

**PREVALENCE OF SELF-REPORTED MUSCULOSKELETAL
SYMPTOMS AND ASSOCIATED RISK FACTORS AMONG THE
HEALTH PROFESSIONS STUDENTS IN BANGLADESH HEALTH
PROFESSIONS INSTITUTE AND NURSING COLLEGE**



By

Jafrin Luba

March, 2016

*This thesis is submitted in total fulfillment of the requirements for the subject
RESEARCH 2 & 3 and partial fulfillment of the requirements for degree:*

Bachelor of Science in Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Faculty of Medicine,
University of Dhaka

Study completed by:
Jafrin Luba
4th year B.Sc. in Occupational Therapy

Signature

Study supervisor's name, designation & Signature:
Md. Yeasir Arafat Alve
Lecturer in Occupational Therapy
Department of Occupational Therapy
BHPI, CRP.

Signature

Head of department's name, designation and Signature:
Nazmun Nahar
Assistant Professor & Head of the department
Department of Occupational Therapy
BHPI, CRP.

Signature

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Signature: _____ Date: _____

Jafrin Luba

4th year, B. Sc. in Occupational Therapy

ACKNOWLEDGEMENT

All the praise must go to Almighty Allah for blessing and giving me the ability to conduct this study.

I would like to pay my highest gratitude to my honorable supervisor Md. Yeasir Arafat Alve for increasing my inspiration and endless support for completing my study. Besides my supervisor I would like to express the deepest appreciation to Nazmun Nahar (Assistant professor and Head of the Department, of Occupational Therapy Department, BHPI, CRP) for giving me permission and approve of this study. I am also grateful to Mizan sir for checking the Bangla languages within the study and his valuable advice. Lastly, I would like to give thanks all participants of my study who cooperate me during data collection. I would also like to offer very special thanks to the Occupational Therapy Department and Bangladesh Health Professions Institute (BHPI) for providing me the opportunity to do this study.

I would like to express my gratitude to my parents who constantly inspired me to carry out this study. This thesis is heartily dedicated to my parents who encouraged me and prayed for me throughout the time of my research and are the most important people in my world.

I am also thankful to friends whose support and productive criticisms helped me to bring my work to success.

Abstract

Background: Health professionals' student group has the chance to develop musculoskeletal symptoms in different body region. Prevalence of musculoskeletal symptoms among health professionals student higher due to the student are stay long period of time in their class room, library, use laptop computer, and their placement. The prevalence of MSS at last 1 body region 7 days (88.6%) and 12 months (88.4%). It was helpful to professional development for occupational therapist in current situation and this study was benefited for those students who already affected by MSS.

Objectives: To determine the prevalence of musculoskeletal symptoms among health professionals' student and the association between demographic factors and MSS and also identify postural risk factors for musculoskeletal symptoms due to awkward posture.

Method: A cross-sectional study among health professions students in Bangladesh Health Professions Institute and nursing college was carry out to accomplish the objectives of the study by using Dutch Musculoskeletal Questionnaire with using purposive sampling procedure to select the sample group.

Result: It has found that in the most affected body part last 7days neck 42.9%, lower back 41.4%, knee 41.4% and 12 months neck 67.1%, upper back 42.1%, lower back 50.7%, wrist 40.7%, knee 45% and significant association socio-demographic factors and MSS 7 days years (.002), department (.009), working hours (.026) and 12 months year (.002), department (.009), working hours (.003) also significant association physical risk factor and MSS 7 days VDU work for long Periods (.002), working in uncomfortable posture (.005), and working in slight twisting position trunk for long time (.003) 12 months VDU work for long Periods (.002)working in extension of arms/hands (.003) and Working in uncomfortable Posture (.001).

Conclusion: Results is suggested that there is a high prevalence of musculoskeletal symptoms among health professionals' students. The findings of musculoskeletal problem can be reduced by taking proper strategies and effective ergonomic management.

Keywords: *Musculoskeletal symptoms, Work related musculoskeletal disorder musculoskeletal risk factors.*

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List of Abbreviations

BHPI: Bangladesh Health Professions Institute

CRP: Centre for the Rehabilitation of the Paralysed

DMQ: Dutch Musculoskeletal Questionnaire

MSD: Musculoskeletal Disorder

MSS: Musculoskeletal Symptom

WRMSD: Work Related Musculoskeletal Disorder

VDU: Video Display Unit

VDT: Video Display Terminal

BDS: Bangladesh dental surgeon.

RULA: Rapid upper limb assessment.

USA: United States of America.

CHAPTER 1 INTRODUCTION

1.1. Background

Work-related musculoskeletal disorders (WRMSDs) are a subset of functional disorder caused by numerous external factors such as occupational repetitive movements, overexertion, force, awkward postures (Cheng et al., 2013, p. 138) and also (WRMSDs) or non-traumatic soft tissue disorders which are caused by work activities, for example exposures to frequent or heavy manual handling, awkward postures, forceful and repetitive exertions (Spector et al., 2011, p. 537). The musculoskeletal complaints in working population which signify one of the most worrying work-related health issues at the current time (Parot-Schinkel *et.al.*, 2012) but the incidence of musculoskeletal disorders (MSDs) is not new, Berrandro Ramazzini the father of occupational medicine, first introduced the common musculoskeletal disorders in eighteenth-century and now a days it's frequency varies from 10% to 25% and prevalence rate of MSDs has increased as four times since 20 years ago (Aghilinejad *et al.*, 2012, p. 89).

Musculoskeletal Disorder have becomes one of the most regarding occupational health problem due to the different workforce. The prevalence of self-reported musculoskeletal complaints is relatively high amongst the healthcare professionals around the world (Akrof et al.2010, p.16). In fact, sick level absenteeism, lost workday and high rate of health compensation due to work related musculoskeletal disorders (Alexopoulos et al.,2006, p. 289) made the issue most challenging for both developed and developing countries (Maul et al.,2003, p. 497). Excessive demand of physical workload including patient handling, awkward sustained posture are believed as most significant work related physical factors associated with musculoskeletal complaints among the health professionals (Kim *et al.*, 2010). According to Occupational Safety and Health Research Institute the proportion of (WRMSDs) among the total agreed occupational diseases increased from 49.6% in 2003 to 76.5% in 2007 (Kim *et al.*, 2010).Almost 1.1 million people in the United Kingdom suffer from musculoskeletal disorders, and 11.6 million working days are lost (Akrouf et al., 2010, p.16; Facts, 2000). About 1.7% of the Gross National Product in the Netherlands is lost and approximately 93% of the cost of this caused by absenteeism (Facts, 2000). As a developing country in Bangladesh the incidence of musculoskeletal symptoms in spine,

neck, shoulder and knee is newly developed with the incidence rates of 10.9/100 person per year (Kim *et al.*, 2010). In Bangladesh there is no published study among student specifically Health Professionals Students correlated with (MSS) prevalence and its associated risk factors. But there is some study in Bangladesh which is about health professions related. One related study which is about occupational and physiotherapy health professions from this study got information form 12 months from the onset of collecting data study about health professionals the rate of neck pain 63.6%, upper back 38.2%.lower back 72.2%, hip 23.6%, shoulder 34.5%, elbow 12.7%, wrist 52%, knee 40% ankle 27.3%.(Farjana.I., 2014). Another study shows that the dental students of Bangladesh are suffering from MSD neck 21.90%, shoulder and neck 15.60%, upper back 3.10%, low back 37.50%, hip and low back 3.10% due to performing the same task 18%, working in awkward posture 28.20%, working in same position 37.50%, bending and twisting 12.50%, not enough breaks and rest 3.10% (Sadeq.F.I., 2006). One another study result shows that dental professionals are suffering from MSS the prevalence of neck pain 0%, shoulders 5.56%, elbows 0%, wrists 22.22%, upper back 11.11%, hip/thigh 0%, ankles 0% (Hossain.M.U., 2015).

Epidemiology of (MSS) among Korean nursing students used a validated, questionnaire survey. Among 202 students, the prevalence of MSS at anybody site ranged from 69.0% to 77.1% (overall rate: 73.3%). MSS was most commonly reported at the shoulder (46.0%), followed by the lower back (39.1%), neck (35.6%), feet (25.2%) and lower legs (23.8%) (DR.Smith, 2005).In Australian occupational therapy students replies were obtained from 95.7%, 100% and 97.7% students in the first, second and fourth years of a large occupational therapy school in northern Queensland, Australia. The 12-month period prevalence of MSDs was as follows: neck (67.4%), shoulder (46.3%) and upper back (39.5%) (DR Smith, 2006). Another literature reported that highest prevalence of musculoskeletal among physical therapy student, were in the following anatomical areas: low back (45%), wrist/hand (29.6%), upper back (28.7%), and neck (24.7%) (Niraj A.et.al., 2014, p. 157). One Another study show that (76.2%) of dental students of Pakistan have musculoskeletal pain, out of which back pain was experienced by 32.1% and neck pain by 32.4%. Although 82.9% dental students knew the correct working posture, only 43.8% dental students' worked corresponding to the guided working positions. (Niraj A.et.al., 2014, p. 161). Another study show that self-reported musculoskeletal trouble (ache, pain, discomfort) among dentists of South Africa of 77,9% involving the neck, 69,8% the lower back, and 72,4% the shoulders.

Multiple regression analysis show that a decrease in height among the respondents was associated with an increase in neck trouble (Khurram.P.S. et.al, 2015). One another study show that (83 %) radiologists responded, and 38 % reported radiology-associated occupational injury (magnetic resonance imaging (MRI), computer tomography (CT), positron emission tomography (PET), nuclear cardiology treadmill studies, mammography, or ultrasound, image-guided biopsy, percutaneous trans luminal angioplasty, trans hepatic biliary drainage, and nephrostomy catheter placement). Lower back discomfort was the commonest radiology associated musculoskeletal symptom (41 %). One study revealed that in radiologist students a prevalence of 72% and 77% of low back pain was found among male and female radiographers, respectively. Ergonomic equipment and education are provided by application specialists, but the incidence of WRMSD appears to be prevailing (D.R. Smith et.al., 2005). The result of some studies indicated that between 6% and 67% health professionals student in a variety of setting have experienced a work related injury (Borkberg et al.,1996).One study revealed that where total responds 74.9% results indicated that 50.6%of surveyed reported to regularly experience physical stress related to their work and 39%of the reported also suffer physical symptoms after working day (Marcello. M., 2004).

After viewing these literatures we can understand the impact of musculoskeletal symptoms among the health professions students. Although many study have allocated all over the about musculoskeletal disorders among students, only a few of those focused on health professions students. This study is first study and it is formulate to fill the gap of knowledge in this area.

1.2: Significance

(WRMSDs) are one of the most important occupational health problems for the health professional's students. It is important to identify the musculoskeletal symptoms prevalence and associated risk factor among the health professional's students. The musculoskeletal symptoms are caused due to long period time in their class room, library, also used laptop, computer, practical class, clinical placement. This might be lead to development of different kind of MSS among them. Many literatures showed that health professionals' students have high prevalence in musculoskeletal symptoms. In Bangladesh there are many health professions student and there is no published study about the prevalence of musculoskeletal symptoms among health professions student.

From this study, the investigator was able to find out the prevalence and associated physical risk factor among survivors. This study also helps to discover the lacking area of a student especially about their posture before doing any activities in their workplace. Beside this it was helpful to professional development which essential for occupational therapist in current situation and this study was benefited for those students who already affected by MSS and different type of disorder and chance to develop MSS in future. Because when they know about postural risk level then they try to maintain this and also try to prevent this.

Many literatures showed that health professional students are suffering from MSS due to their work responsibilities. One study in China shows that 88% of the dentists reported at least one musculoskeletal disorder (Dr.Yuling.Y., 2014). Another study which about nursing health professionals, prevalence of MSS at anybody site ranged from 69.0% to 77.1% (D.R., Smith. 2013). Without this many articles and study expose that inappropriate posture and movement lead to MSS. It is important to identify which risk factor impact on health professional's student in BHPI and Nursing College. When know about the which physical risk are cause MSS then try to prevent the cause. It is very important to know the ergonomic factors of student, because occupational therapist has major role in ergonomic area and it help to discover the role and importance of occupational therapy in every sector of Bangladesh. From the result of this study the relationship between posture and musculoskeletal symptoms would found. This study was help to develop new literature on the ergonomic sector and reduce the literature gap. This study was helpful for future study in ergonomic setting and this study is very helpful for occupational therapist and other health professionals to know the exact prevalence of musculoskeletal symptoms and postural risk level.

1.3. Aim

To estimate the 7 day and 12-months prevalence of self-reported MSS and associated risk factors among the health professions students in Bangladesh Health professions Institute.

1.4. Objectives

- To determine the prevalence of MSS among health professionals student, over the 7 days, and over the previous 12 months.
- To know the association between demographic factors and MSS in last 7 days and over the previous 12 months.
- To identify postural risk factors for MSS due to awkward posture.

CHAPTER 2 LITERATURE REVIEW

2.1. Musculoskeletal symptoms:

Musculoskeletal symptoms are a collection of painful disorder of muscles, tendon, and nerve (Sender, 2004). Signs or symptoms of musculoskeletal disorder are numbness or a burning sensation, reduced grip strength in the hand, swelling or stiffness in the joints, pain in wrists, forearms, elbows, neck, or back, reduced range of motion in the shoulder, neck, or back, dry, itchy, or sore eyes, blurred or double vision, aching or tingling, cramping, weakness (Canadian center for occupational health and safety, 2013). This symptoms can develop when the same muscle are used over and over again or for long time without taking time to rest (Canadian center for occupational health and safety, 2013). The chance of getting this type of injury increases if the force is high and job requires an awkward posture. It is important to report signs and symptoms as early as possible to prevent serious injury or permanent damage. Now a day musculoskeletal symptoms are affecting the student in wide range. The common musculoskeletal symptoms among students are neck pain, shoulder pain, arm pain, hand and wrist pain, one literature about (WRMSDs) among Nurses in Ibadan expressed that eighty-four point four percent of the nurses have had WMSDs once or more in their occupational lives. The 12-months period and point prevalence rate of WMSDs at anybody region was 78% and 66.1% respectively. WMSDs occurred mostly in low back (44.1%), neck (28.0%), and knees (22.4%) (Bolanle. M.S et al., 2010).

2.2. Work related musculoskeletal disorder:

According to Canadian Centre for Occupational Health and safety MSS are inflammatory and degenerative conditions that affect the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels. This include clinical syndromes such as tendon inflammations and related conditions (Tenosynovitis, Epicondylities, bursitis) nerve compression disorder (carpal tunnel syndrome, sciatica) and osteoarthritis (Lu, 2003). (WRMSDs) disorder which are often soft-tissue injuries occur when there is a mismatch between the physical requirements of the physical capacity of the human body (Sender, 2004). Common musculoskeletal disorders (or

injuries) are Carpal Tunnel Syndrome, Tendonitis, Muscle/Tendon strain, Ligament Sprain, Tension Neck Syndrome, Thoracic Outlet Compression, Rotator Cuff Tendonitis, Epicondylitis, Radial Tunnel Syndrome, Digital Neuritis, Trigger Finger/Thumb, De-Quervain's Syndrome, Mechanical Back Syndrome, Degenerative Disc Disease, Ruptured / Herniated Disc, repetitive motion injury, repetitive stress injury, overuse injury (Middlesworth, 2014). One literature shows that prevalence and risk factor associated with musculoskeletal pain amongst students of MGM Dental College in India- prevalence of musculoskeletal disorder in different body region, in this study found a total of 81% prevalence of musculoskeletal pain among the dental students. Statistical significance was observed between different clinical activities and musculoskeletal pain hand (92%) ,wrist (85%) and lower back (72%) (Dr. Madaan.V et.al. 2013). One Indian study shows that the prevalence and distribution of musculoskeletal pain among physiotherapy students at Government Physiotherapy College, New Civil Hospital Surat. It was found that around 52% of the students had a musculoskeletal pain in last 12 months. Most common site of pain was lower back 22(37.29%), neck 15(25.42%) and upper back 11(18.64%). Dull aching was the most common pain among 39(66.10%) students (Niraj A., et.al, 2014).

2.3. Stages of musculoskeletal disorder:

(WRMSDs) disorders may progress in the following stages- (Canadian center for occupational health and safety, 2013).

Intermediate stage: Aching and fatigue occur early in the work shift and persist at night. It decreases the capacity for repetitive work (Canadian center for occupational health and safety, 2013).

Late stage: Aching, fatigue, and weakness persist at rest inability to sleep and to perform light duties (Canadian center for occupational health and safety, 2013). The first pain is a sign that the muscles and tendons should rest and recover. Otherwise, an injury can become long-lasting, and sometimes, permanent. The earlier people recognize symptoms, the quicker they should respond to them (Lowa State University, 2013); (Canadian center for occupational health and safety, 2013).

2.4. Risk factors of work related musculoskeletal disorders:

(WRMSDs) are associated with many factors many factors that are mentioned below-

1. Improper working posture and movement
2. Forceful exertion
3. Repetitive work
4. Imbalanced temperature
5. Inadequate breaks (Facts, 2000: Canadian center for occupational health and safety, 2014: Sanders, 2004)

2.5. Physical Risk Factor:

Physical risk factors are the aspect of a job or task that make a force of biomechanical stress on the worker. Physical risk factors are the most significant element of musculoskeletal disorder hazards or problems ((Lowa State University, 2013). There are different study showing that the exposure to physical risk factors in the risk of developing the MSDs (Dul and Weerdmeester, 2008). Musculoskeletal disorder arise from ordinary arm and hand movement such as bending, straightening, gripping, holding, twisting, reaching (Dul and Weerdmeester, 2008).This common movement are not particularly harmful in everyday life while performing the ordinary activities (Sanders, 2004). It makes them hazardous in work situation if it is the continual repetition, often in a forceful manner and most of all the speed of the movement and lack of recovery time (Sanders, 2004). MSDS are associated with work patterns that include (Sanders, 2004).

1. Awkward posture.
2. Forceful exertion
3. Repetition
4. Bending or twisting
5. Maintaining same work positions or posture for a long period
6. Performing motions constantly without short pauses or breaks

2.6. Awkward Posture:

Posture is one of the most frequently cited physical risk factors for MSS. Although the protective influence of neutral posture on health and productivity is recognized in ergonomics (Sender, 2004). Awkward posture is those in which joint are hold or moved away from the body's neutral position. The closer the joint is to its end of range of

motion (for instance bending the back forward as far as possible), the greater the stress placed on the soft tissue, joint, muscles, nerves and tendons (Sender, 2004). In an awkward posture, muscles and tendons cannot work appropriately and thus they need much more force to complete tasks (Lowa State University, 2013). All joints move through a special range of motion. Postures in the middle of the range of motion are generally considered as neutral postures while postures at the end of the range can be considered as awkward posture (Sanders, 2004). Awkward postures involve working in a position that is deviated from neutral position (Lowe State University, 2013). Awkward posture is the primary ergonomic risk factor to which is exposed when the height of working surfaces is not correct. It brings the body out of alignment and is less efficient and effective position than neutral posture (Sanders, 2004). When performing any work by doing long reaching, it may significantly alter the positions of shoulders, elbows and backs from the neutral position (Sanders, 2004). This kind of awkward posture places excessive force on joints and overload the muscle and tendon around the joint which may lead to occur (WRMSDs) (Middlesworth, 2014). Student are suffering from MSS and associated risk factors due to their awkward posture. They pass long period of time in their class room, library, practical room in this time they does not maintain their proper posture and movement. One study show that nursing student have had WMSDs once or more in their occupational posture. Nursing education should prepare students for a lifelong professional career including managing clinical physical demands. MSS, such as bodily pain, have been reported among nurses and nursing students but less is known about the impact of symptoms in daily activities. The aim was to explore the prevalence of self-reported musculoskeletal symptoms and their impact on general physical activity among nursing students. This cross-sectional study was based on a questionnaire to all undergraduate nursing students. Of 348 students 224 responded, 84% women, mean age 24.6 years. Of those 143 (64%) reporting symptoms during the past 12 months, 91 (64%) reported impact on physical activities. Most commonly reported were everyday activities such as transportations and prolonged sitting. The prevalence of musculoskeletal symptoms was high among nursing students and higher the final study year and not only resulted in discomfort but had an impact on the students' general physical activities (Bergberg, et al, 2014).

2.7. Forceful exertion:

Closely all activities require some degree of force. Force is the involuntary effort required to carry out a movement or to prevent movement. Force may be exerted against a work piece or tool, or against gravity, to stabilize body segments (Sanders, 2004). Muscles and tendons can be overloaded when a strong (high) force is applied against the object load (Lowa State University, 2013). Excessive force can cause muscle fiber, or by disruption of the contractile unit in the muscle fiber. Forceful muscle contractions also rise intramuscular pressure, which may compress nerves and blood vessels within the active muscle (Sanders, 2004).

Force is the mechanical effort required to carry out a repetitive movement or to prevent movement. Force may be exerted against a work piece or tool, or against gravity, to stabilize body segments (Sanders, 2004). The force that a worker exerts on an object is a primary risk factor. Muscles and tendons can be overloaded when a strong (high) force is applied against the object load (Lowa State University, 2013).

Performing work by doing forceful exertions of muscles will make them fatigue rapidly. The more force is applied, the more frequently the muscle will be fatigue or strained. Overuse of muscles through forceful exertions lead to strain or damage muscles, irritate tendons, joints and disks. The final result of excessive force leads to create inflammation, fluid build-up, and constriction of blood vessels and nerves in the area (Lowa State University, 2013). More force equals more muscular effort and consequently, a longer time is needed to recover between tasks. Since in repetitive work, as a rule, there is not sufficient time for recovery, the more forceful movements develop fatigue much faster (Canadian center for occupational health and safety, 2014). A risk can also occur when a weaker (low) force is applied repeatedly (repetition) or continuously over a long period of time (Sanders, 2004). The combined effect of excessive force and repetitive movement has been suggested to be considerably more injurious than either factor alone. Studies have demonstrated that high repetition of negligible force applied to the same muscle group, joint or tendon causes inflammation of soft tissues (Abledu.J.K., 2015). One literature shows that the Work-related Musculoskeletal Pain among Dental Students at China (76.2%) of students reported to have musculoskeletal pain, out of which back pain was experienced by (32.1%) and neck pain by (32.4%) (Beibei. F., et al., 2014)

2.8. Repetition:

Repetition refers to the performance of the same motion over within a given time period (Sanders, 2004). When work is combined with other risks factors such as high force and/or awkward postures it will be high repetitive task that can lead to develop of musculoskeletal problems (Canadian center for occupational health and safety, 2014). If the working cycle time is 30 seconds or less, this work will be highly repetitive (Middlesworth, 2014). Repetitive movements are hazardous when involve in the same joints and muscle groups in the same motion too often, too quickly and for too long (Sanders, 2004). The musculoskeletal problems are associated with repetitive motion (Canadian center for occupational health and safety, 2014). Some back problems also result from repetitive activities. The joints are most affected for repetitive motion injuries; especially the wrists, fingers, shoulders, and elbows (Lowa State University, 2013). Repetitive work that is done with the foot or knees may also result in musculoskeletal disorders (Environmental Health and Safety, 2013). Different muscular conditions that result from repeated motions are performed in the normal work or daily activities (National Institute of Neurological Disorders and Stroke, 2013). Health professionals student are doing repetitive work such as same hand movement when computer use, patient handling in there placement, writing, sitting in same posture in class room that are harmful for them. That repetitive movement develop different type of musculoskeletal symptoms and disorder. One literature shows that knee pain 19.8%, was most common complain among health professionals, followed by low back pain 51.1%, neck pain 9.8%,. A total number of 169 health professionals 41.7% reported symptoms in at least one part of their bodies. Prolong sitting, neck flecion were the most reported ergonomics hazards among health professionals (Mehrdad.R,M. et.al, 2012).

2.9. Bending or twisting:

Bending or twisting while manual handling creates an awkward posture and changes the way of forces which are distributed (Lowa State University, 2013). When the spine is in its natural position, forces are directed along the bony structure and distributed into the tissue as the spine curves. However, bending and twisting redirects the forces, placing more compressive and shear forces on the discs (Lowa State University, 2013). Bending and twisting create different type of WRMSD. One literature shows that

(70.1%) students reported having MSDs in the previous 12 months, of which a total 88 (56.1%) suffered disabling effects, while 70(44.6%) students reported having MSDs in the past 7 days. The prevalence of MSDs in the different body regions was generally low with clustered distribution in the neck, upper back, wrists/hands and lower back (Abledu.J.K, 2015).

2.10. Maintaining same work positions or posture for a long period:

Working for long time in the same position will make the student feel "stiff, sore and tired (Lowa State University, 2013). Static postures are those postures that are held over a long period of time that resist the force of gravity or stabilize a work piece or body part (Sanders, 2004). It involves a prolonged state of contraction during which no movements is being performed. During static contractions, the internal pressure of muscle tissue compresses blood vessels and reduces blood flow to the muscle so that the oxygen and energy supply to the exertion and duration of forces (Sanders, 2004;). One literature shows that the prevalence of pain in neck 16%, shoulder 1%, elbow/hand 6%, upper back 1%, low back 23%, hip 0%, knee33%, ankles 9% (Israni.M., 2013).

After reviewing this literature it is said that musculoskeletal symptoms are impaired of body structure. This symptoms may vary form discomfort and pain to decreased body function and invalidity. The study give evidence the health professions students are higher risk of MSD. Student are always do their work in awkward posture, repetition, and long period static sitting or standing posture due to their work responsibilities. To prevent this problem student must avoid awkward posture and know about those factor which cause MSD.

CHAPTER 3 METHODOLOGY

In this chapter the methodology of the study is discussed under the following parts: study design, setting, participants and sampling, inclusion and exclusion criteria, data collection tools, data collection procedure, data analysis plan and ethical consideration.

3.1. Study design:

The study was conducted in cross-sectional of quantitative design. A cross-sectional quantitative research study design was conducted because in this way it is possible to identifying a defined population of particular point of time (Levin, 2006) and it can be helpful to estimate the prevalence of the outcome of interest for a given population and collect data on individual characteristics, including exposure to risk factors, alongside information about the outcome. Cross-sectional research method is often used to utilize in many areas including social science and education (Cherry, 2014; Trochim, 2006). Cross-sectional studies are observational in nature and are known as descriptive research (Trochim, 2006). This type of study helps to find out the prevalence of acute and chronic conditions of a population, but they do not manipulate variables (Cherry, 2014; Trochim, 2006). This type of study utilizes different group of people who differ in the variable in interest and other characteristics such as socioeconomic status, educational background, and ethnicity (Olsen, C. & Marie, D., 2004)

However, the study aim is to find out the musculoskeletal symptoms prevalence and its associated risk factors among health professionals' students in BHPI and CRP Nursing College at a point of time. Investigator also wanted to find out the risk factors among health professionals students at a short period of time. For this reason, the cross-sectional study was more appropriate design to fulfill the aim and objective of this study.

3.2. Study settings

The study was conducted in the following areas.

Centre for the Rehabilitation of the paralysed (CRP):

It is situated in Saver, which 20 km away from Dhaka. The founder of CRP is a British physiotherapist Valerie Taylor. It was founded in 1979 by of a small group of Bengalis. In CRP, there is an institute of BHPI with the combination of a nursing institute which

was established in 1993. In CRP hospital, B.Sc. in nursing course has been started since session 2013-2014.

Bangladesh Health Professions Institute and Nursing College:

BHPI was established in 1992 with the goal of producing highly skilled staff to work in health care provision and rehabilitation countrywide. BHPI provides a number of nationally recognized training courses. These courses include BSc in Physiotherapy, Occupational Therapy and Speech and Language Therapy, Physiotherapy and Occupational Therapy Diplomas, Laboratory Sciences and Radiography Diploma, Certificate in Education for Special Education, Diploma in Rehabilitation Nursing and M.Sc. in Rehabilitation Science. All the courses run at the BHPI are recognized by their respective government departments. In CRP hospital, B.Sc. in nursing course has been started since session 2013-2014. Than 18 student admitted B.Sc. in Nursing College. Student number of BHPI of in B.Sc. in Physiotherapy unit 190, B.Sc. in Occupational Therapy unit 120, B.Sc. in Speech and Language Therapy unit 73 and Diploma in Physiotherapy unit 40, Diploma in Radiology and Imaging unit 6, Diploma in Laboratory Medicine unit 76.

3.3. Study population:

Sample should be representing the population as closely as possible. For survey it is better to get many subjects as possible with the consideration of the size of ideal population (Cherry, 2014;). In this study sample collected in purposive way. Study participants' student who was engaged in health professions. Investigator will select 100-140 students who meet the inclusion criteria of the study. The investigator will explain the aim of the research also inform consent and at last select participants who enthusiastically participate in this project.

3.5. Sampling:

Purposive sampling used because purposive sample is a non-representative subset of some larger population, and is constructed to serve a very specific need or purpose (Cherry, 2014;).

“Purposive sampling is that a researcher do not simply study whoever is available, but use his/her judgment to select a sample that he/she believes based on prior information. In this type of sampling the sample is statistically representative”(Cherry, 2014;)

As there are many student in BHPI and Nursing College, the researcher will select the study participant by purposive sampling method. It is the most common type of non-probability sampling to complete the study within the fixed time period.

3.5.1. Sample size:

The following analyses were restricted to BHPI and Nursing College students. The data will be collected from approximately 140 students including males and females.

3.5.2. Sampling technique

After taking permission from the ethical body of the selected organization, the investigator had collected a list of students on those selected in organization. Those participants had fulfilled inclusion criteria as they are the participants of the study. Researcher had selected them through “purposive sampling” that are available in between the days of data collection. When population under study is not available at a time or unreachable with all population then purposive sampling can be used (Cherry, 2014).

3.5.3. Sample size determination:

Sample size will estimated according to following criteria: 50% prevalence common for the main characteristics of the study, 95% confidence interval, and sampling error 5%. The total study sample need to meet these criteria was calculated at 480 students. Sample size will be 480.

$$z= 1.96$$

$$p= .5 \text{ (Prevalence 50\%)}$$

$$q =0.5 \text{ (1-p)}$$

$$r =.05 \text{ (sampling error 5\%)}$$

Sample size (n): $z^2 \times p \times q / r^2 = 480$ by using standard formula of sample size determination.

If researcher was use standard measurement like the above formula to find out the sample size, it would be very difficult for the researcher for data collection as researcher had got only two months for data collection. If the researcher uses 80% prevalence to find out the sample size, it would be 307. As the researcher was an undergraduate student had two month to complete data collection, it will be very difficult for her to use 307 participants. For this 140 participants were selected for this study.

3.6. Inclusion criteria:

In this study participants was the students of BHPI and CRP Nursing College. The participants was selected from 1nd to 4th year student of department of Occupational therapy, Physiotherapy, Speech and language therapy, Nursing, Lab. Medicine. Male and female both students was included in this study

3.7. Exclusion criteria:

Participants who have joint disease last one year before data collection was excluded from this study because their symptoms are similar as like musculoskeletal symptoms. Person who were not interested to attend the program at the time of data collection, are also excluded.

3.8. Variables:

Independent variable:	Dependent variable:
Demographic <ul style="list-style-type: none">• Age• Sex• Year• Department	Musculoskeletal pain. <ul style="list-style-type: none">• Physical• Psychological• Environmental

3.9. Data collection Methods:

Before collecting data, the study aims, objectives and study procedures were explained to participants. They were given the opportunity to ask questions and when they were satisfied they were asked to sign the written consent form. Data was collected from those participants who gave the consent. Once they signed the consent form, the investigator completed the Dutch Musculoskeletal Questionnaire along with demographic questionnaire through some face to face interview and some questionnaire give the students. Investigator collected data from 15st October to 15 November, 2015. Investigator went to the selected department where the participants are working for collecting data. Finally investigator thanked them and completed her data collection.

3.10. Data collection tools:

Following instruments will be used during data collection period for the purpose of accumulating data from the participants to fulfill the aim and objectives of the study.

1. Information sheet & Consent form
2. Dutch Musculoskeletal Questionnaire
3. Paper, pen, pencil and eraser

3.11. Information sheet and Consent form:

Permission was taken from every participant by using the consent form. At the beginning of the data collection the researcher informed every participant about the ethical and confidential issues. It was also informed that, participants have the right to refuse to answer any questions and also have the right to withdraw from any part of the research. They were informed that data was used only for the research purpose and it will be protected

3.12. The Dutch Musculoskeletal Questionnaire:

The Dutch Musculoskeletal Questionnaire is using World Wide to find the prevalence of musculoskeletal symptoms of different part of the body among different working population (Hildebrandt, 2004). The validity of the questionnaire was analyzed in different studies (Vincent, 2005) so The Dutch Musculoskeletal Questionnaire is called a valid questionnaire & global assessment for measuring prevalence and ergonomic risk factors. Investigator was using standard version of the Dutch Musculoskeletal Questionnaire. The DMQ questionnaire covers the socio demographic characteristics like age, sex, employment status. The questionnaire includes item, asking to find out the prevalence and experience of musculoskeletal symptoms in nine body areas (neck, upper back, and lower back, shoulders, elbows, wrists, hips, knees & ankles) over the past week & over the past year. That's why The Dutch Musculoskeletal Questionnaire was used to find out the prevalence & associated physical risk factors of musculoskeletal symptoms among health professions students in the present study. Here, the investigator was modify standard version of Dutch musculoskeletal questionnaire for this study because of the work nature of the students and perspective of Bangladesh. There are some general questions at the beginning of the questionnaire and some other questions to find out the prevalence and risk factors.

3.14. Ethical Issues:

The investigator gained approval from the ethical committee of Bangladesh Health Professions Institute (BHPI) and Nursing collage. The investing gained permission

from the authority of NMQ. The investigator consent from the student by informing them about the study and samples was not detriment by the study. A written consent form was signed by each participant after the study had been explained to them and any questions that they had were answered for their satisfaction. The investigator assured them that their personal identity would be kept confidential and all the documents were kept in a safe place where only the investigator could have access and was strictly maintained. The study gave them assurance that Participation in the study was entirely voluntary and participants knew that they could refuse to participate or stop participating at any time without that decision. Where data will be made public, as in publications, it would presented in such a way that no individual will be identifiable.

3.13: Field test:

To make this DMQ questionnaire possible, the main questionnaire was translated into Bengali by taking permission from DMQ author body. Then the pilot study was performed with the 3 students in BHPI. It was conducted to check the appropriateness of questionnaire as well as to test the understanding. It also checked that, the translated questionnaire was suitable for the survey and data collection.

3.15. Reliability and validity:

- ✓ The Dutch Musculoskeletal Questionnaire is a reliable and valid instrument and other different authors have used it in their study.
- ✓ The Dutch Musculoskeletal Questionnaire was individually discussed with each participant and for questionnaire enough time was given to them for completing form.
- ✓ There was 10-15 minutes time limitation in filling out the Dutch Musculoskeletal Questionnaire and socio-demographic questioners.
- ✓ Dutch Musculoskeletal Questionnaire was not translated manually, the authority has shared readymade translated Bangla version.
- ✓ Dutch Musculoskeletal Questionnaire is a perfect selection for assessing musculoskeletal who are suffering MSD related problem.
- ✓ The questionnaire was forward translation and backward-translation with expert panel.

CHAPTER 4 DATA ANALYSIS & RESULT

4.1. Data analysis process:

Statistical test was performed by using the Statistical Package for social science (SPSS) Inc. version 20. For doing data analysis, all Information was collected and gathered. First of all, every variables of the questionnaire was defined in the means of variables name, type, width, decimals, label, values, missing, and column, align and measure in variable view of SPSS spread sheet. Then it was ready to inputted raw data in the data view of spread sheet. After that the data of every participant were input in data view and it was checked for missing values.

The prevalence of musculoskeletal symptoms among students in past 7 days and 12 months was calculated by percentage through the first row of section B of Dutch musculoskeletal questionnaire (DMQ). The demographic data were calculated by frequencies of section A (general factor) of DMQ. The investigator used the raw data in SPSS to find out the percentage of socio-demographic factors, prevalence of musculoskeletal symptoms in nine body regions & associated physical risk factors.

For finding the percentage of socio-demographic factors & prevalence of musculoskeletal symptoms the investigator used frequencies in SPSS in nine body regions.

The chi-square test for making association is used to discover categorical variables to find out if there is any relationship between two categorical variables. Chi-square test (χ^2) was used to find out the statistical significant association between risk factors and musculoskeletal symptoms among students. Chi-square test was conducted at $p < .05$, to find out the association between the prevalence of musculoskeletal symptoms and risk factors.

4.2. Result

In this chapter the result of the study is discussed under the following parts: Characteristics of the study participants involved in health professions students, the prevalence of developing musculoskeletal symptoms at least 1 body regions 7 days and 12 months prior to data collection, musculoskeletal symptoms in different body regions

during 7 days and 12 months, Association between socio-demographic factors and reported musculoskeletal symptoms in the 7 days and 12 months, Association between reported physical risk factors and musculoskeletal symptoms in the past 12 months.

4.2.1. Characteristics of the study participants involved in health professions students.

Selected demographic Factors N= 140	Frequency (N)	Percentage (%)
Age		
18-20 years	59	42.1
21-24 years	81	57.9
Gender		
Male	59	42.1
Female	81	57.7
Year		
1 st year	11	7.9
2 nd year	58	41.4
3 rd year	39	27.9
4 th year	31	22.1
Department		
Occupational therapy	43	30.7
Physiotherapy	33	23.6
Speech and language therapy	26	18.6
Nursing	21	15.0
Diploma physiotherapy	5	3.6
Lab. Medicine	12	8.6
Working hour's everyday		
5-10 hours	86	61.1
11-15 hours	53	37.9
16-20 hours	1	57.7
Sick live		
Yes	36	25.0
No	105	75.0
Consult any doctors		
Yes	38	27.1
No	98	70.0
Health condition		
Good	74	52.9
Not too bad	40	28.6
Poor	22	15.7
Physical tiredness		
Not tired	6	4.3
A bit tired	48	34.3
Rather tired	77	55.0
Very tired	9	6.4
Habit of smoking		
Yes I'm smoking nowadays	18	12.9
Yes, I did smoking in the past	14	10.0
No, I never smoke	108	77.1

Table 1: Characteristics of the study participants involved in health professions students

N= number of student, %= percentage of student

The study has selected 140 participants for this study. In (table 1), it is showed that the characteristics of selected demographic factors (N=140) of the study participants are involved in health professions students. The investigator has categorized age in two different range and they are (18-20) and (21-24). In this study 42.1% participants are 18-20 and 57.9% of them are between 21-24 age ranges. Among them 42.1% are male and 57.7% were female.

This also categorizes year and department of the health professionals where 7.9% 1st year, 41.4% 2nd year, 27.9% 3rd year, 22.1% 4th year. Occupational therapy department 30.7%, physiotherapy 23.6%, speech and language therapy 18.6%, nursing 15.0%, diploma physiotherapy 3.6%, lab. Medicine 8.6%.

The working hours are categorized 5-10 hours, 11-15 hours and 16-20 the percentages are 5-10 hours 61.4%, 11-15 hours 37.9%, 16-20 hours 7%. Sick live and consult any doctor categorize yes or no. Due to pain sick live 25.0% and 75.0% no sick live, due to pain 27.1% consult with doctor and 70.0% no consult with doctor.

In generally the health status of study participant are good for 52.9% not too bad for 28.6% and poor for 15.17%. The percentage of tiredness are, 4.3% for a bit tired, 34.3% for a rather tired 55.0% very tired and 6.4%. In this study, 12.9 % participants smokes, 10.0% smoked in the past and 77% never smoked.

The prevalence of developing musculoskeletal symptoms at least 1 body regions 7 days and 12 months prior to data collection.

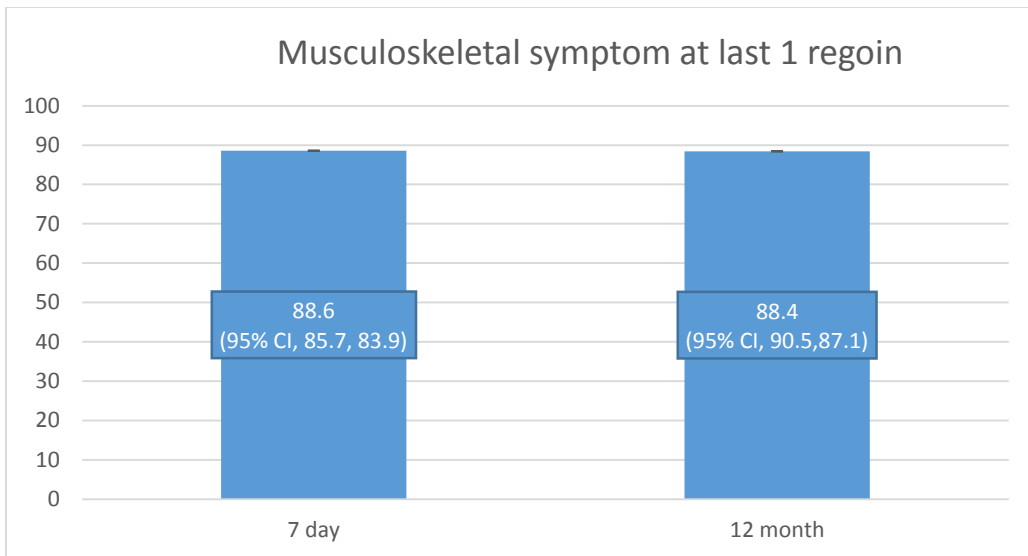


Figure 1: The prevalence of developing musculoskeletal symptoms at least 1 body regions at 7 days and 12 months.

In this study, figure-1 is presented that study participant have been developing musculoskeletal symptoms at least 1 body regions at during 7 days 88.6% (95% CI, 85.7, 83.9)and in the past 12 months 88.5% (95% CI, 90.5, 87.1).

Musculoskeletal symptoms in different body regions during 7 days and 12 months

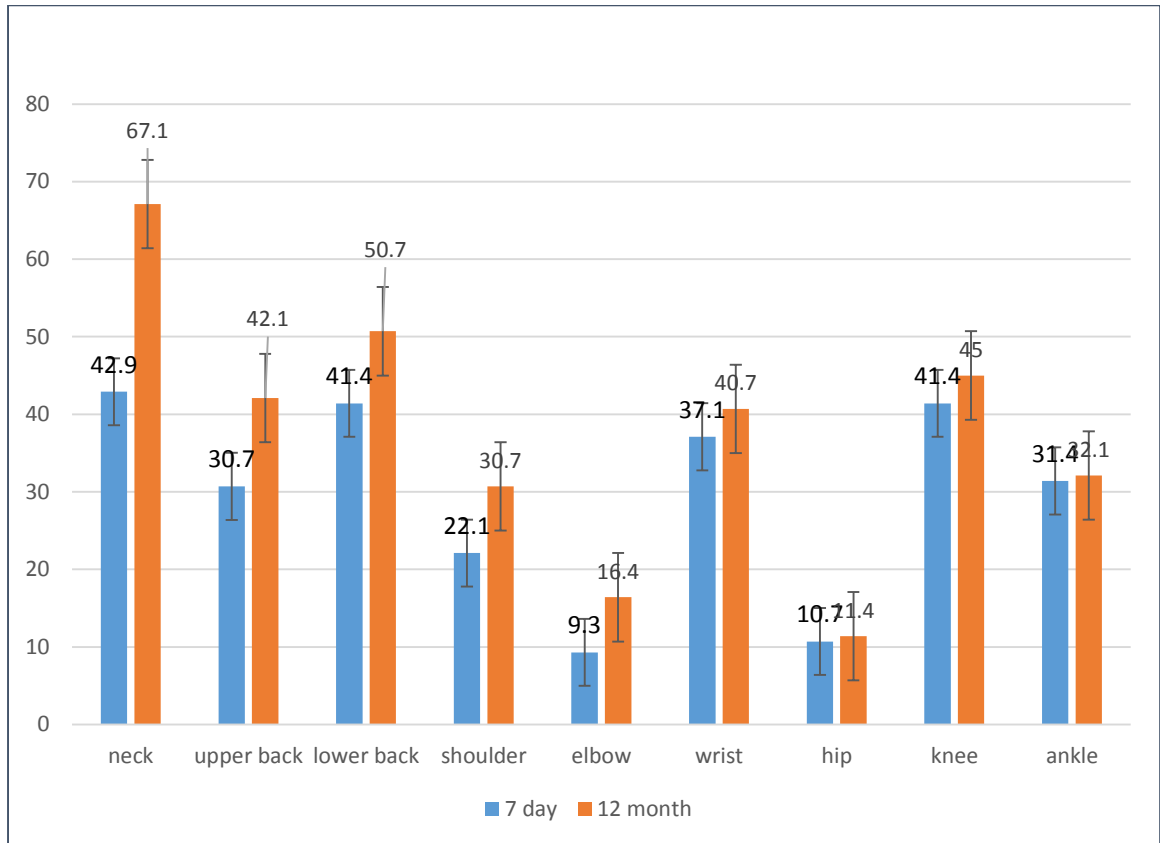


Figure 2: Prevalence of musculoskeletal symptoms in different body regions during 7 days and 12 months prior to data collection.

Figure 2 is presented that the prevalence of musculoskeletal symptoms in nine body regions during 7 days preceding data collection. In this study, the investigator has found the prevalence of musculoskeletal symptoms in four body region during 7 days. They were neck 42.9%, upper back 30.7%, lower back 41.4%, shoulder 22.1%, elbow 9.3%, wrist 37.1%, hip 10.7%, knee 41.4%, and ankle 31.4%

In figure 2 it is found that the prevalence of musculoskeletal symptoms in nine body regions in the past 12 month preceding data collection. In this study, the investigator has found that musculoskeletal symptoms are in neck 67.1%, upper back 42.1%, lower back 50.7%, shoulders 30.7%, elbows 16.4%, wrist 40.7%, hip 11.4%, knee 45.0% and ankle 32.1%.

Association between socio-demographic factors and reported musculoskeletal symptoms in the 7 days

Reported general factor	Musculoskeletal symptoms in past 7 days		Chi square value(x²)	P-value
	Yes (%)	No (%)		
Age:				
18-20	47(79.7%)	12(20.3%)	1.647	.082
21-24	71(87.7%)	10(12.3%)		
Gender:				
Male	49(83.1%)	10(16.9%)	.117	.174
female	69(85.2%)	12(14.8%)		
Year of experience:				
1 st yea	9(81.8%)	2(18.2%)	8.417	.002
2 nd yea	47(81.0%)	11(19.0%)		
3 rd year	36(92.3%)	3(7.7%)		
4 th year	32(100%)	0(0.0%)		
Department:				
1.Occupational therapy	41(95.3%)	2(4.7%)	4.683	.009
2.Physiotherapy	26(78.8%)	7(21.1%)		
3.Speech\$languagetherapy	23(88.5%)	3(11.5%)		
4.Nursing	14(66.7%)	7(33.3%)		
5.Deploma physiotherapy	4(80.0%)	1(20.0%)		
6.Lab.Medicine	9(75.0%)	3(25.0%)		
Working hour's everyday				
5-10 hours	77(89.5%)	9(10.5%)	5.084	.026
11-15 hours	10(83.3%)	2(16.7%)		
16-20hours	1(100.0%)	0(0.0%)		
Sick live				
Yes	33(94.3%)	2(5.7%)	3.523	.037
No	85(81.0%)	20(19.0)		
Consult any doctors				
Yes	34(89.5%)	4(10.5%)	2.039	.157
No	80(81.6%)	18(18.4%)		
Health condition				
Good	60(81.1%)	14(18.9%)	2.407	.081
Not too bad	36(90.0%)	4(10.0%)		
Poor	18(18.8%)	4(18.2%)		
Physical tiredness				
Not tired	5(83.3%)	1(16.7%)	2.017	.080
A bit tired	39(81.2%)	9(18.8%)		
Rather tired	65(84.4%)	12(15.6%)		
Very tired	9(100.0%)	0(0.0%)		
Habit of smoking				

Yes I'm smoking nowadays	17(94.4%)	1(5.6%)	2.918	.058
Yes, I did smoking in the past	11(78.6%)	3(21.4%)		
No, I never smoke	89(82.4%)	19(17.6%)		

A Table 2: Association between socio-demographic factors and reported musculoskeletal symptoms in the 7 days

Association between socio-demographic factors and reported musculoskeletal symptoms in the 7 days at least 1 body region prior of data collection. (n=140)

The socio-demographic factors such as age, sex, department, sick live, consult any doctor, health condition, physical tiredness and smoking did not have any significant association on the presence of in last musculoskeletal symptoms in the 7 days. In this study there is significant association between years (.002), department (.009), working hours (.026).

Association between socio-demographic factors and reported musculoskeletal symptoms in the past 12 months

Reported general factor	Musculoskeletal symptoms in past 12 months		Chi square value(x2)	P-value
	Yes (%)	No (%)		
Age:				
18-20	48(81.4%)	11(18.6%)	5.245	.017
21-24	76(93.8%)	5(6.2%)		
Sex:				
male	51(86.4%)	8(13.6%)	.547	.167
female	73(90.1%)	8(9.9%)		
Year of experience:				
1 st yea	9(81.8%)	(18.2%)	8.417	.002
2 nd year	47(81.0%)	11(19.0%)		
3 rd year	36(92.3%)	3(7.7%)		
4 th year	32(100%)	0(0.0%)		
Department:				
1.Occupational therapy	41(95.3%)	2(4.7%)	4.683	.009
2.Physiotherapy	29(87.9%)	4(21.1%)		
3.Speech \$ language therapy	23(88.5%)	3(11.5%)		
4.Nursing	18(85.7%)	3(14.3%)		
5.Deploma physiotherapy	4(80.0%)	1(20.0%)		
6.Lab.Medicine	9(75.0%)	3(25.0%)		
Working hour's everyday				
5-10 hours	82(95.3%)	4(4,7%)	10.615	.003
11-15 hours	41(77.4%)	12(22.6%)		
16-20hours	1(100.0%)	0(0.0%)		

Sick live				
Yes	34(97.1%)	1(2.9%)	3.387	.046
No	90(85.7%)	15(14.3%)		
Consult any doctors				
Yes	37(97.4.5%)	1(12.6%)	4.877	.066
No	83(84.7%)	15(15.3%)		
Health condition				
Good	65(87.8%)	9(12.2%)	.742	.122
Not too bad	36(90.0%)	4(10.0%)		
Poor	19(86.4%)	3(13.6%)		
Physical tiredness				
Not tired	5(83.3%)	1(16.7%)	2.017	.080
A bit tired	44(91.7%)	4(8.3%)		
Rather tired	66(85.7%)	11(14.3%)		
Very tired				
Habit of smoking				
Yes I'm smoking nowadays	9(100.0%)	0(0.0%)	2.918	.058
Yes, I did smoking in the past	17(94.4%)	1(5.6%)		
No, I never smoke	11(78.6%)	3(21.4%)		
	89(82.4%)	19(17.6%)		

Table 3: Association between socio-demographic factors and reported musculoskeletal symptoms in the past 12 months

Association between socio-demographic factors and reported musculoskeletal symptoms in the past 12 months at least 1 body region prior of data collection. (n=140) The socio-demographic factors such as age, sex, department, sick live, consult any doctor, health condition, physical tiredness, and smoking did not have any significant association on the presence of in last musculoskeletal symptoms in the 12 months. In this study there is significant association between years, working hour's musculoskeletal symptoms in last 12 months and p-value are year (.002), department (.009), working hours (.003).

Association between reported physical risk factors and musculoskeletal symptoms in the 7 day.

Reported physical risk factor	Musculoskeletal symptoms in past 7 day		Chi square value(x2)	P-value
	Yes (%)	No (%)		
Type of work				
Yes	23(79.3)	6(20.7)	.484	.029
No	94(48.7)	17(15.3)		
Breaks				
1-5 hours	103(85.1)	18(14.9)	1.565	.176
6-10 hours	14(73.7)	5(26.3)		

Break satisfaction				
Yes	36(70.6)	15(29.4)	10.367	.016
No	73(90.11)	8(9.9)		
Sitting for long periods				
Never	7(63.6)	4(36.4)	6.175	.103
Sometimes	33(86.8)	5(13.2)		
Often	15(89.5)	6(11.5)		
Always	26(76.5)	8(23.5)		
VDU work for long Periods				
Never	23(76.7)	7(23.3)	14.917	.002
Sometimes	36(76.6)	11(23.4)		
Often	52(98.1)	1(1.9)		
Always	6(60.0)	4(40.0)		
Extension of arms/hands				
Never	24(64.9)	13(35.1)	14.005	.003
Sometimes	44(86.3)	7(13.7)		
Often	33(94.3)	2(5.7)		
Always	16(94.1)	1(5.9)		
Working in uncomfortable Posture				
Never	19(73.1)	7(26.9)	12.797	.005
Sometimes	49(87.5)	7(12.5)		
Often	41(93.2)	3(96.8)		
Always	8(57.1)	6(42.9)		
Working in same postures for long periods				
Never	10(66.7)	5(33.3)	6.975	.073
Sometimes	38(92.7)	3(7.3)		
Often	51(85.0)	9(15.0)		
Always	18(75.0)	6(25.0)		
Doing repetitive tasks				
Never	14(73.7)	5(26.3)	.614	.656
Sometimes	32(84.2)	6(15.8)		
Often	52(85.2)	9(14.8)		
Always	19(86.4)	31(13.6)		
Bent slightly with trunk				
Yes	91(85.8)	15(14.2)	3.477	.176
No	22(73.3)	8(26.7)		
Bent heavily with trunk				
Yes	62(91.2)	6(8.8)	5.570	.015
No	55(76.4)	17(23.6)		
Work slight twisting				
Yes	32(84.2)	6(15.8)	.016	.563
No	85(83.31)	17(16.7)		
Work heavily twisting				
Yes	12(75.0)	4(25.0)	.967	.254
No	105(84.7)	19(15.3)		

Bent and twist simultaneously with trunk				
Yes	22(81.5)	5(18.5)	.106	.469
No	95(84.1)	18(15.9)		
Working bent posture for slightly long periods				
Yes	81(88.0)	11(12.0)	3.909	.043
No	36(75.0)	12(25.0)		
In a slightly twisted posture for long periods				
Yes	22(78.6)	6(21.4)	.637	.294
No	95(84.8)	17(15.2)		
In a heavily bent posture for long periods				
Yes	44(88.0)	6(12.0)	1.111	.209
No	73(81.1)	17(18.9)		
In a heavily twisted posture for long period				
Yes	14(70.0)	6(30.0)	3.130	.080
No	103(85.8)	17(14.2)		
In a bent and Twisted posture for long periods				
Yes	22(84.6)	4(15.4)	.025	.570
No	95(83.3)	19(16.7)		
Working wrist bending				
Yes	62(88.6)	89(11.4)	2.549	.085
No	55(78.6)	15(21.4)		
Working wrist twisting				
Yes	26(83.9)	5(16.1)	.003	.601
No	91(83.5)	18(16.5)		
Working arms/hands bending, twisting				
Yes	55(91.7)	5(8.3)	5.012	.020
No	62(77.5)	18(22.5)		
Working trunk bending, twisting				
Yes	20(76.9)	6(23.1)	10.028	.230
No	97(85.1)	17(14.9)		
Working head bending, twisting				
Yes	35(85.4)	6(14.6)	.136	.462
No	82(82.8)	17(17.2)		

Table 4: Association between reported physical risk factors and musculoskeletal symptoms in the 7 day.

Association between reported physical risk factors and musculoskeletal symptoms in the 7 day at least 1 body region prior to data collection. (n=140)

The physical factors such as type of work, break time, break satisfaction, sitting for long periods, computer work for long periods, working in uncomfortable Postures, working in same postures for long periods, working in slight twisting position trunk for long time doing repetitive tasks, work slight or heavy bending, working in slight twisting position trunk for long time ,work heavy twisting, working bending and twisting together and working with the movement (bending and twisting) of arms/hands, wrist, trunk and head don't not have any significant association on the presence of last musculoskeletal symptoms 7 days.

In this study, there is a significant association between VDU work for long Periods, working in extension of arms/hands and p-value; VDU work for long Periods (.002), working in uncomfortable posture (.005), and working in slight twisting position trunk for long time (.003).

Association between reported physical risk factors and musculoskeletal symptoms in the past 12 months

Reported physical risk factor	Musculoskeletal symptoms in past 12 months		Chi square value(x2)	P-value
	Yes (%)	No (%)		
Type of work				
Yes	26(89.7)	3(10.3)	.005	.623
No	99(89.2)	12(10.8)		
Break time			.592	.331
5-10 hours	109(90.1)	12(9.9)		
11-16hours	16(84.2)	3(15.8)		
Break satisfaction			8.255	.041
Yes	42(82.4)	9(17.6)		
No	76(93.8)	5(6.2)		
Sitting for long periods			.907	.824
Never	9(81.8)	2(18.2)		
Sometimes	34(89.5)	4(10.5)		
Often	52(91.20)	5(8.8)		
Always	30(88.2)	4(11.8)		
VDU work for long Periods			14.917	.002
Never	26(83.3)	5(16.7)		
Sometimes	41(87.2)	6(12.8)		
Often	51(96.2)	2(3.8)		
Always	8(80.0)	2(80.0)		

Extension of arms/hands				
Never	27(73.0)	10(27.0)	14.211	.003
Sometimes	48(94.1)	3(5.9)		
Often	34(97.1)	1(2.9)		
Always	16(94.1)	1(5.9)		
Working in uncomfortable Posture				
Never	18(69.2)	8(30.8)	17.569	.001
Sometimes	53(94.6)	3(5.4)		
Often	43(97.7)	1(2.3)		
Always	11(78.61)	3(21.4)		
Working in same postures for long periods				
Never	11(73.3)	4(26.7)	7.846	.049
Sometimes	40(97.6)	1(2.4)		
Often	54(90.0)	6(10.0)		
Always	20(83.3)	4(16.7)		
Doing repetitive tasks				
Never	15(78.9)	4(21.1)	2.548	.467
Sometimes	35(92.1)	3(7.9)		
Often	55(90.2)	6(9.8)		
Always	20(90.9)	2(9.1)		
Work slight bending				
Yes	96(90.6)	10(9.4)	1.250	.535
No	26(86.7)	4(13.3)		
Work heavily bending				
Yes	65(95.6)	3(4.4)	5.490	.017
No	60(83.3)	12(16.7)		
Work slight twisting				
Yes	34(89.5)	4(10.5)	.002	.617
No	91(89.2)	11(10.8)		
Work heavily twisting				
Yes	14(87.5)	2(12.5)	.060	.536
No	111(89.5)	13(10.5)		
Bent and twist simultaneously with trunk				
Yes	25(92.6)	2(7.4)	.382	.415
No	100(88.5)	13(11.5)		
Working bent posture for slightly long periods				
Yes	86(93.5)	6(6.5)	4.930	.029
No	39(81.2)	9(18.8)		
In a heavily bent posture for long periods				
Yes	25(89.3)	3(10.7)	.000	.613
No	100(89.3)	12(10.7)		

In a slightly twisted posture for long periods				
Yes	47(94.0)	3(6.0)	1.807	.144
No	78(86.7)	12(13.3)		
In a heavily twisted posture for long period				
Yes	16(80.0)	4(20.0)	2.103	.145
No	109(90.8)	11(9.2)		
In a bent and Twisted posture for long periods				
Yes	23(88.5)	3(11.5)	.023	.556
No	102(89.5)	12(10.5)		
Working wrist bending				
Yes	65(92.9)	5(7.1)	1.867	.137
No	60(85.7)	10(14.3)		
Working wrist twisting				
Yes	28(90.3)	3(9.7)	.045	.566
No	97(89.0)	12(11.0)		
Working arms/hands bending, twisting				
Yes	55(19.7)	5(8.3)	.622	.308
No	70(87.5)	10(12.5)		
Working trunk bending, twisting				
Yes	22(84.6)	4(15.4)	.728	.293
No	103(90.4)	11(9.6)		
Working head bending, twisting				
Yes	37(90.2)	4(9.8)	.056	.539
No	88(88.9)	11(11.1)		

Table 5: Association between reported physical risk factors and musculoskeletal symptoms in the past 12 months

Association between reported physical risk factors and musculoskeletal symptoms in the past 12 months at least 1 body region prior to data collection. (n=140)

The physical factors such as type of work, break time, break satisfaction, sitting for long periods, computer work for long periods, extension of arms/hands, working in uncomfortable Postures, working in same postures for long periods, doing repetitive tasks, work slight or heavy bending, working in slight twisting position trunk for long time ,work heavy twisting, working bending and twisting together and working with the movement (bending and twisting) of arms/hands, wrist, trunk and head don't not have any significant association on the presence of last musculoskeletal symptoms 12 months

In this study, there is a significant association between working in VDU work for long Periods extension of arms/hands and Working in uncomfortable Posture and p-value; VDU work for long Periods (.002)working in extension of arms/hands (.003) and Working in uncomfortable

CHAPTER 5 DISCUSSION

The prevalence of MSS in last 7 days 12 months:

The prevalence of developing musculoskeletal symptoms at least 1 body regions 7 days (88.6%) and 12 months (88.4%).

According to these studies the most commonly affected body parts is in last 7 days neck and the prevalence is 42.9%, lower back and knee the prevalence is same 41.4%, wrist 37.1% , upper back 30.7%, ankle 30.4%, shoulder 22.1%, and in past 12 months most affected body part is neck 67.1%, lower back 50.7%, knee 54% , upper back 42.1%, wrist 30.4%, ankle 32.1%, shoulder 30.7%, elbow 16.4%.

In one study which about dental student Brazilian in relation to the anatomical location, it was found that the musculoskeletal symptoms concentrated in the cervical region (76.50%), lumbar region (73.22%), dorsal (64.48%), wrist / hand / fingers (60.66%), shoulders (55.74%) hips (44.81%), arms (42.08%), forearm (24.04%) and elbows (22.00%) (SP Kumar. 2012). One another study show that one hundred and ten (70.1%) students reported having MSDs in the previous 12 months, of which a total 88 (56.1%) suffered disabling effects, while 70(44.6%) students reported having MSDs in the past 7 days. The prevalence of MSDs in the different body regions was generally low with clustered distribution in the neck, upper back, wrists/hands and lower back (JK Abedu.2013).

After reviewing this study we seen that health professions students are higher risk of MSS and their most affected body part are neck, shoulder, low back, wrist, and knee in Bangladesh like other country..

Socio-demographic characteristics are a strong predictor cause of musculoskeletal symptoms among health professions students.

Age is the important factor the mean age of this study is (Standard deviation) SD 2o. In this study most of the participant are young. There is no significant association between musculoskeletal symptoms and age. One study in India which is about dental student also show result there is no association MSS and age (Dr. Madaan.,V et.al.2013). Age is not important factor for developing musculoskeletal symptoms. Musculoskeletal symptoms can be developed at age it depends on their characteristics of work. Sex is

an also important factor of socio- demographic characteristics. Regarding the socio-demographic status, this study finding is similar to other study findings. Demographic data of students, shows that among all of participants, most of the participants were (81%) female rather than male (59%). Female exposure suffers a lot than male due to their physical structure and cultural aspect. There is no association MSS and sex in this study but one study in Iran which about different health professionals show significant association MSS and sex (0.01). Therefore, the study participants are smaller than other study, thus why, it does not match with another statistics. In case of their year of experience, about (7.9%) were 1st year, (41.4) % were 2nd year, (27.9%) were 3rd year and (22.2%) were 4th year. The result show significant association year of experience and MSS. In health sectors health professionals are working in same posture for long period of time. Due to working in same posture MSS developed in their different body part. This study show that 3rd and 4th year students are more suffering MSS rather than 1st and 2nd students' because of their year of experience. One Australian study also shows result 4th year student are most affected rather than 1st and 2nd year student due to their year of experience. Among all of the participant, Occupational therapy department includes 30.7%, physiotherapy includes 23.6%, speech and language therapy are includes 18.6%, nursing consists 15.0%, diploma physiotherapy 3.6%, lab. Medicine consists 8.6%. Result shows that most of the occupational therapy department students are suffering from MSS. Another study in University of Ghana shows that result MSS is the common problem nursing and dental student rather other department student.

Working hour is one of the important Socio-demographic factor which cause musculoskeletal symptoms. In this study most of the student reported that they are working for 5-10 hours and it has a significant association with musculoskeletal symptoms. One study expresses that the health professionals are most affected due to their work responsibility such as long period class time, practical class, examination (during examination student are sitting same posture for long time and it increases back pain). This study result shows nursing health professions students are regularly attending their class and also the provide duty in hospital. Work hours per shift, lost day caused MSS among nursing student (Mehrdad.R,M et al, 2012).

Health condition also the greatest reason that lead to increase of MSS in health professions students. Here there is no significant association with health condition but

one Australian study says that who have poor health status, they are mostly affecting MSS. Yet health professionals' having excessive demand of physical workload including patient handling, care of patient affect their health condition. When a health professionals are maintaining a good health condition then they can provide proper service of their patient. Physical tiredness is associated with health condition who have poor health status they are feeling tired within short period of time rather than who have good physical status. There are many personal habit but here is discussed about smoking. There does not found any association MSS and smoking. One Indian study also expresses that personal habit not reason of MSS but some it can case MSS.

Association between physical risk factor and musculoskeletal disorder at last 1 body region last 7 days and 12 months:

The physical factors such as type of work, break time, break satisfaction, sitting for long periods, computer work for long periods, working in uncomfortable Postures, working in same postures for long periods, working in slight twisting position, trunk for long time doing repetitive tasks, work slight or heavy bending, working in slight twisting position trunk for long time ,work heavy twisting, working bending and twisting together and working with the movement (bending and twisting) of arms/hands, wrist, trunk and head don't not have any significant association on the presence of last musculoskeletal symptoms 7 days and 12 months. In this study there is significant association between years (.002), department (.009), working hours (.026) in 7 day and VDU work for long Periods (.002)working in extension of arms/hands (.003) and Working in uncomfortable Posture (.001).

In this study, percentage of developing musculoskeletal symptoms at least 1 body regions overall 88.6%, during 7 days and 88.4% in the past 12 months & the most affected area were neck, lower back, wrist, upper back and ankle in the last 7 days & 12 months. In one study which was about dental student of Brazilian, it was found that the musculoskeletal symptoms concentrated in the cervical region (76.50%), lumbar region (73.22%), dorsal (64.48%), wrist / hand / fingers (60.66%), shoulders (55.74%) hips (44.81%), arms (42.08%), forearm (24.04%) and elbows (22.00%) (Kumar, S,P 2012). Another study which was about nursing health professionals' students in Africa the percentage of musculoskeletal symptoms previous 12 months, of which a total 88 (56.1%) suffered disabling effects, while 70(44.6%) students reported having

MSDs in the past 7 days. The prevalence of MSDs in the different body regions was generally low with clustered distribution in the neck, upper back, wrists/hands and lower back (Kwame, J, A., 2013). One another study which about dental student in India Maximum pain was observed in the hand (92%) followed by wrist (85%) and lower back (72%) (Dr. Madaan.V et al., 2013). One study Mazandaran University of Medical Sciences, Sari, Iran show WMSDs were seen mostly in the neck (28.2%), knees (18.2%) and upper back (17.3%). A significant relationship was seen between sex of participants ($P < 0.05$) and WMSDs, and there was a positive correlation between sex of subjects and WMSDs problem in the neck ($P < 0.05$) (Mirmohammadi.S et al.2014). After reviewing this study about different health professionals students neck, low back, upper back, wrist pain are common among the health professionals students among them neck and low back pain is most common.

In this study found that study participants often work in, sitting for long periods, computer work for long periods, working in uncomfortable Postures, working in same postures for long periods, working in slight twisting position trunk for long time doing repetitive tasks and this study shows that there is a significant association between VDU work for long Periods (.002) and working in slight twisting position trunk for long time (.003) last 7 days and VDU work for long Periods (.002) working in extension of arms/hands (.003) and Working in uncomfortable Posture (.001) in last 12 month. Students are mostly working in sitting for long periods, doing computer work for long periods due to their study purpose. A study of dental student in India found that frequent bending at work and uncomfortable with their current working stool were the most contributing risk factor of having musculoskeletal symptoms (Dr. Madaan.V et al., 2013). In another study of Nursing student in Iran, prolonged sitting (.009), standing (.001), neck flexion (.001), lifting, pulling, pushing (.003) were the most common reported ergonomic hazards among nursing students (Mehrddad.R,M et al, 2012).One another study of in Nursing student in Nigerian University high academic stress/workload, habitual long sitting hours and poor study posture during this period might have increased the incidence of MSDs among the students. Heightened academic stress, especially during examinations, has been hypothesized as a risk factor for MSDs among undergraduates significantly associated with MSDs (Abledu.J.K, 2015). This study are evident that sitting and standing for long periods, working in uncomfortable posture are the common cause of development of MSD in health professional's students.

Prolonged standing and sitting, static posture and uncomfortable back support are associated with lower back pain (Melanie.J et al., 2014). Prolonged standing has been closely associated with neck/shoulder pain (Smith, 2013). Another study of China reported that developing of neck pain associated with working in forward bending of head for long time of (Peter. A et al., 2007). Awkward arm position is associated with shoulder pain.

Work related musculoskeletal symptoms are common in different health professions. But the region of the pain may vary in different health professions due to their different working posture. Dentist and occupational therapy student are more suffering from upper body MSS. Dental student are commonly suffer from wrist and neck pain and occupational therapist student are suffer from neck, shoulder, upper back MSS. The nursing student has reported that their mostly affected body parts are neck, low back, and knee. The prevalence of musculoskeletal symptoms was high among health professions students and higher among the final year students and not only resulted in discomfort but also had an impact on the students' general physical activities.

Limitations:

Limitations are: This may not be generalized and may not give the actual result because only 140 participants actively participate in this study and this not represent whole students. So, the result of the present study should be cautious to generalize and also the overall sample size was relatively small and samples were chosen from only one area in Bangladesh Health Professions Institute Dhaka by using purposive method. Limited contextual study in Bangladesh and there was not enough resource found of the prevalence and postural risk factor for developing musculoskeletal symptoms (MSS) among health professional's students in Bangladesh Health Professions Institute. Related article was found but it was different countries but in Bangladesh basis article has not found.

CHAPTER 7 CONCLUSION

Conclusion:

In Bangladesh, there is no actual information about the musculoskeletal symptoms prevalence and associated physical risk factors among health professionals students. This study found a high prevalence of musculoskeletal symptoms and respondent reported musculoskeletal symptoms in different parts of the body at last 7 days & 12 months. In these studies the most affected area were upper back, lower back, neck, knee, and the wrist & others regions are affected respectively. Student were involved awkward posture in back, neck, and wrist during work as well as uncomfortable position that are potentially associated with developing musculoskeletal symptoms.

Work related musculoskeletal symptoms impact in physical and mental health, individual work as well as quality of life. Therefore, musculoskeletal symptoms becomes cause of absenteeism, activity limitation and sick leave. If individual become sick, it will be hamper on their performance and production. This study is helpful for occupational therapy student therapist to explore their role in these areas & run different prevention programs efficiently & effectively by small ergonomic changes, modifications and education and other student know about risk factor of MSS and try to prevent this risk. The study is play important role for CRP clinical side and BHPI when student are go for clinical placement the supervisor alert the student about their posture and correct patient handling and BHPI try to remove their physical and environmental risk by teach about proper posture and modify the study stating environment. Bangladesh government can also take step to prevent the MSS of different health professions institute discuss with ergonomist about adjustable chair, table height and consider noise, light intensity and also give massage about correct posture.

The study was not able to quantitatively assess musculoskeletal symptoms prevalence and associated physical risk factors among health professionals' students due to short period of time and small size of sample. The information might be more effective if further possible to follow-up their MSS. The finding could be generalized, if MSS could assess again further and follow-up it until five to ten years. The results also suggest that the MSS in different health professionals' student are not universal. In this study, a huge number of people are affected by musculoskeletal symptoms. Therefore, it is necessary

to prevent or improve the management of work related musculoskeletal symptoms among health professional's students.

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Appendix:1

Permission letter from BHPI ethical committee

September 12, 2015

To

The Head of the Department
Department of occupational therapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

Subject: Prayer for seeking permission to conduct the research project.

Sir,

With due respect and humble submission to state that I am a 4th year student of B.Sc. in Occupational Therapy of Bangladesh Health Professions Institute, the academic institute of Centre for the Rehabilitation of the Paralyzed (CRP). I am sincerely seeking permission to conduct my research project as the part of fulfillment of the requirements of degree of B.Sc. in Occupational Therapy. The title of my research is, "Prevalence of Musculoskeletal Symptoms Among students in BHPI. The aim of the study is "To investigate the musculoskeletal symptoms prevalence and its associated risk factors among student.

So, I therefore hope that you would be kind enough to grant me by giving the permission of conducting the research and will help me to complete a successful study as a part of my course.

Sincerely,

Jafrin Luba

Jafrin Luba
4th year, B.Sc. in Occupational Therapy,
Bangladesh Health Professions Institute
(BHPI) CRP-Chapain, Savar, Dhaka-1343

Approved by	Signature and Comments
Head of the Department Nazmun Nahar Assistant professor & Head of the department, Department of Occupational Therapy BHPI,CRP-Chapain ,Savar,Dhaka-1343	<i>AS per supervisor's repermission, she may conduct this study.</i> <i>Nazmun Nahar</i> 13/09/15
Research supervisor Md. Yeasir Arafat Alve Lecturer in Occupational Therapy Department of Occupational therapy BHPI,CRP-Chapain ,Savar,Dhaka-1343	<i>Recommended to conduct the study accordingly to proposal. forwarded of head of dept for approval.</i> <i>MD YEASIR ARAFAT ALVE</i>

MD YEASIR ARAFAT ALVE
Lecturer in Occupational Therapy
Dept. of Occupational Therapy
BHPI CRP Savar

Appendix- 2



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
BANGLADESH HEALTH PROFESSIONS INSTITUTE (BHPI)

(The Academic Institute of CRP)
CRP-Chapain, Savar, Dhaka, Tel: 7745464-5, 7741404, Fax: 7745069
BHPI-Mirpur Campus, Plot-A/5, Block-A, Section-14, Mirpur, Dhaka-1206. Tel: 8020178, 8053662-3, Fax: 8053661

তারিখ : ১৭.১০.২০১৫

প্রতি
অধ্যক্ষ
সিআরপি নার্সিং কলেজ
সিআরপি, সাভার, ঢাকা।

বিষয় : রিসার্চ প্রজেক্ট (dissertation) প্রসঙ্গে।

জনাব,
বিএইচপিআই'র ৪র্থ বর্ষ বিএসসি ইন অকুপেশনাল থেরাপি কোর্সের ছাত্রী জাফরিন লুবাকে তার রিসার্চ সংক্রান্ত কাজের জন্য আগামী ১৮.১০.২০১৫ তারিখ থেকে ১৮.১২.২০১৫ তারিখ পর্যন্ত সময়ে আপনার নিকট প্রেরণ করা হলো।

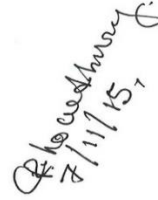
তাই তাকে সার্বিক সহযোগীতা প্রদানের জন্য অনুরোধ করছি।

ধন্যবাদান্তে




নাজমুন নাহার
সহকারী অধ্যাপক ও বিভাগীয় প্রধান
অকুপেশনাল থেরাপি বিভাগ
বিএইচপিআই।




১৭/১০/১৫

Appendix- 3

 **Hildebrandt, V.H. (Vincent)** <vincent.hildebrandt@tno.nl> 8/24/15 ☆ ↶ ▼
to me ▾

Dear Jafrin Luba,

Herewith I give you permission to use the DMQ for your research.
Success with your study!

Kind regards,
Vincent Hildebrandt

From: jafrin luba [mailto:jafrinluba@gmail.com]

Sent: zaterdag 22 augustus 2015 15:10

To: Hildebrandt, V.H. (Vincent)

Subject: Request for getting permission to use your survey instrument the Dutch Musculoskeletal Questionnaire

...

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Appendix 4

Information Sheet

The title of the study is- “prevalence of self-reported musculoskeletal symptoms and associated risk factors among the health professionals students in Bangladesh Health Professions Institute” BHPI and CRP Nursing College.

I am Jafrin Luba student of 4th year, Department of Occupational Therapy, Bangladesh Health Professions Institute (BHPI), the academic institute of Centre for the Rehabilitation of the Paralyzed (CRP). As a part of my academic issues, I have to conduct a research in this academic year.

Information's of this study:

- The participants will be asked some question and data will be collected through interview and it will be completed within 12 minutes.
- Participation will be voluntary and it will never be beneficial or harmful to them.
- All the information collected from the interview that is used in the study will be kept in safety and confidentiality will be maintained strongly.
- Participant must have the right to refuse himself in taking part any time at any stage of the study. That's why he will not be bound to answer anybody.
- Participant can consult with the investigator and the investigator's supervisor about the research process or anything about research project.

Consent form

In this study I am _____ a participant and have been clearly informed about the purpose of the study. Here I read the information sheet and understand that it will not harmful for me. That's why I am willing participating in the study with giving consent.

Signature of the participant	Date:
Signature of the investigator	Date:
Signature of witness	Date:

তথ্যপত্র

গবেষনার বিষয় হল –বাংলাদেশের হেল্থ প্রফেশনস ইনস্টিটিউট এর ছাত্র ছাত্রীদের পেশি ও অস্থি সম্বন্ধীয় সমস্যার হার নির্ধারণ এবং আনুষাঙ্গিক ঝুঁকি খুঁজে বের করা।

আমি জাফরিন লুবা, চতুর্থ বর্ষে অধ্যয়নরত, অকুপেশনাল থেরাপি বিভাগ বাংলাদেশ হেল্থ প্রফেশনস ইনস্টিটিউট (সিআরপি শিক্ষাপ্রতিষ্ঠান)এর এক জন ছাত্রী।আমার প্রাতিষ্ঠানিক কাজের অংশ হিসেবে আমাকে এই বছরে একটি গবেষণা মূলক কাজ কাজ করতে হবে।

গবেষনার তথ্য সমূহ–

- অংশ গ্রহনকারীকে কিছু প্রশ্ন করার মাধ্যমে তথ্য সংগ্রহ করা হবে এবং সাক্ষাৎকার ১২ মিনিটের মধ্যে শেষ হবে।
- ঐচ্ছিকভাবে অংশগ্রহন করতে হবে এবং গবেষণাটি ফলে আপনাদের কোন ক্ষতি হবেনা এবং কোন সুবিধা পাবেন না।
- সাক্ষাৎকার থেকে সংগৃহীত সব তথ্য নিরাপত্তার মধ্যে রাখা হবে এবং গোপনীয়তা দৃঢ় ভাবে বজায় রাখা হবে।
- অংশগ্রহনকারীগবেষণাথেকেযেকোনসময়নিজেপ্রত্যাহারকরারঅধিকাররাখেএবংএক্ষেত্রেসেকারোকাজেজবাবদিতেবাধ্যনয়।
- অংশগ্রহনকারী গবেষণা প্রক্রিয়া বা গবেষণা প্রকল্প সম্পর্কে যে কোনো বিষয়ে গবেষক ও গবেষকের সুপারভাইজারের সাথে পরামর্শ করতে পারবে।

সম্মতিপত্র

এ গবেষণায় আমি _____ এক জন অংশগ্রহনকারী এবং এ গবেষণার উদ্দেশ্য আমি পরিষ্কার ভাবে জানি।আমি তথ্যপত্রটি পড়েছি এবং বুঝতে পেরেছি যে এটা আমার জন্য ক্ষতিকর নয়।এই কারণে আমি সম্মতির সাথে জানাচ্ছি যে, আমি স্বেচ্ছায় এ গবেষণায় অংশগ্রহন করতে ইচ্ছুক।

অংশগ্রহন কারীর সাক্ষর	তারিখঃ
গবেষকের সাক্ষর	তারিখঃ
সাক্ষ্য দানকারীর সাক্ষর	তারিখঃ

Dutch Musculoskeletal Questionnaire

Participant Code no:

Research Questionnaire:

General questions:

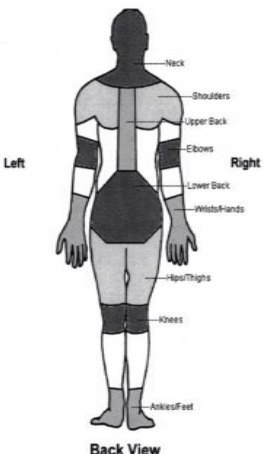
1. What is your age?	Years:
2. What is your gender?	1.Male 2.Female
3. Which year do you read in?	
4. How many years have you been passed in BHPI?	
5. What is your department?	
6. How many hours do you work normally every day?	
7. Have you take any sick live due to neck/back/shoulders/elbows/wrists//hips/knees/ankles pain?	1.Yes 2.No
8. Have you consult any doctor due to neck/back/shoulders/elbows/wrists//hips/knees/ankles pain?	1.Yes 2.No

Health (1)

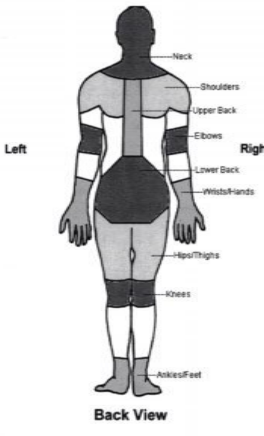
1. How is your health status in general?	1.Good
	2.Not too bad
	3.Poor
2. How tired are you normally at the end of a working day physically?	1.Not tired
	2.A bit tired
	3.Rather tired
	4.Very tired
3. Do you smoke or did you smoke in past?	1.Yes I'm smoking nowadays
	2.Yes, I did smoke in the past
	3.No, I never smoke

Health (2)

1. Have you had during the past 7 days trouble (pain, discomfort) from your?

 <p>Back View</p>	Body part	Yes	No
	neck		
	upper back		
	lower back		
	Shoulders		
	Elbows		
	wrists/hands		
	hips/thighs		
	Knees		
	ankles/feet		

2. Have you had in the past 12 months trouble (pain, discomfort) from your?

 <p>Back View</p>	Body part	Yes	No
	neck		
	upper back		
	lower back		
	Shoulders		
	Elbows		
	wrists/hands		
	hips/thighs		
	Knees		
	ankles/feet		

Work (1)

- Do you carry out the same work almost the whole day? yes 1 no 2
- How many breaks do you have during a normal working day? breaks per day
- How many minutes resting time do you have normally? minutes per day
- Are your normal breaks sufficient
- Which kind of work do you perform in your work ?

Work pattern	never	sometimes	Often	always
Sitting for long periods				
VDU work for long periods				
Work which requires extension of arms/hands				
Working in uncomfortable Postures				
Working in same postures for long periods				
doing repetitive tasks				

Work (2)

1. Do you in your often have to bend	yes	No
-Bent slightly with your trunk?		
-Bent heavily with your trunk?		
-Twist slightly with your trunk?		
-Twist heavily with your trunk?		
-Bent and twist simultaneously with your trunk?		
2. Do you in your work often have to work:		
-in a slightly bent posture for long periods?		
-in a heavily bent posture for long periods?		
-in a slightly twisted posture for long periods?		
-in a heavily twisted posture for long period?		
-in a bent and twisted for long periods?		
3. Do you in your work often have to:		
-bent your wrist or hold your wrist bent for long periods?		
-the same movements (bending, twisting) with your trunk many times per minute		
-the same movements (bending, twisting) with your head many times per minute?		

অংশ গ্রহন কারীর কোড নম্বরঃ

সাধারণ প্রশ্ন

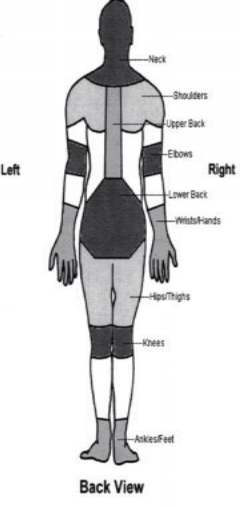
১। আপনার বয়স কত?	বছর
২। আপনার লিঙ্গ কি?	১। পুরুষ ২। মহিলা ।
৩। আপনি কোন বসে অধ্যয়নরত ?	
৪। আপনি কত বছর যাবৎ বি.এইচ. পি .আই আছেন ?	
৫। আপনার বিভাগ কি ?	
৬। আপনি প্রতিদিন কত ঘনটাকাজ করেন?	
৭। আপনি কি কখনো ছুটি কাটিয়েছেন ঘাড়/কোমড়/কাধ/কুনই/কজি/ নিতম্বের সংযোগ বা উরু/ হাঁটু/ গোড়ালি বা পায়ের পাতার ব্যাথার জন্য ?	১। হ্যাঁ ২। না
৮। আপনি কি কখনো চিকিৎসকের কাছে গিয়েছেন ঘাড়/কোমড়/কাধ/কুনই/কজি/ নিতম্বের সংযোগ বা উরু/ হাঁটু/ গোড়ালি বা পায়ের পাতার ব্যাথার জন্য ?	১। হ্যাঁ ২। না

স্বাস্থ্য (১)

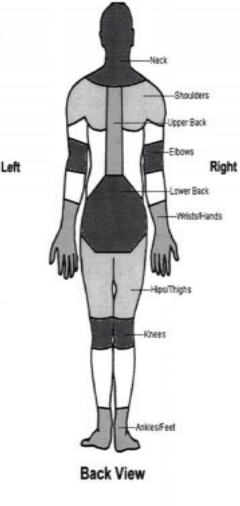
১। সর্বোপরি আপনার স্বাস্থ্যের অবস্থা কি?	১। ভাল
	২। খুব খারাপ না
	৩। খারাপ
২। সারাদিনের কাজ শেষে আপনি শারীরিক ভাবে কতটুকু ক্লান্ত হন?	১। ক্লান্ত না
	২। সামান্য ক্লান্ত
	৩। মোটামুটি ক্লান্ত
	৪। খুব ক্লান্ত
৩। আপনি কি ধূমপান করেন অথবা আগে ধূমপান করতেন?	১। হ্যাঁ, আমি ধূমপান করি
	২। হ্যাঁ, আমি আগে ধূমপান করতাম
	৩। না, আমি কখনই ধূমপান করি নাই

স্বাস্থ্য (২)

১। বিগত ৭ দিনে, কখনও কি আপনি নিম্ন উল্লেখিত শরীরের অংশ সূমহে কোন ধরনের সমস্যা (ব্যাথা, অস্বস্তি) বোধ করছেন ।

	শরীরের অঙ্গ	হ্যাঁ	না
	ঘাড়		
	পিঠের ওপরের অংশ		
	পিঠের নিচের অংশ		
	কাঁধ		
	কনুই		
	কজি / হাত		
	নিতম্বের সংযোগ বা উরু		
	হাঁটু		
	গোড়ালি বা পায়ের পাতা		

১। বিগত ১২ মাসে, কখনও কি আপনি নিম্নে উল্লেখিত শরীরের অংশ সূমহে কোন ধরনের সমস্যা (ব্যাথা, অস্বস্তি) বোধ করছেন ।

	শরীরের অঙ্গ	হ্যাঁ	না
	ঘাড়		
	পিঠের ওপরের অংশ		
	পিঠের নিচের অংশ		
	কাঁধ		
	কনুই		
	কজি / হাত		
	নিতম্বের সংযোগ বা উরু		
	হাঁটু		
	গোড়ালি বা পায়ের পাতা		

কাজ ১

১। সারাদিন কি আপনি একই ধরনের কাজ করেন?	হ্যাঁ ১ না ২
২। স্বাভাবিক কাজের দিনে আপনি কতবার বিরতি পেয়ে থাকেন?	দিনের বিরতি
৩। সাধারণত বিরতিতে আপনি কত মিনিট সময় পান?	মিনিট
৪। এই বিরতি কি আপনার জন্য যতেষ্ট?	হ্যাঁ ১ না ২

৫। আপনি কি কি ধরনের কাজ করেন?

কাজের ধরন	কখনই না	মাঝেমাঝে	প্রায়ই	সবসময়
অনেকক্ষন বসে থাকতে হয়				
অনেকক্ষন ধরে কম্পিউটারে কাজ করতে হয়				
বাহু বা হাত প্রসারিত করে করতে হয় এমন কাজ				
স্বাচ্ছন্দহীন অবস্থায় করা কাজ				
অনেকক্ষন একই অবস্থায় কাজ করতে হয়				
বারবার করতে হয় এমন কাজ				

কাজ ২

১। কাজের ক্ষেত্রে আপনাকে প্রায়ই বুকতে হয়?	হ্যাঁ	না
কোমর একটু বুকবে		
কোমর একটু বেশি বুকবে		
কোমর একটু মোচড় দেয়		
কোমর একটু বেশি মোচড় দেয়		
একসাথে বুকবে এবং মোচড় দেয়		
২। প্রায়ই কি আপনার নিম্নলিখিত ভাবে কাজ করতে হয়ঃ		
-অনেকক্ষন ধরে কিছুটা বুকবে?		
-অনেকক্ষন ধরে অনেক বেশি বুকবে?		
-অনেকক্ষন কিছুটা মোচড় দিয়ে বসে?		
-অনেকক্ষন বেশি মোচড় দিয়ে বসে?		
-অনেকক্ষন একসাথে বুকবে এবং মোচড় দিয়ে?		
৩। প্রায়ই কি আপনার নিম্নলিখিত ভাবে কাজ করতে হয়ঃ		
-অনেকক্ষন কজি নত করে বা নত অবস্থায় স্থির রাখতে হয়?		
-অনেকক্ষন কজি মোচড় দিয়ে বা মোচড় অবস্থায় স্থির রাখতে হয়?		
৪। প্রায়ই কি আপনার নিম্নলিখিত ভাবে কাজ করতে হয়ঃ		

-প্রতি এক মিনিটে অনেকবার বাহু, হাতের আঙ্গুল একইভাবে নাড়াচাড়া করতে হয়?		
-প্রতি এক মিনিটে অনেকবার কোমর একইভাবে নাড়াচাড়া করতে হয় (ঝোঁকে, মোচড় দিয়ে)		
-প্রতি এক মিনিটে অনেকবার মাথা একইভাবে নাড়াচাড়া করতে হয় (ঝোঁকে, মোচড় দিয়ে)		

