PREVALENCE OF POST-TRAUMATIC MUSCULOSKELETAL DISORDERS AMONG THE RANA PLAZA TRAGEDY PATIENTS.

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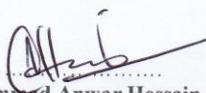
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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

PREVALENCE OF POST-TRAUMATIC MUSCULOSKELETAL DISORDERS AMONG THE RANA PLAZA TRAGEDY PATIENTS.

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Declaration

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of information of the study. I would be bound to take written consent from the Physiotherapy Department, Bangladesh Health Professions Institute (BHPI).

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Acronyms

BHPI	:	Bangladesh Health Professions Institute
BMRC	:	Bangladesh Medical Research Council
CRP	:	Center for the Rehabilitation of the Paralyzed
CTS	:	Carpal Tunnel Syndrome
CTD	:	Cumulative Trauma Disorder
IRB	:	Institutional Review Board
LBP	**:**	Low Back Pain
MSD	:	Musculoskeletal Disorder
PTMD	:	Post-traumatic Musculoskeletal Disorder
PTOA	:	Post-traumatic Osteoarthritis
SPSS	:	Statistical Package for the Social Sciences
RMG	:	Readymade Garments
UK	:	United Kingdom
USA	:	United State of America
WHO	:	World Health Organization
WRMD	:	Work Related Musculoskeletal Disorder

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Abstract

Purpose: The purpose of this study was done to identify the prevalence of post-traumatic musculoskeletal disorders among the Rana Plaza tragedy patients. *Objective:* To find out the presenting complains of the post-traumatic patients, to identify the most affected body part of the post-traumatic patients, to determine socio demographic characteristics of the study population. *Methodology*: The study design was cross-sectional. Total 50 samples were selected convenience for this study from at Savar upzella. Data was collected by using mixed type of questionnaire. Descriptive statistic was used for data analysis. *Results:* The result of the study shows that, 60% had post-traumatic musculoskeletal disorder & participants mean age was 28.93 years is more vulnerable. Most of the participant education level was primary level (30%) & illiterate (20%). The duration of job experience 5-15 years (60%) most commonly suffered by the PTMDs. In this research, the researcher found the participants had post-traumatic musculoskeletal disorders with higher prevalence of pain. The result indicates that most pain of the body regions is in the spine (43.3%), knee (13.3%), hip (13.3%), ankle (13.3%). The maximum severity of symptom was moderate (70%). The most common risk factors were working in same position for long time (60%) during sitting and standing and most common risk factor in sewing (73.3%) during sitting. Most of the patient about 80% participants had taken physiotherapy treatment for their condition. The percentage of prognosis were improved in (63.3%). *Conclusion:* The study was found the strong evidence that prevalence of post-traumatic musculoskeletal disorders among the Rana Plaza tragedy patients. In order to reduce musculoskeletal problems, correct postural practices, physiotherapy treatment, proper design of tools and equipment's significantly can prevent MSDs.

Key words: PTMDs, Rana Plaza tragedy patients.

| CHAPTER - I | INTRODUCTION |

1.1 Background Information

The apparel and textile industry is an early one that can be dated back to as far back as 30000 BC when humans recycled animal skin to fashion garments. Until the industrial revolution, this industry experienced a relaxed progress. With the industrial revolution, came various technologies that completed the processes faster, more efficient and less time consuming, thus increasing success. This industry can be separated into two categories: that of production of textiles from raw materials and then the building of clothing apparels from these textiles (Berdine, et al., 2008). While the textile industry established automated quite early on, the garment industry to-date remains labour concentrated, forcing the need to look for cheaper sources of labor in less developed and under developed countries (Keane & Velde, 2008). The garment manufacturing industry is almost completely determined by consumer demands (Nordas, 2004). With economic downturns, this demand has arisen for cheaper, affordable ready-made garments (RMG) which has in turn required companies and brands to cut costs and introduce lower cost clothing lines that offer concessions, making them affordable to consumers (Nordas, 2003). In the process, however, the workers, their working conditions, salaries, their families and their lifestyles remain suffering (McCormick & Schmitz, 2001).

In Bangladesh the successful export oriented readymade garments (RMG) industry has seen amazing growth since its beginning in late 1970s. The industry has also provided occupation to nearly 2.8 million workers most of them are female from the rural areas. The annual complex growth rate of RMG export industries in Indonesia (31.2%), Mauritius (23.8%) & Dominican Republic (21.1%) compares extremely high with that of Bangladesh (81.3%) done the 1980-87 periods of time (Bhuiyan, 2012). Recent reports declared about 5,000 garment factories in Bangladesh and 3.6 million garment workers. It is the third-largest exporter of clothes in the world, after China and Italy (Alam & Hossain, 2013). Presently, about twenty lakh staff (among that eightieth is female) are operating during this sector that may be a nice supply of employment one. It's conjointly mentionable that regarding seventy six of the exchanges attained by this sector.

The industry of Bangladesh has been increasing quickly since late Seventies (Schierhout, et al., 1995).

Bangladesh is a developing country with predictable population of 163 million. As of 2012, Bangladesh" per capita GDP was expected at $2100. Although common of the nation depends on agriculture, in the last 30-40 years, the readymade garments (RMG) industry of Bangladesh has also succeeded to now home over 3000 factories, employing approximately two million workers, and increasing the country's exports by 16% to $2.7 billion in 2013 alone (CPD Report, 2013).

Building collapses are a central cause of mortality and morbidity around the world. In the last decade, a number of buildings had collapsed causing a momentous number of deaths and disease. In latest years, high and central income countries similar USA, South Korea, Turkey, Austria, and China had knowledgeable tragedies due to malformed buildings (BBC News, 2014). India has experienced a number of recent lethal building collapse disasters. During 2014, the country had two major building disasters, which occurred in Mumbai in April 2014 killing 45 people containing 15 children and another 70 people were damaged in the incident (BBC News, 2014). Similarly, Bangladesh has also knowledgeable such man-made disasters throughout the last 10 year, which have caused a large number deaths and injuries.

On 24th April 2013, Bangladesh experienced a tragic occurrence and it was the most shocking incidence than previous which is called "Rana Plaza Tragedy". It is one of the poorest tragedies of building collapse in the history of the world which grabbed more than one thousand lives. About 1129 people died due to collapse of the building and more than 2000 people are existing with or without disabilities in Bangladesh (WHO, 2013). Rana Plaza was a nine-storied building in Savar that contained four garment factories with a variation of shops. Although Rana Plaza had a certificate to build a five- storied building for shops and residential accommodation, the owner finished it nine storied. The Bangladeshi news media reported that inspection teams exposed cracks in the structure of Rana Plaza on Tuesday. Shops and a bank branch on the lower floors were directly closed (Malkin, 2014). However, the owners of the garment factories on the upper floors ordered

workers to work on Wednesday (the day of collapse), despite the security risks. Labor activists searched the wreckage on Wednesday afternoon and discovered labels and production records suggestive of that the factories were making garments for major European and American brands (Ahad, 2013).

Jahangir (2013) supposed in an article that after Rana plaza incident, the rescue teams through their surprising efforts get ahead to save 2465 lives from the rubbles. It was estimated that roughly 3122 workers were stuck inside. According to WHO report it is found that about 1127 survivors died at the spot and hospital, about 1,885 people were cleared by May 2, 2013 (after one week) with getting immediate treatments from different hospitals. Centre for the Rehabilitation of the Paralyzed (CRP) has admitted some injured (fracture, amputation, spinal cord injury etc) (WHO, 2013).

It was appraised that on an average day near about four thousand people recycled to work in the building. So far, nearly 1,200 dead bodies have been mended while more than 2,438 people had been rescued alive, comprising many who have lost their limbs and/or are struggling for their lives in different hospitals. 118 severely injured patients were mentioned to National Institute of Traumatology & Orthopedic & Rehabilitation only and they were admitted in C&D Wards. Out of them 81 were Female and 37 are Male. The types of damages were spinal injury, femur, humerous, tibia fibula, radius & ulna and ankle fractures together with soft tissue injuries. Still 72 patients are below treatment in National Institute of Traumatology & Rehabilitation, and Centre for Rehabilitation and Paralyzed, Savar, Dhaka. Thirteen dead bodies are silent missing. Evidence displays that nearly 100 patients were amputated who have develop permanently disabled. Moreover, nearly all patients have established psychiatric problems (EMC, 2013).

Musculoskeletal disorders (MSD) are amongst the most common in the world, affecting persons of all ages, sexes, socioeconomic classes, and ethnicities (WHO, 2003). The relationship between MSD and numerous socio-demographic factors is well known in the literature like population-based studies directed in Canada, Finland, Sweden, and the United Kingdom recognized gender, increasing age, education, and personal smoking history as significant predictors of MSD (Schulte et al., 2007). Disorders of the

musculoskeletal system are the only major group of work-related disease in the industrialized world (Punnett & Wegman, 2004). Some conditions and body areas are associated with certain industries and job structures for example; Lower back pain has been related to warehouse work, repetitive lifting of heavy loads, and prolonged contact to whole body vibrational forces (Waters et al., 2011). A survey of the general UK population establish current smokers 20-50% more likely to report musculoskeletal pain that restricted activity as compared to lifetime non-smokers (Palmer et al., 2002).

Musculoskeletal conditions are predominant and their impact is persistent. They are the greatest common reason of severe long term pain and physical disability, and they disturb hundreds of millions of people around the world. They significantly affect the psychosocial position of affected people as well as their relatives and cares (Akesson & Woolf, 2001). At any one time, 30% of American adults are exaggerated by joint pain, swelling, or limitation of movement (Hazes & Woolf, 2000). Musculoskeletal conditions are adverse group with regard to pathophysiology but are allied anatomically and by their association with pain and reduced physical function. They include a spectrum of conditions, from those of acute onset and short duration to lifetime disorders, comprising osteoarthritis, rheumatoid arthritis, osteoporosis, and low back pain. The prevalence of many of these conditions rises markedly with age, and many are exaggerated by lifestyle factors, such as obesity and lack of physical activity. The growing number of older people and the changes in lifestyle throughout the world callous that the burden on people and society will rise dramatically. This has been documented by the United Nations and WHO with their confirmation of Bone and Joint Decade 2000–2010 (Woolf & Pfleger, 2003).

Overall, the maximum common musculoskeletal injuries are lacerations (65%), fractures (22%), and soft-tissue contusions or sprains (6%) (Mulvey et al., 2008). Building collapse sufferers requiring tertiary care frequently have long-bone fractures, pelvic fractures (particularly lateral compression pelvic fractures), (Tahmasebi et al., 2005) crush injuries, compartment syndrome, and gangrene. Comminuted fractures (when bone was fractured into three or more pieces) are recurrent and the leg is the most exaggerated limb (Chen et al., 2009). Described proportions of open fractures vary from 11% to 54%. 36% of fracture

patients have numerous breaks and 6% of fractures are convoluted by neurovascular injury (Liu et al., 2009).

Building collapse are projected to result in crush injuries in 3–20% of people,22 with the lower limb most commonly affected (74%).1 Patients with crush injuries have a high frequency of sepsis, disseminated intravascular coagulation, adult respiratory distress syndrome, and death (p<0001 for all) (Hosseini et al., 2009). Hypovolaemia and hyperkalaemia are the central causes of death for patients with crush injuries in the first 5 days after an building collapse.36 Multi-organ failure from sepsis is the most common cause of delayed mortality (Oda et al.,1997). Knee osteoarthritis (OA) is a enlightened joint disease that represents the leading cause of disability in adults (Lawrence et al., 2008) This disease includes not only articular cartilage, but all tissue components of the joint, comprising periarticular muscles, ligaments, subchondral bone, and synovial membrane (Wieland et al.,2005).

According to one study, IDD is present in 39% of persons suffering from chronic low back pain and most commonly disturbs L4/5 and L5/S1 vertebral segments. IDD follows as part of the degenerative cascade, which can be age connected, post-traumatic, or predisposed by genetic predisposition (Meleger & Krivickas, 2007). In general, new-onset spinal pain after crucial injury that involves axial compression, hyperextension, or flexion-type trauma should be measured for possible fracture or fracture/dislocation. Patients who have a doubt of post-traumatic spinal fracture need to feel immediate clinical and radiologic assessment for fracture stability and to regulate out spinal cord injury (Meleger & Krivickas, 2007).

There has no any statistic about the prevalence of post-traumatic musculoskeletal disorder about the injured persons after any incidence like building collapse. Therefore, the researcher is interested to find out the wellbeing of the existing survivors who have experiences of that horrific tragedy (Rana plaza), might be affected positively or negatively on their physical, mental, psychosocial life.

1.2 Rationale

Bangladesh is a developing country, this country always fronting a lot of challenges including health, shelter, food education, natural disaster. Musculoskeletal disorder adding more burden for the country by contributing mortality and morbidity. The percentage of building collapsed in our country is very low but survivors suffering rate is very high as for example Rana Plaza tragedy survivors. Here approximately 1129 people died due to collapsed of the building and more than 2000 people are living with or without disabilities in Bangladesh (WHO 2013). After the incidence many people are injured where the number of fracture, amputation, musculoskeletal disorder and spinal cord injury patients were large. As I knew, few studies were conducted before on this topic so I felt this is the area where I had to do something for the patient of musculoskeletal disorder. Post-traumatic musculoskeletal disorders comprise a major health problem for the general population, affecting their quality of life, demanding increased health care & organization. This study also will be helpful in making physiotherapist to aware about the musculoskeletal problem of the post-traumatic patients. On the other hand this study will be helpful for professions and professionals of physiotherapy & with this connection to other professionals will have a chance to gather their knowledge from this study. This study aims to find out common post-traumatic musculoskeletal disorder and finding of the study will brought to authority concern for future intervention whereby physiotherapy may extent their cooperation and will take preventive measure. Thus the study might creat a future prospect of physiotherapy profession in Bangladesh Physiotherapist can help them to teach and give proper education about the posture and preventive methods. From this study patients will able to identify the risks that can control and review their activities. In my research I will try to show the prevalence of post-traumatic musculoskeletal disorders among the Rana plaza tragedy patients?

So that the national or international and govt. or non-govt. organization who are working with this type of survivors and disaster management program they can take proper steps to minimize the effect of disaster and take necessary steps to improve the health related quality of life.

1.3 Research Question

What are the prevalence of post-traumatic musculoskeletal disorders among the Rana plaza tragedy patients?

1.4 Objectives of the Study

General Objectives

- To identify the prevalence of post-traumatic musculoskeletal disorders among the Rana plaza tragedy patients.

Specific objectives

- To establish the prevalence of musculoskeletal disorders among the post-traumatic patients.

- To find out the presenting complains of the post-traumatic patients.

- To identify the most affected body part of the post-traumatic patients.

- To identify the ratio among common musculoskeletal problems which are arises among the post-traumatic patients.

- To identify the first experience of musculoskeletal disorder of the post-traumatic patients.

- To find out the risk factors that are considered a problem for the patients.

- To determine socio demographic characteristics of the study population.

1.5 List of variables

Independent variable   **Dependent variable**

Socio-economic demography (age, sex, education, economy)	→

Safety equipment	→

Duration of work	→

Marital status	→

Abnormal posture	→

Lack of health awareness	→

Involved area	→

Common complain	→

Post-traumatic musculoskeletal disorder.
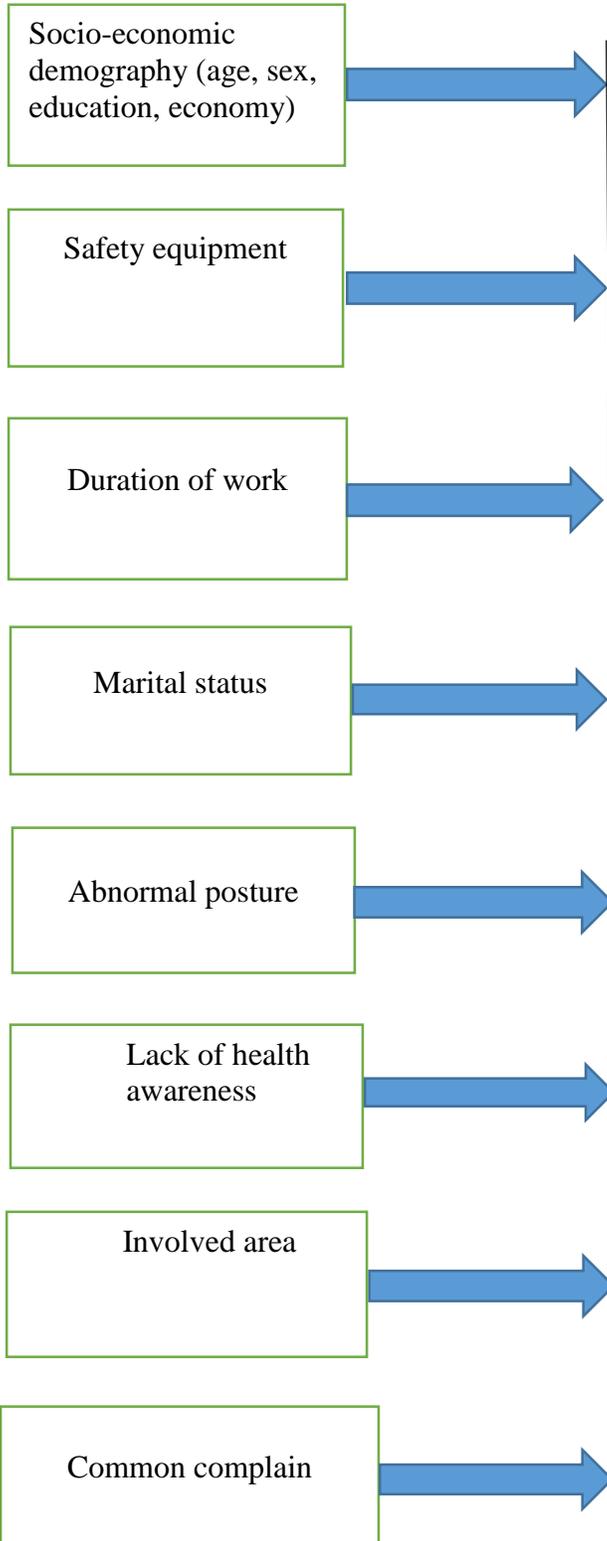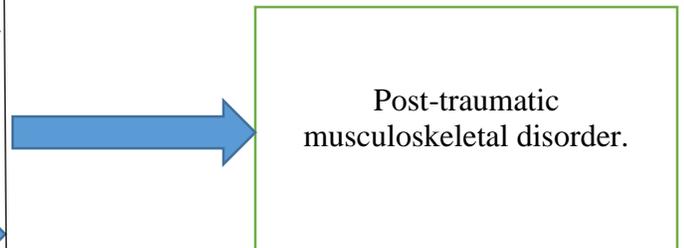
1.6 Operational Definitions

Prevalence

The degree to which something is prevalent, especially the percentage of a population that is affected with a particular disease at a given time.

Musculoskeletal disorders

Musculoskeletal disorders (MSD) encompass a wide range of physical health problems involving muscles, ligaments, tendons, joints, blood vessels, and nerves. Pain may occur in any location in the body, though the lower back, neck, shoulder, and wrist are among the most frequently reported sites.

Low back pain

Low back pain refers to pain felt in lower back. It may also have back stiffness, decreased movement of the lower back, and difficulty standing straight.

Fracture

A bone fracture (sometimes abbreviated FRX or Fx, F_x, or #) is a medical condition in which there is a damage in the continuity of the bone. A bone fracture may be the result of high force impact or stress, or a minimal trauma injury as a result of certain medical conditions that weaken the bones, such as osteoporosis, bone cancer, or osteogenesis imperfecta, where the fracture is then properly termed a pathologic fracture.

''Musculoskeletal disorders'' comprise a wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels. These include clinical syndromes such as tendon inflammations and linked conditions (tenosynovitis, epicondylitis, bursitis), nerve compression disorders (carpal tunnel syndrome, sciatica), and osteoarthrosis, as well as less well consistent conditions such as myalgia, low back pain and other regional pain syndromes not attributable to known pathology (Jahan et al., 2015). Health problems of the locomotors apparatus, i.e. muscles, joints tendons, the skeleton, cartilage, the vascular system, ligaments, nerves and the localized blood circulation system represents the term musculoskeletal disorder. MSDs are disorders that affect the musculoskeletal system, resulting from a repetitive coverage to loading. Upper limbs (the hand, wrist, elbow and shoulder), the neck and lower back are predominantly vulnerable to MSDs. Lower limbs and the upper back may also be exaggerated (Kumar et al., 2011). The musculoskeletal disorders are categorized by the presence of discomfort, disability or persistent pain in the joints, muscles, tendons, and other soft parts. They are produced or aggravated by repeated movements and prolonged awkward or forced body postures. Work related musculoskeletal disorders are the most common self-reported, work related illness in many workplace that is considered by discomfort, impairment, disability, or persistent pain in joints, muscles, tendons.

Johnos (2011) stated that the risk factors for the development of musculoskeletal disorders are- repetitive work; painful positions, carrying or moving heavy loads, other risk factors such as - prolonged standing or walking. Musculoskeletal disorders are sometimes called ergonomic injuries and illnesses. Ergonomics is the study of the worker's interaction, environment, with jobs, tasks, tools, work methods, equipment work rates etc. (Maire & Ross-Motta, 2007).

Nelson (2005) showed that MSDs are a momentous public health problem today, due to their high impression on disability, personal suffering, absence from work and the direct and indirect costs to the health care system. According to the statistics of the Global Burden of Diseases which has been advanced by the World Health Organization (WHO), MSD contributes 37% of the disease problem which attributes to job-related risk issues, in addition to 16% of hearing loss, 13% of chronic obstructive pulmonary diseases (COPDs), 11% of asthma, 8% of injuries, 9% of lung cancer and 2% of leukaemia.

Punnett & Wegman (2004) stated that the single largest group of work related illness in the settled world are the musculoskeletal disorder. The number of studies shows that musculoskeletal problems, diseases of the respiratory system and eye, accidents, injuries, skin diseases, stress, insomnia, etc. are all common among the garments workers. The ill health is compounded by various socioeconomic factors such as poverty, lack of education, poor working conditions, excess working hours, and poor diet (Srivastava & Bihari, 2008).

Jahan et al. (2015) suggested that the prevalence of musculoskeletal problems amongst these Sri Lankan garment workers was quite low, with just a handful of sewing machine operators reporting upper extremity or neck pain. This is surprising as the garment industry typically carries one of the highest rates of neck and shoulder pain relative to other manufacturing fields.

Korkmaz et al. (2011) stated that musculoskeletal disorders are sometimes named ergonomic injuries and illnesses. Ergonomics is the study of the worker's communication with tools, equipment, environment, jobs, tasks, work methods, work rates etc. Musculoskeletal symptoms are produced by multi-factorial different physical influences. Different socio-demographic factors such as age, gender, working conditions, and working hours are related with developing musculoskeletal disorders. The highest prevalence of musculoskeletal pain among garments workers was initiated in the 40 to 49 ages group (Jahan et al., 2015).

Muscles, tendons, ligaments and nerves are disturbed by the musculoskeletal injuries. These injuries can grow up when the same muscles are used over & over or for a long time without captivating time to rest. The chance of getting this type of injury rises if the force exerted is high and or the job mandatory an awkward postures. Comprise back pain, neck

pain, carpal tunnel syndrome, tendonitis and tenosynovitis are the some examples of musculoskeletal disorders. Other expressions recycled to describe MSDs include Repetitive Strain Injuries (RSIs), Work related musculoskeletal disorder (WRMD, Cumulative Trauma Disorders, Overuse Injuries, Repetitive Motion Disorders) (Department of labor statistics, 2012).

Pinder et al. (2007) showed that MSDs are disorders that affect the musculoskeletal system, resulting from a repetitive exposure to loading. Upper limbs (the hand, wrist, elbow and shoulder), the neck and lower back are mostly helpless to MSDs. Lower limbs and the upper back may also be affected. Work related musculoskeletal disorders are the most common self-reported, work related illness in many workplaces that is characterized by discomfort, impairment, disability, or persistent pain in joints, muscles, tendons or other soft tissues (Putz-Anderson et al., 2007).

Joshi et al. (2001) stated that the prevalence of upper extremity musculoskeletal disorders among the workers in an industrial town in Tamilnadu was found to be 32.6%.It is comparative to the global prevalence of 37%, but it is much less than the 59.4% prevalence which was observed by in their study among the workers in North India.

Canadian Centre for Occupational Health & Safety (2005) suggested that work activities which are regular and repetitive, or activities with stubborn postures cause these disorders which may be painful during work or at rest. Almost all work needs the use of the arms and hands. Therefore, most WMSD disturb the hands, wrists, elbows, neck, and shoulders. Work using the legs can initiate to MSD of the legs, hips, ankles, and feet. Some back problems also result from repetitive activities. Guo et al. (2004) showed that the risk factors that may damage the bones, joints, muscles, tendons, ligaments, nerves and blood vessels, leading to fatigue, pain and musculoskeletal disorders (MSDs) are bad postures, repetitive work or handling heavy loads. Work-related MSDs are mostly cumulative, resulting from over & over revelation to loads at work over a period of time. There wre ranges of different terminologies used to pronounce WMSDs problems such as Cumulative Trauma Disorders (CTDs), Monotonous Strain Injury (RSI), Repeated Motions Injury (RMI) and Occupational Overuse Disorders (OODs).

Ravichandran et al. (2016) stated that musculoskeletal problems were found to be present among 77.6% of the workers. The most common sites exaggerated were neck (32.1%), knee (28.7%) and low back (26.6%). Among the 295 workers, who had any one post-traumatic musculoskeletal problem during the last 12 months, 236 (80%) had problems during the last 7 days. Among them low back pains (78.2%) were ed to be more common, followed by ankle / feet pain (76.3%) and neck pain (73.7%) during the last 7 days.

There are mainly four different groups of factors may potentially contribute to WRMDs there are Physical or biomechanical work related factors, Organizational or psychosocial work related factors, Individual or personal factors and factors relating to social context (European Agency for Safety and Health at Work, 1993). Physical factors comprise the work procedures, equipment and environment that lead to biomechanical pressure in the muscles, tendons, spinal discs and nerves. Force, repetition, awkward postures or long-term static postures are considered the principal physical work-related risk factors in relation to MSDs. Applying manual force with the intention of moving objects loads the muscles and tendons of the arms. Repetitive work using the same muscles and tendons for a considerable part of the working day may be responsible for fatigue and injuries. In bad postures (with the hands above shoulder height or with the wrists noticeably bent) the joints are more disposed to injuries and the muscles have less capacity for exerting force.

Workers with pre- existing medical problems may be at higher risk of developing symptoms those healthy workers. The prevalence of MSDs increases as people enter their working years. By the age of 35, most people have had their first episode of back pain (Guo et al., 2009). Musculoskeletal impairments are among the most prevalent and symptomatic health problems of middle and old age (Bruce & Bernard, 2007).

Pain in the lower back area that can relate to problems with the lumbar spine, the discs between the vertebrae, the ligaments around the spine and discs, the spinal cord and nerves, muscles of the low back, internal organs of the pelvis and abdomen, or the skin covering the lumbar area (Ostgaard, 2011).

Meligrsted & Westgaard, (2005) stated that the length of daily working hours as a risk factor for the development of musculoskeletal complains was evaluated, it was showed that some sample worked 8 hours per day and few were worked 5 hours per day. It is stated that

any reorganization of work activities to counteract musculoskeletal injuries from repetitive work should aim to break up the muscular activity patterns over time periods considerably shorter than the 5 hours working per day of the part time workers in the present study.

The workers in this sector are living from hand to mouth and they are unable to maintain their basic needs from their income. They cannot afford to maintain minimum health care, medical services, hygienic accommodation as well as access to other amenities is a dream to them. So they had to suffer from different types of physical complexity. In addition to this, the working environment of the garment factories is not congenial to ensure good health. Furthermore, garment workers are upset about their future hope due to less earning which also effect on their mental and social stability. Over 1000 million people worldwide are employed in small-scale industries.

Jahan et al. (2015) showed that workers with high physical work demands are well documented to be at elevated risk for impaired work ability, musculoskeletal disorders, cardiovascular disease, all-cause mortality, long term sickness absence and early retirement from the labour market. Specifically, prolonged standing, highly repetitive work, heavy lifting, working with the hands lifted to shoulder height or higher, and working with the back twisted or bent forward are physical exposures, that have been shown to predict impaired work ability, musculoskeletal disorders and enhance long term sickness absence. Therefore, workers in job groups exposed to these physical factors at work are at particular need for health promoting initiatives for preserving or improving their work ability. The risk of the musculoskeletal system depends on a great in the operator. Pensri et al. (2010) suggested that especially twisting or bending the risk of the trunk can result in increased for the development of diseases of the lower back. Postural demands play an important role, particularly when working in confined spaces. Working for a long time in the sitting position is called forced position. It has been suggested that prolonged working in forced position causes musculoskeletal disorders (MSDs).

Initially, most research on MSD symptoms focused only on physical exposure (Bongers et al., 1993). However recent studies have demonstrated that complain arm, neck, shoulder, back & lower limb have a multi-factorial origin; possible risk factors are of a physical, psychosocial or personal origin (Bongers et al., 2006). Physical activities such as manual

material handling (e.g., heavy load lifting) and bad working postures are very natural. In this condition, a high rate of MSD is predictable (Choobineh & Tabatabaee, 2009). Heavy, static or monotonous work, extreme or embarrassed postures, repetitive movements, unsuitable workplaces and equipment, forces etc. Lifting heavy objects that shouldn't be boosted by one person without the help of assist devices or helpers. Working in unnatural positions can lead to strains, sprains, muscle pain and nerve damage in the neck, upper and lower back, shoulders, elbows, forearms, wrists and fingers. Standing for long periods of time in one position on a hard surface can lead to muscle fatigue, back pain and soreness in legs and feet (Bureau of Labor Statistics, 2005).

Lee et al. (2012) showed that back muscles act to support the spine and maintain the stability of the spine; weakness of back muscles can lead to low back pain and is known as a main cause of recurrence. Generally we found that these people sit for long time from early in the morning to night continuously, but the sitting system is poor, most of the cases poor posture in a low stool where the height of the chair is not equal to the leg length, knees are not kept in 90 degree (Kader, 2005). Lee et al. (2012) found that the back is not supported and they do not use arm rest. As a result their lumbar spine stays in fully slump position placing various Ligamentous structures on full stretch. The basic vertical alignment of trunk & head are not maintained. So staying in prolonged sitting in bad posture with flexed lumbar spine without lumbar support & continuous overstretching of Ligamentous structures made them one of the most vulnerable groups of being suffered from LBP. Kader (2005) found that these types of activity include lifting goods, measuring goods, transferring goods. To do these types of activities forward bending, twisting & vibratory movements have to do very frequently. Due to lack of funding they cannot put sufficient place in the shop. For this reason they had to work in narrow space.

Tulder (2003) showed that LBP can be defined as pain or discomfort located between the lower costal arch and the gluteal folds, with or without referred leg pain. Robinson (2011) stated that back pain (also known as dorsopathy) is pain felt in the human back that may come from the muscles, nerves, bones, joints or other structures in the spine. The pain may constant or intermittent, stay in one place or refer or radiate to other areas. It may be a dull ache, or a sharp or piercing or burning sensation. Shiel (2009) informed us that low back

pain is pain and stiffness in the lower back. It is one of the most common reasons people miss work. Pain in the low back, often referring into the hip, buttock or one leg.

Murray (2013) stated that osteoarthritis is the most similar form of arthritis. It books for more mobility disability than any other disease and is one of the leading reasons of disability in the USA and worldwide. Anderson (2011) showed that post-traumatic osteoarthritis (PTOA), the osteoarthritis that progresses following joint injury, causes life-long pain and disability for millions of people. Anderson (2011) showed that Acute joint injury and post-traumatic residual joint abnormalities, primarily instability and articular surface incongruity, lead to progressive loss of articular cartilage, to bone remodeling, and to changes in the joint soft tissues, resulting in PTOA. Unfortunately, current treatments of joint injuries all too often fail to prevent PTOA. Muscle strain probably is the most natural reason of neck and low back pain. Acute muscle strain typically outcomes from a single event of macrotrauma with the severity of injury directly proportional to the amount of force applied. This type of tissue trauma usually arises when the muscle undergoes forceful, passive elongation or, more commonly, when elongation arises while the muscle is in the process of activation this is seen with eccentric muscular shrinkages. Tearing of muscle fibers occurs primarily at the musculotendinous border with the belly of the muscle involved less frequently (Meleger & Krivickas, 2007).

Ivancic (2004) showed that ligamentous sprains are produced by forceful, passive stretching beyond the physiologic range or with strong muscular contractions and are among the most common causes of neck or back pain. Ivancic (2004) showed that any of the many spinal ligaments can be sprained, depending on the mechanism of injury and the developmental cross-sectional area of the ligament elaborate; thicker ligaments are less prone to injury. Traumatic micro- and macrotears of the anterior longitudinal ligament and the cervical facet joint capsule stayed implicated in whiplash-type injuries.

Newton & Love (2007) found that crush injury of an extremity occurs when a limb is compressed between two hard surfaces, to the point where vascular supply is impaired and vulnerable tissues undergo necrosis. Most commonly, limbs are crumpled during auto versus pedestrian accidents, motor vehicle crashes, and industrial accidents. However,

during natural disasters such as earthquakes, building collapses, landslides, mine cave-ins, and acts of war with mass civilian casualties, epidemics of limb crush injuries can happen.

Part (2009) stated that foot pain is very common, especially in women, owing to inappropriate footwear. Overuse, repetitive strain and minor, easily forgettable injuries may result in chronic foot and ankle pain. Part (2009) stated that Inflammation or irritation of a tendon, from repeated stressful movement's Occurs most often in the flexor and extensor tendons of the fingers, thumb, forearm, elbow, shoulder or wrist. Stevens (2008) showed that compression of the median nerve in the carpal tunnel of the wrist is caused by repeated bending and twisting of the wrist, especially when force is applied. Pan (2009) stated that inflammation of tendons and/or tendon sheaths because of repetitive movements, often non-strenuous. Rotator cuff tendinitis is the most common tendon disorder of the shoulder. Shoulder pain, Stiffness and also problem in reaching behind on upper back (Pan, 2009).

Brown et al. (2006) suggested that traumatic knee injury strongly contributes to knee OA development in the young adult. The incidence of acute knee injury was approximately 900,000 cases per year in the US. Joint injury generates a lengthy remodeling process in the cartilage and surrounding tissues that has adverse biomechanical and biochemical implications that reassure joint degeneration. Numerous types of joint injury, counting meniscal, ligament, and joint capsule tears, joint dislocations, and intra-articular fractures are known to markedly increase knee OA risk. OA secondary to joint injury is typically analyzed earlier in life and progresses much quicker, resulting in a lengthier period of joint-related morbidity linked to patients with primary (Thambyah, 2005).

Nathan et al. (2010) stated that heavy physical work appeared to include other potential risk factors for back disorder, particularly lifting and awkward postures. Lifting is definite as moving or bringing something from a lower level to a higher one. The concept covers stresses resulting from work done in transferring objects from one plane to another as well as the effects of varying techniques of patient handling and transfer. Forceful movements contain movement of objects in other ways, such as pulling, pushing, or other efforts. Several studies encompassed in this review used indices of physical workload that combined lifting/forceful movements with other work-related risk factors (particularly

heavy physical work and awkward postures). Some studies have definitions for lifting which include criteria for number of lifts per day or average amount of weight lifted.

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

CHAPTER – III	METHODOLOGY

3.1 Study design

The researcher was designed to find out the prevalence of post-traumatic musculoskeletal disorders among the Rana plaza tragedy patients. Cross sectional study design was selected for this study. This design involved identifying group of people and then collecting the information that researcher required when they will be use the particular service (Hicks, 2000). Cross-sectional studies can be thought of as providing a "snapshot" of the frequency and characteristics of a disease in a population at a particular point in time. This type of data can be used to assess the prevalence of acute or chronic conditions in a population (Depoy & Gitlon, 1998). While this approach allows the researcher to select participants according to the clearly define criteria. The cross sectional study design is usually cheaper and quicker and confounding variables can be controlled for during data analysis.

3.2 Study area

Savar upzella was chosen as a venue by which investigator could obtain an appropriate sample who had post-traumatic musculoskeletal disorder. The investigator thought that it was the most suitable place because there has the availability of the desire sample.

3.3 Study population

A population refers to the members of a clearly defined set or class of people, objects or events that was the focus of the investigation. So, all of garments workers in Rana Plaza tragedy in Savar upzella, Bangladesh who fulfill the inclusion and exclusion criteria of this study were the population of this study.The populations of this study were the post-traumatic patients.

3.4 Sampling techniques

The study was conducted by using the convenience sampling methods because it was the easiest, cheapest and quicker method of sample selection. It was easy to get those subjects according to the criteria concerned with the study purpose through the convenience sampling procedure. Sampling was an important concept in research basically it was about how to choose the people who would study or who would participate in research. Finding the appropriate number and type of people take part in study was called sampling (Hicks, 1999).

3.5 Inclusion criteria

- ❑ Participants with having post-traumatic disorder.

- ❑ Both male female are selected.

- ❑ All ages were included as there was objective of the study to explore the relationship between age and work related musculoskeletal disorders, so samples are selected from all age group.

- ❑ Subject who were willing to participate in the study otherwise they will not give exact information that was helpful to the study.

- ❑ Those who are motivated.

3.6 Exclusion criteria

- ❑ Subject who are not willing to participate in the study.

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

- ❑ Subject who have any, associated pathological condition at last year because these also exacerbate of musculoskeletal symptoms.

- ❑ Subjects who has not post-traumatic disorder.

3.7 Sample size

Sample size for this study was calculated by the following equation-

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

Here,

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

d = 0.05

P = 0.76 (Talwar et al., 2009)

q = 1-p = (1- 0.76)

=0.24

According to this formula of sample size calculation, the actual sample size was about 276 but due to the limitation of time took only 50 samples conveniently from the population for this study. 50 Samples were selected according to the inclusion and exclusion criteria from the population of the study. Sample is a group chosen or obtained from a much larger group of the population. Bailey (1997) claimed that a sample is a subset of the population that has been selected to participate in the project. Sample should represent the population as closely as possible. For survey research it is better to get as many subjects as possible with the consideration of the size of the ideal population (Bowling, 1997).

3.8 Method of data collection

3.8.1 Data collection tools & instruments

A structured questionnaire and demographic information chart was used as a data collection instrument. In that time some other necessary materials are used like pen, pencil, white paper, clip board etc. Following that before the data collection informed consent was taken from the participant. Firstly, identity of author and the research project as well its purpose were delivered verbally among them. Then individual subject was selected to find out if they were interested in participating. For data collection, the Bengali type of questionnaire was delivered.

3.8.2 Data collection procedure

Before data collection, researcher was first introduced himself to the participants & took verbal consent. Then provide written consent form to the participant, and after signed the consent form, data was collected through a questionnaire from the participants by face to face conversation. In that way questionnaire was present and data was completed. In the questionnaire, there was participant's demographic information including Demographic information included age, sex, educational level, marital status, previous occupation & some open & close ended questions. For data collection, the Bengali type of questionnaire was delivered. On the other hand the Bengali version about disease condition might be helpful. After that a date was fixed to collect the questionnaire from the recipients. The question will ask face to face interview.

3.9 Data analysis

Data was analyzed with the software named Statistical Package for Social Sciences (SPSS) Version 20.0. Data resolve numerically coded and captured in Microsoft Excel, used an SPSS 20.0 version software program. Microsoft Office Excel 2013 used to decorate the bar graph and pie charts, chi-square test & data was calculated as percentage.

Chi-Square (x^2) test

Chi-Square (x^2) test is the most popular discrete data hypothesis testing method. It is a nonparametric test of statistical significance for bivariate tabular analysis with a contingency table. Chi-Square test helps to analyze data come in the form of counts. This test can be applied to nominal or categorical data which can't be analyzed using the ranking technique.

Calculation of Chi-Square

Chi square (x^2) is the sum of the square difference $(O-E)^2$ between observed (O) and the expected (E) data divided expected (E) in all possible data completing by the following equation;

$$\frac{(\text{Observed count} - \text{Expected count})^2}{\text{Expected count}}$$

$$(x^2) = \frac{(O - E)^2}{E}$$

The mathematical notation, the formula looks like this:

$$X^2 = \sum_{i=1}^{k} \frac{(O - E)^2}{E}$$

3.10 Ethical consideration

Ethical issues were followed by World Health Organization (WHO) and Bangladesh Medical and Research Council (BMRC). At first to conduct study, the research project was submitted to the Physiotherapy Department of BHPI and obtained approval from the ethical board. The research was approved by Institutional Review Board (IRB). During the course of the study, the samples who were interested in the study had given consent forms and the purpose of the research and the consent form were explained to them verbally. The study did not interfere with their jobs. When researcher will receive an approval letter from the ethical committee then data collection will start.

3.11 Informed Consent

For this study a consent form was given and the purpose of the research and consent forms was explained to the subject verbally. Participants were fully voluntary and they have the right to withdraw at any time. Participants were also ensured that their confidentiality will be maintained. Information might be published in any presentations or writing but they will not be identified. The study results might not have any direct effects on them but the members of Physiotherapy population may be benefited from the study in future. They would not be embarrassed by the study.

Ratio of post-traumatic disorder
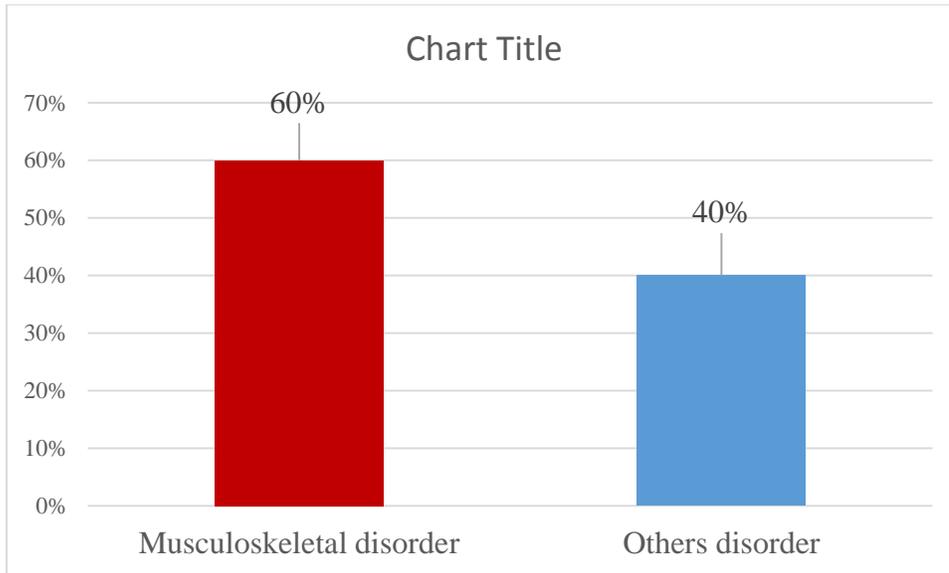
Figure- 1: Ratio of post-traumatic disorder of the participants

Analysis showed that among the 50 participants 60% (n=30) participants had post-traumatic musculoskeletal disorder & 40% (n=20) participants had others post-traumatic disorder.

Socio-demographic Information

Age of the participants

The study was conducted on 30 participants who have post-traumatic musculoskeletal disorder. In the study the minimum age of a participant is 19 & maximum age of a participant is 40. Their mean age is 28.93, median is 28.50 and standard deviation is 4.66 & the participants in between age range 15-25 years is 26.7%, participants in between age range 26-35 years is 66,7%, participants in between age range 36-45 years is 6.7%.
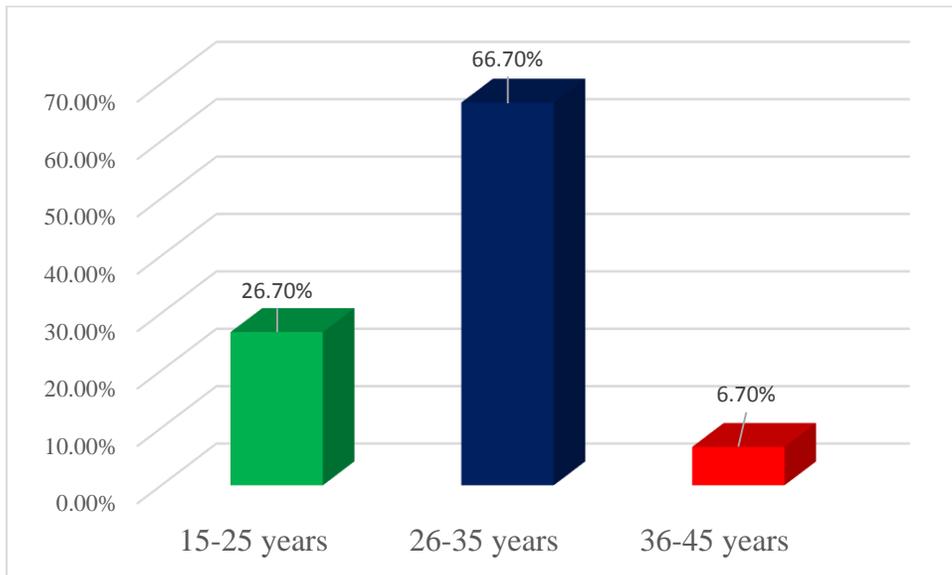
Figure- 2: Age range of the participants

Gender Ratio:

Analysis showed that among the 30 participants 46.70% (n=14) participants are male & 53.30% (n=16) participants are female.
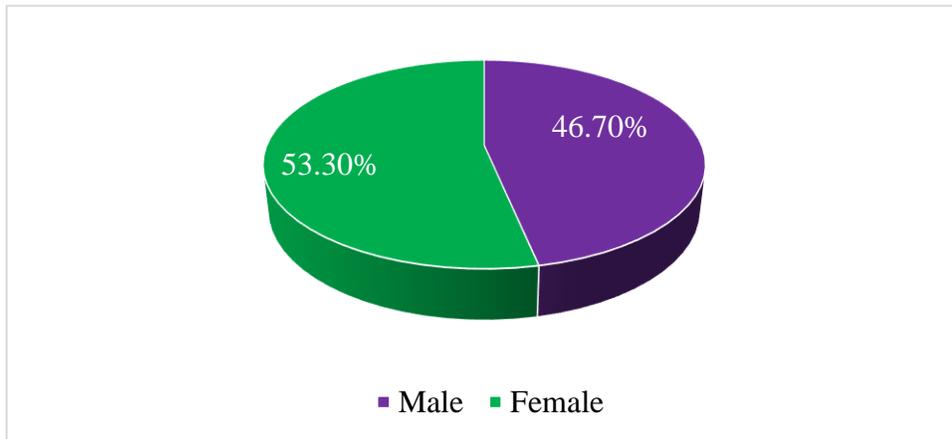
Figure-3: Gender of the participants

Occupation

Analysis showed that among the 30 participants 6.7% (n=2) participants were garments worker, 56.7% (n=17) were business, 20% (n=6) were housewife, 3.3% (n=1) participants were driver, 13.3% (n=13.3) were unemployed.
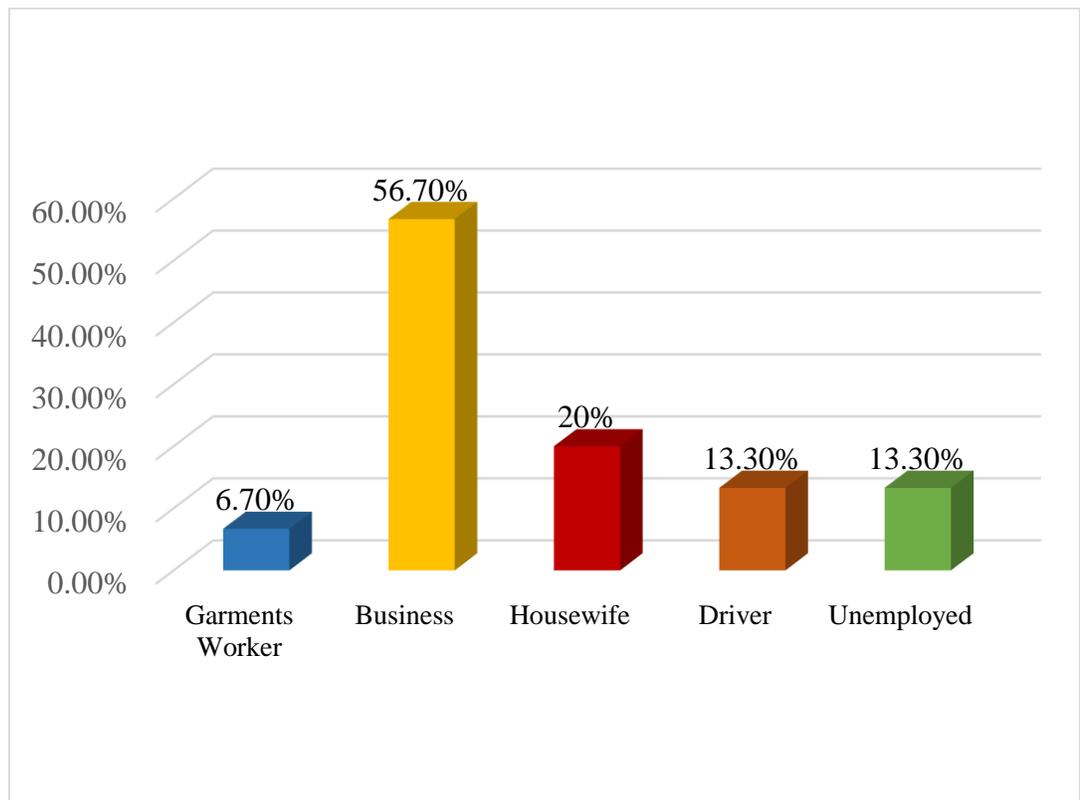
Figure – 4: Occupation of the participants

Working experience

Outcome reveals that among the 30 participants, 3.3% (n=1) participants had job experience 0-1 year, 36.7% (n=11) participants had 1-5 years, 60% (n=18) participants 5-15 years.
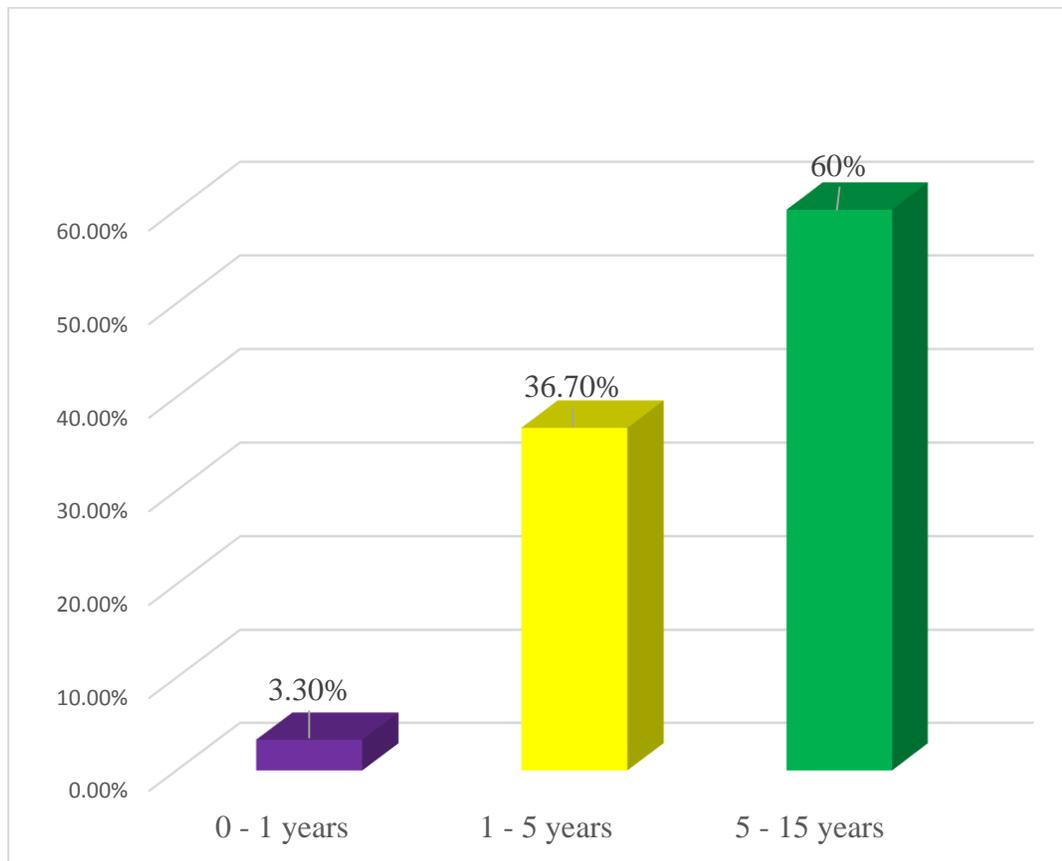
Figure-5: Working experience of the participants

Educational status

Among the 30 participants, 20% (n=6) participants had illiterate 30% (n=9) participants had primary education, 30% (n=9) participants had secondary education, 6.7% (n=2) participants had S.S.C, 10% (n=3) participants had H.S.C, & 3.3% (n=1) participants had Graduate.
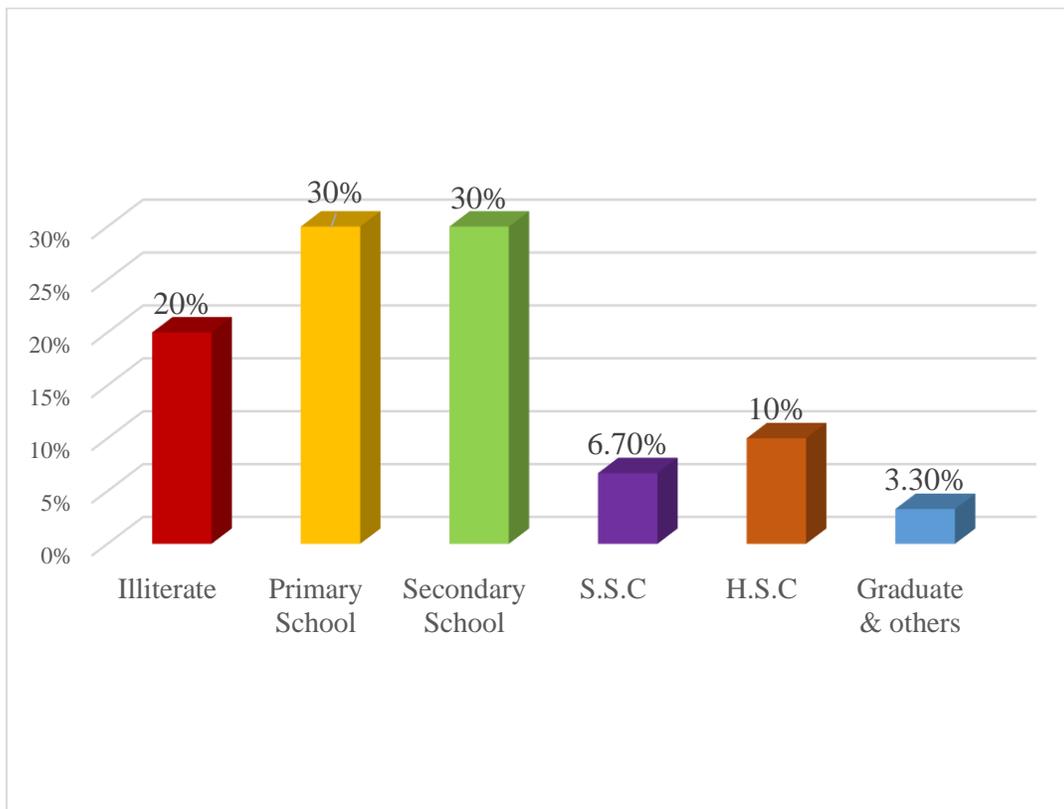
Figure-6: **Education level of the participants**

Area of the participants

Outcome reveals that among the 30 participants, 56.7% (n=17) participants who were lived in the urban area & 43.3% (n=13) participants who were lived in rural area.
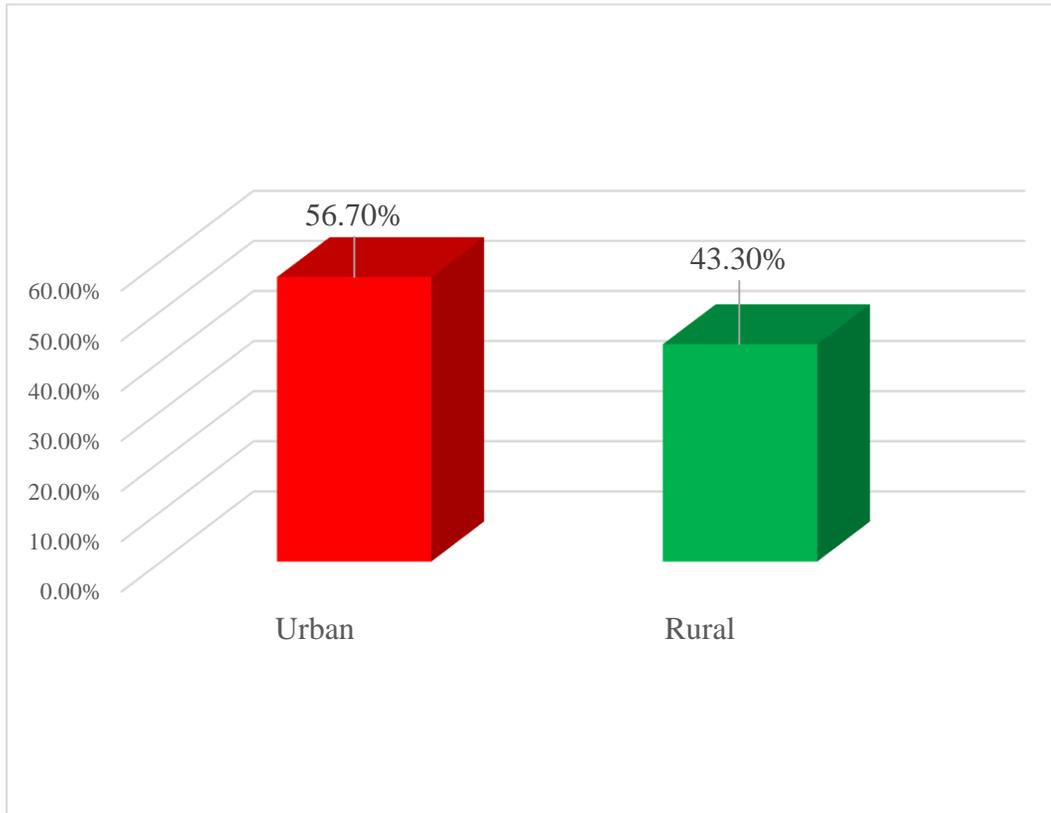
Figure-7: Area of the participants

Type of work of the participants

Analysis showed that among the 30 participants 73.3% (n=22) participants were swing operator, 6.7% (n=2) were counting materials, 20% (n=6) were supervisor.
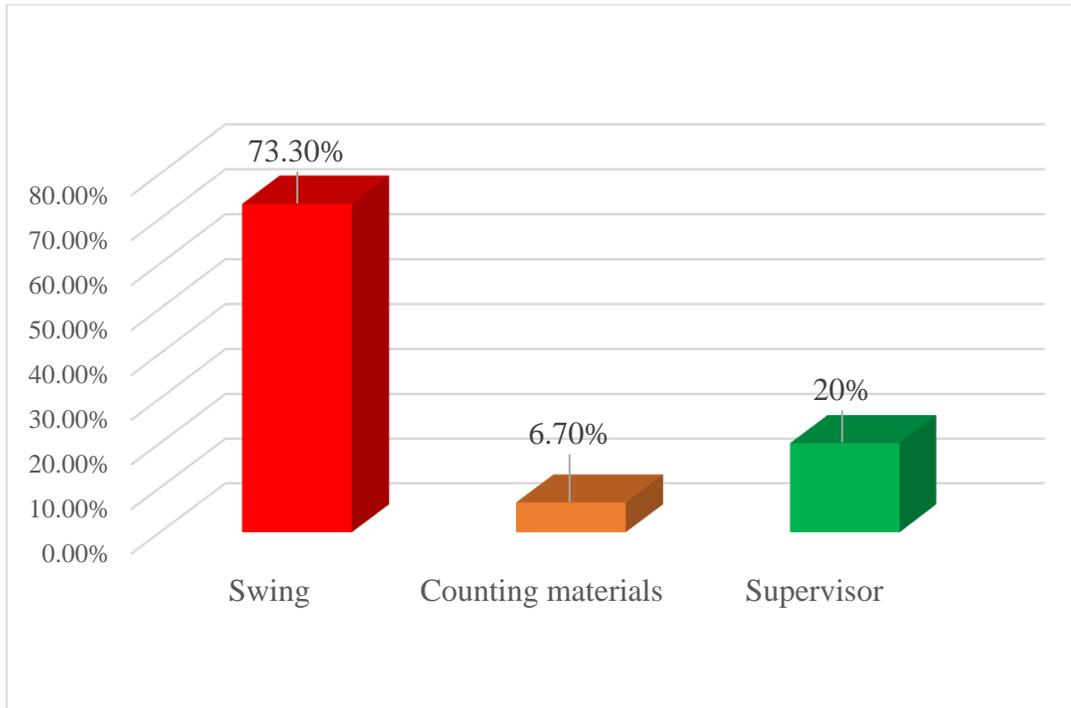
Figure-8: Type of work of the participants

Days of working of the participants

Outcome reveals that among the 30 participants the working day in Rana Plaza were 33.3% (n=10) participants were 0-6 months, 20% (n=6) participants were 6-12 months, 3.3% (n=1) participants were 12-18 months, 10% (n=3) participants were 18-24 months, 6.7% (n=2) participants were 24-36 months & 26.7% (n=8) participants were more than 36 months.
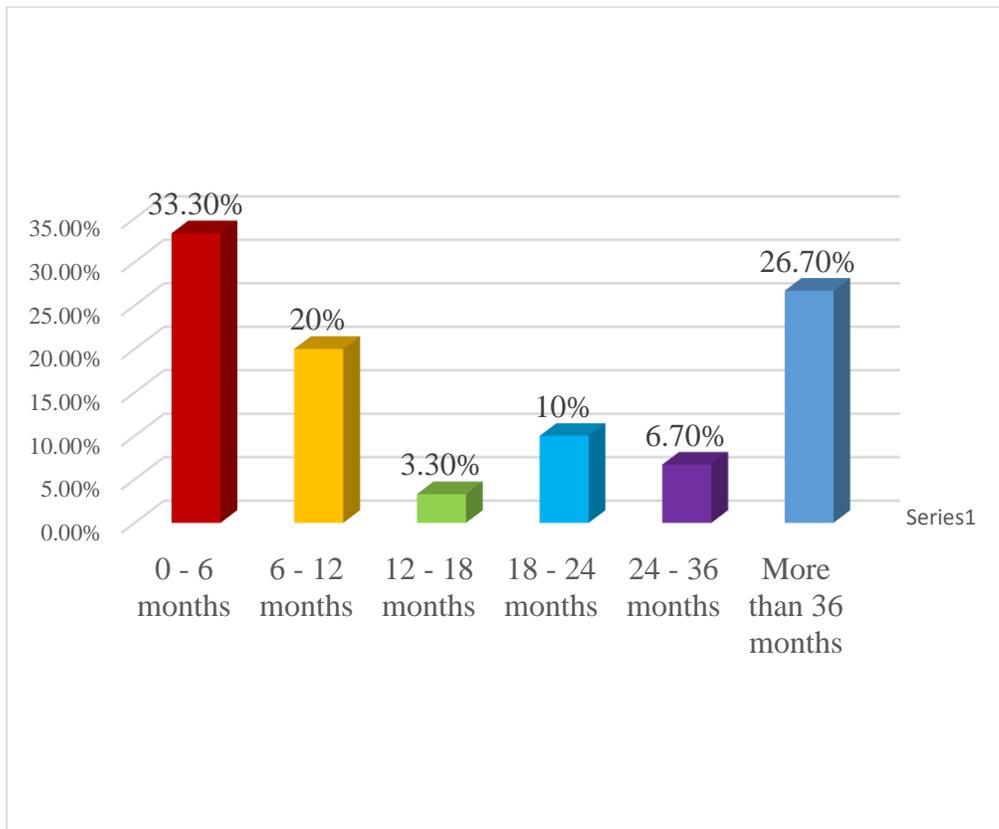
Figure-9: Days of working of the participants

Affected body part

After analysis researcher found that among 30 participants who suffered from PTMD most affected body parts were spine in 43.3% (n=13) participants, hip in 13.3% (n=4) participants, knee in 13.3% (n=4) participants, ankle in 13.3% (n=4) participants, elbow in 6.7% (n=2) participants, wrist in 6.7% (n=2) participants, head in 3.3% (n=1) participants.
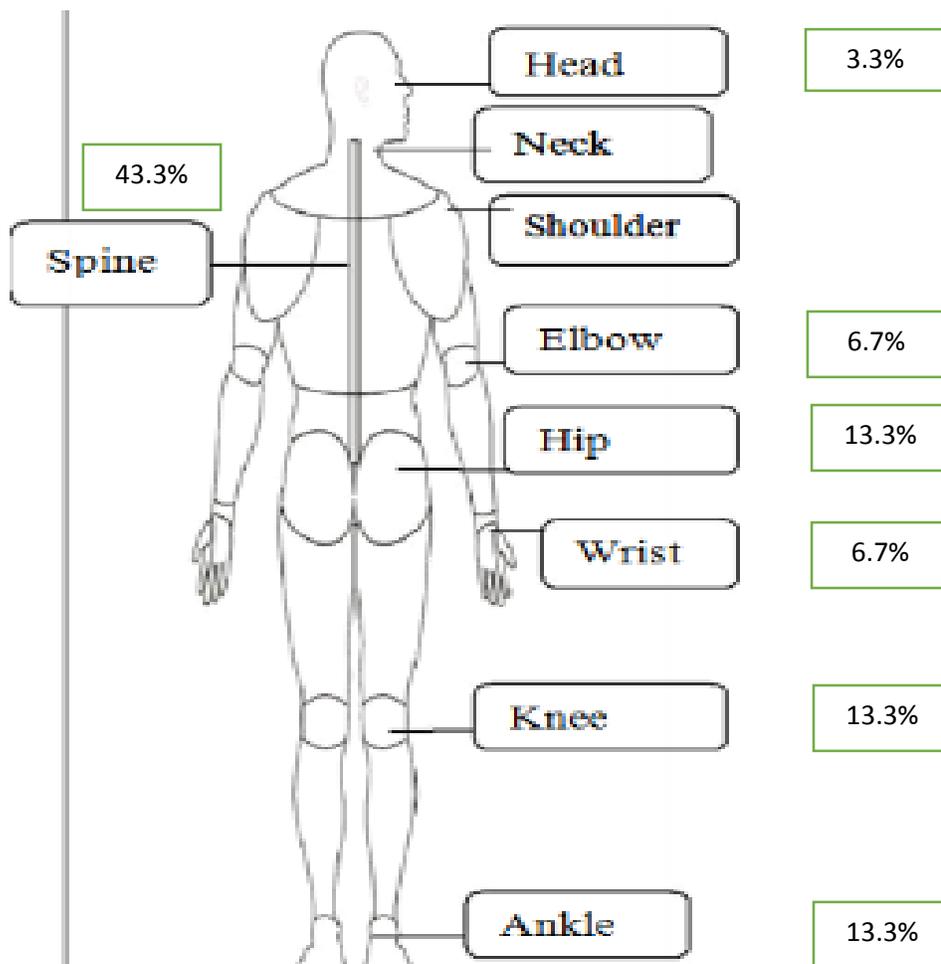
Figure-10: Affected body part of the participants

Symptoms of the participants

Analysis demonstrated that 30 participants who suffered from PTMD 56.7% (n=17) participants suffered from pain, 33.3% (n=10) participants had paresthesia, 10% (n=3) had cramp. Analysis showed that, most patients suffered from PTMD, the most common symptom was pain.
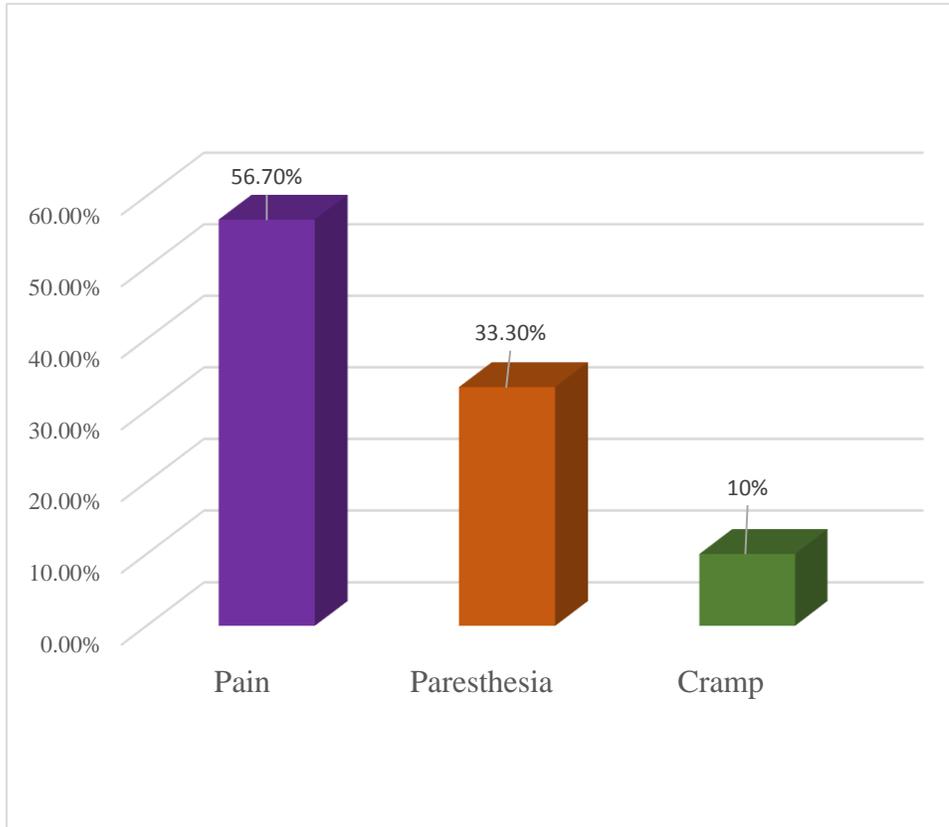
Figure-11: Symptoms of the participants

Onset of pain

Analysis demonstrated that 30 participants who suffered from PTMD 56.7% (n=17) participants pain came from sudden & 43.3% (n=13) participants pain came from gradually.
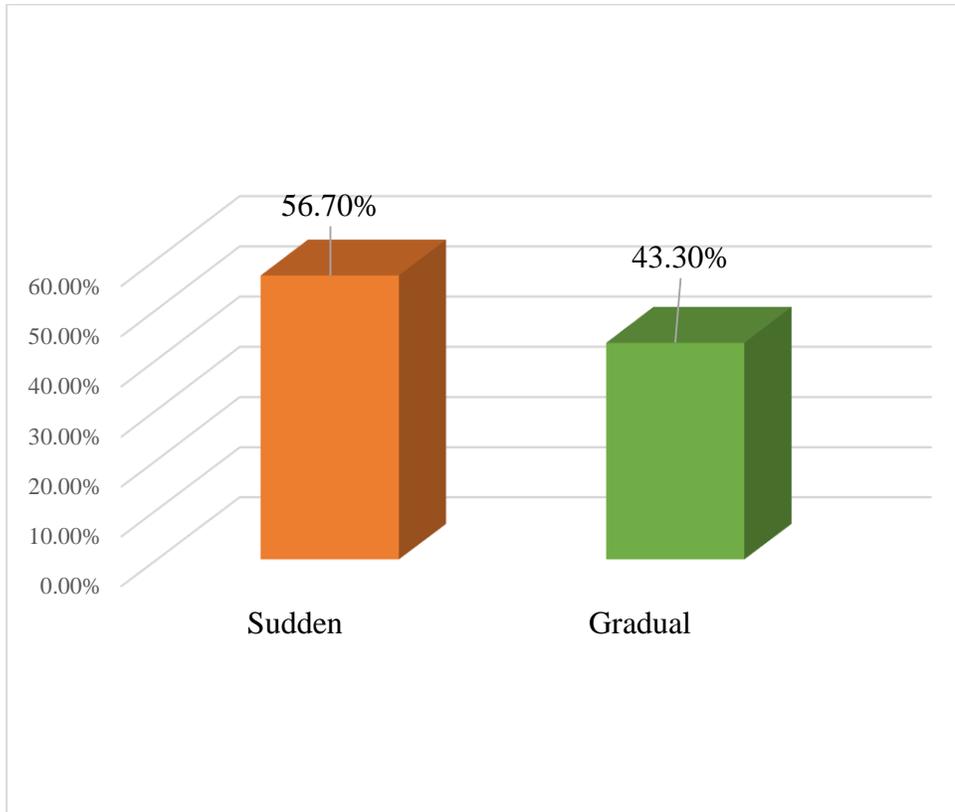
Figure-12: Onset of pain of the participants

Severity of the symptoms

Analysis demonstrated that 6.7% (n=2) participants had mild symptoms, 70% (n=21) participants had moderate symptoms and 23.3% (n=7) participants had moderate symptoms out of 30 participants.
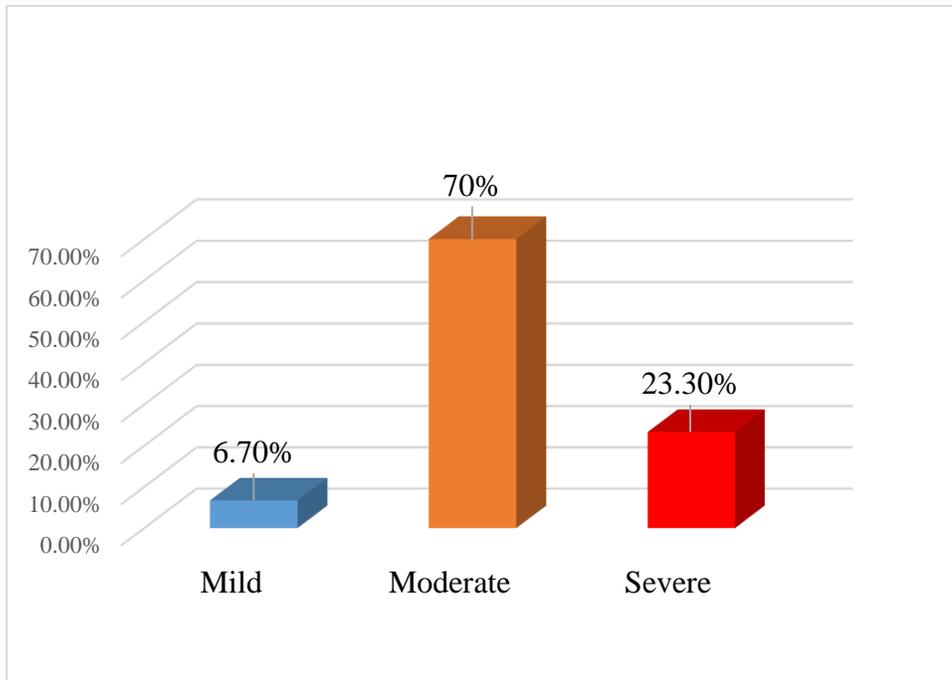
Figure-13: Severity of the symptoms of the participants

Work interruption

Analysis showed that 83.3% (n=25) participants out of 30 participants had work interruption due to PTMD and 16.7% (n=5) participants out of 30 participants had not work interruption due to PTMD.
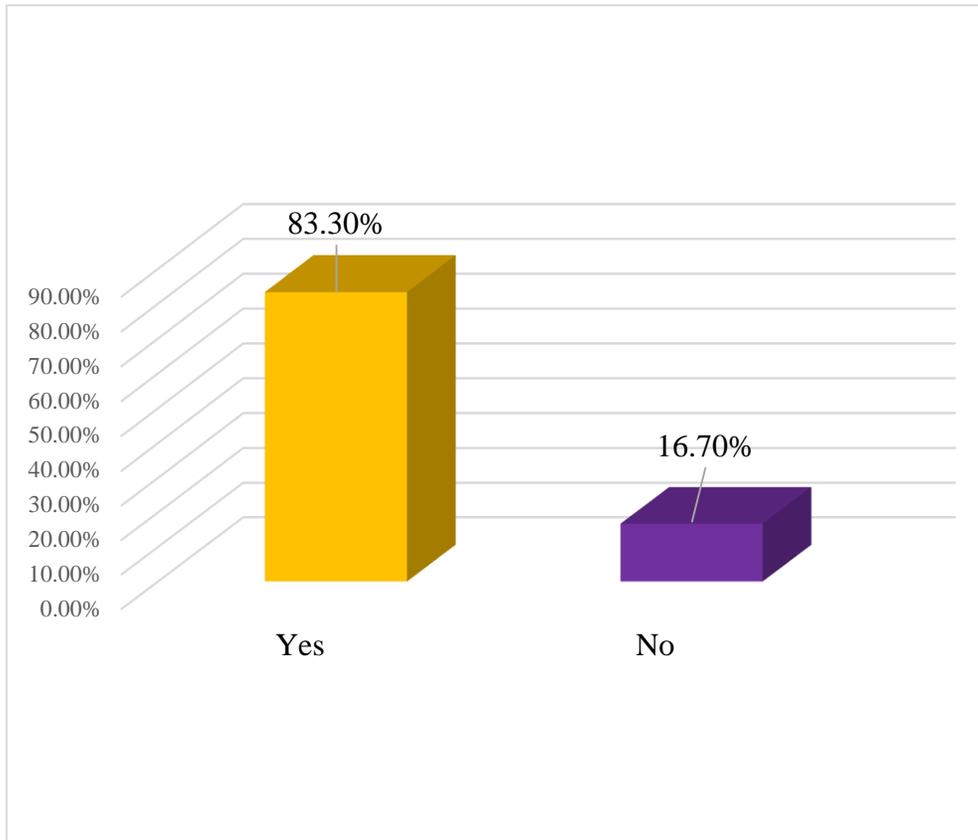
Figure-14: Work interruption of the participants

Stressful positions

Analysis showed that among the 30 participants who had suffered from PTMD, stressful position were working in same position for long periods for 60% (n=18) participants, performing same task over and over for 3.3% (n=1) participants, bending for 6.7% (n=2) participants, carry heavy load for 30% (n=9) participants. So, most common risk factors were working in same position for: (60%) and carry heavy load for 30% (n=9) participants.
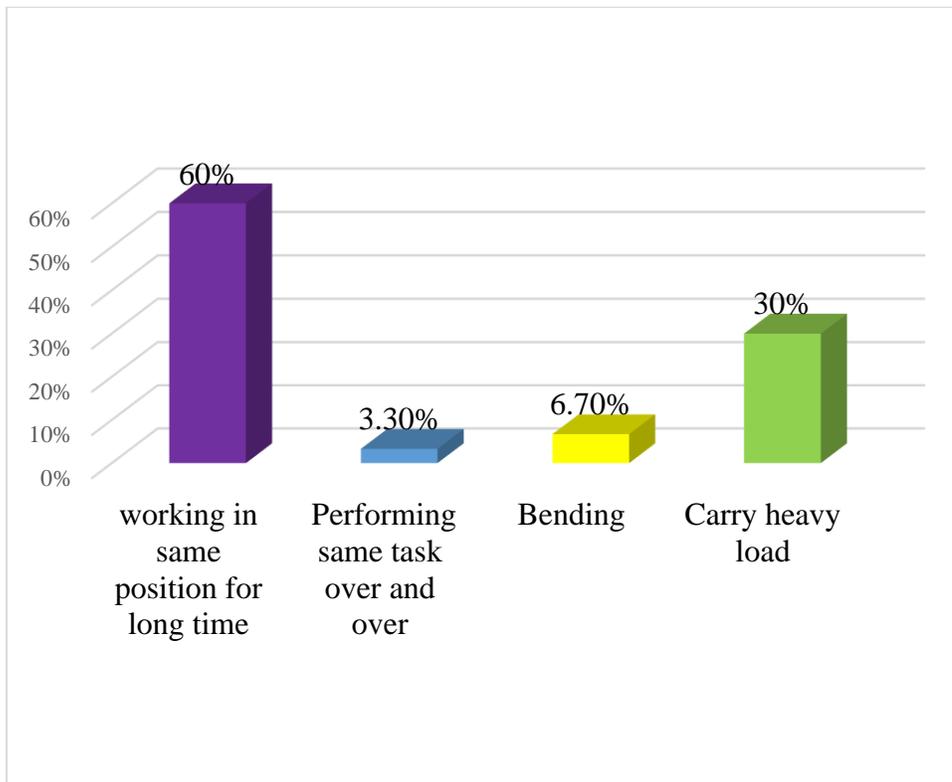
Figure-15: Stressful position of the participants

Fracture in the body

Analysis showed that 56.7% (n=17) participants out of 30 participants had fracture and 43.3% (n=13) participants out of 30 participants had no fracture work interruption due to PTMD.
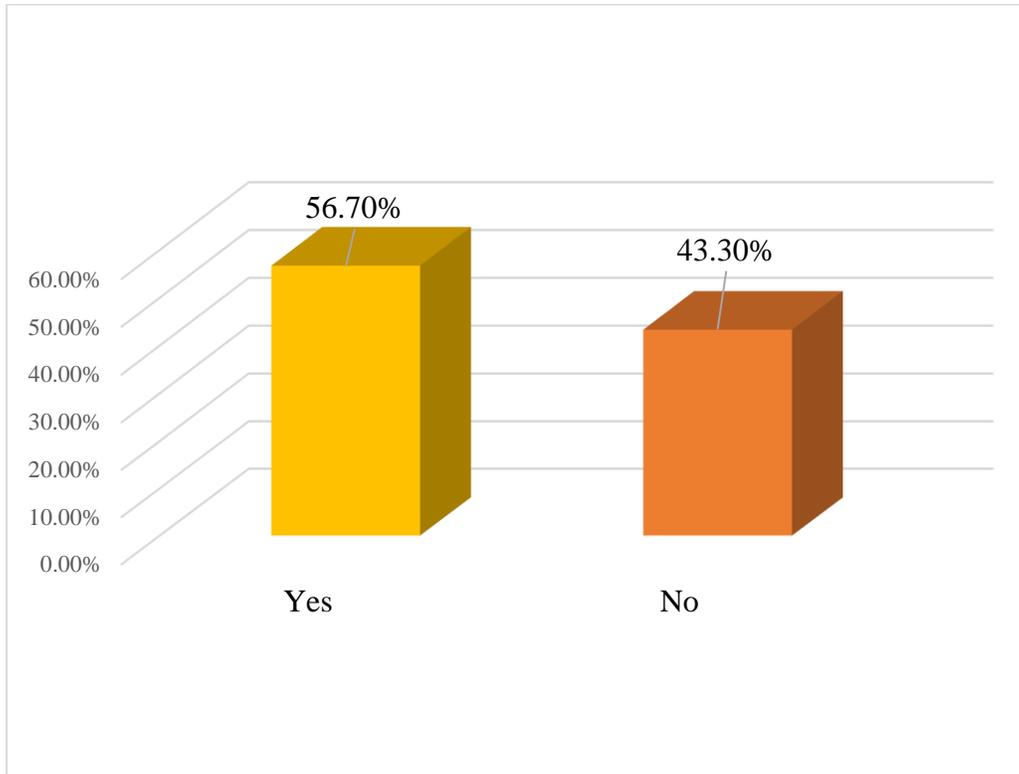
Figure-16: Fracture in body of the participants

Part of fracture in the body

After analysis researcher found that among 30 participants who suffered from PTMD most affected body parts were shoulder in 3.3% (n=1) participants, elbow in 6.7% (n=2) participants, wrist in 10% (n=3) participants, upper back in 3.3% (n=1), lower back in 10% (n=3), hip in 10% (n=3) participants, knee in 3.3% (n=1) participants, ankle in 10% (n=3) participants.
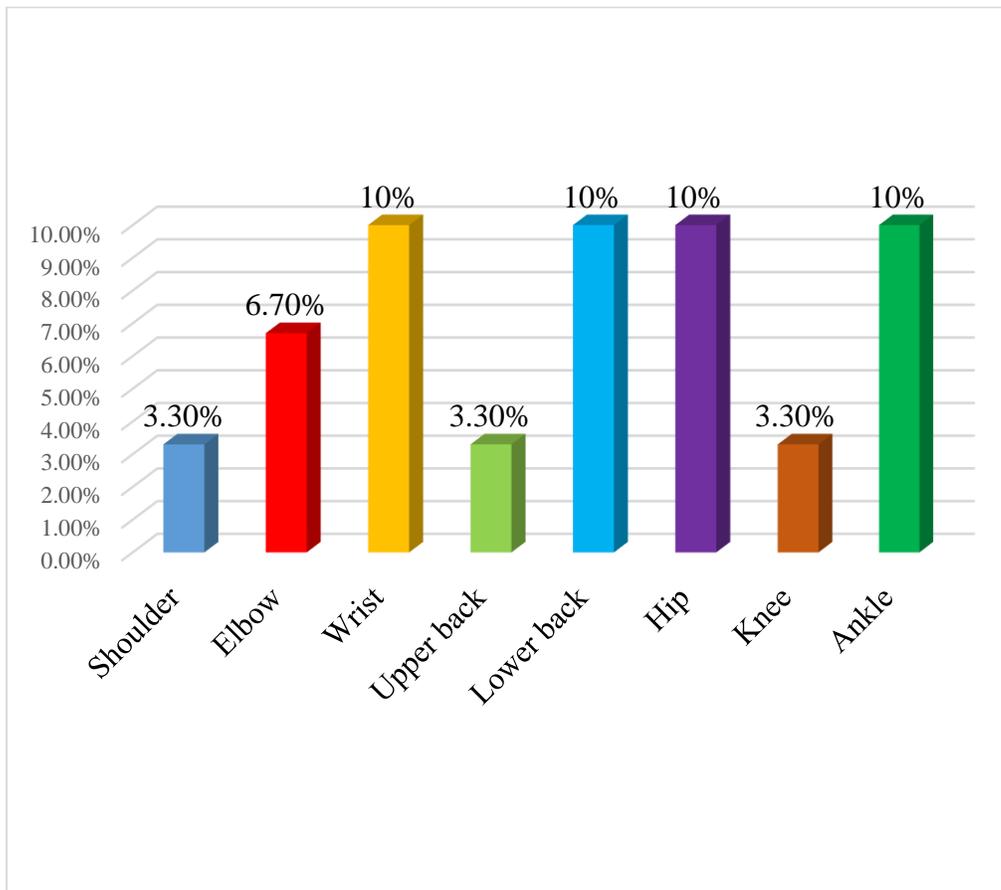
Figure-17: Part of the fracture of the participants

Surgery of the body

Analysis demonstrated that 40% (n=12) participants out of 30 participants had done surgery & 60% (n=18), only 8% (n=4) participants out of 30 participants had not done surgery for their condition.
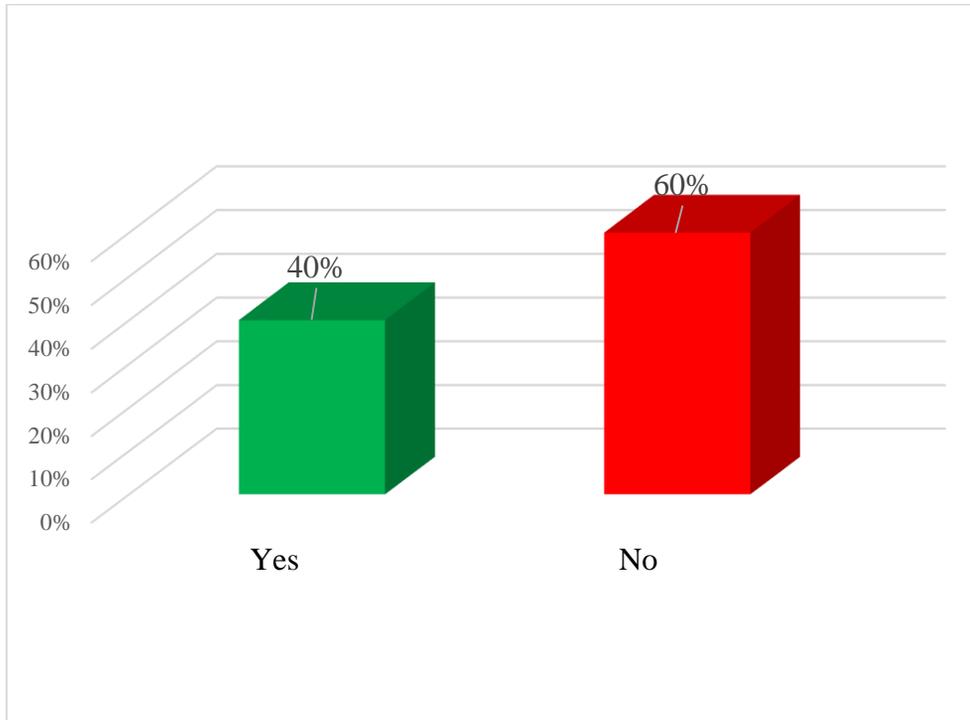
Figure-18: Surgery of the participants

Soft tissue injury

Analysis showed that 76.7% (n=23) participants out of 30 participants had soft tissue injury due to PTMD and 23.3% (n=7) participants out of 30 participants had no soft tissue injury due to PTMD.
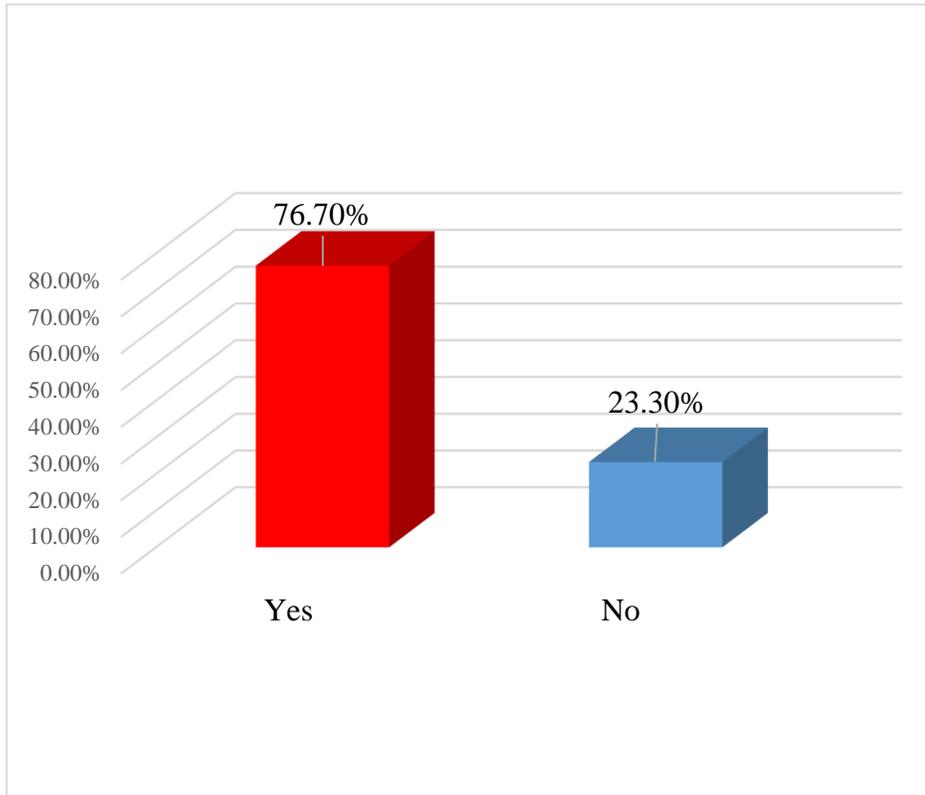
Figure-19: Soft tissue injury of the participants

Receiving treatment

Analysis showed that among 30 participants who suffered from PTMD 80% (n=24) participants had taken physiotherapy treatment for their condition and 20% (n=6) participants had taken medication.
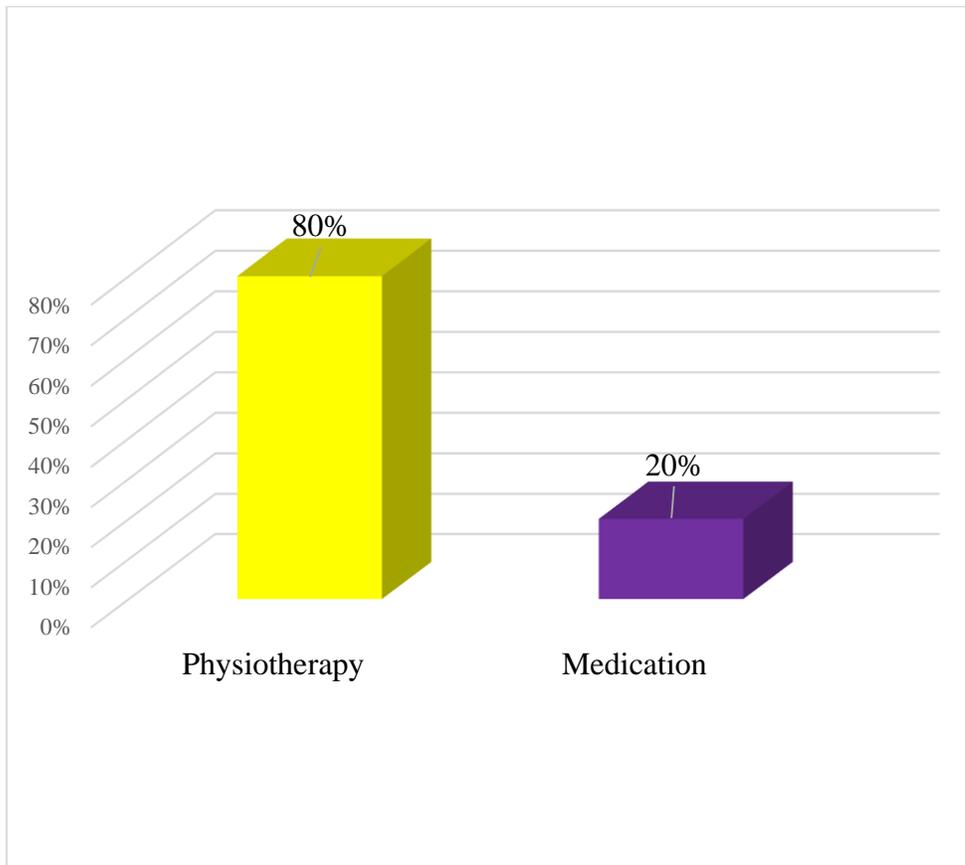
Figure-20: Receiving treatment of the participants

Treatment Consequences

Among the 30 participants, who had taken physiotherapy and medication for their condition all of the participants had a good prognosis. The percentages of prognosis were in 63.2% (n=19) improved, 6.7% (n=2) worse and 30% (n=9) unchanged in the total participants.
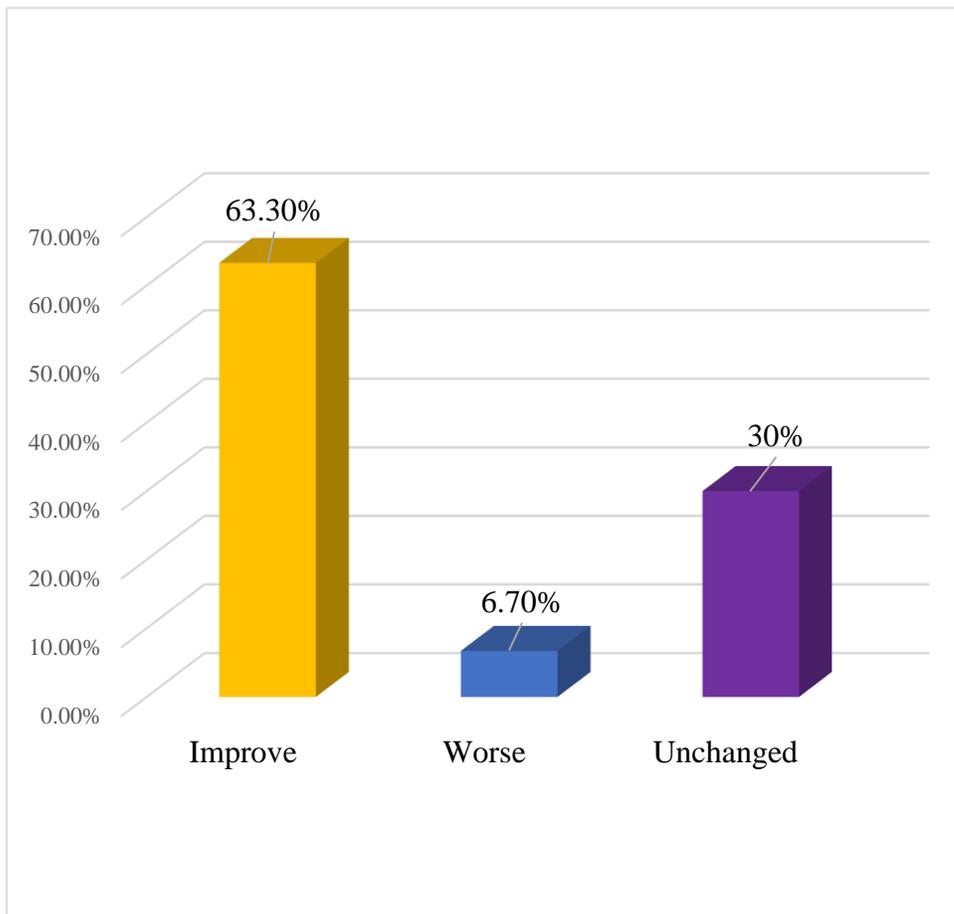
Figure-21: Treatment consequences of the participants

4.1.1: Distribution between the age & severity of the symptoms of the participants:

Table- 4.1.1: Distribution between the age & severity of the symptoms

		Severity of the symptoms of the participants			Total
		Mild	Moderate	Severe	
	15 - 25 years	0	7	1	8
Age of the participants	26 - 35 years	2	13	5	20
	36 - 45 years	0	1	1	2
Total		2	21	7	30

Among the 30 participants those were in the 8 participants in the age range 15-25 years & 0 participants have mild pain, 7 participants have moderate pain, 1 participants have severe pain. 20 participants were in the age range 26-35 years & 2 participants have mild pain, 13 participants have moderate pain, 5 participants have severe pain. 2 participants were in the age range 36-45 years & 0 participants have mild pain, 1 participants have moderate pain, 1 participants have severe pain.

4.1.2 Association between age & severity of the symptoms:

Age & Severity of the symptoms	Chi-square	P- value
	2.571	0.632

From the table 4.1.2 found that the Chi-square value between age & severity of symptoms was 2.571 and p-value was 0.632 (<.05). So the result was not significant that indicate there was no association between age & severity of symptoms of the participants.

4.2.1 Distribution between the gender & severity of the symptoms of participants:

Table- 4.2.1: Distribution between the gender & severity of the symptoms

		Severity of the symptoms of the participants			Total
		Mild	Moderate	Severe	
Gender of the	Male	2	8	4	14
participants	Female	0	13	3	16
Total		2	21	7	30

Among the 30 participants those were in the 14 participants in male & 2 participants have mild pain, 8 participants have moderate pain, 4 participants have severe pain. 16 participants were in female & 0 participants have mild pain, 13 participants have moderate pain, 3 participants have severe pain.

4.2.2 Association between gender & severity of the symptoms:

Gender & Severity of the symptoms	Chi-square	P- value
	3.214	0.200

From the table 4.2.2 found that the Chi-square value between gender & severity of symptoms was 3.214 and p-value was 0.200 (<.05). So the result was not significant that indicate there was no association between gender & severity of symptoms of the participants.

4.3.1 Distribution between the occupation & work interruption of the participants:

Table-4.3.1 Distribution between the occupation & work interruption

		Work interruption of the participants		Total
		Yes	No	
	Garment's worker	1	1	2
Occupation of the participants	Business	16	1	17
	Housewife	3	3	6
	Driver	1	0	1
	Unemployed	4	0	4
Total		25	5	30

Among the 30 participants those were in the 2 participants in garments worker & 1 participants have Work interruption, 1 participants have no Work interruption. 17 participants were in business & 16 participants have Work interruption & 1 participants have no Work interruption. 6 participants were in housewife & 3 participants have Work interruption & 3 participants have no Work interruption. 4 participants were in unemployed & 4 participants have Work interruption & 0 participants have no Work interruption.

4.3.2 Association between the occupation & work interruption:

	Chi-square	P- value
Occupation & work interruption	8.824	0.050

From the table 4.3.2 found that the Chi-square value between occupation & work interruption was 8.824 and p-value was 0.050 (<.05). So the result was significant that indicate there was association between occupation & work interruption of the participants.

4.4.1 Distribution between the occupation & symptoms of the participants:

Table-4.4.1 Distribution between the occupation & symptoms of the participants

		Symptoms of the participants			Total
		Pain	Paresthesia	Cramp	
Occupation of the participants	Garment's worker	2	0	0	2
	Business	7	8	2	17
	Housewife	4	1	1	6
	Driver	0	1	0	1
	Unemployed	4	0	0	4
Total		17	10	3	30

Among the 30 participants those were in the 2 participants in garments worker & 2 participants have pain symptoms, 0 participants have no pain symptoms. 17 participants were in business & 7 participants have pain symptoms & 8 participants have paresthesia symptoms, 2 participants have cramp symptoms. 6 participants were in housewife & 4 participants have pain symptoms & 1 participants have paresthesia symptoms, 1 participants have cramp symptoms. 4 participants were in unemployed & 4 participants have pain symptoms & 0 participants have no other symptoms.

4.4.2 Association between the occupation & symptoms of the participants:

	Chi-square	P- value
Occupation & symptoms of the participants	9.194	0.326

From the table 4.4.2 found that the Chi-square value between occupation & symptoms of the participants was 9.194 and p-value was 0.326 (<.05). So the result was not significant that indicate there was no association between the occupation & symptoms of the participant.

4.5.1 Distribution between educational level and severity of the symptoms:

Table-4.5.1 Distribution between educational level and severity of the symptoms

		Severity of the symptoms of the participants			Total
		Mild	Moderate	Severe	
	Illiterate	0	5	1	6
	Primary School	0	7	2	9
Educational level of the participants	Secondary School	0	7	2	9
	S.S.C	0	1	1	2
	H.S.C	1	1	1	3
	Graduate & other	1	0	0	1
Total		2	21	7	30

Among the 30 participants those were in the 6 participants in illiterate & 5 participants have moderate pain, 1 participants have severe pain. 9 participants were in primary school & 7 participants have moderate pain, 2 participants have severe pain. . 9 participants were in secondary school & 7 participants have moderate pain, 2 participants have severe pain. 2 participants were in S.S.C & 1 participants have moderate pain, 1 participants have severe pain. 3 participants were in H.S.C & 1 participants have mild pain, 1 participants have moderate pain, 1 participants have severe pain.

4.5.2 Association between educational level and severity of the symptoms of the participants:

	Chi-square	P- value
Educational level & Severity of the symptoms	2.079	0.023

From the table 4.5.2 found that the Chi-square value between educational level & Severity of the symptoms was 2.079 and p-value was 0.023 (<.05). So the result was significant that indicate there was strongly association between educational level & Severity of the symptoms.

4.6.1 Distribution between area and stressful position of the participants:

Table-4.6.1 Distribution between area and stressful position of the participants

		Stressful position of the participants				Total
		Working in the same position for long-time	Performing the same task over & over	Bending position	Carry heavy load	
Area of the participants	Urban	10	1	2	4	17
	Rural	8	0	0	5	13
Total		18	1	2	9	30

Among the 30 participants those were in the 17 participants lived in urban area & 10 participants have Working in the same position for long-time, 1 participants have Performing the same task over & 2 participants have Bending position & 4 participants have Carry heavy load. 13 participants were lived in rural area & 8 participants have Working in the same position for long-time & 5 participants have Carry heavy load.

4.6.2 Association between Area and Stressful position of the participants:

	Chi-square	P- value
Area of the participants & Stressful position	2.851	0.415

From the table 4.6.2 found that the Chi-square value between area of the participants & stressful position was 2.851 and p-value was 0.415 (<.05). So the result was not significant that indicate there was no association between area of the participants & Stressful position.

4.7.1 Distribution between area and severity of the symptoms of the participants:

Table-4.7.1 Cross tabulation between area and severity of the symptoms of the participants

		Severity of the symptoms of the participants			Total
		Mild	Moderate	Severe	
Area of the participants	Urban	1	12	4	17
	Rural	1	9	3	13
Total		2	21	7	30

Among the 30 participants those were in the 17 participants lived in urban area & 1 participants have mild pain, 12 participants have moderate pain, 4 participants have severe pain. 16 participants were lived in rural area & 1participants have mild pain, 9 participants have moderate pain, 3 participants have severe pain.

4.7.2 Association between Area and Severity of the symptoms of the participants:

Area of the participants & severity of the symptoms	Chi-square	P- value
	0.039	0.981

From the table 4.7.2 found that the Chi-square value between Area of the participants & Severity of the symptoms was .039 and p-value was 0.981 (<.05). So the result was not significant that indicate there was no association between area of the participants & severity of the symptoms

4.8.1 Distribution between days of working & occurring pain of the participants:

Table-4.8.1 Distribution between days of working & occurring pain of the participants.

		Occurring pain of the participants		Total
		Sudden	Gradual	
Days of working of the participants	0 - 6 months	6	4	10
	6 - 12 months	4	2	6
	12 - 18 months	1	0	1
	18 - 24 months	2	1	3
	24 - 36 months	0	2	2
	More than 36 months	4	4	8
Total		17	13	30

Among the 30 participants those 10 participant were working days in 0-6 months & 6 participants have sudden pain during working time & 4 participants have gradual pain. 6 participant were working days in 6-12 months & 4 participants have sudden pain during working time & 2 participants have gradual pain. 3 participant were working days in 18-

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24 months & 2 participants have sudden pain during working time & 1 participants have gradual pain. 2 participant were working days in 24-36 months & 2 participants have gradual pain. 8 participant were working days in more than 36 months & 4 participants have sudden pain during working time & 4 participants have gradual pain.

4.8.2 Association between days of working & occurring pain of the participants.

Days of working & occurring pain of the participants	Chi-square	P- value
	3.937	0.559

From the table 4.8.2 found that the Chi-square value between Days of working & Occurring pain of the participants was 3.937 and p-value was 0.559 (<.05). So the result was not significant that indicate there was no association between Days of working & Occurring pain of the participants

This study examined prevalence of post-traumatic musculoskeletal disorder among the Rana Plaza tragedy patients. Analysis showed that among the 50 participants 60% (n=30) participants had post-traumatic musculoskeletal disorder & 40% (n=20) participants had others post-traumatic disorder. In India musculoskeletal problems were reported by 76.5% (Talwar et al., 2009). The European Agency for Safety and Health at Work (2007) found that 84% WRMD reported in Europe countries. Priya et al., (2010) found that With MSD 76.25 % and Without MSD 23.75 %. In Iran 87.1% experienced some form of MSD symptoms (Choobineh & Tabatabaee, 2009). In America MSD pain was experienced by 75% (Scherzer et al., 2005).

In this study it was found that among participants who were suffering from post-traumatic musculoskeletal disorder the age distribution of them were 15- 25 aged were 26.7%, 26-35 aged were 66.7%, 36-45 aged were 6.7 %.The higher number of age of participants are 40 years who had suffered from post-traumatic musculoskeletal disorder & the lower age of the participants are 19 years. The mean age was 28.93(SD ± 4.66) years. Chyuan et al., (2012) stated that the mean Age was 33.3 ± (SD ± 11.3) years. Choobineh & Tabatabaee (2009) showed that the mean age was 34.63(SD ± 11.07) years. Wang et al., (2007) stated that in the study for musculoskeletal disorders significant differences were found for age group (p=0.036) but in this study from (Table-4.4.1) the association between the age and severity of symptoms that Chi-square value was 2.571 and the p-value was .632 (<.05) that indicate the result was not significant and there was no association between age & severity of symptoms of the participants.

Analysis showed that among the 30 participants 46.70% participants were male & 53.30% participants were female who suffered from post-traumatic musculoskeletal disorder. Literature says that men are more vulnerable to musculoskeletal disorder then female. In Chennai, India 77.5% male and 22.5% suffered from MSD (Priya et al., 2010). In Korea Kun et al., (2010) found that 74.2% male and 25.8% female suffered from MSD. But in this study the researcher had found that female were more affected musculoskeletal disorder than male and the ratio was female 53.30% & male was 46.70%. Wang et

al.,(2007) stated that in the study for musculoskeletal disorders significant differences were found for gender (p=0.005) but in this study from the table 4.2.2 found that the Chi-square value between gender & severity of symptoms was 3.214 and p-value was .200 (<.05). So the result was not significant that indicate there was no association between gender & severity of symptoms of the participants.

(Bindra et al. 2013) stated that the prevalence of MSD pain has been found to increase with age and to be more common among females. Low socioeconomic status and poor education have been found to be associated with MSD pain. Present episode of MSD pain was found to be associated with previous history of MSD. Heavy physical work in terms of lifting heavy loads, repetitive job, prolonged static posture and awkward posture have been found to be some of the risk factors of MSD.

Analysis showed that among the 30 participants who had suffered from post-traumatic musculoskeletal disorder 6.7% participants were garments worker, 56.7% were business, 20% were housewife, 3.3% participants were driver,13.3% were unemployed. From the table 4.4.2 found that the Chi-square value between occupation & symptoms of the participants was 9.194 and p-value was .326 (<.05). So the result was not significant that indicate there was no association between the occupation & symptoms of the participant.

Outcome reveals that among the 30 participants who had suffered from post-traumatic musculoskeletal disorder, 3.3% participants had job experience 0-1 year, 36.7% participants had 1-5 years, 60% participants 5-15 years. In this study showed that the most working experience of the garments worker was 5 – 15 years.

In this study the investigator found that among the 30 participants, 20% participants had illiterate 30% participants had primary education, 30% participants had secondary education, 6.7% participants had S.S.C, 10% participants had H.S.C, & 3.3% participants had Graduate. Another study found in Iran that showed that among the participant 33.9% completed their basic educational level, 20.2% completed moderate educational level and 15% completed their higher education. Where most affected group completed their basic educational level (Biglarian et al., 2012). From the table 4.5.2 found that the Chi-square value between educational level & Severity of the symptoms was 2.079 and p-value was

.023 (<.05). So the result was significant that indicate there was strongly association between educational level & Severity of the symptoms.

Analysis showed that the post-traumatic musculoskeletal disorder among the 30 participants, 56.7% participants who were lived in the urban area & 43.3% participants who were lived in rural area. In this study the urban area ratio was higher than rural area. Biglarian et al., (2012) found a statistically significant association between place of residence and PTMD patients but in this study from the table 4.7.2 found that the Chi-square value between Area of the participants & Severity of the symptoms was 0.039 and p-value was 0.981 (<.05). So the result was not significant that indicate there was no association between area of the participants & severity of the symptoms

 Analysis showed that among the 30 participants 73.3% participants were swing operator, 6.7% were counting materials & 20% were supervisor. Sokas et al., (2007) stated that compared sewing machine operators to a subset of the general population matched for age, race, and gender. They found that sewing machine operators had a higher prevalence of self-stated upper back and upper-extremity pain. Wang et al.,(2007) stated that in the study for musculoskeletal disorders significant differences were found for gender (p=0.005), age group (p=0.036), and marital status (p=0.017) respectively which is also almost similar to Aghili et al., (2012)   study among the Iranian Sewing machine operators of a shoe manufacturing factory. From the above discussion it can be concluded that sewing operators in different setting and different population is affected mostly.

Outcome reveals that among the 30 participants the working day in Rana Plaza were 33.3% participants were 0-6 months, 20% participants were 6-12 months, 3.3% participants were 12-18 months, 10% participants were 18-24 months, 6.7% participants were 24-36 months & 26.7% participants were more than 36 months. From the table 4.8.2 found that the Chi-square value between Days of working & Occuring pain of the participants was 3.937 and p-value was 0.559 (<.05). So the result was not significant that indicate there was no association between Days of working & Occuring pain of the participants.

After analysis researcher found that among 30 participants who suffered from PTMD most affected body parts were spine in 43.3% participants, hip in 13.3% participants, knee in 13.3% participants, ankle in 13.3% participants, elbow in 6.7% participants, wrist in 6.7%

participants, head in 3.3% participants. In India most of the workers were exaggerated body parts were neck (80%), shoulder (20%), wrist (45%), and low back (75%) (Ghosh & Das, 2010). Alexopoulos et al., (2004) create that prevalence of affected body parts were head/neck (42%), low back (34%), upper back (28%), wrists/hands (20%), shoulders (16%), ankles/feet (13%), knee (12%), hips (6%) and elbows (5%). Gangopadhyay et al., (2010) stated that musculoskeletal disorders mostly affecting the lower back (97%), knees (85%) and shoulders (77%).

Analysis demonstrated that 30 participants who suffered from PTMD 56.7% participants suffered from pain, 33.3% participants had paresthesia, 10% had cramp. Analysis showed that, most patients suffered from PTMD & the most common symptom was pain. Chyuan et al., (2012) 84% participants reported experience of WRMD related pain. Scherzer et al., (2005) 75% was experienced Work-related pain. From the table 4.4.2 found that the Chi-square value between occupation & symptoms of the participants was 9.194 and p-value was 0.326 (<.05). So the result was not significant that indicate there was no association between the occupation & symptoms of the participant.

Analysis demonstrated that 30 participants who suffered from PTMD 56.7% participants pain came from sudden & 43.3% participant pain came from gradually. Analysis demonstrated that 6.7% participants had mild symptoms, 70% participants had moderate symptoms and 23.3% participant had severe symptoms out of 30 participants.

Analysis showed that 83.3% participants out of 30 participants had work interruption due to PTMD and 16.7% participants out of 30 participants had not work interruption due to PTMD. In Germany work interruption due to WRMD in 28.7% (Prins et al., 2007). Scherzer et al., (2005) found in his research at Riyadh that only 21.62% missed work due to neck pain and only 24.66% due to back pain. (57.7%) 45 of the participants had work performance reduce due to WRMDs. According to European Agency for Safety and Health at Work (2009) 61% of work performance reduces due to PTMDs. From the table 4.3.2 found that the Chi-square value between occupation & work interruption was 8.824 and p-value was 0.050 (<.05). So the result was significant that indicate there was strongly association between occupation & work interruption of the participants.

Analysis showed that among the 30 participants who had suffered from PTMD, stressful position were working in same position for long periods for 60% participants, performing same task over and over for 3.3% participants, bending for 6.7% participants, carry heavy load for 30% participants. So, most common risk factors were working in same position for: (60%) and carry heavy load for 30% participants. Palmer (2007) claimed that repetitive work, static loading are responsible for most of the WRMDs. From the table 4.5.2 found that the Chi-square value between area of the participants & stressful position was 2.851 and p-value was 0.415 (<.05). So the result was not significant that indicate there was no association between area of the participants & Stressful position.

Analysis showed that 56.7% participants out of 30 participants had fracture and 43.3% participants out of 30 participants had no fracture due to PTMD. After analysis researcher found that among 30 participants who suffered from PTMD most affected body parts were shoulder in 3.3% participants, elbow in 6.7% participants, wrist in 10% participants, upper back in 3.3%, lower back in 10%, hip in 10% participants, knee in 3.3% participants, ankle in 10% participants.

After analysis researcher found that 40% participants out of 30 participants had done surgery & 60%, only 8% participants out of 30 participants had not done surgery for their condition. Analysis showed that 76.7% participants out of 30 participants had soft tissue injury due to PTMD and 23.3% participants out of 30 participants had no soft tissue injury due to PTMD.

In this study among 30 participants who suffered from PTMD 80% participants had taken physiotherapy treatment for their condition and 20% participants had taken medication. Krause et al., (2009) found that 73% taken medical treatment for musculoskeletal disorder.

Among the 30 participants, who had taken physiotherapy and medication for their condition all of the participants had a good prognosis. The percentages of prognosis were in 63.2% improved, 6.7% worse and 30% unchanged in the total participants.

Limitation of the study

Though the expected sample size was 276 for this study but due to resource constrain & time limitation researcher could manage just 50 samples which is very small to generalize the result for the wider population of the injured patients. There are no literatures about post-traumatic musculoskeletal disorder among the Rana plaza tragedy patients in the perspective of Bangladesh so it is difficult to compare the study with the other research. The researcher was able to collect data from savar upzella for a short period of time which will affect the result of the study to generalize for wider population. The questionnaire was developed only through searching sufficient literature but considering the context of the demography of the population a pilot study would substantial before developing questionnaire. The research project was done by an undergraduate student and it was first research project. So the researcher had limited experience with techniques and strategies in terms of the practical aspects of research. As it was the first survey of the researcher so might be there were some mistakes that overlooked by the supervisor and the honorable teacher.

CHAPTER - VI   CONCLUSION & RECOMMENDATIONS

6.1 Conclusion

In the garment sector of Bangladesh a large number of female workers are found to continue their work even they suffer from various diseases and illness as they have no other alternative to survive in the society. The growth and development of the garment sector largely depends on the female worker because female workers are the main contributor to this sector. We should believe that ill workers could not give us healthy economy. The competitive strength of the garment sector in the world market is seriously affected by the health problems of the workers, since it decreases the productivity of the workers to a great extent. Most of the garments factories do not have standard working hours. Forced labors common in Bangladesh especially in the RMG sector. Analysis showed that among the 50 participants 60% (n=30) participants had post-traumatic musculoskeletal disorder & 40% (n=20) participants had others post-traumatic disorder. The result of the study shows that, participants mean age was 28.93 years is more vulnerable. Most of the participant education level was primary level (30%) & illiterate (20%). The duration of job experience 5-15 years (60%) most commonly suffered by the PTMDs. In this research, the researcher found the participants had musculoskeletal disorders with higher prevalence of pain. The result indicates that most pain of the body regions is in the spine (43.3%), knee (13.3%), hip (13.3%), ankle (13.3%). The maximum severity of symptom was moderate (70%). The most common risk factors were working in same position for long time (60%) during sitting & standing and most common risk factor in sewing (73.3%) during sitting. Most of the patient about 80% participants had taken physiotherapy treatment for their condition. The percentage of prognosis were improved in (63.3%).

In addition to this, factory should have safety policy to practice and female workers should be given safety training, precaution in handling load, advice workers from awkward postures, ensure first aid box and trained workers to utilize it, and psychological counseling is essential to minimize the MSDs and pain. The study was represents the strong evidence that prevalence of post-traumatic musculoskeletal disorders among the Rana Plaza tragedy patients. In order to reduce musculoskeletal problems, correct postural practices,

physiotherapy treatment, proper design of tools and equipment significantly can prevent MSDs.

6.2 Recommendations

The aim of the study was to find out the prevalence of post-traumatic musculoskeletal disorder among the Rana Plaza tragedy patients. However, the study had some limitations it some further steps were identified that might be taken for the better accomplishment of further study. The main recommendations would be as follow:

☐ The random sampling technique rather than the convenient would be chosen in further in order to enabling the power of generalization the results.

☐ The duration of the study was short, so in future wider time would be taken for conducting the study.

☐ Investigator use only 50 participants as the sample of this study, in future the sample size would be more.

☐ In this study, the investigator took the sample from savar upzella but it was small area to take available sample. So for further study investigator strongly recommended to include every place in Bangladesh and so the results would be generalized in wider population.

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Consent Form

Assalamu-alaikum/ Namasker,

I am Md. Atiqur Rahman, 4th year student of B.Sc in Physiotherapy at Bangladesh Health Professions Institute. I am conducting a research and the title is **"Prevalence of post-traumatic musculoskeletal disorders among the Rana Plaza tragedy patients"** which is included my course. For that I'm asking you to answer some questions, which will take 15-20 minutes. It also ensures that the information you provide will be kept confidential.

Participation here depends on your own will. If you want, you can skip your name from the list of participants at any time. In addition, if you have any questions as a participant in this study or if there is any problem, you can contact with my Supervisor Mohammad Anwar Hossain, Associate Professor, BHPI and Head of the Department, Department of Physiotherapy, CRP, Savar, Dhaka-1343.

Do you have any questions before starting the research?

Can I start this interview with your permission?

Yes: ☐   No: ☐

Signature of the Participant _____

Signature of the Interviewer _____

Signature of the Witness   _____

Questionnaire (English)

Code No:

Prevalence of post-traumatic musculoskeletal disorders among the Rana Plaza tragedy patients.

Section- A: Personal information

1.1 Name of Interviewer: ....

1.2 Date of interview: ………………………

1.3 Time of interview: ……………………

Respondent Identification

1.4 Name of Respondent: ……………………………….Age:…………

1.5 Address:………………………………………………………

1.6 Contact number: …………………………….

Questionnaire (English)

This questionnaire is developed for **"Prevalence of post-traumatic musculoskeletal disorders among the Rana Plaza tragedy patients"** this study and this section will be filled (V) mark in the right of point, but in special consideration researcher using a black or blue pen.

Section- B: Socio demographic Information

2.1	Gender	1. Male
		2. Female
2.2	Present occupation :	1. Garment's worker
		2. Day labor
		3. Business
		4. Housewife
		5. Cleaner
		6. Driver
		7. Unemployed
		8. Other
2.3	Work experience :	1. 0-1Years
		2. 1-5 years
		3. 5-15 years
		4. More than 15 years
2.4	Marital status:	1. Married
		2. Unmarried

2.5	Educational level :	1. Illiterate 2. Primary School 3. Secondary School 4. S.S.C 5. H.S.C 6. Graduate & Other
2.6	Area :	1. Urban 2. Rural
2.7	Monthly income :	Amount :
2.8	What type of work do you perform in Rana Plaza?	1. Swing 2. Counting the materials 3. Put on the bottoms 4. Pushing 5. Lifting 6. Supervisor 7. Others
2.9	How many day do you work in Rana Plaza?	1. 0 – 6 months 2. 6 – 12 months 3. 12 – 18 months 4. 18 – 24 months 5. 24 – 36 months 6. More than 36 months
2.10	Habit :	1. Smoking 2. battle leaf

Section-C: Symptoms and Risk indicator related question

3.1	Have you ever experienced musculoskeletal discomfort in any part of your body due to work?	1. Yes 2. No
3.2	Which type of post-traumatic disorder are you being experienced?	1. Musculoskeletal disorder 2. Others
3.3	Please mark body areas where you have problems:	

3.4	What words best describe your symptoms?	1. Pain 2. Paresthesia 3. Cramp 4. Numbness 5. Tingling 6. Swelling 7. Stiffness 8. Weakness
3.5	How does your pain come?	1. Sudden 2. Gradual
3.6	How severe is your pain? (VAS)	0--------------------5--------------------10 1. Mild (0 – 3) 2. Moderate (4 – 7) 3. Severe (8 – 10)
3.7	Do you feel any difficulty in your work?	1. Yes 2. No
3.8	Which type of activity increase your work related musculoskeletal disorder?	1. Working in the same position for long-time (Standing, bend over, sitting position etc.) 2. Performing the same task over and over 3. Bending position 4. Repetitive movement of upper limb 5. Carry heavy load

3.9	Did you have any fracture in your body?	1. Yes 2. No
3.10	Where was the fracture of your body?	1. Neck 2. Shoulder 3. Elbow 4. Wrist 5. Upper back 6. Lower back 7. Hip 8. Knee 9. Ankle
3.11	Did you have any surgery due to post-traumatic musculoskeletal disorder?	1. Yes 2. No
3.12	Do you have any problem in your gait?	1. Yes 2. No
3.13	Do you use any assistive device?	1. Yes 2. No
3.14	Do you have any soft tissue injury in your body?	1. Yes 2. No
3.15	Did you go to physician or physiotherapist due to any musculoskeletal problem?	1. Yes 2. No
3.16	What kind of treatment did you receive?	1. Physiotherapy 2. Medication 3. Others
3.17	If yes, then what was the result?	1. Improved 2. Worse

		3. Unchanged

Thank you for completing the survey

APPENDIX-C

সম্মতি পত্র

(অংশগ্রহণকারীকে পড়ে শোনাতে হবে)

আমি মোঃ আতিকুর রহমান, 'বাংলাদেশ হেলথ প্রফেশন ইন্সিটিউট' এর চতুর্থ বর্ষের একজন ছাএ। আমি একটি গবেষণা করছি যার শিরোনাম হল **"রানা প্লাযা বিপর্যয়ে আঘাত পরবর্তি পেশি-অস্থির ব্যাধি সংক্রান্ত রোগের প্রাদুর্ভাব নির্ণয়"** যেটা আমার অধ্যয়নের অন্তর্গত।এই জন্য আমি আপনার কাছে কিছু প্রশ্নের উত্তর জানতে চাচ্ছি, যেটাতে সর্বমোট ১৫-২০ মিনিট সময় লাগবে। এটাও নিশ্চিত করছি যে আপনি যেসব তথ্য প্রধান করবেন তার গোপনীয়তা বজায় থাকবে।

এখানে অংশগ্রহন আপনার নিজের উপর নির্ভর করে।আপনি চাইলে যে কোন সময় কোন ফলাফল ছাড়াই চলে যেতে পারেন। এ ছাড়াও যদি আপনার এই গবেষণায় অংশগ্রহন কারী হিসেবে কোন প্রশ্ন থাকে তাহলে আপনি আমাকে অথবা আমার তত্ত্বাবধায়ক মোহাম্মদ **আনোয়ার হোসেন, সহযোগী অধ্যাপক** এবং বিভাগীয় প্রধান ফিজিওথেরাপী, বিএইচপিআই, সিআরপি, সাভার, ঢাকা– ১৩৪৩, যোগাযোগ করতে পারেন। এরসাথে যোগাযোগ করতে পারেন।

গবেষণাটি শুরু করার আগে আপনার কোন প্রশ্ন আছে?

আমি কি আপনার অনুমতি পেয়ে এই সাক্ষাতকারটি আরাম্ভ করতে পারি?

হ্যাঁ...............

না ....

অংশগ্রহণকারীর স্বাক্ষর ও তারিখ.............................

তথ্য সংগ্রহকারীর স্বাক্ষর ও তারিখ...........

গবেষকের স্বাক্ষর ও তারিখ..........................

প্রশ্নপত্র (বাংলা)

ক্রমিক

নম্বর :

"রানা প্লাযা বিপর্যয়ে আঘাত পরবর্তি পেশি-অস্থির ব্যাধি সংক্রান্ত রোগের প্রাদুর্ভাব নির্ণয়"

অংশ – ক ব্যাক্তিগত তথ্য

১.১ তথ্য সংগ্রহকারীর স্বাক্ষর :..

১.২ তথ্য সংগ্রহের দিন : ....   সময় :....................

তথ্য প্রদানকারির পরিচিতি

১.৩ তথ্য প্রদানকারির নাম :...

১.৪ বয়স : ....

১.৫ ঠিকানা : ....

১.৬ মোবাইল নম্বর : ....

প্রশ্নপত্র (বাংলা)

এই প্রশ্নপত্রটি "রানা প্লাযা বিপর্যয়ে আঘাত পরবর্তি পেশি-অস্থির ব্যাধি সংক্রান্ত রোগের প্রাদুর্ভাব নির্ণয়" চিহ্নিত করার জন্য তৈরি করা হয়েছে এবং এই প্রশ্নপত্রটি গবেষণায় অংশগ্রহণকারী ব্যক্তি সঠিক উত্তরের ডান পাশে (V) চিহ্ন দিয়ে পূরণ করবেন, এবং বিশেষ ক্ষেত্রে গবেষক কালো অথবা নীল কালি ব্যবহার করবেন।

অংশ -খ : আর্থ-সামাজিক তথ্য সম্পর্কিত প্রশ্ন

২.১	লিঙ্গ	ক) পুরুষ
		খ) মহিলা
২.২	বর্তমান পেশা	ক) কারখানা শ্রমিক
		খ) দিন মজুর
		গ) ব্যবশা
		ঘ) গৃহিনী
		ঙ) পরিস্কার করা
		চ) গাড়ি চালক
		ছ) বেকার
		জ) অন্যান্য
২.৩	কাজের অভিজ্ঞতা	ক) ০-১ বৎসর
		খ) ১-৫ বৎসর
		গ) ৫-১৫ বৎসর
		ঘ) ১৫ বৎসর এর বেশি
২.৪	বৈবাহিক অবস্থা	ক) বিবাহিত
		খ) অবিবাহিত

২.৫	শিক্ষাগত যোগ্যতা	ক) অশিক্ষীত
		খ) প্রাথমিক
		গ) উচ্চ বিদ্যালয়
		ঘ) এস এস সি
		ঙ) এইচ এস সি
		চ) ডিগ্রী অথবা অন্যান্য
২.৬	বাসস্থান	ক) শহর
		খ) গ্রাম
২.৭	মাসিক আয়	টাকা :
২.৮	আপনি রানা প্লাযায় কি কাজ করতেন ?	ক) সেলাই করা
		খ) উপাদান গোনা
		গ) বোতাম লাগানো
		ঘ) ধাক্কা
		ঙ) টানা
		চ) তত্ত্বাবধায়ক
২.৯	আপনি কত দিন ধরে রানা প্লাযায় কাজ করেছন ?	ক) ০ – ৬ মাস
		খ) ৬ – ১২ মাস
		গ) ১২ – ১৮ মাস
		ঘ) ১৮ – ২৪ মাস
		ঙ) ২৪ – ৩৬ মাস
		চ) ৩৬ মাসেরও বেশি
২.১০	অভ্যাস	ক) ধুমপান
		খ) পান-জর্দা

	অংশ – গ: উপসর্গ ও ঝুঁকি সম্পর্কিত প্রশ্ন	
৩.১	আপনার কি শরীরের কোন অংশে কাজ সম্পর্কিত পেশি-অস্থির ব্যাধির অভিজ্ঞতা আছে ?	ক) পেশি-অস্থির সমস্যা খ) অন্যান্য
৩.২	আঘাত পরবর্তি কোন ধরনের রোগের অভিজ্ঞতা রয়েছে আপনার।	ক) খ)
৩.৩	আপনার দেহের কোন অংশে পীড়া আছে সেই অংশটি নিচের ছবিটিতে কালো কালিতে পূরণ করুন।	Head Neck Shoulder Spine Elbow Hip Wrist Knee Ankle
৩.৪	কোন শব্দটি আপনার লক্ষনকে বর্ণিনা করে ?	ক) ব্যাথা খ) যন্ত্রণা গ) শিরটান ঘ) অবশতা ঙ) জড়তা চ) খিঁচুনি ছ) রণন জ) ফুলে যাওয়া
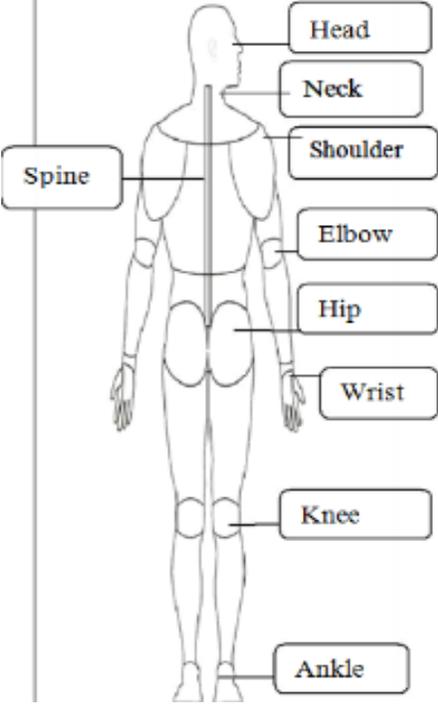
৩.৫	কেমন করে আপনার ব্যথা শুরু হয় ?	ক) হঠাৎ করে খ) ঢালুভাবে
৩.৬	আপনার ব্যথার তীব্রতা কি রকম ?	০---------------------৫-----------------------১০ ক) হালকা ব্যথা (০ – ৩) খ) মাঝারি ব্যথা (৪ – ৭) গ) তীব্র ব্যথা (৮ – ১০)
৩.৭	কাজ করার সময় কি কোন অসুবিধা অনুভব করেন ?	ক) হ্যাঁ খ) না
৩.৮	কি ধরণের কাজে আপনার পেশি-অস্থির ব্যাধির লক্ষন প্রকাশ পায় ?	ক) একই অবস্থায় দীর্ঘ সময় কাজ করলে (দাঁড়িয়ে, বসে) খ) একই কাজ বারবার করলে গ) হাঁটু গেড়ে বসে কাজ করলে ঘ) দুই হাতে খুব বেশী কাজ করলে ঙ) বেশী ভার বহন করলে
৩.৯	আপনার শরীরের কোন অংশ কি ভেঙ্গে গিয়েছিল ?	ক) হ্যাঁ খ) না
৩.১০	কোন অংশে ভেঙ্গে গিয়েছিল ?	ক) ঘাড় খ) কাধ গ) কনুই ঘ) কজ্জি ঙ) পিছনের উপর ভাগ চ) পিছনের নিচ ভাগ ছ) ঊরু-স্বধি জ) হাঁটু ঝ) গিরা

৩.১১	আঘাত পরবর্তি পেশি-অস্থির ব্যাধি সংক্রান্ত রোগের জন্য কি আপনার কোন অপারেশন করা হয়েছিল ?	ক) হ্যাঁ খ) না
৩.১২	আপনি কি চলাফেরার সময় অসুবিধা অনুভব করেন ?	ক) হ্যাঁ খ) না
৩.১৩	আপনি কি চলাফেরার জন্য কোন সাহায্যকারি বস্তু ব্যবহার করেন ?	ক) হ্যাঁ খ) না
৩.১৪	আপনার শরীরের কোন অংশে নরম পেশির সমস্যা অনুভব করেন ?	ক) হ্যাঁ খ) না
৩.১৫	আপনি কি কখনও চিকিৎসক অথবা ফিজিওথেরাপিস্টের কাছে পেশি-অস্থির ব্যাধির চিকিৎসার জন্য গিয়েছিলেন ?	ক) হ্যাঁ খ) না
৩.১৬	আপনি কি ধরণের চিকিৎসা নিয়েছিলেন ?	ক) ফিজিওথেরাপি খ) ঔষধ গ) অন্যান্য
৩.১৭	যদি নিয়ে থাকেন, তাহলে ফলাফল কি ?	ক) উন্নত খ) খারাপ গ) অপরিবর্তিত

জরিপটি সম্পূর্ণ করার জন্য আপনাকে ধন্যবাদ

<center>**Permission letter**</center>

April 25, 2017

Head of the Department

Department of Physiotherapy

Bangladesh Health Professions Institute (BHPI)

CRP, Chapain, Savar, Dhaka-1343.

Subject: Seeking permission for data collection to conduct my research project.

Dear Sir,

With due respect and humble submission to state that I am Md. Atiqur Rahman, a student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project entitled on**"PREVALENCE OF POST-TRAUMATIC MUSCULOSKELETAL DISORDERS AMONG THE RANA PLAZA TRAGEDY PATIENTS".** To conduct this research project, I want to collect data from the community at savar upzella. I would like to assure that anything of my study will not be harmful for the participants.

I, therefore, pray and hope that you would be kind enough to grant my applicationand oblige thereby.

Sincerely yours,

MD. Atiqur Rahman

Md. Atiqur Rahman

Student of 4th Professional B.Sc. in Physiotherapy

Roll-35, Session:2012-2013

Bangladesh Health Professions Institute (BHPI)

(An academic Institute of CRP)

CRP, Chapain, Savar, Dhaka-1343.

Seen 26/04/17

Allowed
26/04/17
Md. Obaidul Haque
Associate Professor & Head of the Department
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)
(The Academic Institute of CRP)

Ref: CRP-BHPI/IRB/04/17/114   Date: 15/04/2017

To
Md. Atiqur Rahman
B.Sc. in Physiotherapy
Session: 2012-2013, Student ID: 112120036
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: "Prevalence of post-traumatic musculoskeletal disorders among the Rana Plaza tragedy patients"

Dear Md. Atiqur Rahman,

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on 16/08/2016 to conduct the above mentioned dissertation, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

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

Since the study involves a self-administered questionnaire that takes 15 to 20 minutes and have no likelihood of any harm to the participants. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 09:00 AM on August 17, 2016 at BHPI.

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

Best regards,

Millat Hossain

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

CRP-Chapain, Savar, Dhaka-1343. Tel: 02-7745464-5, 7741404 , Fax: 02-7745069,
Email: contact@crp-bangladesh.org, www.crp-bangladesh.org