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Prevalence of Musculoskeletal Disorders Among The Garment Workers In Dhaka City

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CONTENTS

LIST OF TABLES

Table no	Title	Page
Table no-1	Distribution of the respondents by age	42
Table no-2	Distribution of the respondents by family member	46
Table no-3	Distribution of the respondents by monthly family income	47
Table no-4	Distribution of respondents by regular working hours	47
Table no-5	Distribution of the respondents by duration of work (in year)	48
Table no-6	Distribution of the respondents by daily time spending sitting at work (hours)	49
Table no-7	Distribution of the respondents by daily time spending standing at work (hours)	49
Table no-8	Distribution of the respondents by heavy physical duty (lifting)	50
Table no-9	Distribution of the respondents by perceived stress at work	50
Table no-10	Distribution of the respondents by suffering from diabetes	51
Table no-11	Distribution of the respondents by suffering from common co-morbidities	53
Table no-12	Distribution of the respondents by sick number of days last 12 months	52
Table no-13	Distribution of the respondents by duration of suffering from musculoskeletal disorder pain (n=109)	53
Table no-14	Distribution of the respondents by Pain in different part	53
Table no-15	Distribution of respondents by pattern of musculoskeletal disorder	54
Table no-16	Distribution of the respondents by leave for musculoskeletal disorder pain	55
Table no-17	Distribution of the respondents by frequency of leave last 12 months	55
Table -18	Distribution of the respondents by received treatment for musculoskeletal disorder pain	56
Table-19	Distribution of the respondents by causes of not received treatment (n=111)	56
Table-20	Distribution of the respondents by experienced usculoskeletal disorder in the past	57
Table-21	Distribution of the respondents by duration of affected musculoskeletal disorder	57
Table-22	Distribution of respondents by height	58
Table-23	Distribution of respondents by weight	58
Table-24	Distribution of respondents by BMI	59
Table-25	Relationship between hours spent sitting and participants with and without musculoskeletal disorder pain	59
Table-26	Relationship between hours spent standing and participants with and without musculoskeletal disorder pain	60
Table-27	Relationship between hours lifting and participants with and	60

LIST OF FIGURES

LIST OF ABBREVIATIONS

BDHS: Bangladesh Demographic Health Survey
BRAC: Bangladesh Rural Advancement Committee
DGHS: Directorate General of Health Services
DSF: Demand Side Financing
FWV: Family Welfare Visitor
FWC: Family Welfare Centre
JICA: Japan International Cooperation Agency
MDG: Millennium Development Goal
NIPORT: National Institute of Population Research and Training.
NGO: Non Governmental Organization
PAHO: Pan American Health Organization
SD: Standard Deviation
SEAR: South East Asia Region
UNICEF: United Nations Children's Fund
UHCs: Upazilla Health Complexes
WHO: World Health Organization

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ABSTRACT

Ready made Garment sector is the major sector contributing to the national economy. There are 4296 garment industries are running where 4.00 million workers are employed. In the financial year 2014-2015, RMG export 25491.40 million dollar which is the 81.71% of total export. It is very important to know the prevalence and associated risk factors for occurring musculoskeletal disorders among the RMG workers. A descriptive type of cross sectional study was carried out to find the prevalence of musculoskeletal disorders among the readymade garment workers in Dhaka city. The study was conducted from June 2015 to May 2016. Random sampling was used to collect data. Respondents (N=260) were interviewed with a custom made questionnaire. The gathered data were analyzed by SPSS software version 20 using descriptive statistics, chi-square test. In this study the mean age of the respondent was 21.89; (SD ± 3.899). Educational levels of 44.2% respondents belong to secondary or bellow secondary level. Number of family member mean 4.30; (SD=±4.30). Monthly income average was Taka 6750.38 and most of (52.3%) were in Taka 6001-7000. Working hours average was 9.63; (SD=±1.725). The musculoskeletal disorder pain prevalence was 41.9% and among them more than two third (63.8%) of garments workers had been suffering from 1-2 years. There is more neck pain in respondents, 29.3%. 18.3% in shoulder, 10.1% in elbow 7.3%, 11%, 14.6% in hips, knee, ankles/feet and the rest of 14.6% is low back pain. Musculoskeletal disorder (e.g. pain) developed in 46.2% of respondents who spent 7-8 hours of total working hours daily in sitting and 47.3% worked in standing posture. Most of 43.5% respondent experienced occasional mental stress due to excessive work load and 26.2% experienced all the time stress. 23.8% respondents were

involved in heavy physical duty (lifting). Type of co-morbidities 13.8% had suffered diabetes, 23.1% had hypertensive and 22.3% had arthritis and more than fifty (52.2%) had common co-morbidities. There was relationship between increased daily times hours spend in sitting, standing, lifting by participants and development of musculoskeletal disorders were increased and the risk of developing musculoskeletal disorder pain was 1.64, 1.62 & 1.31. Average loss of working days due to musculoskeletal disorder per year for per person was 6.67 days. The findings are statistically highly significant (p=0.001).

Key words: **Prevalence, Musculoskeletal disorders, Garment, Workers**

Chapter- I

1.1 INTRODUCTION:

Readymade Garment (RMG) sector plays an important role in the overall economic development of Bangladesh. Presently, approximately 2.0 million workers (among which 80% is female) are working in this sector which is a great source of employment (EPB, 2006). It is also mentionable that about 76% of the foreign exchange is earned by this sector (BGMEA, 2008). The garment industry of Bangladesh has been expanding rapidly since late 1970s. As new industries expand, the labor force grew with the economy of the country, at the same times the health hazards for those workers present there in various occupational diseases and accidents highly prevailed among the workers. Occupational health hazard is concerned with health hazard in relation to work environment. The science of occupational health hazards covers a wide field, like work physiology, occupational hygiene, occupational psychology, occupational toxicology etc. (Saha, 2010). "Musculoskeletal disorders'' include 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 related conditions (tenosynovitis, epicondylitis, bursitis), nerve compression disorders (carpal tunnel syndrome, sciatica), and osteoarthrosis, as well as less well standardized conditions such as myalgia, musculoskeletal disorder pain and other regional pain syndromes not attributable to known pathology. Body regions most commonly involved are the low back, neck, shoulder, forearm, and hand, although recently the lower extremity has received more attention. Musculoskeletal disorders (MSDs) are widespread in many countries, with substantial costs and impact on quality of life. Although not uniquely

caused by work, they constitute a major proportion of all registered and/or compensable work-related diseases in many countries. Accurate data on the incidence and prevalence of musculoskeletal disorders are difficult to obtain, and official 103 statistics are difficult to compare across countries. Nevertheless, MSDs are the single largest category of work-related illness, representing a third or more of all registered occupational diseases in the United States, the Nordic countries, and Japan. MSDs occur in certain industries and occupations with rates up to three or four times higher than the overall frequency. High-risk sectors include nursing facilities; air transportation; mining; food processing; leather tanning; and heavy and light manufacturing (vehicles, furniture, appliances, electrical and electronic products, textiles, apparel and shoes) (Bernard, 2015). Disorders of the musculoskeletal system are the single largest group of work related illness in the developed world. 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. Work provides income and thus contributes to a better socioeconomic condition which, in turn, is related to good health. However, the work environment exposes many workers to health hazards that may result in injuries, respiratory diseases, cancers, musculoskeletal disorders, reproductive disorders, cardiovascular diseases, mental and neurological illnesses, eye damage, and hearing loss, as well as communicable diseases. Musculoskeletal problems were the commonest health problem detected in the study population. This may be explained by the fact that their work required them to remain in a bent position for many hours at a stretch, often in an overcrowded, ill-ventilated, and poorly illuminated room. The

neck was the commonest anatomical area to be affected. Similar findings were reported by the Canadian Women's Health Network, with musculoskeletal disorders being the most common hazard in women engaged in sewing and the neck being the most commonly affected part, followed by the low back. From 1996 to 2000, the Union of Needle trades Industrial and Textile Employees created a union-based health program to provide more timely access to medical treatment for garment and textile workers in New York. Investigators at New School University Health Policy Research Center conducted a descriptive evaluation of the project. The evaluation also described the patient population, their work-related injuries and the impact of these injuries on income and their medical benefits. The union implemented the system in 1996. According to the project director, since 1999 approximately 1,000 injured workers each year have received medical treatment for workplace injuries through the center or its participating outside providers. Carpal tunnel syndrome was the top diagnosis for both the garment workers and the computer users. Other common work-related conditions included forearm tendonitis, lateral epicondylitis (i.e., tennis elbow), neck tension and wrist/digit tendonitis. (Robert Wood, 2014). In developing countries, great efforts are directed towards the advancement of small-scale industries as these are considered the engine for their economic growth. According to WHO, over 1000 million people worldwide are employed in small-scale industries.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 (Holtermann, 2012). 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. Stress at work is a growing problem for all workers, especially women. Many of the job conditions, along with the problem of balancing work and family issues, contribute to stress in the workplace (Nusrat Jahan, 2015) Musculoskeletal conditions are prevalent and their impact is pervasive. They are the most common cause of severe long term pain and physical disability, and they affect hundreds of millions of people around the world. They significantly affect the psychosocial status of affected people as well as their families and careers. At any one time, 30% of American adults are affected by joint pain, swelling, or limitation of movement. Musculoskeletal conditions are a diverse group with regard to pathophysiology but are linked anatomically and by their association with pain and impaired physical function. They encompass a spectrum of conditions, from those of acute onset and short duration to lifelong disorders, including osteoarthritis, rheumatoid arthritis, osteoporosis, and musculoskeletal disorder pain. The prevalence of many of these conditions increases markedly with age, and many are affected by lifestyle factors, such as obesity and lack of physical activity. The increasing number of older people and the changes in lifestyle throughout the world mean that the burden on people and society will increase dramatically (Anthony, 2003).

This has been recognized by the United Nations and WHO, with their endorsement of Bone and Joint Decade 2000–2010. The burden of musculoskeletal disorders can be measured in terms of the problems associated with them, that is the pain or impaired functioning (disability) related to the musculoskeletal system, or in relation to the cause, such as joint disease or trauma. The burden should also be considered in terms of who is at risk. A review of existing data as part of the Bone and Joint Monitor Project in collaboration with WHO's global burden of disease 2000 project recently identified the burden of musculoskeletal conditions (Anthony, 2003).

1.2 JUSTIFICATION OF THE STUDY

According to BGMEA source, there are 4296 garment industries are running where 4.00 million workers are employed. Export promotion bureau data source shows that in the financial year 2014-2015, RMG export 25491.40 million dollar which is the 81.71% of total export. Garment sector provides employment opportunities for both rural and urban populations and cater to the needs of the domestic and export markets. The manufacturing of readymade garments is highly labour intensive. Workers usually work for more than 9 hours a day and perform the same activity through out the day. Earlier studies indicate that garment manufacturing workers had neurological, respiratory and musculoskeletal problems. The objective of occupational Health and safety is to assure as far as possible that every working man and woman in the nation has a safe and healthy working environment. This is not achieved due to lack of studies on workers engaged in both organized and non organized sectors with reference to the health and safety measures.

Although some studies have dealt with musculoskeletal disorder pain among garment workers, the exact nature and prevalence of neck and shoulder problem has not been studied before in Bangladesh.

Work provides income and thus contributes to a better socioeconomic condition which, in turn, is related to good health. However, the work environment exposes many workers to health hazards that may result in injuries, respiratory diseases, cancers, musculoskeletal disorders, reproductive disorders, cardiovascular diseases, mental and neurological illnesses, eye damage, and hearing loss, as well as communicable diseases.

Musculoskeletal problems were the commonest health problem detected in this study population. This may be explained by the fact that their work required them to remain in a bent position for many hours at a stretch, often in an overcrowded, ill-ventilated, and poorly illuminated room. The neck was the commonest anatomical area to be affected. Similar findings were reported by the Canadian Women's Health Network, with musculoskeletal disorders being the most common hazard in women engaged in sewing and the neck being the most commonly affected part, followed by the low back (Tushar Kanti Saha et al., 2010).

1.3. RESEARCH QUESTION:

What is the prevalence of musculoskeletal disorders among the readymade garment workers in Dhaka city?

1.4. OBJECTIVES:

1.4.1 General Objective:

To find out the prevalence of musculoskeletal disorders among the readymade garment workers in Dhaka city.

1.4.2 Specific Objectives:

i) To find out the percentage of neck, shoulder, back pain among the swing and cutting workers.

ii) To evaluate awareness of workers about the safety body mechanics and correct use of machines.

iii) To assess the type's of musculoskeletal health problems experienced by female garment workers.

iv) To assess the relationship of socio-demographic with the musculoskeletal disorders.

v) To identify the socio-demographic characteristics among the garments worker.

1.5 KEY VARIABLES:

A. Socio-Demographic Variables

- Age

- Sex

- Religion

- Marital status

- Educational status

- Education of husband/father's

- Occupation of husband/father's

- Monthly family income

- Number of child

- Duration of work experience

- Pattern of working section

B. Variables Related To Environment of Working Place

- Standard working hours

- Status of overtime facilities

- Type of overtime

- Average overtime hours per day

C. General Health Related Information

- Suffer from any other disease

- Hypertension

- Suffer from any of co-morbidities

- During last twelve months sick leave

D. Musculoskeletal Disorder Related Information

- Musculoskeletal pain

- Place of treatment of Musculoskeletal pain

- Past experience of Musculoskeletal pain

- Duration of present experience of Musculoskeletal pain

1.6 OPERATIONAL DEFINITIONS

Prevalence: Prevalence measures the proportion of the population that experiences musculoskeletal disorder pain at a given time, which can be at any specified point (point prevalence) or in a past period such as 1 month, 1 year, or a lifetime.

Garment-worker: Garment factory workers refers to employees working in the garment factory

Garments factory: Factory where readymade garments are prepared, using cotton cloths, mixed synthetic cotton cloths, cotton thread and wool as raw materials.

Perception-The way in which something is regarded, understood or interpreted.

Education: A continuous variable giving completed years of education Enroll A binary variable equal to one if the individual was enrolled in school in a given year (constructed using retrospective information about the age the individual began school and ultimate completion), and zero if the individual was not enrolled in school. It is defined from ages 5 to 18.

Musculoskeletal Disorders: Musculoskeletal disorders (MSDs) consist of minor physical disabilities. This term is used to describe a variety of conditions that affect the muscles, bones, and joints. The severity of the MSD can vary. Pain and discomfort may interfere with everyday activities. MSDs are extremely common, and risk increases with age. Early diagnosis is the key to ease pain while potentially decreasing further bodily damage. Symptoms of musculoskeletal disorders can hamper everyday tasks, such as walking, limited range of motion, as well as difficulties accomplishing favorite activities.

Low Back Pain: Low back pain is a universal human experience almost everyone has it at some point. The lower back, which starts below the ribcage, is called the lumbar region. Pain here can be intense and is one of the top causes of missed work. Fortunately, low back pain often gets better on its own. When it doesn't, there are effective treatments.

Sciatica: The kind of back pain that follows heavy lifting or exercising too hard. Sometimes back pain can be related to a disc that bulges or ruptures. If a bulging or ruptured disc presses on the sciatic nerve, pain may run from the buttock down one leg. This is called sciatica.

Obesity: Height was measured in centimeters in a standing position, with shoes removed, using a wall-mounted stadiometer. Weight was measured in kg with the subject in light indoor clothes, with shoes removed and emptied pockets. BMI (body mass index) was calculated as weight in kilograms divided by height in meters squared, and subjects were stratified into obese (BMI ≥ 30 kg/m2) and non obese (BMI < 30 kg/m2).

Neck Pain: Neck is made up of vertebrae that extend from the skull to the upper torso. Cervical disks absorb shock between the bones. The bones, ligaments, and muscles of neck support head and allow for motion. Any abnormalities, inflammation, or injury can cause neck pain or stiffness. Many people experience neck pain or stiffness in the neck occasionally. In many cases, it is due to poor posture, normal wear and tear, or overuse. Sometimes, neck pain is caused by injury from a fall, contact sports, or whiplash.Most of the time, neck pain is not a serious condition and can be relieved within a few days. In some cases, neck pain can indicate serious injury or illness and require a doctor's care. If neck pain continues more than a week, is severe, or is accompanied by other symptoms, it is important to seek medical attention immediately.

Shoulder Pain: Shoulder pain is a common problem with a number of different causes. It's often a symptom of another problem. What most people call the shoulder is really several joints that combine with tendons and muscles to allow a wide range of motion in the arm. Most shoulder problems fall into four major categories: Tendon inflammation (bursitis or tendinitis) or tendon tear, Instability, Arthritis, Fracture (broken bone). Other causes of shoulder pain include several forms of arthritis, torn cartilage, or a torn rotator cuff. Swelling of the bursa sacs (which protect the shoulder) or tendons can also cause pain. Some people develop bone spurs, which are bony projections that develop along the edges of bones. In some cases, pain in the shoulder isn't caused by a problem in the shoulder joint, but by a problem in another area, such as the neck, that is felt in the shoulder.

Ankle Pain: Ankle pain refers to any type of pain or discomfort in ankles. This pain could be caused by an injury, like a sprain, or by a medical condition, such as arthritis. According to the National University of Health Sciences, an ankle sprain is one of the most common causes of ankle pain making up 85 percent of all ankle injuries. A sprain occurs when ligaments (the tissues that connect bones) tear or get overstretched. Most ankle sprains are lateral sprains, which occur when foot rolls, causing outside ankle to twist toward the ground. This action stretches or rips the ligaments. A sprained ankle often swells and bruises for about seven to fourteen days. However, it may take a few months for a severe injury to heal fully.

Knee pain: The knee joint is particularly vulnerable to damage and pain because it takes the full weight of body and any extra force when run or jump. Persons are more likely to experience knee pain as they get older, and people who are overweight or do lots of sports have a higher risk of damaging their knees. Some sports that involve a lot of turning, such as football, netball and skiing carry a particularly high risk of knee injuries.

Chapter- I I

2. LITERATURE REVIEW

This study was designed to find out the prevalence of musculoskeletal disorders among the readymade garment workers in Dhaka city. For in depth conceptualization of the study problem, acquiring the background information and for selecting appropriate methods, considerable number of research articles published in various different national and international journals, reports, symposiums and seminars, abstract and textbooks were reviewed thoroughly and critically. For the search of literature, various organizations and institutions, libraries especially library of National Institution of Preventive and Social Medicine (NIPSOM), National health Library, Library of NIPORT, Dissemination and Information Service Center (DISC) of International Centre for Diarrhoeal Disease and Research, Bangladesh (ICDDR'B), Hinari and other different wed sites were used for this purpose.

The RMG industry has been Bangladesh's key export industry and a main source of foreign exchange for the last 25 years. As a result of an insulated market guaranteed by Multi-Fibre Agreement (MFA) of General Agreement Tariff and Trade (GATT) and supportive policies of the Government of Bangladesh (GoB), it attained a high profile in terms of foreign exchange earnings, exports, industrialization and contribution to the GDP within a short period. In less than a decade it increased its exports, foreign exchange earnings, and contribution to the GDP by 4.39 %. RMG

exports reached a steadfast figure of USD 17.91 billion in fiscal year 2010-2011; accounting more than 78% of national export earnings, which was about 4%-5% of the global total of such exports. It further contributes 10% to the country's GDP (Mahmud, 2012). RMG products are exported mainly to the United States of America and the European Union. Bangladesh's garment industry provides employment to about than 3.6 million workers which 2.8 million are women (Mahmud, 2012). Workers in these garment factories are almost always illiterate. They have very limited knowledge of human rights, working conditions and labour standards (Ahamed, 2015).

The cost and prevalence of work related musculoskeletal pain disability in industrialized countries are extremely high. Epidemiological studies indicate that as many as 85% of adults will miss work or seek professional care for musculoskeletal pain during their working career. Although most cases of acute pain sustained in occupational settings resolve quickly, with a rapid return to work, a small number of cases will progress to the chronic stage of work-related chronic musculoskeletal pain disability. The cases that progress to this chronic stage have been found to account for a disproportionately large amount of costs. For example, although only 10% of individuals with acute musculoskeletal disorder pain develop chronic musculoskeletal disorder pain disability, approximately 80% of all expenses arising from musculoskeletal disorder pain disability are accounted for by these individuals. Furthermore, chronic musculoskeletal disorder pain is the leading cause of occupational disability for people under the age of 45, and the third leading cause of disability for those over age 45 (Jeffrey, et al., 2002).

Kumar (2006) focuses; Garments workers are concerned with long working hours or double consecutive shifts, personally unsafe work environment, poor working conditions, wage and gender discrimination. Indeed, employers treat the RMG workers as slaves, exploiting workers to increase their profit margins and keep their industry competitive in the face of increasing international competition.

In 2001, service industries reported the highest proportion of WMSDs (25.8%) of WMSD cases, followed by manufacturing industries (22.9%) of WMSD cases. Data from the US Department of Labor, Bureau of Labor Statistics show that newly reported illnesses due to repeated trauma have represented about 4% of all injuries and illnesses since their peak number in 1993. Among the top 10 industries reporting WMSDs, half (i.e., assemblers, construction laborers, supervisors in sales, carpenters, and cashiers) are prone to develop UE WMSDs through the use of hand tools or the performance of hand-intensive tasks. Illnesses due to repetitive motion resulted in the longest absences from work in 2001, a median of 18 days. Carpal tunnel syndrome (CTS), caused by compression of the median nerve in the carpal tunnel with subsequent loss of sensorimotor function along the median nerve distribution, was associated with the highest median days away from work (25 days), and injuries to the wrist in general resulted in a median of 13 days away from work (Ann , 2016).

Utilization of health care services- Musculoskeletal complaints are the second most common reason for consulting a doctor and constitute, in most countries, up to 10% to 20% of primary care consultations. In the Ontario Health Survey, musculoskeletal complaints were the reason for almost 20% of all health care utilization. They were the most expensive disease category in the Swedish cost of illness study, representing

22.6% of the total cost of illness; the greatest costs were indirect costs related to morbidity and disability. The total direct cost for use of health services that results from musculoskeletal conditions was 0.7% of the gross national product in the Netherlands, 1.0% in Canada, and 1.2% in the USA. The indirect costs of musculoskeletal conditions (loss of productivity and wages) were much greater than the direct costs, corresponding to 2.4% and 1.3% of the gross national products of Canada and the USA, respectively (Anthony, 2003).

Alireza, Houshang & Mohammadali (2004), did a study to identify an effective tool for ergonomic bottlenecks in weaving workshops and enlisted a checklist containing lighting, hand tools, working posture and thermal conditions after studying around 50 such stations. (Alireza, et al., 2004)

Treaster & Burr (2004), did a literature review on the current base to determine the strength of support for the hypothesis that women experience higher prevalence of upper extremity musculoskeletal disorders (UEMSDs) than men, for which 56 articles were reviewed and concluded that majority of the studies showed that women had significantly higher incidences of various types of UEMSDs than men. (Treaster, 2004)

Tiwari, Pathak & Zodpey (2003),did a cross sectional study on 514 textile workers by using an interviewer method as a tool and found out that working position and duration of exposure are significant factors in the prevalence on low back pain among the textile workers along with other factors.(Tiwari, 2003)

Ohisson, et al. (1995), did a cross-sectional study to assess physical examinations of the neck and upper limbs on 82 working female industrial workers with exposure to repetitive work tasks and on 64 working referent subjects without exposure to

repetitive work tasks and found statistically significant association between repetitive work tasks and musculoskeletal injuries among the 82 working female population then compared to the 64 group (Ohlsson, 1995)

Chavalitsakulchai & Shahnavaz (1993), in their survey using interviews based on Standardized Nordic Questionnaires for evaluating musculoskeletal disorders of 1,000 female workers in five different industries in Thailand, viz. garment, fertilizer, pharmaceutical, textile, and cigarette found that about 50% of the female workers experienced a high prevalence of musculoskeletal symptoms in their lower backs, particularly the textile workers. (Chavalitsakulchai, 1993).

Bongers, et al. (1993) did a study to find out the association between psychosocial work factors and musculoskeletal disease and concluded that monotonous work, high perceived work load, and time pressure are related to musculoskeletal symptom (Bongers , et al., 1993).

Hopkins, (1990) did a survey on repetition injuries among keyboard operators using the Insel and Moo Work Environment Scale and certain other job stress variables and came to the conclusions about the need to redesign jobs in order to reduce the risk of repetition injuries.(Hopkins, 1990).

Dempsey, Patrick G., Burdorf, Alex, Webster, Barbara S. did a study to find out the influence of Personal Variables on Work-Related Low-Back Disorders and concluded that age, gender, injury history, relative strength, smoking, and psychosocial variables have a very significant affect on work related low back disorders (Salik, 2004).

Prevalence of musculoskeletal disorder:

Workers in the garment industry work in clothes designing; sewing or cutting services, and clothes wholesaling (Chan, et al., 2002). Due to the nature of these jobs, the prevalence of work related musculoskeletal disorders has been high. The nature and severity of the disorders have been considered to be the results of the job characteristics constrained and sustained work postures, highly repetitive actions, and strong visual demands. The consequences are obvious from the ergonomics points of view – physical and emotional suffering of the workers, high worker compensation costs, decreased productivity and overall inefficiency (Sarder, 2006).

Tushar Kanti Saha study found that on enquiring about their chief complaints we found that musculoskeletal problems (69.64%) were the commonest health problem. The body areas commonly affected was neck (64.10%), low back (41.03%), hand, wrist, finger, and shoulder. The common symptoms in these subjects were pain (69.23%), weakness (38.46%), and stiffness (23.08%) of the affected parts. The other morbidities that they detected were generalized weakness (14.29%), acidity and heart burn (26.79%), menstrual problems (5.36%), insomnia (21.43%), problems with vision (12.05%), skin diseases (25%), injury (9.82%), anemia (8.93%), angular stomatitis (14.29%), pedal edema (7.14%), hypertension (16.07%), malnutrition (37.50%), swelling of feet, cough and cold, loose motion, fever, and pain abdomen. Musculoskeletal morbidity was more common among older (>45 years) workers than in younger (<45 years) ones (77.27% *vs*. 67.78%), in females as compared to males (76.93% *vs*. 67.44%), in illiterate workers as compared to those who were literate (75.08% *vs*. 68.60%), and in substance abusers as compared to those who had no

history of substance abuse (74.32% *vs*. 60.53%); however, none of these differences were statistically significant. They also observed that musculoskeletal disorders were more common among those who had worked for more number of years (>10 years) (x^2=16.94; *P*= 0.0002, df = 2), worked for longer hours (>10 h/day) (x^2 = 12.67; *P*=0.0018, df = 2), and in those who were engaged in cutting and sewing (x^2 = 6.38; P = 0.0412, df = 2). All these differences were statistically significant (Tushar, et al., 2010)**.**

Lombardo (2011) study found that 164 (15.5%) of workers reported musculoskeletal symptoms occurring more than 3 times or lasting a week or greater during the previous 12 month period. The back was the most frequently affected region (57.3%), followed by knees (31.7%), shoulders (9.1%), hand and wrist (7.3%), neck (6.7%), and forearm and elbow (3.0%). Average symptom severity was moderate, and most individuals (55.8–83.3%) reported difficulty maintaining work quality as a result of their pain. Nearly all women (>90%) felt their problems affected their leisure activities and household work, though few reported missing work as a direct consequence of their discomfort. Frequency of musculoskeletal complaints increased monotonically with increasing age. Higher monthly income or more months spent working in the industry, and lower educational attainment all correlated positively with complaints. No significant relationships were identified for BMI or job type. In multiple regression analysis age, time in the industry, and monthly income were significantly associated with musculoskeletal complaints for any location. Those with any complaints were more likely to report moderate or worse quality of life and health satisfaction (Lombardo, 2011).

The prevalence of persistent neck and shoulder disorders has been found to increase with years of employment in sewing machine operators. However, some women never experience more than slight or moderate symptoms and never develop clinical neck or shoulder disorders despite many years of work. Knowledge of what makes neck and shoulder complaints develop into chronic conditions is sparse. 15.2% and 5.8% among sewing machine operators compared with 9.0% and 2.2%, respectively, among controls. The presence of the disorders was strongly associated with a self perception of poor general health. Although myofascial pain syndrome showed a U shaped association with years as a sewing machine operator, rotator cuff tendinitis was absent among the newest recruits and present among 15% of the women with more than 20 years as a sewing machine operator. Besides years as a sewing machine operator, the risk of having a neck-shoulder disorder at baseline was significantly associated with high stress (prevalence ratio (PR) =2.54; 95% confidence interval (95% CI) 1.28 to 5.05 (Anette, et al., 2016).

Studies consistently point to a high prevalence of work-related musculoskeletal symptoms in the clothing and textile industry (Anderson & Gaardboe, 1993b; Behrens, et al., 1994; Montreuil & Tellier, 1996). Symptoms especially occur in the regions of the neck, shoulder, hand, middle (thoracic) and lower (lumbar) back (Nag, Desai, & Nag, 1992). An ergonomics model is used to consider the current knowledge regarding these musculoskeletal problems, the associated risks and measures to control them.

Parimalam, et al. (2007) mention that the proportion of male and female workers in the finishing section were 43% and 57% respectively. 97% of the workers had knowledge of health problems about the various tasks involved in the finishing section. Ten percent of the workers had respiratory problems such as

breathing difficulty and asthma. Musculoskeletal problems were more common among the workers (34%). The reasons stated for such kinds of musculoskeletal problems were the repetitive nature of the job (56%), improper or lack of furniture and constrained work posture (38%). Musculoskeletal disorder pain (LBP) is a common, complex and difficult to manage health condition (Manchikanti, et al., 2009). Approximately, 20% of the adult population experience an episode of LBP at any given time and estimates of lifetime prevalence are around 80% (Walker, 2000). The economic burden of LBP is significant. For example, in the USA health-care expenditure for LBP is more than $90 billion/year (Luo, et al., 2004), in the UK it is $17 billion/year (Maniadakis & Gray, 2000) and in Australia $1 billion/year. Most of the costs of LBP are associated with persistent or chronic LBP, i.e. LBP which lasts for more than 3 months (Walker, et al., 2003). There are several important consequences of LBP including work loss (Marty, et al., 2008), disability and depression (Tucer, et al., 2009). Considerable attention has been applied to understanding and managing these problems (Cohen, et al., 2008), often with limited success. Evidence is beginning to accumulate that patients with LBP also report significant problems with their sleep (Hush, et al., 2009 & Tang, et al., 2007).

Common illnesses among the garment workers like asthma and other respiratory problems, backache, weak eye-sight, piles and anemia. In the factory workers suffer from allergy, backache, knee pain and headache which they attribute to the long hours of sitting work (Singh, 2009). Musculoskeletal disorder pain (LBP) is the most common and expensive musculoskeletal disorder in industrialized countries (Anderson, 1999). The 12-month prevalence in the general population has been estimated at 44% (Picavet & Schouten, 2003). LBP is frequently associated

with persistent or recurrent disability and absence from work. High costs are mainly due to sick leave and disability (Van- Tulder, et al., 1995). Almost one fourth of workers with LBP reported sick leave in the past year in the Netherlands (Picavet & Schouten, 2003). Consequently from an individual and societal perspective, effective interventions for LBP are needed to prevent long-term disability and promote early and safe return to work (Anema, et al., 2007).

In general the prevalence of chronic back pain should be placed in the circumstance of the prevalence of back pain. Many studies indicate to the high frequency of back complaints in society. 70–85 percent of all people have back pain at some time in life. The twelve-monthly prevalence of back pain ranges from 15% to 45%, with point prevalence averaging 30%. In the United States of America (USA), back pain is the most common cause of activity limitation in people younger than 45 years, the second most frequent reason for visits to the physician, the fifth-ranking cause of admission to hospital, and the third most common cause of surgical procedures. About 2% of the United States (US) labor force are remunerated for back injuries each year (Anderson, 1999).

The reason of musculoskeletal disorder pain cannot be clearly identified in 90% of patients. On the other hand, there is strong evidence that personal and occupational psychosocial variables play a more important role than spinal pathology or the physical demands of the job (Nguyen & Randolph, 2007). Musculoskeletal disorder pain is the enormous burden to individuals and society it have documented studies from around the world. A huge amount of studies have explored the relation between work factors and LBP. Risk of LBP have been consistently associated with the heavy lifting, frequent twisting and bending, whole body vibration, low social support at work, and low job satisfaction. The

relation between mechanical exposures at work and the occurrence of LBP related sickness absence was reported in several studies, with a majority of positive associations (Eriksen, et al., 2004). Low back disorders have been classified into physical job demand factors, psychosocial factors and individual factors as risk factors for occupational lower back disorders (Ferguson, et al., 2004).

The presence and severity of musculoskeletal disorder pain is associated with several socio- demographic factors, among them sex, age, education level, smoking, and occupation. Although the prevalence of back pain increases with age, the dose–response relation between age and musculoskeletal disorder pain is not linear, suggesting that multiple factors are involved. Gender differences in the prevalence of musculoskeletal disorder (MSD) are frequently observed, but the degree might differ from country to country. The 1988 National Health Interview Survey (NHIS) in the U.S. reported a higher prevalence of back pain in male workers, and a study on lower back pain in Japan from 1986 to 1988 showed the incidence in male worker was about four times greater than that in female workers. The association between education level and MSD has been documented for back pain and a high education level is generally found to be associated with a decreased risk of back pain (Guo, et al., 2004). One study of young adolescents and young adults' age 12–22 years demonstrated an overall prevalence of back pain of 7% (pain > 30 days during the past year). Young people with musculoskeletal disorder pain are more likely to suffer from asthma and headache. The same investigators showed a statistically significant association between high birth weight and risk of developing musculoskeletal disorder pain in male patients but not in female patients (Hestbaek, et al., 2004).

Heavy physical duty: lifting

During strenuous repetitive mechanical work, structures associated with the vertebral column are placed under tension. According to the Panel of Musculoskeletal Disorders and the, the biomechanical load tolerance model of musculoskeletal disorders manifests as a result of an imbalance between load and tolerance. They described "load" as physical stresses imposed on the anatomical structures of the body, for example kinetic (motion), kinematic (force), oscillatory (vibration) or thermal energy sources and "tolerance" is described as the capacity of the body to endure load through physical and physiological responses. An imbalance between load and tolerance caused by heavy physical duty may cause degenerative disc changes which may be the primary cause of non specific low back pain. Lifting of more than 10kg was reported as a risk factor for low back pain in both males and females. Heavy, frequent physical work and repeated rotation of the trunk were also associated with low back pain did a systematic review in order to assess aspects of physical load during work and leisure time as risk factors of low back pain and found that handling manual materials, bending and twisting were notable risk factors. Similarly, reviewed literature on work-related back disorders and found that lifting or carrying loads and frequent bending and twisting was consistently associated with low back pain. Linked to that was also the finding that lifting loads of any weight increases the risk of sick leave due to low back pain. A significant positive association between duration of sick leave due to low back pain and heavy work was established (Burdorf, 1997).

The Effect of Co-Morbid Diseases on Low Back Pain

Co-morbid diseases have been associated with low back pain Prevalence estimates for low back pain in patients with diabetes ranged from 4.8% to 5.1%. A psoas abscess is a common occurrence in patients with diabetes mainly as a result of secondary infections

following staphylococcal colonisation. A patient with a psoas abscess, usually present with fever, hip or back pain. A psoas abscess is just one cause of low back pain in patients with diabetes. Spinal epidural abscesses are also associated with diabetes. One of the symptoms of spinal epidural abscesses is localised back pain found that the range of prevalence estimates of low back pain for patients with hypertension varied between 17.6% and 24.4%. Possible causes of low back pain associated with hypertension may be disc degeneration as a result of altered blood circulation due to vascular constriction, carboxyhemoglobin generation, atheroma formation and cellulose dissolution problems also established that 4.4% of patients with low back pain suffered from rheumatoid arthritis. Rheumatoid arthritis may cause pain in various joints, including the lower back. Diabetes, hypertension and arthritis are co-morbid diseases which affect a person's general health. Other co-morbidities not discussed above may also play a role in the development of low back pain. Each of these diseases influences the lower back by means of different causal mechanisms. (Ritzwoller, et al., 2006).

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Various physical demands, including manual lifting, bending, twisting, and whole body vibration, are associated with an increased possibility of low back pain (Nguyen & Randolph, 2007). Bodily work demand risk factors include bending and twisting and frequent lifting as well as other factors. Evaluation techniques of risk to measure bending, twisting and lifting vary (Ferguson, et al., 2004). Factors of workplace, including physical and psychosocial factors and their interaction, are strong determinants of back pain. Physical factors such as heavy physical work, night shifts, lifting, bending, twisting, pulling, and pushing have often been associated with low back pain (Manek & MacGregor, 2005). In the garment factory prolonged standing is also common. In the finishing section of the factory, the ironer category workers have to keep standing up throughout their work period. The case is similar with the folder category workers. The helper category workers in the sewing section also have to work standing up for a long time. According to occupational physicians, low back pain, sore feet, varicose veins,

swelling in the legs, general muscular fatigue and other health problems have been associated with prolonged standing. Results of the study showed that the most frequent illness reported by 70 percent female workers was headache. Gastritis was more prevalent among the female workers. About 47 percent suffered from gastritis problem. In general, 36.7 percent workers suffered from some kind of weakness. This occurred due to long hours of work and low quality of food that they took for lunch (Begum, et al., 2010).

Predictors of new-onset chronic back pain using prospective data in the general household population identified general health and psychosocial factors in both men and women (Kopec, et al., 2004). Studies show a strong association between back pain and depressive disorders, but a cross-sectional analysis cannot establish cause and effect, Back pain is not a short-term consequence of depressive disorder but emerges over periods longer than 1 year. The combination of chronic back pain and major depression is associated with greater disability than either condition alone (Currie & Wang, 2004).

Nguyen & Randolph (2007) mentioned that depression, education level, excessive pain level, fear avoidance, job dissatisfaction, legal representation, somatization disorder, unemployment, workers" compensation cases are associated with work absenteeism and chronic disability.

LBP can develop due to many causes, including muscle strain, back injury, overuse, muscle disorders, pressure on a nerve root, poor posture, and many others. Pregnant women, smokers, construction workers, and people who do repetitive lifting all have increased risk of back pain. Although arthritis in the back or degenerated discs is often seen in persons with low back pain (Cowan,

2008). The most common causes of low back pain are injury or overuse of muscles, ligaments, and joints, pressure on nerve roots in the spinal canal this can be caused by herniated disc, osteoarthritis, spondylolisthesis, spinal stenosis, or narrowing of the spinal canal, fractures of the vertebrae, spinal deformities, including curvature problems such as severe scoliosis or kyphosis, compression fractures. These are more common among post-menopausal women with osteoporosis and in men or women after long-term corticosteroid use. Less common spinal conditions that can cause low back pain include ankylosing spondylitis, bacterial infection spinal tumors (Back Pain Health Center, 2011a).

Muscles get tired and don't have time to refresh if work in fixed positions. Doing the same measures over and over again cause pains in the body. Using force with some kinds of work like hammering; twisting is related to tendon and fibrous tissue damage. These injuries are also made worse by some of the things you do at home, particularly for women with a lot of housework to do. If the soreness is around for a long time it leads to muscle weakness, to the point that even lifting a cup can be painful. It's important to prevent these things. Your body has a memory, if you stop something and recover and start doing it again 6 months later the body can begin to hurt again. Most workplaces are designed for only one body type. Tall and short workers have to strain to reach their task surface as they are not adjustable. The facilitator demonstrated this by asking one of the participants to sit on a chair. His feet did not touch the floor and his arms were too high. Melody sat in the same chair and her feet could touch the ground (she's much taller). A good chair will support the lower back and reduce fatigue. Optimal position is with joints at 90 degrees such as the arms when typing on a computer etc, poorly lit work may cause workers to sit or stand in unnatural

positions so they can see the task at hand. Changing positions and shifting weight reduces fatigue and back pain when performing standing tasks. A foot rest is an inexpensive solution (AMRC, 2005).

The goals of physical therapy are to decrease back pain, increase function and teach the patient a maintenance program to prevent future back problems. Common forms of physical therapy include: Passive physical therapy (modalities) which includes things done to the patient, such as heat application, ice packs and electrical stimulation. For example, a heating pad may be applied to warm up the muscles prior to doing exercising and stretching, and an ice pack may be used afterward to sooth the muscles and soft tissues. Active physical therapy which focuses on specific exercises and stretching. For most low back pain treatments, active exercise is the focus of the physical therapy program. Lumbar spine (low back) stability is largely dependent on the supporting abdominal (stomach) and low back musculature. The abdominal muscles provide the initial stabilizing support through their ability to generate pressure within the abdomen which is exerted posteriorly on the spine, thus providing an anterior support column (from the front of the spine). The low back muscles stabilize the spine from the back and lead to posterior support. Another aspect of physical therapy program may include lumbar traction. Proper stretching of the muscles along with active exercise will help maintain normal range of motion and provide relief for muscles that are often suffering disuse atrophy (shrinking muscles from lack of use) or in spasm from inappropriate posture or nerve irritation. For many patients it is best to follow a stretching routine that has been individually designed for them by a physical therapist or a spine physician. As a general rule, low back pain patients should focus on stretching the lower

back muscles, abdominal muscles, hips and legs. The patient should never bounce during stretching, and all stretches should be slow and gradual (Dickerman, 2005).

Life style modification

Low back pain can often be the result of improper lifestyle choices. Smoking can increase the risk of low back pain[12]. Obesity can worsen back pain and contribute to disk degeneration. Heavy lifting, sport related injuries and motor vehicle accidents can cause back pain. Education to patients with low back pain is critical to help them recover from back pain and prevent future back pain. Smoking cessation and weight control should be strongly recommended to back pain patients. Proper exercise techniques should be taught. Patients, especially those with spinal stenosis often have difficulty walking due to neurological claudication. Treadmills and long distance walking exercise may exacerbate back pain. Some studies suggested therapeutic aquatic exercise is potentially beneficial to patients suffering from chronic low back pain (Waller, et al., 2009).

Hip fracture:

In western populations, the incidence of hip fractures increases exponentially with age, with rates of 2 per100 000 person-years in women aged with rates of 2 per 100 000 person-years in women aged <35 years rising to 3032 per 100 000 person-years in women aged ≥85 years; respective rates in men are 4 and 1909 (Cooper, 1997). Worldwide, 1.66 million hip fractures were estimated to have occurred in 1990: about 1.19 million in women and 463 000 in men. Fracture rates vary in different countries; the highest rates are seen in North America and Europe, particularly Scandinavia. The

risk of osteoporosis fractures is lower in Africa and Asia, but worldwide projections suggest that it will increase markedly in the future (Gullberg, 1997).

Vertebral fracture

The incidence and prevalence of radiological findings increase with age. One in eight men and women aged >50 years in Europe have vertebral deformity. The rates vary between populations, with a threefold variation across Europe and up to twofold variations within European countries in the European Vertebral Osteoporosis Study. Vertebral deformities in younger men may represent developmental changes rather than fractures. Only a third of vertebral fractures present clinically. A prospective radiological study in Europe of men and women aged 50–79 years found an age-adjusted incidence of vertebral deformities of 1% per year among women and 0.6% per year among men. Most vertebral fractures are the result of compressive loading associated with activities, such as lifting or changing positions, and are discovered only incidentally. Only a third of new vertebral fractures relate to falls (European, 2002).

Other fractures

Most fractures in people aged >50 years are the result of osteoporosis. The incidences of proximal humeral, pelvic and proximal tibial fractures also rise steeply with age and are higher in women than in men. About 80% of proximal humeral fractures occur in people aged ≥35 years, with three-quarters occurring in women. Similar

patterns have been observed for fractures of the distal femur, rib, clavicle, and scapula.

At-risk population:

Apart from age and being female, the major determinants of fracture are falling, low bone mass, and previous low trauma fracture. Some risk factors identify those more likely to fall and those who may have osteoporosis or are at risk of fracture. Bone density has the strongest relation to fracture, but many fractures also occur among women without osteoporosis. Combinations of risk factors are being used to predict 10-year probability of fracture.

Impact:

Hip fracture results in pain, loss of mobility, and excess mortality. Nearly all patients are hospitalized, and most undergo surgical repair of the fracture or replacement of the joint. At one year, hip fracture is associated with 20% mortality within the first year after fracture and 50% loss of function; only 30% of patients regain function (Sernbo, 1993). Many patients lose their independence and need long-term care. In urbanized countries, mortality from hip fracture is high in the first year, perhaps up to 25% in women and 35% in men. Co-morbidity is an important contributory factor to hip fractures and is a determinant of outcome. Acute vertebral fracture affects quality of life by limiting activities and restricting participation. Up to a fifth of patients are hospitalized, and some will need subsequent long-term care. Pain and disability worsen with each new vertebral fracture, with an increasing total number of vertebral fractures and worsening of spinal deformity. Vertebral fractures are also associated with an increased mortality of about 5% over the five-year period after fracture.

Fracture of the distal forearm results in hospitalization rates of 23% among men and 19% among women (50). Only 50% of patients have a good functional outcome at six months (Cooper, 1997).

Musculoskeletal disorder pain:

Description and definitions musculoskeletal disorder pain is a major health and socioeconomic problem in western countries. It usually is defined as pain localized below the line of the twelfth rib and above the inferior gluteal folds, with or without leg pain; and it can be classified as "specific" (suspected pathological cause) or "non-specific" (about 90% of cases). Back pain is usually defined as acute if it lasts less than six weeks; sub acute if between six weeks and three months; and chronic when it lasts more than three months (Frymoyer, 1998). Frequent episodes are described as recurrent back pain. Most episodes of musculoskeletal disorder pain settle after a couple of weeks, but many have a recurrent course, with further acute episodes affecting 20–44% of patients within one year in the working population and lifetime recurrences of up to 85% (Andersson, 1999). Frequently, musculoskeletal disorder pain never fully resolves, and patients experience exacerbations of chronic musculoskeletal disorder pain.

Knee has been found among 2.9% of women aged 45–65 years. Estimates for osteoarthritis of the knee for seven regions of the world. Hip osteoarthritis is less common, with a radiographic prevalence of 1.9% among men and 2.3% among women aged >45 years in one Swedish survey. In general, osteoarthritis is more prevalent in Europe and the USA than in other parts of the world. African American women are more prone than white women to osteoarthritis of the knee but not of the

hip. Osteoarthritis of the hip occurs more often in European whites than in Jamaican blacks, African blacks, or Chinese (Jeffrey, 2002).

Stress at work is a growing problem for all workers, especially women. Many of the job conditions, along with the problem of balancing work and family issues, contribute to stress in the workplace. According to the European Foundation's 1996 European Union-Wide Survey, women are more likely to have difficulty in taking breaks, days off, or holidays. In this study it was observed that the majority of the women workers had to perform their household activities in addition to their work and as a result of this family care were affected. Women had little time to take rest, to attend to personal health problems, and to attend to social engagements. (Women's health and safety, 2007).

Productivity Losses

Losses in worker productivity resulting from work related MSD pain present a significant societal burden. Absenteeism and presenteeism (job attendance in a reduced work capacity) are costly to both the employer and the worker, the former due to reduced work efficiency and the later because of decreased earnings. In 2001 the UK economy lost an estimated £5.7 billion due to the combined 9.8 million work days lost as a result of neck, upper extremity, and musculoskeletal disorder pain (Buckle, 2005). Among a closed population of shipyard workers MSD pain accounted for 22.3% of total sick leaves and 24% of total workdays lost during a 12 month period (Alexopolous, et al., 2006). Musculoskeletal disorder pain, as compared to pain at other sites, was associated with higher rates of absenteeism. Though difficult to quantitate, the cumulative effect of presenteeism should not be overlooked. A report from the 2005 Canada Community Health Survey revealed that 21% of arthritis

suffers described reduced activity at work (presenteeism) as compared to 3% of individuals with no chronic conditions (Zhang, Koehoorn & Anis, 2010). The presence of back or arthritis pain nearly doubled rates of absenteeism and the percentage of individuals reporting on the job impairment in a population based US national survey (McDonald, DiBonaventure, & Ullman, 2011). This negative impact of MSD pain on productivity remained significant even after adjusting for demographic and health characteristics. (Lombardo, 2011).

3. METHODOLOGY:

3.1 Study design: This is a descriptive cross sectional study.

3.2 Place of study: The female workers working in different types of garments factory in Dhaka. The working pattern and environment is almost same in the garments of all districts including Dhaka. The patterns of the garments are like knitting, dying, finishing etc. There are 300 listed (approximate) garments in Dhaka city.

3.3 Study period: The study was done within the time period of June 2015 to May 2016.

3.4 Study population: Total female workers of 8 selected garments are 2687. Among them 260 female workers are taken randomly as sample for this study.

3.5 Eligibility criteria of participants:

Inclusion criteria: Those who were female garments workers who get wage on monthly basis.

Exclusion criteria of participants:

- Those who were unwilling to take part in the study.
- Who were seriously ill and mentally retarded.

3.6 Sample size: Sample size was thought to be taken as per formula prior to the study-

$$n = \frac{z^2 pq}{d^2} = \frac{(1.96)^2 \times (0.5)(0.5)}{(0.05)^2} = 384.16 = 384$$

n= the desired sample size (eventual sample size).

z= 1.96 which corresponds to the 95% confidence level.

p= proportion of the target population estimated 50%, q=(1-p).

d= degree of accuracy set at 5%= 0.05.

But due to limitation of time and unavailability of the responded, the feasible sample size was 260.

3.7 Sampling technique: The sample was selected randomly by using lottery. Total 260 female workers are randomly selected, which was taken from 2687 female workers out of eight factories. Data were collected by using parts of a standardized CUPID (Cultural and Psychosocial Influences on Disability) questionnaire focused on MSP in 10 body sites, including the low-back, neck, right and left shoulders, elbows, wrists/hands, individual, physical and psychosocial risk factors.

3.8 Data collection instrument: According to the study objectives, all variables were listed and appropriate scales of measurements were determined. In the study for maximum output, semi structured questionnaire was developed and applied for data collection. The questionnaire was pre tested among similar group of people. Several consultations were made with other faculty members those who have skilled in their field with the developed questionnaire.

3.9 Data collection technique: The purpose of the study was explained to the selected respondents. Then data were collected by face to face interview by researcher himself and the responses were written in questionnaire accordingly. One questionnaire was used for each respondent.

A range of 10-15 respondents were interviewed each day within 20 days and each interview required around 25 to 40 minutes including rapport building with the respondents.

Pre test: Data collection instrument was pre tested in two different sites other than my study area having the similar socio demographic characteristics.

Pre test was done among 10 respondents. After pre test some changes were made of the instrument for its validity and its reliability. Change in the language and irrelevant wording were done after consultation with the respected guide.

3.10 Data collection plan: A different work plan was done regarding data collection.

- Permission for collection of data taken.
- Setting necessary time for data collection.
- Data collection.
- Data handling.

All possible measures have been taken to maintain good quality of data. To avoid the chance of missing and inconsistency after collection of data every day, were checked and kept in the sequences in which those have been numbered.

3.11 **Data analysis plan:** At the end of data collection through semi structured interview questionnaires were edited, coded and checked finally for any inconsistency with full attention and sincere efforts. Four point pain index scale (0=No pain, 1=Mild pain, 2=Moderate pain, 3=Severe pain) was used for the measurement of pain. The data were entered into a personal computer using the programme SPSS, version 20 entered data were cleaned, edited and appropriate statistical test were done depending on the distribution of the data. Prevalence percentage for musculoskeletal pain and the odd ratios of the test measures were obtained.

3.12 Expected Outcome:

There is a positive chance to find out prevalence of musculoskeletal disorders in ready made garment workers.

Chapter- IV

4. RESULTS

This cross-sectional study was conducted among 260 garments women worker were enrolled in this study. The objectives of the study were to assess the factors influencing the musculoskeletal disorder pain among young female garment workers, determine the demographic characteristics of the workers related to musculoskeletal disorder pain. Data were analyzed with the help of SPSS+PC software and the results obtained were as follows.

4.1 SOCIO-DEMOGRAPHIC INFORMATION

Table-1. Distribution of the respondents by age

Age	Frequency (no.)	Percent (%)
17-18 years	53	20.4
19-20 years	75	28.8
21-22 years	41	15.8
23-24 years	33	12.7
≥25 years	58	22.3
Total	260	100.0

Mean = 21.89; (SD = ± 3.899)

Above table-1 shows the distribution of the respondents by age (incomplete year). Majority of the respondents (28.8%) were between 19-20 years. Only 22.3% were above 25 years. The mean age of the respondents were 21.89; (SD = ± 3.899) years.

Figure-1. Distribution of the respondents by religion
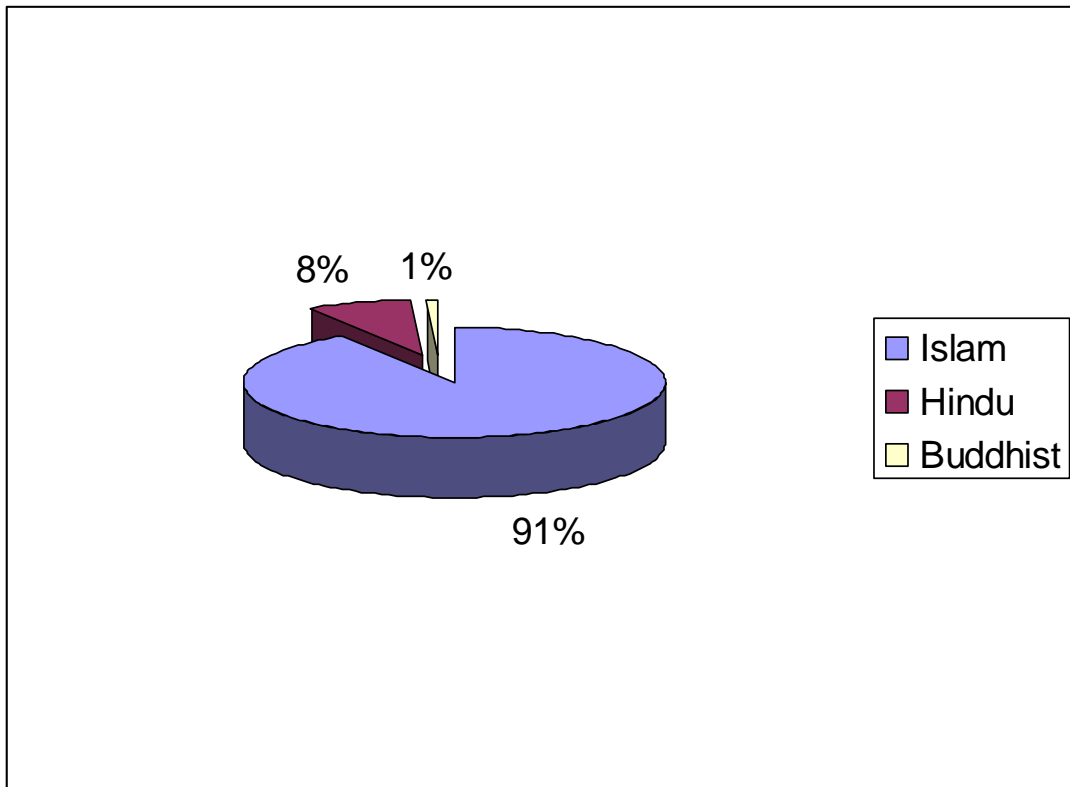
Most of the respondents were Muslim (91.2%), followed by Hindu (8%) & Buddhist (1%).

Figure-2. Distribution of the respondents by marital status
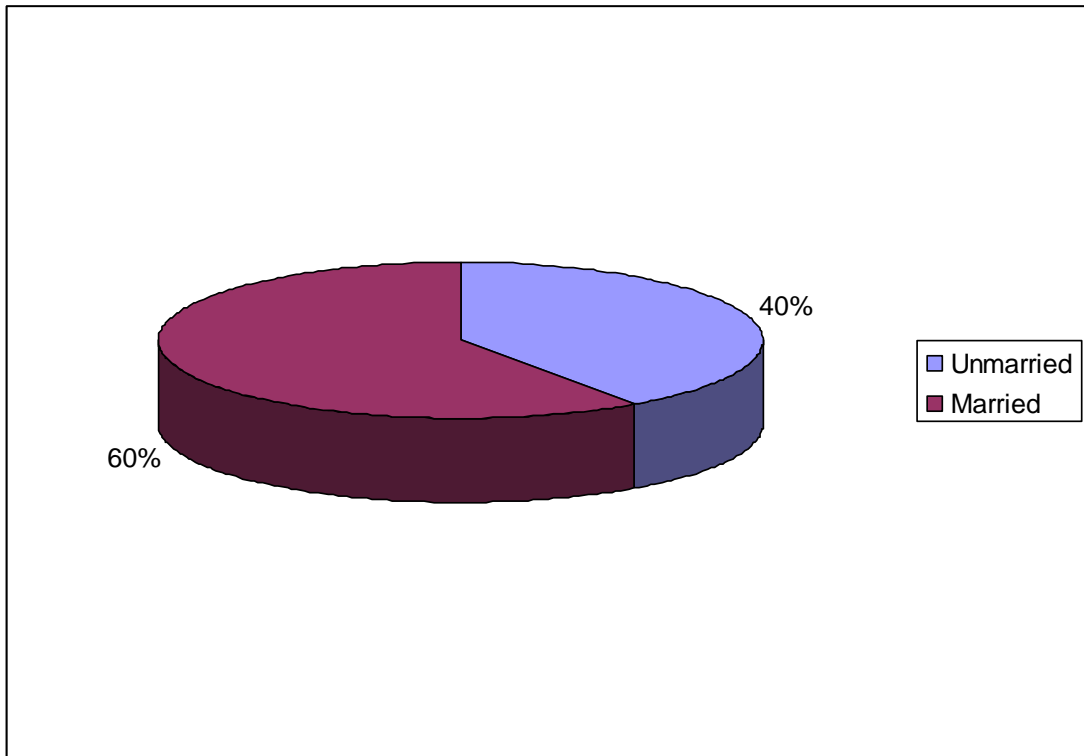
Figure-2 shows most of the respondents 59.6% garments worker were married and rest of the 40.4% were unmarried.

Figure-3. Distribution of the respondents by educational level
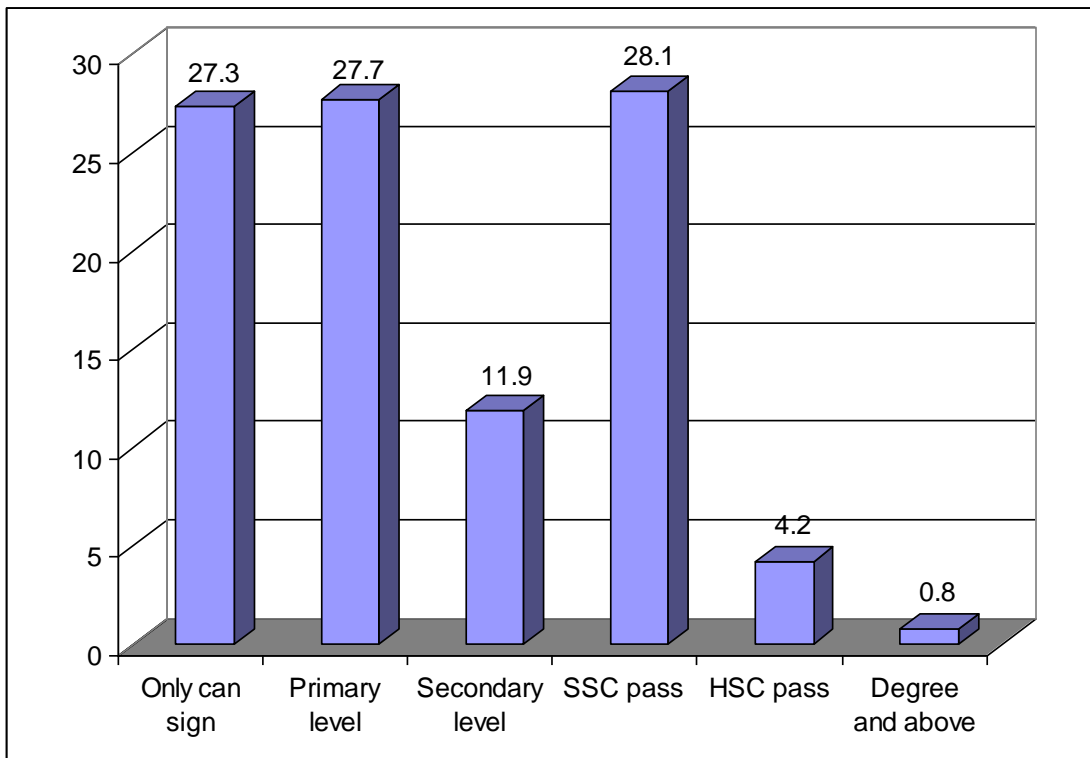
This figure-3 shows that 27.3% were can sign their name only 27.7% garments workers had primary level education 28.1% were up to SSC level and 5% respondents HSC and above.

Figure-4. Distribution of the respondents by occupation of husband/fathers
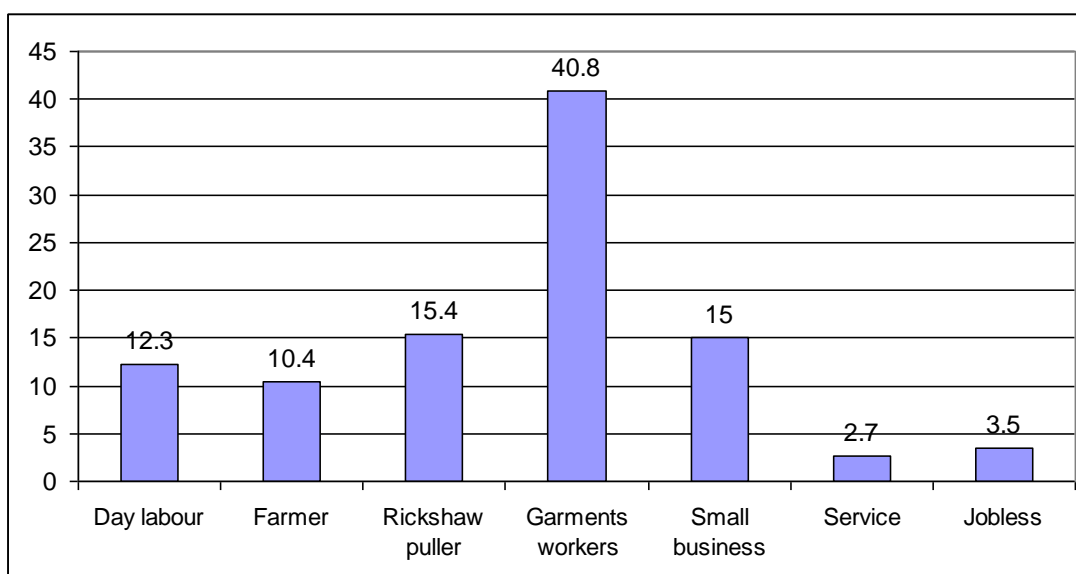
Figure-4 shows that most of the respondent's husbands or fathers (40.8%) were working garments followed by 12.3% day labour, 10.4% farmer, 15% small business and 2.7% were service respectively.

Table-2. Distribution of the respondents by family member

Family member	Frequency	Percent
≤ 2	45	17.3
3-4	103	39.6
5-6	83	31.9
7-8	19	7.3
>8	10	3.8
Total	260	100.0

Mean=4.30; (SD=±4.30)

Above the table shows that most of the respondents (39.6%) had family member 3-4 followed by 31.9% had 5-6, 7.3% had 7-8 and the rest of minimum family member ≤ 2 were 17.3 and maximum >8 were 3.8 persons respectively.

Table-3. Distribution of the respondents by monthly family income

Monthly income	Frequency (no.)	Percent (%)
Taka ≤ 6000	54	20.8
Taka 6001-7000	136	52.3
Taka 7001-8000	39	15.0
Taka >8000	31	11.9
Total	260	100.0

Mean =6750.38±1.3575

Table-3 revealed that most of half (52.3%) respondents had monthly income Taka 6001-7000, 20.8% had monthly family income Taka ≤6000/; 15% had monthly income Taka 7001-8000/- and remaining 11.9% had monthly income more than Taka 8000/- respectively.

4.2 Job Related Information

Table-4. Distribution of respondents by regular working hours

Working hours	Frequency	Percent
8	127	48.8
10	45	17.3
11	18	6.9
12	70	26.9
Total	260	100.0

Mean=9.63; (SD=±1.725)

As the table-4 shows more than one third (48.8%) respondents were 8 hours their working in garments factories according to 17.3% were 10 hours, 6.9% were 11 hours and the highest number 26.9% were 12 hours. The mean working hours was Mean =9.63; (SD=± 1.725).

Table-5. Distribution of the respondents by duration of work at present RMG (in year)

Duration of work (in year)	Frequency (no.)	Percent (%)
≤1	39	15.0
2	85	32.7
3	42	16.2
4	52	20.0
5	42	16.2
Total	260	100.0

As the table-6 shows 15.0% did this work for one or less than one year according to 32.7% two year, and remaining 16.2% did this work three years, 20% were four years and 16.2% were five years.

Figure-5. Distribution of the respondents by name of section
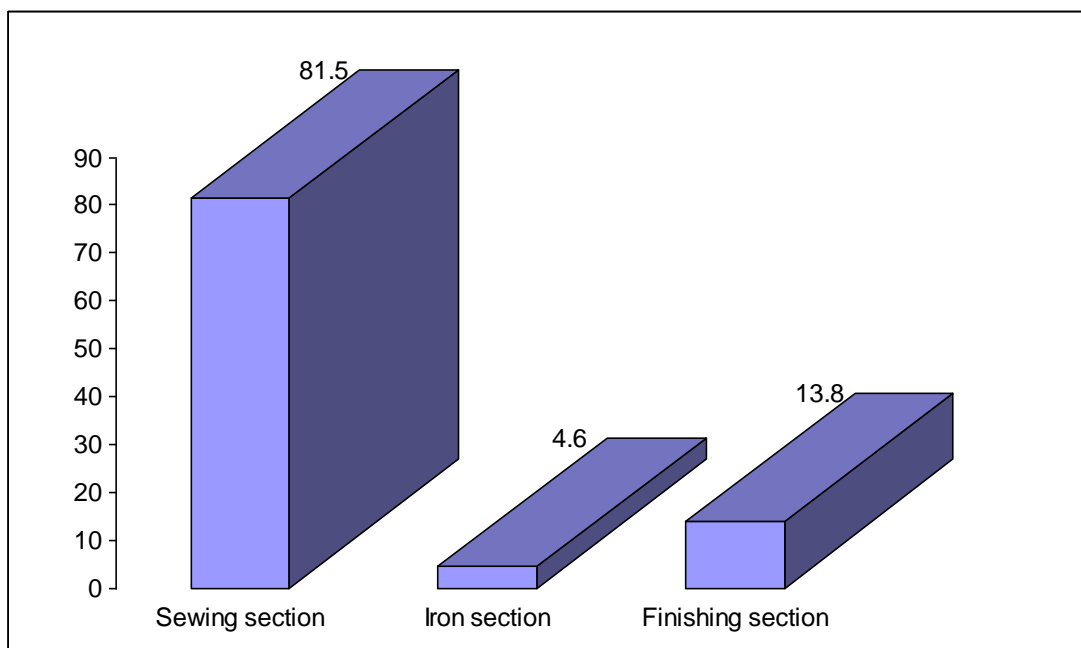
Above the figure shows that almost garments workers (81.5%) were working in their sewing section followed by 4.6% were iron section and 13.8% were working finishing section.

Musculoskeletal disorder pain related information:

Table-6. Distribution of the respondents by daily time spending sitting at work (hours)

Sitting at work (hours)	Frequency	Percent
2-4	22	8.5
5-6	73	28.1
7-8	120	46.2
>8	45	17.3
Total	260	100.0

The risk of developing musculoskeletal disorder pain was most of 46.2% respondents were 7-8 hours and 28.1% were 5-6 hours by daily time spending sitting at work.

Table-7. Distribution of the respondents by daily time spending standing at work (hours)

Standing at work (hours)	Frequency	Percent
2-4	25	9.6
5-6	74	28.5
7-8	123	47.3
>8	38	14.6
Total	260	100.0

The risk of developing musculoskeletal disorder pain was most of similar percentage by sitting. Less than half (47.3%) respondents were 7-8 hours and 28.5% were 5-6 hours by daily time spending standing at work.

Table-8. Distribution of the respondents by heavy physical duty (lifting)

Heavy physical duty (lifting)	Frequency	Percent
Yes	62	23.8
No	198	76.2
Total	260	100.0

Its regards 23.8% respondents by heavy physical duty (lifting)

Table-9. Distribution of the respondents by perceived stress at work

Stress at work	Frequency	Percent
Never	66	25.4
Sometimes	113	43.5
Often	13	5.0
All the time	68	26.2
Total	260	100.0

The risk of developing musculoskeletal disorder respondents was 43.5% times with the increase in amount of perceived sometimes stress. Those who never stress (25.4%) participate in group respectively.

Table-10. Distribution of the respondents by suffering from diabetes, hypertension and arthritis

Variables	Frequency	Percent
Diabetes	36	13.8
Hypertension	60	23.1
Arthritis	58	22.3

From the table shows that few percentages (13.8%) had suffered from diabetes, 23.1% had suffered from hypertension and 22.3% had from arthritis.

Table-11. Distribution of the respondents by suffering from common co-morbidities

Common co-morbidities	Frequency	Percent
No disease	127	48.8
Dermatitis	11	4.2
Hearing problem	41	15.8
Skin allergies	33	12.7
Diarrhea disease	6	2.3
Asthma	15	5.8
Common cold	6	2.3
Fever	7	2.7
Anemia	14	5.4
Total	260	100.0

Above the table shows maximum 48.8% respondents were no suffering from common co-morbidities. Among them 15.8% were suffering hearing problem and 12.7% were skin allergies and the little percentage were others co-morbidities.

Table-12. Distribution of the respondents by sick number of days (sick leave) last 12 months

Sick	Frequency	Percent
1-6 days	87	33.5
7-12 days	125	48.1
More than 12 days	48	18.5
Total	260	100.0

From table shows majority of half (48.1%) respondents were sick 7-12 days in last 12 months, 33.5% sick in 1-6 days and 18.5% were sick more than 12 days.

Figure-6. Distribution of the respondents by experienced musculoskeletal disorder pain
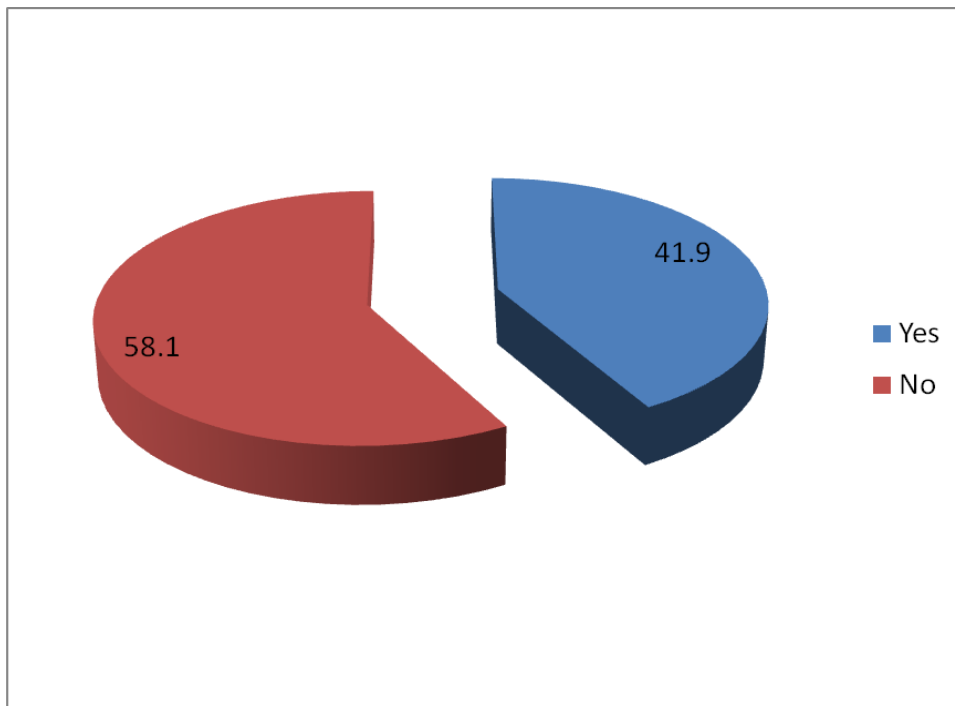
Figure shows that out of 260 respondents. Among the 109(41.9%) had experienced musculoskeletal disorder pain and 151(58.1%) had no experienced musculoskeletal disorder pain. The musculoskeletal disorder pain prevalence was 109(41.9%).

Table-13. Distribution of the respondents by duration of suffering from

musculoskeletal disorder pain (n=109)

Duration of suffering from musculoskeletal disorder pain	Frequency	Percent
1-2 years	75	68.8
3-4 years	24	22.0
>5 years	10	9.2
Total	109	100.0

It is observed that more than two third (68.8%) garments worker were duration of suffering from 1-2 years followed by 22.0% in 3-4 years and 9.2% suffering from five or more than five years.

Table-14. Distribution of the respondents by Pain in different part

Pain in different part	Frequency	Percent
Neck	32	29.3
Shoulder	20	18.3
Elbow	11	10.1
Hips	8	7.3
Knee	12	11.0
Ankles/feet	10	9.2
Low back pain	16	14.6
Total	109	100.0

Considering the pain in different parts of the body, 29.3% had neck according to 18.3% had shoulder, 10.1% had elbow 7.3%, 11%, 14.6% had hips, knee, ankles/feet and the rest of 14.6% had low back pain responses respectively.

Table-15. Distribution of respondents by pattern of musculoskeletal disorder

N=109

Pain in body parts	%	Nature of complaints	%	Severity of complaints	%
Neck (n=32)	29.3	Temporary	42.9	Mild	32.4
		Continuous	31.4	Moderate	41.2
		On movement	25.7	Severe	26.5
Shoulders (n=20)	18.3	Temporary	22.2	Mild	20.0
		Continuous	44.4	Moderate	40.0
		On movement	33.3	Severe	40.0
Elbow (n=11)	10.1	Temporary	30.0	Mild	32.4
		Continuous	40.0	Moderate	31.0
		On movement	30.0	Severe	55.2
Hips (n=8)	7.3	Temporary	38.9	Mild	13.8
		Continuous	27.8	Moderate	27.8
		On movement	33.3	Severe	50.0
Knee (n=12)	11.0	Temporary	39.8	Mild	12.9
		Continuous	46.2	Moderate	55.9
		On movement	14.0	Severe	31.2
Ankles/feet (n=10)	9.2	Temporary	11.5	Mild	16.0
		Continuous	42.3	Moderate	40.0
		On movement	46.2	Severe	44.0
Low back pain (n=16)	14.6	Temporary	42.3	Mild	16.0
		Continuous	42.3	Moderate	40.0
		On movement	46.2	Severe	44.0

Regarding the table shows that pattern of musculoskeletal disorder neck pain majority of 42.9% had suffered from temporary 41.2% were continuous according to shoulders, ankles, lumbar spine, cervical spine had Nature of complaints maximum continuous and Severity of complaints on movement.

Table-16. Distribution of the respondents by leave for musculoskeletal disorder pain

Leave	Frequency	Percent
Yes	87	79.8
No	22	20.8
Total	109	100.0

Regarding the table shows that most of the respondents (79.8%) were leave for musculoskeletal disorder pain at work place.

Table-17. Distribution of the respondents by frequency of leave last 12 months

Number of leave	Frequency	Percent
1-6 days	48	56.2
7-12 days	25	28.7
More than 12 days	14	16.1
Total	87	100.0

Mean = 6.67; (SD=±2.17)

From table shows majority of more than half (56.2%) respondents were 16 days leave last 12 months followed by 28.7% were 7-12 days in last 12 months and 16.1% were more than 12 days leave last one year. Average no of leave 6.67 days x24 hours =160 hours loss productivity each year among them 260 respondents. So at present approximately 4.0 million workers in garments sectors of Bangladesh.

Table-18. Distribution of the respondents by received treatment for musculoskeletal disorder pain

Received treatment	Frequency	Percent
Physicians	6	5.5
Pain medication	45	41.3
Physiotherapist	9	8.2
No treatment	46	42.2
Others	3	2.7
Total	109	100.0

All the out of 260 garments respondents, among them 109 respondents were suffering from musculoskeletal disorder pain and received treatment 41.3% take pain killer medication, 16.4% went to physicians and physiotherapist and 42.7% had received no treatment.

Table-19. Distribution of the respondents by causes of not received treatment (n=111)

Causes	Frequency	Percent
Expenditure for treatment	5	10.8
Communication problem	12	26.1
Lack of money	26	56.5
Refusal of decision maker of family	3	6.5
Total	46	100.0

Most of the half (56.5%) respondents received no treatment because they have lack of money according to 10.8% causes of expenditure for treatment and the few percentage 6.5% refused of decision maker of family.

Table-20. Distribution of the respondents by experienced musculoskeletal disorder in the past

Experienced in past	Frequency	Percent
Yes	55	21.1
No	205	78.8
Total	260	100.0

From the table shows that only 21.1% experienced musculoskeletal disorder in the past and large number 76.1% were no experienced musculoskeletal disorder in the past.

Table-21. Distribution of the respondents by duration of affected musculoskeletal disorder

Duration of affected	Frequency	Percent
1-5 years	11	20.0
6-10 years	16	29.1
11-15 years	16	29.1
16-20 years	5	9.1
> 20 years	7	12.7
Total	55	100.0

Above the table shows that the similar percentage 29.1% duration of affected 6-10 & 11-15 years followed by 20% were suffering from 1-5 years and 12.7% had suffered more than twenty years.

Table-22. Distribution of respondents by height

Height	Frequency	Percent
≤ 5 ft	110	42.3
5.1-5.5 ft	132	50.7
>5.5 ft	18	6.5
Total	260	100.0

Most of the respondents (50.7%) were belong to 5.1-5.5 ft height, 42.3 were belong to ≤ 5 ft and only 6.5% were >5.5 ft height respectively.

Table-23. Distribution of respondents by weight

Weight	Frequency	Percent
≤ 45 kg	53	20.6
46-50 kg	66	25.3
51-55 kg	52	20.0
56-60 kg	58	22.3
>60 kg	31	11.9
Total	260	100.0

Above the table shows 20.6% respondents were ≤ 45 kg, according to 25.3% were belong to 46-50 kg, 20.0% were 51-55, 22.3%, 11.9% were 56-60 kg and >60 kg respectively.

Table-24. Distribution of respondents by BMI

BMI	Frequency	Percent
≤18.5	52	20.0
18.5-24.9	195	75.0
≥ 25	13	5.0
Total	260	100.0

This table shows that majority of 75% respondents BMI were 18.5-24.9 followed by 20% respondents were ≤18.5 BMI and the rest of 5% respondents were ≥ 25 BMI.

Table-25. Relationship between hours spent sitting and participants with and without

musculoskeletal disorder pain

Sitting in hours	Musculoskeletal disorder pain				Total (%)	Odds Ratio (OR)	$\chi 2$	P-Value
	Yes		No					
	No.	%	No.	%				
≤ 6 hours	21	22.1	74	77.9	95(100.0)	0.414		
> 6 hours	88	53.3	77	46.7	165(100.0)	1.66	24.147	0.000
Total	109	41.9	151	58.1	260(100.0)			

The relationship between hours spent sitting and participants with musculoskeletal disorder pain. Among them majority of 53.35% respondents spent sitting 6 hours or more than six hours. The risk of developing musculoskeletal disorder pain was 1.66. The findings are statistically highly significant ($\chi 2$ = 24.147; P-value = 0.001).

Table-26. Relationship between hours spent standing and participants with and
without musculoskeletal disorder pain

| Standing in hours | Musculoskeletal disorder pain | | | | Total(%) | Odds Ratio (OR) | χ2 | P-value |
| | Yes | | No | | | | | |
	No.	%	No.	%				
≤ 6 hours	24	24.2	75	75.8	99(100.0)	0.45		
> 6 hours	85	52.8	76	47.2	161(100.0)	1.60	20.527	0.000
Total	109	41.9	151	58.1	260(100.0)			

The relationship between hours spent standing and participants with musculoskeletal
disorder pain. Among them majority of 52.8% respondents spent standing 6 hours or
more than six hours. The risk of developing musculoskeletal disorder pain was 1.60.
The findings are statistically highly significant (χ2 = 20.507; P-value = 0.001).

Table-27. Relationship between hours lifting and participants with and without
musculoskeletal disorder pain

| Lifting | Musculoskeletal disorder pain | | | | Total(%) | Odds Ratio (OR) | χ2 | P-value |
| | Yes | | No | | | | | |
	No.	%	No.	%				
Yes	46	51.1	44	48.9	90(100.0)	1.37		
No	63	37.1	107	62.9	170(100.0)	0.77	4.773	0.02
Total	109	41.9	151	58.1	260(100.0)			

Musculoskeletal disorder pain in participants who lifted objects that table shows the
majority of participants (51.1%) lifted objects or people in the performance of their
occupational activities. The risk of developing musculoskeletal disorder pain was
1.37. The findings are statistically highly significant (χ2 = 4.773; P-value = 0.02).

Table-28. Relationship between co-morbidities with and without musculoskeletal

disorder pain

Co-morbid disease	Category	Musculoskeletal disorder pain				Total	Odds Ratio (OR)	P-value
		Yes		No				
		No.	%	No.	%			
Diabetes	Yes	19	52.8	17	47.2	36	1.31	0.15
	No	90	40.2	134	59.8	224	0.78	
Hypertension	Yes	36	60.0	24	40.0	60	1.64	0.001
	No	73	36.5	127	63.5	200	0.63	
Arthritis	Yes	41	70.7	17	29.3	58	1.62	
	No	68	33.7	134	66.3	202	0.29	0.000

From the table shows the relationship between co-morbid factors and the presence of musculoskeletal disorder pain. Most of the garments workers had co-morbidities in the category diabetes 52.8%, "hypertension". In this category 60% participant s specified that they were suffering from musculoskeletal disorder pain, 70.7% were arthritis. The finding are each statistically highly significant. The risk of developing musculoskeletal disorder pain was (1.31, 1.64, 1.62) and P>0.5

Table-29. Relationship between perceived stress at work and musculoskeletal disorder pain

Perceived work stress	Musculoskeletal disorder pain				Total (%)	χ2	P-value
	Yes		No				
	No.	%	No.	%			
Never	4	16.0	21	84.0	25(100.0)		
Sometimes	42	32.8	86	67.2	128(100.0)		
Often	6	28.6	15	71.4	21(100.0)	33.755	0.000
All the time	57	66.3	29	33.7	86(100.0)		
Total	109	41.9	151	58.1	260(100.0)		

The relationship between perceived stress at work and musculoskeletal disorder pain. Few participants (16%) never experienced stress while 66.3% participants who experienced stress all the time had musculoskeletal disorder pain perceived stress at work was found to be significantly associated with the presence of musculoskeletal disorder pain (p=0.001).

CHAPTER-V

5. DISCUSSION

The cross-sectional study is done in Mirpur, Uttrara and Azampur area under Dhaka district. The study population is the female garments workers. The objectives of the study is to find out to assess the factors influencing of musculoskeletal disorder pain among young female garment workers, determine the demographic characteristics of the workers related to musculoskeletal disorder pain. Among the female garments workers a total of 260 respondents were interviewed with a semi structured questionnaire (customized) as per objectives.

It was observed in the present study the mean age of the respondents was 21.89; (SD ± 3.899) years. Majority of the respondents (28.8%) were between 19-20 years. Only 22.3% were above 25 years and almost were Muslim (91.2%) except one who belonged to Hindu Community.

Maximum (59.6%) garments worker were married and 40.4% were unmarried. Education of respondents 27.3% were can sign their name only 27.7% garments workers had primary level education 28.1% were up to SSC level and 5% respondents HSC and above and husband education 47.3% were can sign their name.

This finding correlates with LFS findings, that people with no or little education had high labour force participation rate (Rahman, 2014).

Participant's husbands or fathers (40.8%) were working garments followed by 12.3% day labor, 10.4% farmer, 15% small business and 2.7% were service respectively.

Most of the respondents (39.6%) had family member 3-4 followed by 31.9% had 5-6, 7.3% had 7-8 and the rest of minimum family member ≤ 2 were 17.3% and maximum >8 were 3.8% persons respectively.

Most of half (52.3%) respondents had monthly income Taka 6001-7000, 20.8% had monthly family income Taka ≤6000/-; 15% had monthly income Taka 7001-8000/- and remaining 11.9% had monthly income more than Taka 8000/- respectively. More than one third (48.8%) respondents were 8 hours their working in garments factories according to 17.3% were 10 hours, 6.9% were 11 hours and the highest number 26.9% were 12 hours. The mean working hours was Mean =9.63; (SD=± 1.725).

Duration of working in the garments 15.0% did this work for one or less than one year according to 32.7% two year, and remaining 16.2% did this work three years, 20% were four years and 16.2% were five years and almost garments workers (81.5%) were working in their sewing section followed by 4.6% were iron section and 13.8% were working finishing section.

The risk of developing musculoskeletal disorder pain was most of 46.2% respondents were 7-8 hours and 28.1% were 5-6 hours by daily time spending sitting at work. The risk of developing musculoskeletal disorder pain due to standing posture was almost similar percentage of sitting. Less than half (47.3%) respondents were 7-8 hours and 28.5% were 5-6 hours by daily time spending standing at work.

The risk of developing musculoskeletal disorder pain was 43.5% times with the increase in amount of perceived sometimes stress. Those who never stress (25.4%) participate in group respectively 23.8% respondents by heavy physical duty (lifting).

Most of the 41.9% experienced had musculoskeletal disorder pain and 58.1% had no experienced musculoskeletal disorder pain. It is observed that more than two third (63.8%) garments worker were duration of suffering from 1-2 years followed by 23.5% in 3-4 years and 12.7% suffering from five or more than five years.

In a Chinese study claimed that the 1-year prevalence of LBP was 64% (Doherty, 2010). Another research in UK shows that 75% people suffered with musculoskeletal disorder pain in every year. Ratio found that musculoskeletal disorder pain is more common in female compared to male. Almost every woman will have at least one episode of musculoskeletal disorder pain at some time in her life. The pain can vary from severe and long term to short period. Usually it resolves within a few weeks. The most common risk factor for musculoskeletal disorder pain of women are heavy physical workload, lifting, awkward posture, static work posture, pregnancy, pushing & pulling, body vibration, increased body mass index and life style (Barua, 2015).

Considering the pain in different parts of the body, 29.3% had neck according to 18.3% had shoulder, 10.1% had elbow 7.3%, 11%, 9.2% had hips, knee, ankles/feet and the rest of 14.6% had low back pain responses respectively. Regarding the table shows that pattern of musculoskeletal disorder neck pain majority of 42.9% had suffered from temporary 41.2% were continuous according to shoulders, ankles, lumbar spine, cervical spine had nature of complaints maximum continuous and Severity of complaints on movement.

 From table shows majority of more than half (56.2%) respondents were 16 days leave last 12 months followed by 28.7% were 7-12 days in last 12 months and 16.1% were more than 12 days leave last one year. Average duration of leave 6.67 days x24 hours =160 hours loss productivity by each garment worker each year among the 260

respondents. At present approximately 4.0 million workers in garments sectors of Bangladesh. So, the country losses huge number of productivity hours in ready made garment sector each year due to musculoskeletal disorders.

Few percentages (13.8%) had suffered from diabetes. Regarding the table shows that 23.1% were suffering from hypertensive It regards that distribution of garments workers were suffering from arthritis 22.3% and 77.7% no suffering from arthritis. Maximum 48.8% respondents were no suffering from common co-morbidities. Among them 15.8% were suffering hearing problem and 12.7% were skin allergies and the little percentage were others co-morbidities.

Co-morbid diseases have been associated with musculoskeletal disorder pain (Ritzwoller, 2006). Musculoskeletal disorder pain in patients with diabetes ranged from 4.8% to 5.1%. A psoas abscess is a common occurrence in patients with diabetes mainly as a result of secondary infections following staphylococcal colonization.

According to the study (Rahman, 2014) proved that majority of workers (55%) complained about musculoskeletal problem. This was followed by neural problem such as headache (40%), respiratory (30%), skin problem (13%), numbness of hands and fingers (8%), hearing (5%) and visual discomfort (2%).

Out of 109 garments respondents among them more than half (57.3%) were received treatment their musculoskeletal disorder pain and 42.7% no received treatment. Most of the respondents 71.2% had no received treatment because they have lack of money according to similarly 10.8% causes of expenditure for treatment communication problem and the few percentage 7.2% causes of refused of decision maker of family.

From the table shows that majority of respondents (83.1%) mentioned those who are not preventable and the least 16.9% mentioned preventable.

All the out of 260 garments respondents, among them 109 respondents were suffering from musculoskeletal disorder pain and received treatment 41.3% take pain medication, 16.4% went to physicians and physiotherapist and 42.7% had no received treatment. Most of the half (56.5%) respondents received no treatment because they have lack of money according to 10.8% causes of expenditure for treatment and the few percentage 6.5% refused of decision maker of family. 21.1% experienced musculoskeletal disorder in the past and large number 76.1% were no experienced musculoskeletal disorder in the past. The similar percentage 29.1% duration of affected 6-10 & 11-15 years followed by 20% were suffering from 1-5 years and 12.7% had suffered more than twenty years.

Most of the respondents (50.7%) were belong to 5.1-5.5 ft height, 42.3 were belong to ≤ 5 ft and only 6.5% were >5.5 ft height respectively. 20.6% respondents were ≤ 45 kg, according to 25.3% were belong to 46-50 kg, 20.0% were 51-55, 22.3%, 11.9% were 56-60 kg and >60 kg respectively. Majority of 75% respondents BMI were 18.5-24.9 followed by 20% respondents were ≤18.5 BMI and the rest of 5% respondent's ≥ 25 BMI.

There was relationship between hours spent sitting and participants with musculoskeletal disorder pain. Among them majority of 53.35% respondents spent sitting 6 hours or more than six hours. The risk of developing musculoskeletal disorder pain was 1.66. The findings are statistically highly significant $\chi2 = 24.147$; P-value = 0.001). The relationship between hours spent standing and participants with

musculoskeletal disorder pain. Among them majority of 52.8% respondents spent standing 6 hours or more than six hours. The risk of developing musculoskeletal disorder pain was 1.60. The findings are statistically highly significant $\chi 2 = 20.507$; P-value = 0.001). Musculoskeletal disorder pain in participants who lifted objects that table shows the majority of participants (51.1%) lifted objects or people in the performance of their occupational activities. The risk of developing musculoskeletal disorder pain was 1.37. The findings are statistically highly significant $\chi 2 = 4.773$; P-value = 0.02). From the table shows the relationship between co-morbid factors and the presence of musculoskeletal disorder pain. Most of the garments workers had co-morbidities in the category diabetes 52.8%, "hypertension". In this category 60% participants specified that they were suffering from musculoskeletal disorder pain, 70.7% were arthritis. The finding are each statistically highly significant. The risk of developing musculoskeletal disorder pain was (1.31, 1.64, 1.62) and P>0.5. The relationship between perceived stress at work and musculoskeletal disorder pain. Few participants (16%) never experienced stress while 66.3% participants who experienced stress all the time had musculoskeletal disorder pain perceived stress at work was found to be significantly associated with the presence of musculoskeletal disorder pain (p=0.001).

Chapter-V I

6.1. CONCLUSION

The variety of morbidities detected among garment workers, especially the high prevalence of musculoskeletal problems, is alarming. It is high time that steps are taken for revising their wages and the other conditions related to their jobs so that they can improve their socioeconomic condition. Counseling for alcohol and tobacco addiction is necessary and they must be educated regarding the prevention of common diseases and the importance of personal hygiene.

In the readymade 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 can 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. Factors can be used to identify workers with cute low-back pain who are at high risk of poor outcomes. The factors - identified—such as recovery expectations interactions with health-care providers, self-reported pain and physical limitations, and physical demands of the job—could be used to screen those workers at high risk of long-term or permanent disability. There is conflicting evidence in the literature on the association of the female sex, for example nursing as an occupation and heavy physical duty are associated with the development of musculoskeletal disorder pain. Participation in physical activities more

than three times per week is protective to the lower back. A balance should exist between prolonged sitting, standing and walking, as either too much or too little can be a cause of musculoskeletal disorder pain. Stress is associated with musculoskeletal disorder pain but this may be due to its association with other chronic diseases. Estimates for musculoskeletal disorder pain associated with co morbid diseases like diabetes, hypertension and arthritis are low.

6.2. Limitations of the study

This cross sectional study was conducted in a selected area (selected Garment factory) of Dhaka city to find out the different type of musculoskeletal disorder pain, to whom female garments worker of the country.

The limitations those are perceived while conducting the research work are stated below-

1. As the study place is purposively selected in Dhaka city so the result of the study might be area specific and might not reflect the country scenario.

2. Information collected from the garment workers was based mainly on their verbal report. During interview, the workers were initially somewhat hesitate about a few questions, but with encouragement response was quite honest.

3. Though the topic of this study is new one, the availability of the relevant published material is not satisfactory.

4. To conduct such a study resource is very much important factor. Researcher being a student without any financial support felt serious problem.

5. Due to limitation of time and unavailability of the responded, the feasible sample size was 260.

6.3. RECOMMENDATIONS

The aim of the study was to find out the prevalence of musculoskeletal disorders among the garment worker in Dhaka city. Though the study has some limitations but further studies in future may bridge the gaps. The main recommendations would be as follow:

Prolong sustain sitting posture have shown more prevalence of musculoskeletal pain. Further study can be carried out to find out why prolong sitting causes more pain.

- Workers who work in standing for more than six hours at a time show more incidence of musculoskeletal pain. Further study should be carried out to evaluate the underlying causes of development of musculoskeletal pain due to prolong standing.

- Physical stresses as well as mental stress in the workers reduce the working capacities and productivity. Appropriate measures should be taken to minimize stress during working hours.

- Further study should be carried out to find out why more Ready Made Garments workers are suffering from neck pain.

- Wide range Country wide further study should carried out to find out clearer picture of prevalence of musculoskeletal disorders in RMG sector in Bangladesh.

- Along with other health care providers, qualified physiotherapists should involve in the treatment of musculoskeletal disorders of RMG workers to reduce losses of working hours and promote productivity in this sector.

- Investigator use only 260 participants as the sample of this study, in future the sample size would be more.

- In this study, the investigator took the sample from 8(eight) selected garments; it was small area to take available sample. So for further study investigator strongly recommended to include every garments factory in Bangladesh and so the results would be generalized in wider population.

- Don't slouch when standing or sitting. The lower back can support a person's weight most easily when the curvature is reduced. When standing, keep your weight balanced on your feet.

- Sit in a chair with good lumbar support and proper position and height for the task. Keep shoulders back. Switch sitting positions often and periodically walk around the office or gently stretch muscles to relieve tension. A pillow or rolled-up towel placed behind the small of the back can provide some lumbar support. During prolonged periods of sitting, elevate feet on a low stool or a stack of books.

- Obesity causes a constant weight on the lower back and contributes to this condition and should be kept under check.

- Don't try to lift objects that are too heavy. Lift from the knees, pull the stomach muscles in, and keep the head down and in line with a straight back. When lifting, keep objects close to the body. Do not twist when lifting.

- Maintain proper nutrition and diet to reduce and prevent excessive weight gain, especially weight around the waistline that taxes lower back muscles. A diet with sufficient daily intake of calcium, phosphorus, and vitamin D helps to promote new bone growth.

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CONSENT FORM

Assalamualaikum,

I am Bahauddin Bayzid, Final part M.Sc. in Physiotherapy student of Bangladesh Health Profession Institute (BHPI) under the faculty of Medicine, University of Dhaka. To obtain my master degree, I have to conduct a research project and it is a part of my study. The participants are requested to participate in the study after a brief the following:

My research title is 'Prevalence of Musculoskeletal disorders among the garment workers in Dhaka city'. Through this study I will try to find out prevalence of musculoskeletal disorders suffered by Garment Workers and their risk factors. Workers may get benefits from this study who is suffering from different types of musculoskeletal disorders.

To fulfill my research project, I need to collect data, so, you are a respected participant of this research. I want to meet you a session for 20 to 25 minutes. Your participation will be voluntary. You may have the right not to answer a particular question that you do not like. All information provided by you will be kept confidential and will be used only for the purpose of academic research.

If you have any query about the study or right as a participant, you may contact with researcher, Bahauddin Bayzid, Lecturer (Part Time) of Physiotherapy, Dept. of Physiotherapy, IHT, Mohakhali, Dhaka.

Do you have any questions before I start?.........................

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

Yes…………………. No…………………………….

Signature of the participant and date………………..

Signature of the Interviewer and date………………..

INFORMED CONSENT

I have read the for-going information. All of my quarries were answered satisfactorily. I have understood that it is a research work for Prevalence of musculoskeletal disorders among the garment workers in Dhaka city. I have fully understood the purpose and duration of this research's. I have got a clear idea of this research including the procedures to be followed. I have understood that my personal identifies and other social information was kept highly confidential and the records connected with my participation in this research were safeguarded. My name was revealed in any publication that may arise from the study. I was haven't any risk and discomfort of participating into this research. I have understood that I have right to leave this research any time for any reason what so ever I have undersigned certify that I signed this document willingly to participate in the same research presence of following witness.

-                                  -
Volunteer's Signature   Witness Signature

Name: Name:

Father's name: Father's name:

Address: Address:

Date: Date:

....

Principal investigator's Signature

Date:

INTERVIEW QUESTIONNAIRE

Respondent

Assalamualaikum, I am a physiotherapist and also a student of MSc (physiotherapist), Roll ….. Course at Bangladesh Health Profession Institute (BHPI) under University of Dhaka, Faculty of Medicine. I am going to conduct a research work about the " Prevalence of musculoskeletal disorders among the garment workers in Dhaka city. For the purpose of the study, I wish to ask you some questions. I will appreciate your cordial support answering following questions. All information provided by you will be kept confidential & will be used only for the purpose of academic research.

Identification Number   : ☐☐☐   Date: ..../......../......./

Name of the Interviewer   : ....

Present Address   : ....

Permanent Address   : ....

A. Sacio-Demographic related Information

1.   What is your age? (In full years) :   ☐☐

2.   What is your religion?   ☐

    (1) Islam   (2) Hindu   (3) Christian

    (4) Buddhist   (99) Others (Specify ....)

3.   Marital Status?   ☐

    (1) Unmarred   (2) Married   (3) Widow

    (4) Divorced   (5) Separated   (99) Others (Specify ....)

4.   What is your educational qualification?   ☐

    0   - Illiterate

    1-16 - Upto which year she has read

    17   - Can sign only

    18   - Can read Arabic only

5.   What is your husbands/fathers occupation?   ☐

    (1) Day labourer   (2) Cultivator   (3) Rickshaw puller

    (4) Garments worker (5) Small business (6) Service

    (7) Hand loom worker (99) Others (Specify ....)

6.   How many family members do you have?   ☐

7.   What is the monthly income of your family?   ☐☐☐☐

8.   What are the actual regular working hours ………………………..   ☐

9.   How long, you are doing this garments job (in year)   ☐

10. In which section of garments have you being working?   ☐

    1. Sewing section   2. Cutting section

3. Ironing section   4. Finishing section

5. Others

11. During an 8 hour working day, how many hours do you spend sitting? .... hours

12. During an 8 hour working day, how many hours do you spend standing? . Hours

13. Do you often lift objects/people during your working day

1. Yes   2. No

14. In your personal opinion, do you experience mentali stress at work?

1. Never   2. Sometimes

3. Often   4. All the time

5. Too much to handle

B. General health related information

15. Do you suffer from any of the following diseases? Diabetes (sugar problems)

1. Yes   2. No

16. Hypertension (high blood pressure)

1. Yes   2. No

17. Arthritis

1. Yes   2. No

18. Do you suffer from any of co-morbidity is existing?

1. Dermatitis   2. Hearing problem   3. Fungal infection

4. Skin allergies   5. Diarrhea disease   6. Asthma

7. Dysentery   8. Pain in abdomen   9. Common cold

10. Fever   11. Nausea and vomiting   12. Anemia

13. Others

19. During the last 12 months, how much sick leave have you taken, if any?

    1. 0 days   2. 1-6 days

    3. 7-12 days   4. 12 more than 12 days

C. Musculoskeletal disorder related information

20. Do you have musculoskeletal disorder at present?

    1. Yes   2. No

21. If yes, Where is is the pain of musculoskeletal disorder (Pain in body parts)

    1. Neck   2. Shoulders   3. Right Elbow

    4. Left Elbow   5. Both Elbow   6 Wrist/hands Upper back

    7. Wrist/Lower back   8. Hip/thighs Knees   9. Ankles/feet

    10. Pain in figure   11. Pain in different part   12. Others

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

Complaints (Pain in body parts)	Nature of complaints	Code no	Severity of complaints	Code no
Neck	1. Temporary 2. Continuous 3. On movement		1. Mild 2. Moderate 3. Severe	
Shoulders	1. Temporary 2. Continuous 3. On movement		1. Mild 2. Moderate 3. Severe	
Elbow	1. Temporary 2. Continuous 3. On movement		1. Mild 2. Moderate 3. Severe	
Wrist	1. Temporary 2. Continuous 3. On movement		1. Mild 2. Moderate 3. Severe	
Hip/thighs Knees	1. Temporary 2. Continuous 3. On movement		1. Mild 2. Moderate 3. Severe	
Ankles/feet	1. Temporary 2. Continuous 3. On movement		1. Mild 2. Moderate 3. Severe	
Low back pain	1. Temporary 2. Continuous 3. On movement		1. Mild 2. Moderate 3. Severe	
Pain in different part	1. Temporary 2. Continuous 3. On movement		*1. Mild* *2. Moderate* *3. Severe*	

23. If yes, how did you manage your musculoskeletal disorder ☐

    1. Physicians   2. Pain medication

    3. Physiotherapist   4. Pharmacist

    5. Not treatment   6. Others (Specify …………………..)

24. If no treatment What were the barriers of not seeking the treatment? ☐

    1. Distance from health facilities   2. Expenditure for treatment

    3. Transport problem   4. Communication problem

    5. Lack of money   6. Service not satisfactory

    7. Refusal of decision maker of family 9. Others (Specify…)

25. Have you experienced musculoskeletal disorder in the past ☐

    1. Yes   2. No

26. If you have musculoskeletal disorder in the past please indicate the number of

    years of months that it has affected ……………………………… years/months

27. Antrometic measurement: ☐

    a. Height (cm) ………………………… ☐

    b. Weight (Kg) ………………………… ☐

    c. BMI …………………………………… ☐

Signature: ……..………….

Date: ..../.........../..........

Ethical Comity Approval

CRP-BHPI/IRB/02/16/034

To

Bahauddin Bayzid

Part – II, M.Sc. in Physiotherapy

Session: 2012-2013, DU Reg. 01

IHT, Mohakhali,Dhaka

Subject: Approval of the thesis proposal – "The Prevalence of Musculoskeletal disorders among the garment workers in Dhaka city" by IRB of BHPI.

Dear Bahauddin Bayzid

Congratulation!

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on January 21, 2016 to conduct the above mentioned thesis, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

SL#	Name of the Documents
1	Thesis Proposal
2	Questionnaire
3	Information sheet & consent form.

Since the study involves answering a questionnaire that takes 15 to 20 minutes, have no likelihood of any harm to the participants rather possibility of benefit by knowing factors associated with the Musculoskeletal disorders with physical disabilities from the information of Questionnaire, IRB has approved the study to be conducted in the presented form at the meeting held at 08:30 AM on February 25, 2016 at BHPI.

IRB 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. IRB of BHPI is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

S.M. Ferdous Alam

Assistant Professor

Dept. of MSc in Rehabilitation Science

Member Secretary, Institutional Review Board (IRB), BHPI.

Annexure-5

Work Schedule

Activities	May 15	June 15	July 15	Aug 15	Sep 15	Oct 15	Nov 15	Dec 15	Jan 16	Feb 16	Mar16	Apr 16
Topic Selection	██											
Planning & designing		██	██									
Literature Review		██	██	██	██	██	██	██	██	██	██	
Selection of Study area				██								
Instrument development					██							
Pretesting & Finalizing						██						
Data Collection							██	██				
Data Analysis									██			
Data Tabulation									██			
Report Writing									██	██		
Finalizing the Report										██	██	██
Final Submission											██	██