramic tiles workers	12	6.5%
Armature fixing worker	26	14%
Electrical worker	2	1.1%
Welder	9	4.8%
Plumber	14	7.5%
Masonry worker	75	40.3%
Laborer	2	1.1%
Cement worker	1	0.5%
Total	186	100

This study total participants 186 , showed that types of work of the participants was plaster workers 24.2% (n=45), participants of ceramic tiles workers 6.5% (n=12), electrical workers 14% (n=26), plumber 1.1% (n=2), Masonry workers 4.8% (n=9). Labore 1.1% (n=2). Cement worker 0.5% (n=1).

4.2.4: Safety training of the participants:

This study most of participants was safety training No 94% (n=175) and safety training Yes 6% (n=11).

Figure no 7: Safety training of the participants
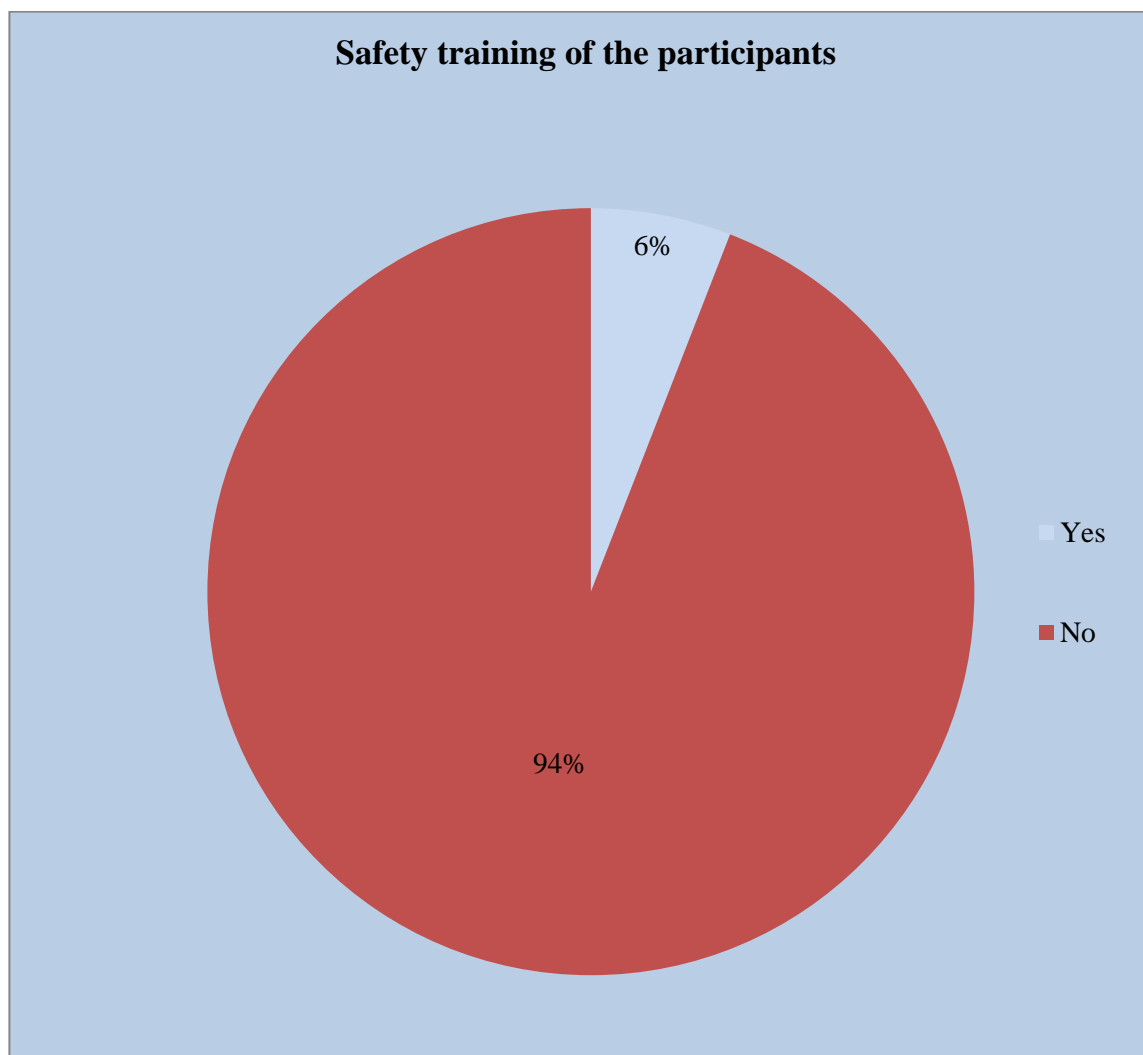
4.2.5: Personal protective equipment of the participants:

This study most of participants was No used of PPE 97 % (n=181), and used of PPE Yes 3% (n=5).

Fig no 8: Personal protective Equipment of the participants

Personal protective Equipment of the participants
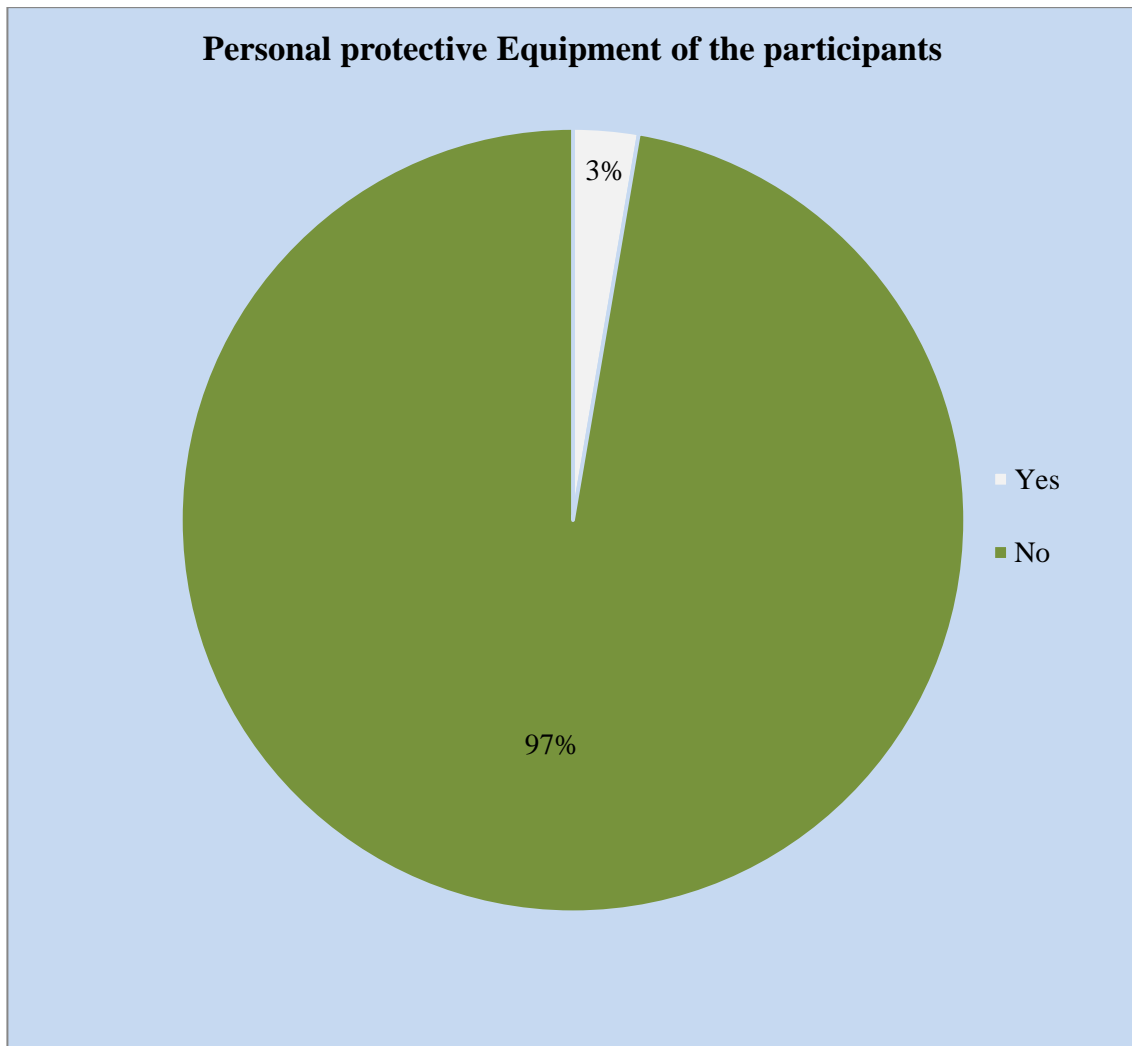
4.3.1: Severity of pain of the participants:

This study showed that participant was mild pain 35% (n=65), participants was moderate pain 63% (n=117), participants was severe 2% (n=4).

Fig no 9: Severity of pain of the participants
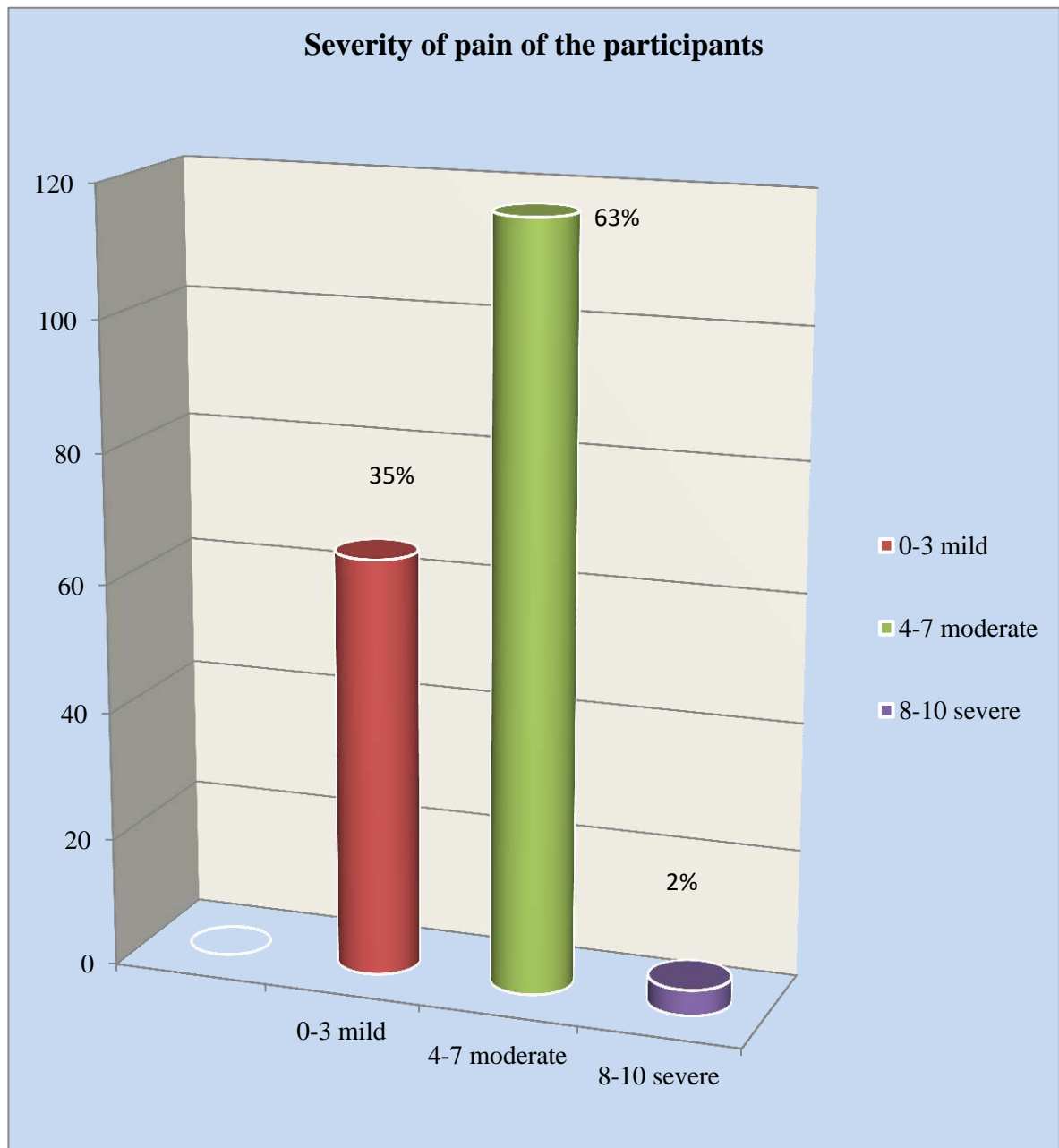
4.3.2 Pain in any part of the body of the participants:

Table no 07: pain in any part of the body of the participants

Body part	Frequency	Percentage (%)
Neck	13	3.9%
Shoulder	15	4.5%
Arm	43	13.0%
Upper back	16	4.8%
Lower back	150	45.2%
Leg pain	62	18.7%
Others	33	9.9%

Among the all participants 186 were experienced pain in the different body part. In this study 7.2% suffered from neck pain, 10.3% suffered from shoulder pain, 18.6% suffered from Arm pain, 2.1% suffered from upper back, 45.4% suffered from lower back pain, 13.4% suffered from leg pain and 3.1% suffered from others pain.

4.4:Association

4.4.1: Association between Working experience and lower back pain of the participants.

Table no 8: Association between Working experience and lower back pain of the participants.

			Do you have back pain				
			Yes	No	Total	Chi value	P-value
Working hours of the participants	<10 hours	n	92	27	119	3.138	0.208
		%	49.6%	9.44%	67%		
	11-19 hours	n	28	27	34		
		%	15%	14.5%	18%		
	>20 hours	n	30	3	33		
		%	16%	1.61%	17.7%		
Total		n	150	36	186		
		%	80.65%	19.35%	100%		

This table showed that the chi value was 3.138 and the p-value 0.208. So there is no significant association between working Experience and lower back pain among the construction workers.

4.2.2: Association between age and severity of pain among the among the construction workers.

Table no 9: Association between age and severity of pain among the among participants.

			Severity of pain			Chi value	P-value
			Mild pain	Moderate pain	Severe pain		
Age of the participants	<30 years	n	43	83	0	17.504	0.008
		%	23%	44.6%	0%		
	31-40 years	n	14	13	2		
		%	7.5%	7%	1.1%		
	41-50 years	n	4	10	0		
		%	2.1%	21.5%	0%		
	51-60 years	n	4	10	0		
		%	2.1%	21.5%	0%		
Total		n	65	117	4		
		%	35%	63%	2.1%		

This table showed that the chi-value was 17.504 and the p-value was 0.008. So there is a strong significant association between age and severity of the pain of the participants.

Most of the construction activities in Bangladesh are handled by manual labors. The worker performs these tasks by continual repetitive body movement, force exertion those are lead to Work-related Musculoskeletal Disorders. Construction sectors are one of the most hazardous and unsafe workplaces. In the construction sites, the amount of hazardous is more than 8 times risky than other manufacturing industries.Work-related Musculoskeletal Disorders (WMSDs) are common health problems in construction workers (Neerja et al.,2016). Ahmad and Shahnawaz conducted a study on 165 construction workers in Saudi Arabi .

They found that 48.5% of the responding workers are experiencing MSDs symptoms. Low back pain (50%) is very high over knee pain (20%) among the responders (Ahmad et al., 2015). Rahman ,M.S.,can be found that only 88 (19.6%) responders were female. That is a lot less than male workers (80.4%) were. The maximum 47.9% of workers was age below or equal to 30 years. The age of 22.4%, workers were within 31 to 40 years. The age of 22.4% of workers was in middle-level range as 41-50. Only 7.3% of workers age was >= 51. Majority of the participants (63.3%) were in the normal BMI range. The body mass index (BMI) of over weighted workers was 30.5%. However, only 3.8% of workers were underweighted and 2.4% was obesity. About 53.3% of the participants were a smoker and 46.7% were a non-smoker. Most of the participants 75.1% were married and only 24.9% were unmarried. Majority of the participants (51.1%) had primary education. About 22.9% of workers had taken secondary level education. About 21.6% of total workers were illiterate. Merely, 4.4% of workers had taken higher education.

In This study showed that age of participant where are Mean ± SD = 29.81 ± 11.417 about 67.7% participants Age <35 years old , 15.6% age 36-45 years old, 9.1% age 46-55 years old and 7.5% age 56-65 years old. Among the 186 participants were experienced pain in the different body part. One of the main health issues is occupational exposure to the building construction sector at work and its effects on people's health. Sultan et al found that many workers in the building construction industry experienced musculoskeletal issues, such as head heaviness (11.3%), leg pain (23.9%), foot pain (13.4%), upper back pain (6.2%), lower back pain (16.5%), and neck discomfort (7.5%), and whole body fatigue 20.1%. In parallel to our findings,

Rosecrance et al. conducted a study in building construction workers and demonstrated that the musculoskeletal symptoms were common in neck 24.7%, shoulders 18.9%; upper back 28.7%; elbows 8.0%; low back 45.0%; wrist / hands 29.6%; hip / thighs 4.7%; knee 10.9% and ankles / feet 10.7 %. Rahman.M.S., find out About 17.4% of the participants said that they suffered from neck pain and 82.6% had no pain. Only 23.3% of workers felt pain in shoulders, and 76.7% had no pain in shoulders. About 25.5%.(119) of the participants blamed that they feel upper back pain during work. Almost 73.5% of workers did not suffer from upper back pain. Workers suffered from elbows pain, as 17.3% and 82.7% had no elbows pain. The wrist is one of the most contacted body parts with the work. As a result, 32.7 % of workers felt wrist pain during their work.In a study by Yu-Sheng et al., 76.2% of the workers who were involved in building construction reported having musculoskeletal symptoms.

The most common work-related complaints were found to be shoulder problems (47.6%), followed by neck pain (43.8%) and low back pain (38.1%). In this study 7.2% suffered from neck pain, 10.3% suffered from shoulder pain, 18.6% suffered from Arm pain, 2.1% suffered from upper back, 45.4% suffered from lower back pain, 13.4% suffered from leg pain and 3.1% suffered from others pain. Hanklang et al.ascertain the frequency of of musculoskeletal complaints in construction workers in construction. The results showed 57.7% of employees stated they had musculoskeletal symptoms, the shoulders and low back being the most common often impacted bodily areas (46.0%). Several An analysis of logistic regression revealed that extended The length of work was substantially correlated with Muscle and joint diseases. In the same way as in the present research, we discovered a duration-response connection. longer exposure times resulting in higher Muscle and joint issues.And also this study found that participant was mild pain 35% (n=65), participants was moderate pain 63% (n=117), participants was severe 2% (n=4).

This study total participants 186 ,showed that types of work of the participants was plaster workers 24.2% (n=45), participants of ceramic tiles workers 6.5% (n=12), electrical workers 14% (n=26), plumber 1.1% (n=2), Masonry workers 4.8% (n=9). Labore 1.1% (n=2). Cement worker 0.5% (n=1).Among the total participants of 103 (22.9%) worked as mixing sand and cement, 51(11.3%) lifting and carrying mortar, 63 (14%) ironwork, 37 (8.2%) bricklaying, 43 (9.6%) plastering, 67(14.9%) concrete

laying, 21 (4.7%) tiles fitting, and 65 (14.4%) were performed others works. Maximum 62% of workers had up to 12 years of working experiences. About 25.8% of workers had experiences within 13 to 24 years. There were 10.7% of workers experienced within 25 to 36 years. Only 7 (1.6%) workers had high working experiences as >= 37 years. Most of the participants (80.2%) worked more than 8 hours per day. There was a few, 19.8% of workers worked below or equal eight hours in a day. In This study show's that working experience <10 years old of the participants was 64% (n=119),working experience 11-19 years old of the participants was 18% (n=34) ,working experience >20-30 years old 18%% (n=33) and mean and Standard Deviation working hours was 10.51 ± 9.5260.

This study most of participants was No used of PPE 97 %(n=181), and used of PPE Yes 3% (n=5). that education level of the participants PSC participants was 54%, SSC participants was 33%, HSC participants was 7% and Illiterate participants was 6%.this study found of Association between working hours and back pain among the construction workers. that the chi value was 3.138 and the p-value 0.208. So there is no significant association between working Experience and lower back pain among the construction workers, In this study This table shows that the chi value was 17.504 and the p-value was 0.008.So there is a strong significant association between age and severity of the pain of the participant, The workers of several work trades suffered from work-related musculoskeletal disorders. The workers of selected trades were associated with MSDs.

CHAPTER -VI	Limitation of the Study

This cross-sectional study has some limitations. As a student this study was conducted by my found ,so there might have some limitation of finicial aspect in this study . ths study data was collected from only the construction sites at Chittagong, Rangpur, Rajshahi and Dhaka division Bangladesh. The workers selected only in building constructions trades and their tasks were mixing cement and sand, lifting and carrying the load, bricklaying, plastering, iron-related work, concrete laying, and few others trades. These participants might not be working other works along with the construction's tasks. Author did not ask the contributors about any previous medical/surgical history that could cause MSDs. The duration and intensity of the pain did not find out. This research is part of my academic study purpose and As it was a new topic area especially from the perspective of Bangladesh. The interview scheduled survey and interviewing skills were not adequate to get deeper information from the participants ,as it was the first attempt for the researcher.

CHAPTER -VII	Conclusion and Recommendations

7.1: Conclusion

This study was conducted on 186 construction workers from parts of Bangladesh such as Chittagong, Rangpur, Rajshahi and Dhaka division Bangladesh. From this study following conclusions can be drawn:

❖ Finding shows that maximum MSDs in low back pain(45.4%) and minimum in the upper back pain (2.1%).

❖ The socio-demographic factors such as age, work experiences, working time and types of works were associated with musculoskeletal disorders (MSDs).

❖ These results indicated construction workers in Bangladesh worked in a risky zone .Only by designing new or redesigning the existing process, tools and equipment can help to reduce or eliminate these problems.

❖ The result also showed that the most affected body parts were the neck, shoulders, upper back, lower back, elbows, wrists, and knees.

❖ Various risk factors were identified that associated with work-related musculoskeletal disorders (WMSDs).

❖ The socio-demographic factors such as age, work experiences, working time and types of works were associated with musculoskeletal disorders (MSDs).

❖ Moreover, the lack of safety facilities has been identified as a vital factor for workplace injuries.

These results indicated construction workers in Bangladesh worked in a risky zone, and they suffered from various types of work-related musculoskeletal disorders (WMSDs). Only by designing new or redesigning the existing process, tools and equipment can help to reduce or eliminate these problems.

7.2: Recommendations

The following recommendations will help to mitigate or reduce the work-related musculoskeletal disorders (WMSDs) and accidental injuries among the construction workers in future.

7.2.1 For the management:

The management and administration of the construction project should perform the following activities to reduce or to eliminate the work-related and accidental injuries from construction workers in Bangladesh.

❖ Redesign the processes, workplace, working layout by considering the strengths, weaknesses, and needs of the workers.

❖ Implementation of job replacement methods where employees will be replaced between jobs to minimize the period of frequent exertion, repetitive motions, and awkward postures.

❖ The management should provide ergonomically designed workplaces and tools to facilitate neutral postures.

❖ Provide adequate training and education to the workers, supervisors, and inspectors to others participate in the work-related musculoskeletal disorders control program.

❖ Utilize the administrative controls to reduce the number of working hours in one position, limit overtime, or to include more breaks time during shifting work.

❖ Provide safety aides facilities for all.

❖ First aid facilities should be provided for all injured workers at the construction site.

❖ Provide mechanical aids to eliminate the manual handling activity as much as possible.

❖ Provide proper personal protective equipment (PPE) for every worker at the construction site.

7.2.2 For the workers:

Besides the management, the workers also should perform the following activities to reduce or eliminate the work-related and accidental injuries.

- ❖ Perform the tasks in natural posture.
- ❖ Workers must wear personal protective equipment (PPE) regularly in order prevent work site injuries.
- ❖ Avoid twisting and implement proper manual handling technique.
- ❖ The workers should avoid static work posture for a long time. A periodic rest is needed to relax the body.
- ❖ Lifting and carrying the heavy load by the workres should be divided into a small one.Two or more person can handle heavy loads if required.
- ❖ To keep the body muscles, joint and spine sound, strong and flexible workers should do some exercise daily.

Masum,O.,(2017).No safety measures for construction workers. (Accessed on 14 April 2019).

Abas, A.B.L., Said, A.R.M., Mohammed, M.A.A and Sathiakumar N,(2011).Non-fatal Occupational Injuries among Non-governmental Employees in Malaysia. *Journal of National Institutes of Health;*17(1);38-48.

Chong, H.Y., and Low, T.S,(2014).Accidents in Malaysian construction industry: statistical data and court cases.International. *Journal of Occupational Safety and Ergonomics;* Vol. 20(3), pp.,503-513. doi 10.1080.

ILO,(2019). Safety and health at work in Bangladesh. (Accessed on 16 September 2019).

pritchard C,(2004). Building for Health. The construction managers of tomorrow. *Journal of Research Society Promot Health;*124:171-176.

Ekpenyong, C.E., and Inyang, U.C,(2014).Associations Between Worker Characteristics, Workplace Factors, and Work-Related Musculoskeletal Disorders. A Cross-Sectional Study of Male Construction Workers in Nigeria:*International Journal of Occupational Safety and Ergonomics;* Vol. 20(3), pp., 447-462.

Leung, M.Y., Chan, I.Y.S., and Yu, J.(2012).Preventing construction worker injury incidents through the management of personal stress and organizational stressors. *Journal of Accid Anal and Prev;* Vol. 48, PP., 156-166.

Tiwary G, Gangopadhyay PK.(2011). A review on the occupational health and social security of unorganized workers in the construction industry. *Indian Journal of Occupational Environment Medicine;*15(1):18-24.

Zewdie A, (2009). Determinants of occupational injury: a case control study among textile factory workers in Amhara regional state. Ethiopia. *Journal of Trop Medicine;* 201:1–8.

Boschman, J.S., van der Molen, H.F., Sluiter, J.K., and Frings-Dresen, M.H (2012). Musculoskeletal disorders among construction workers: a one-year follow-up study. *Journal of BMC Musculoskelet Disorder;* Vol.13,pp.,196.

Stocks, S.J., McNamee, R., Carder, M.,and Agius, R.M (2010).The incidence of medically reported work-related ill health in the UK construction industry. *Journal of Occupational Environmental Medicine*; vol 67(8); pp.,574–576.

Oude, K.M., Blatter, B., Geuskens, G.A., & Koppes, L.L (2011). Factors associated with the ability and willingness to continue working until the age of 65 in construction workers. *International Journal of Occupational and Environmental Health;* vol. 6(2), pp., 345- 456.

Stattin, M., & Jarvholm, B (2005). Occupation, work environment and disability pension: a prospective study of construction workers. *Scandinavian Journal of Public Healt*; vol. 33,pp., 84-90.

Boschman, J.S., van der Molen, H.F., Sluiter, J.K., Frings-Dresen, M.H(2011). Occupational demands and health effects for bricklayers and construction supervisors: A systematic review. *Am Jounal of Indian Med;* vol.54.pp.,55–77.

Santos, A., Ramos, H.M., Ramasamy, G., and Fernandes, C (2014). Improving Workers Health in Projects Based Work: Job Security Consideration. *International Journal of Managing Projects in Business;* Vol. 9, pp., 606-623.

Meo, S.A., Al-Drees, A.M., Al-Masri, A.A., Al-Rouq, F., and Azeem, M.A (2013). Effect of Duration of Exposure to Cement Dust on Respiratory Function of Non-Smoking Cement Mill Workers. *International Journal Environ Res Public Health;* vol.10(1), pp.,390-398.

Chung, Y.C., Hung, C.T., Li, S.F (2013). Risk of musculoskeletal disorder among Taiwanese nurses cohort: a nationwide population-based study. *Journal of BMC Musculoskeletal Disorder;* doi: 10.1186.

Hossain, M.D., Aftab, A., Al Imam, M.H., et al (2018). Prevalence of work related musculoskeletal disorders (WMSDs) and ergonomic risk assessment among readymade garment workers of Bangladesh: a cross sectional study. *Journal of PLoS One;* vol,13(7); e0200122. doi: 10.1371

Chang, F.L., Sun, Y.M., Chuang, K.H., Hsu, D.J (2009). Work fatigue and physiological symptoms in different occupations of high-elevation con-struction workers. *Journal of Appl Ergon;* vol .40,pp., 59-596.

Work-related Musculoskeletal Disorders. Canadian Centre for Occupational Health and Safety; https://www.ccohs.ca/oshanswers/diseases/rmirsi.html, (Accessed on 11 September 2019).

Motamedzade, M., Torkaman, J., Golmohamadi, R., Roshanaei, G (2014). Risk assessment of musculoskeletal disorders using repetitive tasks and programs ergonomic intervention in a manufacturing company. *Journal of Occup Health*

Epidemiol; vol.1(2),pp., 11-19.

Soltanigerdfaramarzi, R., Dehghan, Y., Sadeghinaeeni, H., Falahati, M., Zakaei ,M (2011). Welding posture assessment practices posture assessment OWAS. *Journal of Med Bus;* vol. 3(1),pp., 34- 39.

Ahankoob, A., & Charehzehi, A (2013). Mitigating ergonomic injuries in construction industry. *IOSR Journal of Mechanical and Civil Engineering*; vol. 6(2),pp., 36–42.doi.org/10.9790/1684- 0623642.

Neerja, J., Vashima,V., (2016).Work related Musculoskeletal Disorders among Construction Workers of India. *Research Journal of Family, Community and Consumer Sciences;* Vol. 4(2), pp., 1-5.

Safety, A., Council, C (2006). Work-related musculoskeletal disease in Australia. *Canberra: journal of Common wealth of Australia ISBN 0.pp.,642:326770.*

Zeb, A., Ali,W., Darain, H., and Rahman, M.U (2016). Prevalence of work related musculoskeletal disorders among physicians, surgeons and dentists at tertiary care hospitals of Peshawar. Ann Allied Health Sci; vol.2(1),pp.,5.

Rahman S.M (2019). A Cross-sectional Study of Work-Related Musculoskeletal Disorders among Construction Workers in Bangladesh. *Journal of KUET Institutional Repository;pp.,54-58.*

Telaprolu,N., Lal,B., Chekuri,S (2013). Work related musculoskeletal disorders among the unskilled Indian women construction workers. *National Journal of Community Medicine; vol.4(4),pp.,658-661.*

Chakraborty, T., Das, S. K., Pathak, V., and Mukhopadhyay, S., (2018). Occupational stress, musculoskeletal disorders and other factors affecting the quality of life in Indian construction workers. *International Journal of Construction Management;* Vol. 18(2), pp.,144-150.

Ahmed,A., and Shahnawaz,A (2015).Prevalence of musculoskeletal pain in construction workers in Saudi Arabia. *The Scientific World Journal;* pp.,5.dio.10.1155.

Yu, W., Ignatius, T., Li, Z., Wang, X., Sun, T., Lin, H (2012). Work-related injuries and musculoskeletal disorders among factory workers in a major city of China. *Journal of Accident Analysis & Prevention;vol.*48,pp.,457-63.

Milad,D.J., Mehdi,Hamed,k.,Narges,Abbasi., soheil.,Shakerian., and Mojtaba kamaloinia (2018). Prevalence of self-reported work-related illness and injuries among building construction workers. *EXCLI journal; vol.17,pp., 724-733.doi.10179.*

Daruis, D.D.I., Khamis, N.K., Mohamad, D., Daud, S.F.M., Amdan, S.M., Aziz, R.A., and Deros, N.J.B.M (2014). Prevalence of Work Related Musculoskeletal Disorders Symptoms among Construction Workers. a Case Study in Malaysia; *Iranian Journal of Publ Health;vol. 43(03), pp., 53-57.*

Yang, Y.S.,Goldsheyder, D., Kau, L.J (2002). Survey of Musculoskeletal Symptoms among Building Construction Workers in Southern Taiwan. *Journal of Occupational Therapy Association,R.O.C., vol.20,pp.,12-20.*

Kulkarni, V.S., and Devalkar, R.V., 2017, "Ergonomic analysis of building construction workers using RULA and REBA techniques". *NICMAR – Journal of Constraction Management,* Vol. 32, pp. 09- 15.

Kathiravan, S., and Gunarani, G.I., 2018, "Ergonomic Performance Assessment (EPA) using RULA and REBA for Residential Construction In Tamil Nadu". *International Journal of Civil Engineering and Technology*, Vol. 9(4), pp. 836-843.

Kilbom, A., Vinterberg, H., Biering-Sorensen, F., Andersson, G., Kuorinka G.J.K.I, and Jonsson.B., 1987, "Standardized Nordic Questionnaires for The Analysis of Musculoskeletal". *Journal of Appl Ergon.* Vol. 18, pp. 233-237.

Meo SA, Alsaaran ZF, Alshehri MK, Khashougji MA, Almeterk AAZ, Almutairi SF, et al. Work-Related musculoskeletal symptoms among building construction workers in Riyadh, Saudi Arabia. *Pak Journal of Med Sci* 2013;29(6):1394-1399.

Hanklang S, Kaewboonchoo O, Silpasuwan P, Mungarndee SS. Musculoskeletal Disorders Among Thai Women in Construction-Related Work. *Asia Pac Journal Public Health. 2012 Nov 18. Epub ahead of print.*

Yu-Sheng Yang, David Goldsheyder, Lee-JyyKau. Survey of Musculoskeletal Symptoms among Building Construction Workers in Southern Taiwan. *Journal of Occupational Therapy Association.* 2002;20:12-20.

Saedpanah, K., Motamedzade, M., Salimi, K., Eskandari, T., and Samaei, S.E., 2018, "Physical Risk Factors among Construction Workers by Workplace Ergonomic Risk Assessment (WERA) Method". *Journal of Archives of Occupational Health,* Vol. 2(1), pp. 56-62.

Ekpenyong, C.E., and Inyang, U.C., 2014, "Associations Between Worker Characteristics, Workplace Factors, and Work-Related Musculoskeletal Disorders: A Cross-Sectional Study of Male Construction Workers in Nigeria. *International Journal of Occupational Safety and Ergonomics,* Vol. 20(3), pp., 447-462.

Saedpanah, K., Motamedzade, M., Salimi, K., Eskandari, T., and Samaei, S.E., 2018, "Physical Risk Factors among Construction Workers by Workplace Ergonomic Risk Assessment (WERA) Method", *Jounal of Archives of Occupational Health,* Vol. 2(1), pp., 56-62.

Choi, S.D., Yuan, L., and Borchardt, J.G., 2016, "Musculoskeletal disorders in construction: practical solutions from the literature". *Journal of Professional Safety,* Vol. 61(01), pp., 26-32.

Kulkarni, V.S., and Devalkar, R.V., 2019, "Postural analysis of building construction workers using ergonomics*". International Journal of Construction Management,* Vol.19 (6), pp., 464-471.

Sultana N, FerdousiJ , Shahidullah Md. Health Problems among Women Building Construction Workers. Bangladesh Soc Physiol. 2014, June; 9(1): 31-36.

Jaiswal N, Veerkumar V. Work related Musculoskeletal Disorders among Construction Workers of India. Res. *Journal of Family, Community and Consumer Sci*.2016; Vol. 4(2), 1-5.

Patil S , Makade J , Deshpande S , and Swarupa C ., 2021. Assessment of Socio-Demographic and Health Related Problems of Construction Workers Indulge in Building Industry in Central India; *Indian Journal of Forensic Medicine & Toxicology,* July-September 2021, Vol. 15, No. 3

Nirmala CJ, Prasad SD. Occupational hazards and public health concerns of migrant construction workers: an epidemiological study in southern *India. Internatinal Journal of Community Medicine Public Health* 2019;6:818-22.

Guo HR, Chang YC, Yeh WY, Chen C W, Guo YL. Prevalence of musculoskeletal disorder among workers in Taiwan: a national study. *Journal of Occupatinal Health.* 2004;46(1):26-36.

Parida, R., and Ray, P.K., 2016, "Factors influencing construction ergonomic performance in India." *Journal of Procedia Manufacturing,* vol. 3, pp. 6587-6592.

Arndt V, Rothenbacher D, Brenner H, Fraisse E, Zschenderlein B, Daniel U, Schuberth S, Fliedner TM: Older workers in the construction industry: results of a routine health examination and a five year follow up. *Journal of Occupational Environment Medicine.* 1996, 53: 686-691.

Cook TM, Rosecrance JC, Zimmerman CL: Work-related Musculoskeletal Disorders in Bricklaying: a Symptom and Job factors Survey and Guidelines for Improvement. *Journal of Appl Occupational Environment Hyg.* 1996, 11: 1335-1339.

Village J, Ostry A: Assessing attitudes, beliefs and readiness for musculoskeletal injury prevention in the construction industry. *Journal of Appl Ergon.* 2010, 41: 771-778.

Lenderink AF, Zoer I, van der Molen HF, Spreeuwers D, Frings-Dresen MH, van Dijk FJ: Review on the validity of self-report to assess work-related diseases. *Journal of International Arch Occupatoinal Environment Health*. 2012, 85: 229-251.

SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

Approved by Ministry of Health and Family Welfare
Affiliated with Dhaka University

Ref :

Date : ....

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/56*
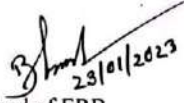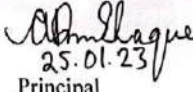
23rd January'2023

To

Md. Nasir Uddin

4th Professional B.Sc. in Physiotherapy

Saic College of Medical Science and Technology (SCMST)

Mirpur-14, Dhaka-1216.

Sub: Permission to collect data

Dear Uddin,

Ethical review board (ERB) of SCMST pleased to inform you that your proposal has been reviewed by ERB of SCMST and we are giving you the permission to conduct study entitled "Occupational work related discomfort among the building construction workers in Bangladesh" and for successful completion of this study you can start data collection from now.

Wishing you all the best.

Thanking You,

23/01/2023

Head of ERB

Ethical Review Board

Saic College of Medical Science and Technology

25.01.23

Principal

Saic College of Medical Science and Technology

Mirpur-14, Dhaka-1216

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1206. Mobile: 01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

Consent form (English)

Dear sir,

Assalamualaikum,

My name is Md. Nasir Uddin, student of B.Sc. in physiotherapy program of Saic College of Medical Science & Technology (SCMST) which is affiliated by University of Dhaka. I am conducting the study entitled **"Occupation related discomfort among the building construction worker in Bangladesh."** as a part of my thesis work for the partial fulfillment of B.Sc. in Physiotherapy degree. There are the lists of question you need to fill- up which is include socio-demographic, Work related information and Orebro Musculoskeletal pain related Questionnaire. For spending your time to participate in this self-administered interview which will take around 20-30 minutes. Iwould like to inform you that this is purely an academic study and the information obtained will not be used for any other purpose. All information provided by you will be kept confidential and the source of the information will remain anonymous. Your participation in this study is voluntary and you have the right not to answer a particular question during the interview that you do not like or wish to answer.

Do you have any questions before I begin?

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

- Yes
- No

Respondent name: .... Researcher name:..................................

Signature and date:.. Signature and date:...............................

Mobile number:..Mobile number:....................................

Witness name:...

Signature and date:......................................

Mobile number:..

APPENDIX: C	Consent form (Bangla)

সম্মতিপত্র (বাংলা)

আসসালামু-আলাইকুম/নমস্কার,

আমি মোঃ নাসির উদ্দীন, ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধীনে সাইক কলেজ অফ মেডিক্যাল সাইন্স এন্ড টেকনোলজি (এসসিএমএসটি) প্রতিষ্ঠানে বি.এস.সি. ইন ফিজিওথেরাপি বিভাগের শেষ বর্ষের ছাত্র। আমার পড়াশোনার আংশিক পরিপূর্ণতার জন্য আমার থিসিসের কাজের অংশ হিসেবে ,বাংলাদেশের ভবন নির্মাণ শ্রমিকদের মধ্যে পেশাগত কাজ-সম্পর্কিত পেশীবহুল অসুবিধা শিরোনামের গবেষণা পরিচালনা করছি। আমি আমার গবেষণা সংক্রান্ত কিছু তথ্য জানতে চাই। সামাজিক-জনতান্ত্রিক তথ্য, কাজ সম্পর্কিত তথ্য এবং ওরেব্রো পেশীবহুল ব্যথা সম্পর্কিত প্রশ্নাবলী এমন একটি প্রশ্নের তালিকা রয়েছে যা আপনাকে পূরণ করতে হবে। এই স্ব-পরিচালিত সাক্ষাৎকারে অংশ নিতে আপনার সময় ব্যয় করার জন্য যা প্রায় ২০-৩০ মিনিট সময় নেবে । আমি আপনাকে জানাতে চাই যে, এটি একটি সম্পূর্ণরূপে একাডেমিক গবেষণা এবং প্রাপ্ত তথ্য অন্যকোন কাজে ব্যবহার করা হবে না। আপনার দেয়া সমস্ত তথ্য গোপন রাখা হবে এবং তথ্যের উৎস অপ্রকাশিত থাকবে। এই গবেষণায় আপনার অংশগ্রহণ স্বেচ্ছায় এছাড়াও স্বাক্ষাৎকারের সময় আপনি পছন্দ করেন না বা উত্তর দিতে চান না এমন একটা নির্দিষ্ট প্রশ্নের উত্তর না দেওয়ার অধিকার রয়েছে।

আমি শুরু করার আগে আপনার কি কোনো প্রশ্ন আছে?

তাহলে স্বাক্ষাৎকার এগিয়ে নিয়ে যাওয়ার জন্য আমি কি আপনার সম্মতি পেতে পারি?

১. হ্যাঁ

২. না

অংশগ্রহণকারীর নামঃ....................................   গবেষকের নামঃ..

স্বাক্ষর এবং তারিখঃ................................   স্বাক্ষর এবং তারিখঃ..................................

মোবাইল নাম্বারঃ..................................   মোবাইল নাম্বারঃ......................................

স্বাক্ষীর নামঃ................................

স্বাক্ষর এবং তারিখঃ................................

মোবাইল নাম্বারঃ..............................

QUESTIONNAIRE(English)

Occupation Related Musculoskeletal Discomfort Among
the Building Construction Workers in Bangladesh.

Code no :   **Date**

Participant name : …………………………………………………………….

Address   : …………………………………………………………..

Phone No.   : …………………………………………………………..

Section: 1. Sociodemographic Information:

Serial no:	Question	Response	Answer
1.	What is your age?	……………………..Years	
2.	What is your gender ?	1. Male 2. Female 3. Others	
3.	Where do you live?	1. Urban 2. Semi urban 3. Rural	
4.	What is your education level?	1. PSC 2. JSC 3. SSC 4. HSC 5. Others	
5.	Are you married?	1. Married 2. Single 3. Divorced 4. Widow 5. Others	

6.	Types of your family?	1. Nuclear 2. Extended 3. Others	
7.	What is your religion?	1. Islam 2. Hindu 3. Christian 4. Buddhist 5. Others	
8.	What's about your monthly income?	……………….(BDT)	

Section: 3 Work related Information:

9.	Working experience	……………..Years	
10.	Working hour per day	……………… Hour	
11.	Types of work	1. Plaster 2. Ceramic tile worker 3. Armature fixing worker 4. Electrical worker 5. Welder 6. Plumber 7. Masonry worker 8. Laborer 9. Painter 10. Cement worker 11. Others	
12.	Do you Smoke?	1. Yes 2. No	
13.	Do you Safety training ?	1. Yes 2. No	
14.	Do you using Wearing PPE?	1. Yes 2. No	

Section: 4 Orebro Musculoskeletal Pain Questionnaire (OMPQ):

These questions and statements apply if you have aches or pains, such as back ,shoulder or neck pain. Please read and answer questions carefully. Do no take long to answer the questions, however it is important that you answer every question. There is always a response for your particular situation.

1. Where do you have pain? Place a tick (√) for all appropriate sites. ☐ Neck ☐ Shoulder ☐ Arm ☐ Upper back ☐ Lower back ☐ leg ☐ Others (state)	2x (Max 10)
2. How many days of work have you missed because of pain during the past 18 months? Tick (√) one. ☐ 0 days (1) ☐ 2 days (2) ☐ days (3) ☐ 8-14 days (4) ☐ 5-30 days (5) ☐ onths (6) ☐ 2 months (7) ☐ -6 months (8) ☐ 2 months (9) ☐ 3-6 months(10)	
3. How long have you had your current pain problem? Tick (√) one. ☐ 0-1 week (1) ☐ 1-2 weeks (2) ☐ 3-4 weeks (3) ☐ 4-5 weeks (4) ☐ -8 weeks (5) ☐ 9-11 weeks (6) ☐ 3-6 months (7) ☐ -9 months (8) ☐ 2 months (9) ☐ Over 1 year (10)	

4. Is your work heavy or monotonous? Circle the best alternative. 0 1 2 3 4 5 6 7 8 9 10 Not at all Extremely	
5. How would you rate the pain that you have had during the past week ? Circle one. 0 1 2 3 4 5 6 7 8 9 10 No pain Pain as bad as it could be	
6. In the past three months, on average, how bad was your pain on a 0-10 scale ? Circle one. 0 1 2 3 4 5 6 7 8 9 10 No pain Pain as bad as it could be	
7. How often would you say that you have experience pain episodes, on average, during the past three months? Circle one. 0 1 2 3 4 5 6 7 8 9 10 Never Always	
8. Based on all things you do to cope, or deal with your pain, on an average day, how much are you able to decrease it ? Circle the appropriate number. 0 1 2 3 4 5 6 7 8 9 10 Can't decrease it at all Can decrease it completely	10-x
9. How tense or anxious have you felt in the past week? Circle one. 0 1 2 3 4 5 6 7 8 9 10 Absolutely clam and relaxed As tense and anxious as I've ever felt	
10. How much have you been bothered by feeling depressed in the past week? Circle one. 0 1 2 3 4 5 6 7 8 9 10 Not at All Extremely	
11. In your view, how large is the risk that your current pain may become persistent ? Circle one. 0 1 2 3 4 5 6 7 8 9 10 No risk Very large risk	

	10 - x

12. In your estimation, what are the chances that you will be able to work in six months? Circle one.
 	
   0   1   2   3   4   5   6   7   8   9   10
 	
  No chance Very large chance	

13. If you take into consideration your work routines, management, salary, promotion possibilities and work mates, how satisfied are you with your job? Circle one.
 	
   0   1   2   3   4   5   6   7   8   9   10
 	
  Not satisfied at all Completely satisfied	

Here are some of the things that others people have told us about their pain. For each statement, circleone number from 0 to 10 to say how much physical activities, such as bending, lifting, walking or driving, would affect your pain.	
14. Physical activity makes my pain worse. 0 1 2 3 4 5 6 7 8 9 10 Completely disagree Completely agree	
15. An increase in pain is an indication that I should stop what I'm doing until the pain decrease. 0 1 2 3 4 5 6 7 8 9 10 Completely disagree Completely agree	
16. I should not do my normal work with my present pain. 0 1 2 3 4 5 6 7 8 9 10 Completely disagree Completely agree	

Here is a list of five activities. Circle the one number that best describes your current ability to participate in each of these activities.	
17. I can do light work for an hour. 0 1 2 3 4 5 6 7 8 9 10 Can't do it because of pain problem can do it without pain being a problem	10-x
18. I can walk for an hour. 0 1 2 3 4 5 6 7 8 9 10 Can't do it because of pain problem can do it without pain being a problem	10-x
19. I can do ordinary household chores. 0 1 2 3 4 5 6 7 8 9 10 Can't do it because of pain problem can do it without pain being a problem	10-x
20. I can do the weekly shopping. 0 1 2 3 4 5 6 7 8 9 10 Can't do it because of pain problem can do it without pain being a problem	10-x
21. I can sleep at night. 0 1 2 3 4 5 6 7 8 9 10 Can't do it because of pain problem can do it without pain being a problem	

প্রশ্নাবলী (বাংলা)

শিরোনাম

বাংলাদেশের ভবন নির্মাণ শ্রমিকদের মধ্যে পেশাগত কাজ-সম্পর্কিত পেশীবহুল অস্বস্তি।

অংশগ্রহণকারীর আইডিঃ

তারিখঃ ..../......./............

অংশগ্রহণকারীর নামঃ ....

ঠিকানাঃ .... মোবাইল নাম্বারঃ ....

শাখা ঃ ১ অংশগ্রহণকারীর সম্পর্কে সামাজিক-জনতাত্ত্বিক সম্পর্কিত তথ্যঃ

ক্রমিক নং:	প্রশ্ন	প্রতিক্রিয়া	কোড
০১.	আপনার বয়স কত?	.........................বছর	
০২.	অংশগ্রহণকারীর লিঙ্গ	১.পুরুষ ২.মহিলা ৩. অন্যান্য	
০৩.	আপনি কোথায় বাস করেন?	১. শহর ২. আধা শহর ৩. গ্রাম	
০৪.	আপনার শিক্ষাগত যোগ্যতা কি?	১. প্রাইমারি ২. মাধ্যমিক ৩. উচ্চমাধ্যমিক ৪. নিরক্ষর ৫. অন্যান্য	
০৫.	আপনি কি বৈবাহিক?	১. বিবাহিত ২.একক ৩. তালাকপ্রাপ্ত ৪.বিধবা ৫.অন্যান্য	

০৬.	আপনি কি ধরনের পরিবারে বাস করেন?	১. একক পরিবার	
		২. যৌথ পরিবার	
		৩. অন্যান্য	
০৭.	আপনার ধর্ম কি?	১. ইসলাম	
		২. হিন্দু	
		৩. খ্রিস্টান	
		4. বৌদ্ধ	
		৫. অন্যান্য	
০৮.	আপনার মাসিক আয় কত?	....................টাকা	

শাখা ঃ ২ অংশগ্রহণকারীর সম্পর্কে কাজের সাথে সম্পর্কিত তথ্যঃ

০৯.	আপনার কাজের অভিজ্ঞতা কত বছর?	...........................বছর	
১০.	আপনি প্রতিদিন কত ঘন্টা কাজ করেন?	.... ঘন্টা	
১১.	আপনি কোন ধরনের কাজের করেন?	১. প্লাস্টার	
		২. সিরামিক টাইল শ্রমিক	
		৩. আর্মেচার ফিঙ্গিং কর্মী	
		৪. বৈদ্যুতিক কর্মী	
		৫. ওয়েল্ডার	
		৬. প্লাম্বার	
		৭. রাজমিস্ত্রি শ্রমিক	
		৮. মজুর	
		৯. চিত্রকর	
		১০. অন্যান্য	
১২.	আপনি কি ধূমপান করেন?	১. হ্যাঁ	
		২. না	

১৩.	আপনি কি নিরাপত্তা প্রশিক্ষণ নিয়েছেন?	১. হ্যাঁ	
		২. না	
১৪.	আপনি কি ব্যক্তিগত প্রতিরক্ষামূলক সরঞ্জাম ব্যবহার করেন?	১. হ্যাঁ	
		২. না	

শাখা ঃ ৪ ওরেব্রো পেশীবহুল ব্যথা প্রশ্নাবলী ঃ

এই প্রশ্ন এবং বিবৃতি প্রযোজ্য যদি আপনার ব্যাথা থাকে, যেমন পিঠ, কাঁধ বা ঘাড়ে ব্যথা। দয়া করে পড়ুন এবং সাবধানে প্রশ্ন উত্তর দিন । প্রশ্নের উত্তর দিতে বেশি সময় লাগবে না, তবে প্রতিটি প্রশ্নের উত্তর দেওয়া গুরুত্বপূর্ণ। আপনার নির্দিষ্ট পরিস্থিতির জন্য সর্বদা একটি প্রতিক্রিয়া আছে।

১৬.	আপনার কোথায় ব্যথা আছে ? সমস্ত উপযুক্ত স্থানে (√) টিক দিন।	২x (সর্বোচ্চ ১০)
	☐ ঘাড় ☐ কাঁধ ☐ বাহু ☐ পিঠ ☐ কোমড় ☐ পা ☐ অন্যান্য (অংশ)	
১৭.	গত ১৮ মাসে ব্যথার কারণে আপনি কত দিন কাজ বন্ধ করেছেন? (√) একটিতে টিক দিন। ☐ ০ দিন (১) ☐ ১-২ দিন (২) ☐ ৩-৭ দিন (৩) ☐ ৮-১৪ দিন (৪) ☐ ১৫-৩০ দিন (৫) ☐ ১ মাস (৬) ☐ ২ মাস (৭) ☐ ৩-৬ মাস (৮) ☐ ৬-১২ মাস (৯) ☐ ১ বছর উপর (১০)	

১৮.	আপনার বর্তমান ব্যথার সমস্যা কতদিন ধরে আছে? (√) একটিতে টিক দিন। ☐ ০-১ সপ্তাহ (১) ☐ ১-২ সপ্তাহ (২) ☐ ৩-৪ সপ্তাহ (৩) ☐ ৪-৫ সপ্তাহ (৪) ☐ ৬-৮ সপ্তাহ (৫) ☐ ৯-১১ সপ্তাহ (৬) ☐ ৩-৬ সপ্তাহ (৭) ☐ ৬-৯ সপ্তাহ (৮) ☐ ৯-১২ মাস (৯) ☐ ১ বছর উপর (১০)	
১৯.	আপনার কাজ ভারী না একঘেয়ে? সেরা বিকল্প বৃত্ত ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ একদমই না অত্যন্ত বেশি	
২০.	গত সপ্তাহে আপনি যে ব্যথা পেয়েছিলেন তা আপনি কীভাবে মূল্যায়ন করবেন? এক বৃত্ত ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ কোন কষ্ট নেই ব্যথা যতটা খারাপ হতে পারে	
২১.	গত তিন মাসে, গড়ে, ০-১০ স্কেলে আপনার ব্যথা কতটা খারাপ ছিল? এক বৃত্ত ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ কোন কষ্ট নেই ব্যথা যতটা খারাপ হতে পারে	
২২.	আপনি বলবেন যে গত তিন মাসে গড়ে কতবার আপনি ব্যথার পর্বগুলি অনুভব করেছেন? এক বৃত্ত ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ কখনো না সব সময়	
২৩.	আপনি যে সমস্ত কাজগুলি মোকাবেলা করেন তার উপর ভিত্তি করে আপনি আপনার ব্যথা গড়ে দিনে কতটা কমাতে সক্ষম? উপযুক্ত সংখ্যা বৃত্ত করুন ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ কিছুতেই কমানো যাবে না সম্পূর্ণভাবে কমতে পারে	
২৪.	গত সপ্তাহে আপনি কতটা উত্তেজনা বা দুশ্চিন্তাগ্রস্ত অনুভব করেছেন? ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ একেবারে শান্ত এবং শিথিল আমি যতটা উত্তেজনাপূর্ণ এবং দুশ্চিন্তাগ্রস্ত অনুভব করেছি	

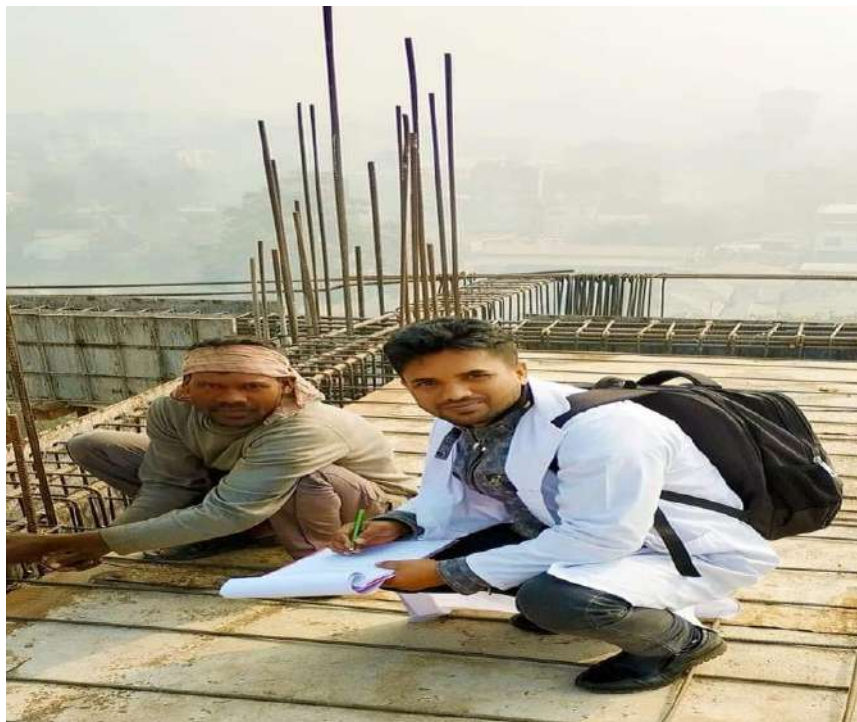|		
২৫.	গত এক সপ্তাহে আপনি বিষণ্ণ বোধ করে কতটা বিরক্ত হয়েছেন? এক বৃত্ত ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ একদমই না অত্যন্ত বেশি	
২৬.	আপনার দৃষ্টিতে, আপনার বর্তমান ব্যথা ক্রমাগত বেড়ে যাওয়ার ঝুঁকি কতটা বেশি ? এক বৃত্ত ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ ঝুঁকিহীন অনেক বড় ঝুঁকি	
২৭.	আপনার অনুমানে, আপনি আগামী ছয় মাসে কাজ করতে সক্ষম হওয়ার সম্ভাবনা কত? এক বৃত্ত ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ কোন সম্ভাবনা নেই অনেক বড় সুযোগ	১০ - X
২৮.	আপনি যদি আপনার কাজের রুটিন, ব্যবস্থাপনা, বেতন, পদোন্নতির সম্ভাবনা এবং কাজের সঙ্গীদের বিবেচনা করেন তবে আপনি আপনার চাকরিতে কতটা সন্তুষ্ট? এক বৃত্ত ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ মোটেও সন্তুষ্ট নন পুরোপুরি সন্তুষ্ট	
এখানে কিছু জিনিস রয়েছে যা অন্য লোকেরা তাদের ব্যথা সম্পর্কে আমাদের বলেছে। প্রতিটি বিবরণ জন্য ০ থেকে ১০ পর্যন্ত একটি সংখ্যাকে বৃত্ত করুন যাতে বলা যায় যে কতটা শারীরিক কাজকর্ম যেমন বাঁকানো, তোলা, হাঁটা বা গাড়ি চালানো আপনার ব্যথাকে প্রভাবিত করে।		
২৯.	শারীরিক কাজকর্ম আমার ব্যথা আরও খারাপ করে তোলে। ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ সম্পূর্ণ দ্বিমত সম্পূর্ণ একমত	
৩০.	ব্যথা বেড়ে যাওয়া একটি লক্ষণ যে আমি যা করছি তা বন্ধ করা উচিত যতক্ষণ না ব্যথা কমে যায়। ০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০ সম্পূর্ণ দ্বিমত সম্পূর্ণ একমত	

৩১.	আমার বর্তমান ব্যথা নিয়ে আমার স্বাভাবিক কাজ করা উচিত নয়।	
	০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০	
	সম্পূর্ণ দ্বিমত সম্পূর্ণ একমত	

	এখানে পাঁচটি কার্যকলাপের একটি তালিকা রয়েছে। এই প্রতিটি ক্রিয়াকলাপে অংশগ্রহণ করার জন্য আপনার বর্তমান ক্ষমতাকে সর্বোত্তমভাবে বর্ণনা করে এমন একটি সংখ্যাকে বৃত্ত করুন।	
৩২.	এক ঘণ্টা হালকা কাজ করতে পারি।	১০-X
	০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০	
	ব্যথার সমস্যার কারনে করতে পারছেন না ব্যথা সমস্যা ছাড়া এটি করতে পারেন	
৩৩.	আমি এক ঘন্টা হাঁটতে পারি।	১০-X
	০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০	
	ব্যথার সমস্যার কারনে করতে পারছেন না ব্যথা সমস্যা ছাড়া এটি করতে পারেন	
৩৪.	আমি ঘরের সাধারণ কাজ করতে পারি।	১০-X
	০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০	
	ব্যথার সমস্যার কারনে করতে পারছেন না ব্যথা সমস্যা ছাড়া এটি করতে পারেন	
৩৫.	আমি সাপ্তাহিক কেনাকাটা করতে পারি।	১০-X
	০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০	
	ব্যথার সমস্যার কারনে করতে পারছেন না ব্যথা সমস্যা ছাড়া এটি করতে পারেন	
৩৬.	আমি রাতে ঘুমাতে পারি।	১০-X
	০ ১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ১০	
	ব্যথার সমস্যার কারনে করতে পারছেন না ব্যথা সমস্যা ছাড়া এটি করতে পারেন	

APPENDIX: F   **Study area Map**

APPENDIX: G	Picture

Location: Rangpur Division

Location : Rajshahi Division

Location :Dhaka Devision

Location : Chittagong Division

Location : Rajshahi Devision

Activities/ Month	July 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	App 23	May 23	Jun 23
Proposal Presentation	■											
Introduction	■	■										
Literature Review	■	■	■	■	■	■	■	■	■	■	■	■
Methodology			■	■								
Data collection							■	■				
Data Analysis									■			
Result									■			
1st progress presentation										■		
Discussion												
Conclusion and Recommendation												
2nd progress presentation										■		
Communication with supervision	■	■	■	■	■	■	■	■	■	■	■	■
Final Submission												■