OCCUPATION RELATED MUSCULOSKELATAL DISORDERS AMONG THE SURGEONS IN DHAKA CITY

Faculty of Medicine

University of Dhaka

By:

Puja Kundu

Roll: 1287

DU Reg. No.: 10240

Session: 2017-18

Student of Bachelor of Science in Physiotherapy

Saic College of Medical Science & Technology

Department of Physiotherapy

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

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

OCCUPATION RELATED MUSCULOSKELATAL DISORDERS AMONG THE SURGEONS IN DHAKA CITY

Submitted by **Puja Kundu**, for the partial fulfillment of the requirement for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT).

……..
Dr. Abul Kasem Mohammad Enamul Haque
Principal
Saic College of Medical Science and Technology
SCMST, Mirpur-14, Dhaka.
Supervisor

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

……
Md. Shahidul Islam
Assistant Professor and
Head Outdoor Patient Service
Department of Physiotherapy
SCMST, Mirpur-14, Dhaka.

…….
Zakia Rahman
Lecturer
Department of Physiotherapy
SCMST, Mirpur-14, Dhaka.

……
Zahid Bin Sultan Nahid
Assistant Professor
Head of Department of Physiotherapy
SCMST, Mirpur-14, Dhaka.

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

DECLARATION

This work has not previously been accepted in substance for any degree and isn't concurrently submitted in candidature for any degree. This dissertation is being submitted in partial fulfillment of the requirements for the degree of B.Sc. in Physiotherapy.

I confirm that if anything identified in my work that I have done plagiarism or any form of cheating that will directly awarded me fail and I am subject to disciplinary actions of authority. I confirm that the electronic copy is identical to the bound copy of the Thesis.

In case of dissemination the finding of this project for future publication, research supervisor will highly concern, it will be duly acknowledged as graduate thesis and consent will be taken from the physiotherapy department of SAIC College of Medical Science and Technology (SCMST).

Signature: **Date:**

CONTENTS

Acknowledgement

First of all, I would like to pay my gratitude to **Almighty Allah** who has given me the ability to complete this project in time with success. The second acknowledgement must go to my parents, my younger sister who have always inspired me for preparing the project properly. I am extremely grateful to my honorable and praiseworthy Supervisor. I am also very thankful to **Dr. Abul Kasem Mohammad Enamul Haque**, Principal, SCMST; for giving me his valuable time, his keen supervision and excellent guidance without which I could not be able to complete this project.

Md. Shahidul Islam, Assistant Professor, Department of Physiotherapy, SCMST; **Zahid Bin Sultan Nahid**, Assistant Professor, Head of the Department of Physiotherapy, SCMST; **Abid Hasan Khan**, Lecturer, Department of Physiotherapy, Saic College of Medical Science and Technology (SCMST), **Md. Furatul Haque**, Lecturer, Department of Physiotherapy, **Zakia Rahman**, Lecturer, Department of Physiotherapy, SAIC College of Medical Science and Technology (SCMST) and also all of my respected teachers for helping me in this study.

I wish to thank to all respectable Physiotherapy staff working at SAIC Physiotherapy Outdoor Department for helping me in doing of my research.

I am grateful to the intern physiotherapists, Department of Physiotherapy, SCMST, Mirpur-14, Dhaka for their support throughout the period of this study. I wish to thank the Librarian of SCMST and his associates for their kind support to find out related books, journals and also access to internet.

Finally, I would like to thank all the participants who willingly participated as the study population during the collection of data for the study and other individuals who were directly or indirectly involved with this study.

Acronyms

MSD:	Musculoskeletal disorder
ORMD:	Occupation related musculoskeletal disorder
BMI:	Body mass index
SCMST:	SAIC College of Medical Science and Technology
WHO:	World Health Organization

List of Tables

List of Figures

Abstract

Purpose: Musculoskeletal conditions are thought to affect a lot of health care professionals, according to mounting research. A greater risk of occupation-related musculoskeletal disorders is suggested by some academic studies for surgeons. Objectives: The objective this research was to identify the occupation-related musculoskeletal disorders among the surgeons in Dhaka city.

Methodology: The present research was a cross sectional type of descriptive study. Purposive sampling technique was applied to select the study participants from different hospitals in Dhaka city. Relevant data were collected from 159 surgeons by face to face to interview using a pretested questionnaire for Sociodemographic information, Nordic Musculoskeletal questionnaire and NPRS scale. Data were numerically coded and put in both Excel and SPSS 25 version software program.

Results: The study revealed that majority of the surgeons (65.4%) belonged to the age group of 28-37 years. The mean age of the participants was 35.82 years. The study showed that during last 12 months 57.90% participants had lower back pain, 52.80% subjects had neck pain and 27.7% respondents had upper back pain. It was found that 23.9% participants had been prevented from doing their normal work due to neck pain during last 12 months. Shoulder pain prevented 15.1% and Elbow-3.1%, Wrist/Hand-6.1%, Both hips/thighs - 5.1%, both knees - 6.9%, Ankle/feet-8.2% study subjects from doing normal activities in last 12 months. The study revealed that 25.8% surgeons could not do their work due to lower back pain and 23.9% participants had been prevented from doing their normal work due to neck pain during last 12 months. The findings suggested that musculoskeletal disorders interfered daily activities of the participants. The study showed that 55.3% participants had moderate pain and 3.8% participants suffered from severe pain. It was evident from the study that more than half of the participants had moderate pain.

Conclusion: Occupation-related musculoskeletal disorders were common among surgeons, especially in their neck, lower back, upper back, knees and ankle regions. The findings of the study recommend for early diagnosis and management of the musculoskeletal problems of the concerned surgeons.

Key words: *Musculoskeletal disorder, Surgeons, Occupation related musculoskeletal disorder.*

CHAPTER- I INTRODUCTION

1.1 Background

Disorder symptoms are a significant health concern for numerous professions worldwide. A number of studies have been done on these musculoskeletal issues in various occupational groups, including office employees, bus drivers, nurse, nurse assistants and patient care staff in medical field. But it has been that no research is done in Bangladesh on musculoskeletal problems of surgeons. Where the prevalence of musculoskeletal disorders among surgeon's in Gujarat is 83.70% (Vaghela et al., 2019).

The surgical community in general and the orthopedic literature in particular have paid more attention to occupational dangers and injuries. In a study it was found that 84.9% of the 86 surgeons were males and most of them were 45 years old and had 10 years of service, 66% of them complained of musculoskeletal problems, of which 29.3% had common low back pain (Al Qahtani et al., 2016).

Most common factor of occupation related musculoskeletal disorders are-

1) Prolonged physical activity 2) Longer work days 3) Repetitive motions when using tools and 4) Awkward positions during surgery. It was found that 67% of pediatric orthopedic society of North America members reported having MSK pain at work (Al-Mohrej et al., 2020).

Occupation related musculoskeletal disorders are occupation related conditions that can affect the muscles, tendons, nerves and result in incapacitating musculoskeletal discomfort. If not treated, postures and jarring repeated tasks are risk factors. Among the Australian surgeons, 329 (16%) respondents had musculoskeletal disorders, with 137 (42%) surgeons were reporting shoulder, neck or upper back pain (Grant et al., 2019).

The prevalence of occupation related musculoskeletal disease is a major concern for many organizations worldwide attempting to keep a safe and healthy workplace environment. In a survey of surgeons in Mumbai and Navi Mumbai India, 50% of medical professionals reported perception problems and 63% reported physical problems during surgery (Dabholkar et al., 2015)

Numerous surveys on working populations have revealed prevalence of 20 to 30% or even higher for upper extremity symptoms. Musculoskeletal disorders are the leading cause of work absenteeism or disability in the United States, Canada, Finland, Sweden and England (Punnett and Wegman, 2004).

Musculoskeletal disorders were significantly higher among dentists (90.9%) than physician (74%). Low back pain (74.2%), upper back pain (62.1%), ankle pain (37.9%), shoulder pain (33.3%), and wrist pain (30.3%) were significantly higher among dentists (Senosy et al., 2019).

Of the 3314 plastic surgeons surveyed, 865 responded (response rate, 26.1 percent); 78.3 percent of them reported having musculoskeletal complaints, which were most frequently felt in the neck, shoulders, and lower back. Norwegain surgeons (79.5) percent versus 69.3 percent; $p<0.05$); 6.7 percent of all respondents required surgical intervention for their symptoms (Khansa et al.,2017).

The rate of back pain has been reported to be as high as 84% among physicians and surgeons compared to 22 - 26% in the general population (Kim-Fine et al., 2012).

Frequency of musculoskeletal disorders among Brazilian dentists was also object of investigation in Belo Horizonte city. The authors observed that among 388 dentists enrolled in the study, 58% have shown musculoskeletal pain in the trunk region. The most common sites of reported pain were arms (22%), spinal column (21%), neck (20%), and shoulder (17%). On the top of that, 26% of the dentists reported pain in a daily basis, 40% described strong and moderate pain, and 77% reported chronic pain (Alexandre et al., 2011).

The prevalence rate of musculoskeletal disorder among the American vaginal surgeon is 86.7% and female are most affected than male (Kim-Fine et al., 2012).

1.2 Justification

It has been established that postural correction and ergonomic modification helps to decrease the rate of development of musculoskeletal disorders among the surgeons. If the associated risk factors of musculoskeletal disorders are known, then it will help the professionals to lead a healthy life. There is no such research on musculoskeletal disorders among the surgeons in Bangladesh.

The present study will be a unique one is this field. The present research is expected to shed lights on the musculoskeletal problems of the surgeons of Bangladesh. The findings of the study will be able to aware the surgeons about musculoskeletal disorders and their ways of preventing these ailments. The study will help the policymakers in reorienting the working environment in order to combat the risk factors of musculoskeletal disorders among the surgeons.

1.3 Research question

What are the common musculoskeletal disorders among the surgeons in Dhaka city?

1.4 Objectives of the study

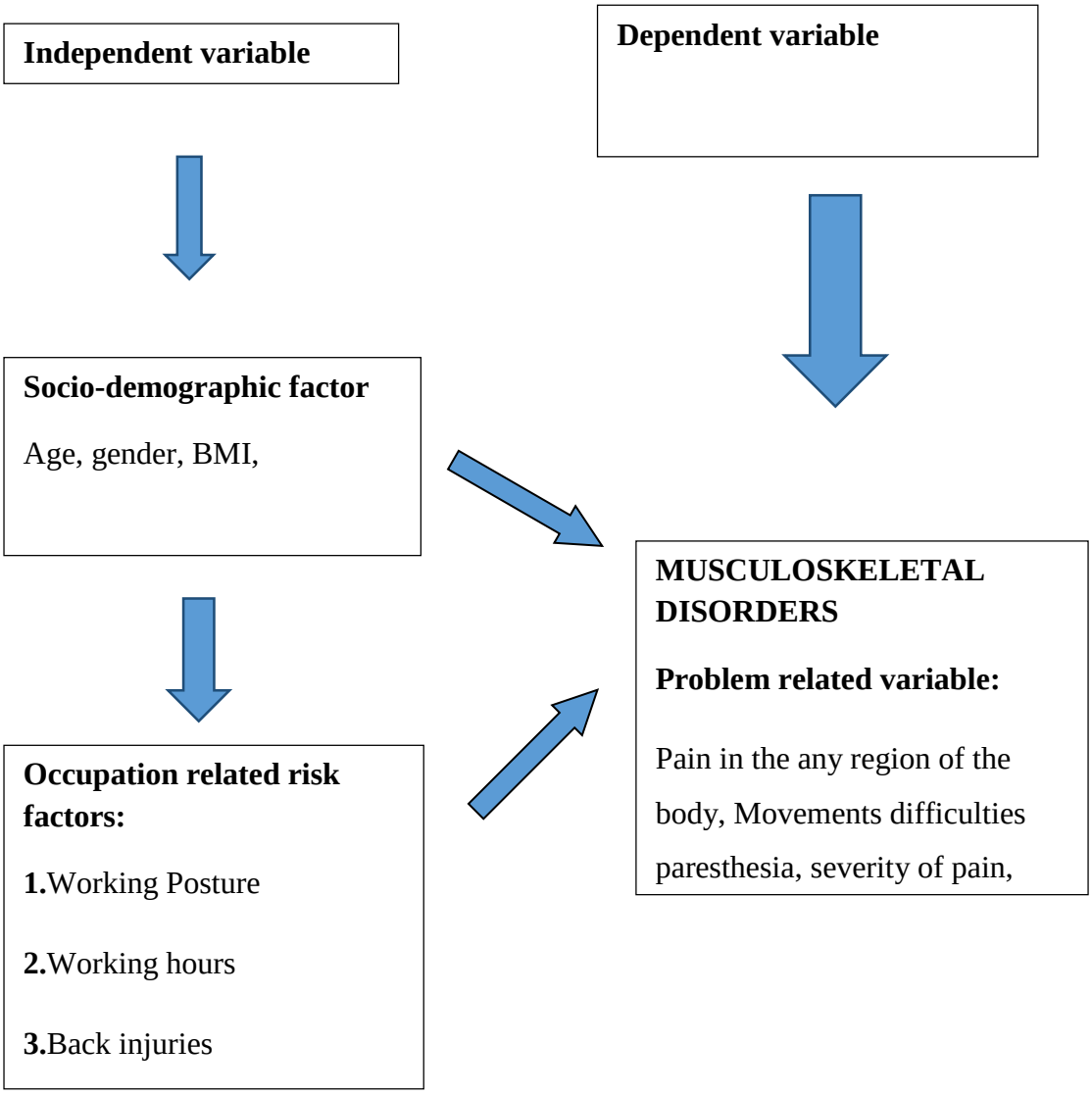
1.4.1 General Objective:

To find out the common musculoskeletal disorders among the surgeons in Dhaka city.

1.4.2 Specific objectives:

1. To calculate the prevalence of musculoskeletal disorders among the surgeons in Dhaka city.
2. To identify the part of the body of the surgeons affected by the disorder.
3. To examine the association between musculoskeletal disorders and working hours, BMI of the study surgeons.
4. To assess the relationship between musculoskeletal disorders and some selected variables such as age, sex, posture of the participants.

1.5 Conceptual frame work



1.6 Operational Definition

Occupation related musculoskeletal disorder

Occupation-related musculoskeletal disorders are the disorders of muscles, tendons, ligaments and nerves that develops due to occupation related factors such as repetitive work or activities with awkward postures with symptoms of pain, paresthesia, tingling, numbness and stiffness etc. Some examples of musculoskeletal disorders include back pain, neck pain, shoulder pain, knee pain, carpal tunnel syndrome and tendonitis etc.

Musculoskeletal System:

The musculoskeletal system gives the body's shape, support, stability and mobility. It consists of the skeleton's bones, muscles, cartilage, tendons, ligaments, joints and other connective tissue that holds tissues and organs together and supports them.

Musculoskeletal Disorders:

Musculoskeletal problems are a wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, peripheral nerves and supporting blood vessels.

Pain:

Pain is a distressing sensory or emotional sensation that is connected to actual or potential tissue damage and in terms of such damage.

NPRS Scale (NPRS):

The NPRS is a segmental numerical version of the VAS in which the respondent chooses an integer value between 0 and 10 that best describes the degree of their pain. The NPRS is supported with phrases that describe the extremes of pain severity, much like the VAS.

Surgeons:

In modern medicine, a surgeon is a medical doctor who performs surgery. Although there are different traditions in different times and places, a modern surgeon is also a licensed physician or received the same medical training as physicians before specializing in surgery.

Body Mass Index (BMI):

Body Mass Index (BMI) is a person's weight in kilograms (or pounds) divided by the square of height in meters (or feet). A high BMI can indicate high body fatness. BMI screens for weight categories that may lead to health problems, but it does not diagnose the body fatness or health of an individual.

CHAPTER II: LITERATURE REVIEW

The world health organization defines work related musculoskeletal disorders (MSDs) as musculoskeletal system disorders and diseases that have been shown or assumed to have at least a partially work-related background and are characterized by the occurrence of several symptoms, whether they occur simultaneously or not such as pain, paresthesia, sleep disturbances, anxiety, depression, fatigue, vertigo, headaches and irritable bowel syndrome that manifest subtly (Ganer 2016).

In many professions around the world, work-related musculoskeletal complaints constitute a serious health concern. Previous studies on hospitals work have primarily concentrated on nurses and few studies have looked at musculoskeletal problems among doctors in different specialties. Surgical work can include intense mental focus and extremely precise motions, which fall under the category of mild to moderate physical demands (Vaghela et al., 2019).

A high risk career involves surgery because of musculoskeletal conditions (MSDs). Surgeons adopt a lengthy stationary position due to fine and accurate operations (Triger., 2013).

Workplace risk factors are the root cause of a collection of illness known as work-related musculoskeletal disorders (WRMSDs). The physical and mental demands of surgery result in significant ergonomic stress. This study's objective was to determine how common WRMSD's were among surgeons in Mumbai and Navi Mumbai who performed minimally invasive procedures. The questionnaire received 75 responses from surgeons. As a result of the ergonomic problems they faced during surgery, 86% of the participating surgeons reported having musculoskeletal disorders and 65% of them reported having discomfort at more than one site. The low back (49.3%) had the highest prevalence of discomfort, followed by the neck, knee, shoulder, elbow, wrist and hand. The main causes that they most frequently cited were (Dabholkar et al., 2015).

The surgical community in general and the orthopedic literature in particular have paid more attention to occupational dangers and injuries. The purpose of this study

was to evaluate the prevalence, features and effects of musculoskeletal problems on orthopedic trauma surgeon's practices (Al Qahtani et al., 2016).

The researcher said that, Studies have looked into the topic of the rising prevalence of musculoskeletal discomfort at work across occupations. Orthopedic doctors, however have not looked at the causes of MSK discomfort in great detail. Consequently, the goal of this study was to roughly determine the prevalence and determinants of MSK pain among Saudi orthopedic surgeons practicing in Riyadh, Saudi Arabia. The response rate was 80.3%, with a total number of 179 of Saudi orthopedic surgeons (173 males and six females). The study showed that 67.0% of the respondents complained of having MSK pain. The most commonly reported MSK pain was lower back (74.0%), followed by neck (58.2%) [Al-Mohrej et al.,2020].

The other researcher said that, Dentists face a number of occupational dangers. The purpose of the study was to compare the incidence of referral morbidity among Brazilian dentists with that reported by physicians, attorneys and the general public. From the Brazilian Household survey, information on referral morbidity was gathered. Prevalence rate and ratios were computed after performing gender stratification. Compared to doctors or attorneys, dentists were more likely to report having arthritis and back pain. Additionally, dentists reported tendinitis more frequently than physicians, attorneys and the general public combined. Stratification showed that male dentists were more likely to mention back discomfort and arthritis than female dentists, compared to doctors and lawyers (Alexandre et al., 2011).

The other researchers also said that many obstetrics and gynecology practitioners are apparently affected by work-related musculoskeletal disease. We propose that a high MSD prevalence rate among vaginal surgeons is correlated with features of the surgeon and the workplace. A large percentage of health care professionals have been documented to suffer from work-related musculoskeletal disorders. Office based procedures, laparoscopic surgery, Orthopedic surgery, Open abdominal surgery, Obstetrics and Gynecology are all things that they practice. MSDs at work are characterized as problems with the muscles, nerves, tendons, ligaments, joints, cartilage or spinal disks. These conditions are also referred to as cumulative trauma disorders, repetitive motion disorders and overuse syndromes (Kim-Fine et al., 2013).

The study's objective is to determine how frequently Saudi Arabian nurses and surgeons experience symptoms associated with occupational skeletal and muscular problems. The descriptive cross-sectional study was conducted in the king Abdullah Complex, East Jeddah General Hospital, Saudi Germany Hospital, and King Abdul-Aziz Hospital. All of the hospitals mentioned here are situated in the Saudi Arabian Kingdom of Jeddah. It was carried out during an eight-month period, from November 2019 to July 2020 (Alshanberi et al., 2021).

A cross-sectional comparison study was carried out using questionnaires among 66 dentists and 131 doctors working in three hospitals in Beni Suef City. According to the Nordic Musculoskeletal Questionnaire, the survey collected information on socio-demographic characteristics, occupation risk factors and musculoskeletal complaints (NMQ). The age ranged from 30 to 55 years, with doctor's average ages being 35.2 ±5 years (Senosy et al., 2019).

One hundred questionnaires were distributed and sent to teachers at primary through higher secondary schools in Kolkata and Aizawl. The response rate among the teachers was 72%. The Dutch Musculoskeletal questionnaire (DMQ), which is standardized, was applied (Damayanti et al., 2017).

Nurses working on PHC in Portugal designed a cross-sectional study to pin point self-reported WRMSD symptoms. Nurse responded to the Nordic Musculoskeletal Questionnaire (NMQ) in Portuguese online (survey monkey platform). The statistical package for the social science (SPSS17) application was used to analyze the data (Ribeiro et al., 2017).

Between September 2012 and May 2013, this case-control study was carried out. There were 34 transportation firms in the province of Qom and we nine business were chosen using the cluster technique and 192 men official workers served as the control group while 181 male truck drivers served as the case study group. Since they had a similar socioeconomic background and equivalent job skills but had a varying physical workload, official workers were chosen as the control group. Truck drivers and office worker's past medical histories were taken into account, however those who and previously had musculoskeletal disease unrelated to their jobs or any other ailments or disorders that might have an impact on the musculoskeletal system were eliminated. Pain or discomfort felt in various body locations that persisted for at least two to four

weeks considered to be complaints connected to musculoskeletal problems, three working days in the last seven days or 12 months. The study team oversaw each medical checkup and questionnaire completion. He demonstrated how to answer the questionnaire for each participant separately. A self-administered anonymous data collection from was filled out by each participant. For the purpose of identifying MSDs in drivers and employees of government agencies, we used the Iranian Version of the modified standard Nordic Questionnaire (Mozafari et al., 2014).

After being approved by our institution's review board, a survey was emailed to members of the American Society of Plastic Surgeons. The Canadian society of Plastic Surgeons and the Norwegian Association of Plastic Surgeons both conducted surveys of their complete memberships. Using analysis of variance, the demographic characteristics of the three groups of surgeons were compared. The chi-square test was used in univariate studies of determinants of musculoskeletal symptoms. It employed binary logistic regression to carry out a multivariate analysis of the musculoskeletal symptom predictors (Khansa et al., 2017).

Cross-Sectional, comparative, questionnaire-based research was conducted between December 2017 and February 2018. In Beni-Suef city, Northern Upper Egypt, three hospitals participated in the study. In each hospital, 100 questionnaires were given to the doctors and dentists. A total of 300 questionnaires were given and 240 of them received responses, yielding an 80.0% response rate. This study's inclusion criteria was, Doctors and Dentists who have been in practice for at least 5 years, between the ages 30 and 60 and no previous surgical procedures for bone correction and exclusion criteria was, Doctors and dentists who have active chronic illness, such as uncontrolled diabetes or severe rheumatism and Active management of any bone impairment (Senosy et al., 2019).

The other researcher's study design was cross-sectional study undertaken in an urban slum and a selected village and this study's population was of Markal village and the Balajinagar slum was used to create the study samples. This study's Inclusion Criteria was, everyone who gave their agreement to take part in the study, regardless of gender and Exclusion criteria was, Non-permanent inhabitants, such as those who traveled for vacation or to see friends or family were not considered to be included in the research (Banerjee et al., 2012).

The total number of participants was 20 young male individuals. The study revealed that mean age and SD were 22.8 ± 2.0 years, height 173.1 ± 4.8 cm, weight 68.4 ± 7.4 kg and BMI 22.8 ± 2.1 kg/m^2. All participants were in good health and free of any musculoskeletal conditions that would have prevented them from doing the experiment. Each participant gave informed consent to the experimental protocol after the university institutional review board had given its approval (Huang et al., 2020).

In a study it was found that, 146 (65%) of the SDA's 225 members who participated in the survey online, 77 (52%) were men and 69 (47%) were women. Among the vast majority of responses, 102 (70%) were under 40 years old. In total 94 respondents (or 64%) were of Saudi descent. The prevalence of WRMDs was not shown to differ according on nationality, though 119 (81%) of the 146 respondents said they were content with their jobs, out of which 146 responded, six (4%), five (3%) dental hygienists and one (1%) dental technicians were among the 146 responses. Of them, 134 (92%) were dentists. Only 68 (47%) of the respondents held a bachelor's degree, while 35 (24%) and 30 (20%) furthermore held master's and doctoral degrees. 13 people (9%) still possessed diploma certificates. 94 (64%) individuals had work experience of at least 5 years. 138 respondents or 94% indicated that this was the case. They were full time employees who had patient contact for a weekly total of almost 15 hours. One hundred thirteen responders (80%) shared their findings, that they were not receiving medical care for any condition. The remaining 23 individuals reported having diabetes, hypertension or both in 19 (57%) and 14 (43%) respectively. 7% of people claimed to have heart disease. 55 (39% of total) respondents claimed to have headache symptoms. At least three per week resulting in 26 (18%) of them being forced to seek treatment (ALGHADIR et al., 2015).

The other researcher showed that. Of the 2058 recipients, 329 (16%) responded. Of these, 137 (42%) surgeons reported shoulder neck or upper back pain within the previous week, 245 (75%) reported pain and 101(31%), pain that prevented them from performing their normal jobs within the previous year. Reduced age (P 0.01), fewer years of employment (P 0.01), and female sex (P 0.001) were all significant predictors of increasing prevalence. Body mass index and practice style had no discernible impact on the occurrence of WRMDs (Grant et al., 2020).

The other researcher explained that, the participants' demographics show that there are 126 women (58.1%) and 91 men (41.9%) most of them are married (46.5%) 51 to 60 years (28.6%) or less. 144 (66. 4%) of the workers had tertiary education and 128 (59.0%) worked between 5-8 hours per day. The bulk of these participants (30.4%) had worked for their current employer 5 for at least 16 years and 30.5% were staff members (Chinedu et al., 2020).

The study included 84 individuals in total. The participants' average age was 32.5 ± 9.5 years. The individual's demographic information weekly work schedule and employment history are compiled. According to the results of the SNMQ analysis, only 21 (25%) of the study participants reported having any pain with the highest prevalence of pain (58.3%) being reported in one body region followed by 10.7% in two regions, 3.6% in three and an equal prevalence of 1.2% for pain in six and nine body regions. In this study, back pain (63.5%), shoulder pain (25.4%) and neck pain (17.5%) were the most frequent WRMDs. The QEC study demonstrated the risk exposure score to back with median values, neck measurement ranges are as follows: 34 (IQR=10.637), shoulder (IQR=12.024), wrist (IQR=11.019) and 16 (IQR= 4.028) (Henry et al., 2015).

It was decided to contact and inform the organization that represents the city of Ankara's taxi drivers about this study. Direct communication between the researchers and taxi drivers was established with The Public Vehicle Owners and Drivers' Union's consent. The Study was briefly explained to the voluntarily participating taxi drivers, the questionnaires, which the researchers carefully delivered were anonymous. With SPSS a statistical analysis was carried out (version 15.0). The Chi- square test was performed to determine the association between driver's age and the duration of their driving history with musculoskeletal problems. *P* values under 0.05 were regarded as statistically significant (Bulduk et al., 2014).

In a laboratory based simulated lifting test, this study aimed to measure the effects of weightlifting and lifting postures on spinal biomechanics, repeated lifting activity analysis findings showed that with the exception of the RF muscle, lifting weights significantly enhanced sEMG activity and muscular exhaustion. The LES muscles had the highest sEMG activation. The outcomes also showed a substantial difference in the RF and MG muscles' sEMG activity in relation to lifting postures. Weightlifting and lifting postures had no discernible effects on spine biomechanics,

according to a mixed design ANOVA. Overall the results point to increased muscle activity, muscle fatigue during repetitive lifting tasks and greater weight lifting as factors that may increase the likelihood of developing WMSDS (Afari et al., 2017).

This study makes an effort to assess the dangers of WMSD in the manufacturing sector. The majority of duties in the fashion industry were carried out manually with hand tools and it is a very labor-intensive industry. Due to use of hand tools and an increased risk of WMSDs since the current study found a high RULA score of 4.2, further research and adjustments are urgently needed, the score is high because producing the upper part join requires quick movements of the arm when pasting, cutting, folding and stitching which increased the risk of musculoskeletal diseases (Ayub and Shah., 2018).

Our study used a self-reported questionnaire to capture nurses' attitudes and perceptions about aching, pain and discomfort. Therefore, due to their attitudes and perceptions, they frequency of WERDs among nurses working in rural hospitals in various nations who are exposed to the same degree of dangers may be extremely different (Anap et al., 2013).

In this study, nurses working in rural hospitals in the state of Maharashtra were found to have a high prevalence of LBP, shoulder, neck and knee pain over a 12 months' period. Additionally, certain risk factors, such as working in the same position for an extended period of time, bending, twisting, lifting and treating an excessive number of patients, were strongly associated with WMSDs. One of the causes of injuries among nurses working in rural Maharashtra was a lack of lifting expertise and the accessibility of lifting equipment. These results need to be confirmed by more prospective trails. According to the report, ergonomics research will be crucial for developing preventative techniques. Prevention approaches including body awareness training for nurses, proper lifting and transfer procedures and workload reduction may be beneficial. Interventions in physiotherapy such as spinal muscle exercises for the upper and lower limbs, relaxation techniques and ergonomic guidance can all be used to treat WMSDs (Anap et al., 2013).

CHAPTER-III METHEODOLOGY

3.1 Study Design

It was a cross sectional type of descriptive study carried out with the objective of determining the occupation related musculoskeletal disorders among the surgeons in Dhaka city.

3.2 Study Area

The relevant data for the present study were collected from the surgeons working in different government and non-government hospitals, medical college hospitals and clinics in Dhaka city.

3.3 Study Population

Surgeons working in different medical college hospitals, clinics and other government and non-government hospitals constituted the study population for the present study.

3.4 Sample Size

The required sample size for the present study has been calculated by the following statistical formula.

$$n = \frac{z^2pq}{d^2}$$

Here,

z = 1.96

p = Prevalence = 83% (Vaghela et al., 2019).

=0.83

q = 1-P

d = Confidential interval = 0.05

According to standard formula, sample size will be

$$\frac{z^2pq}{d^2} = [(1.96)^2 \times 0.83 \times 0.17] \div (0.05)^2 = 216$$

So, sample size is 216

So, the initial sample size is 216. But limitation of as this research, the feasible 159 samples were selected for this study.

3.5 Sampling technique:

Purposive sampling technique was used select sample units from the study population.

3.6 Inclusion & Exclusion Criteria:

3.6.1 Inclusion criteria:

. Age group: Above 25 years.

. Both male and female surgeons.

. Willingness of participants.

3.6.2 Exclusion criteria:

. Physically unstable.

3.7 Method of data collection:

Face to face formal interview technique was adopted to collect information from the study participants.

3.8 Instrument of data collection

1. **Questionnaire**

A questionnaire was prepared according to the objectives and variables of the present study. The questionnaire contained both open and close ended questions. The questionnaire had two parts. First part contained questions on socio-demographic information. The second part included questions on work related information.

2. **Nordic Musculoskeletal Questionnaire**:

   This scale was used to collect information on musculoskeletal problems of the surgeons.

3. **NPRS scale**: This was used to collect data about musculoskeletal pain of the participants.

3.9 Procedure of data collection

The required data for the present study were collected by the researcher herself. Obtaining permission from the Directors of the hospital and clinic, the researcher introduced herself to the surgeons. The participants were explained in details about the

aims and objectives of the research. Obtaining informed verbal consent from the respondents, the researcher started the interview and the responses were recorded in the questionnaire. Nordic Musculoskeletal Questionnaire was used to collect information on musculoskeletal problems of the surgeons. NPRS scale was used to collect data about severity of musculoskeletal pain of the participants.

3.10 Analysis of data:

At the end of each day the questionnaires were checked for any error or inconsistency in the responses. Necessary corrections were done accordingly. Data from the questionnaire were entered into SPSS program. Analysis of the data was carried out according to the objectives of the study. Mean and percentage were two measurements of descriptive statistics used in the most of the cases. Relationship was assessed between dependent and independent variables.

3.11 Results:

The result of the study had been presented by frequency tables showing percentage of the variables. The findings were also presented by various charts, graphs and description of the variables.

3.12 Ethical Consideration:

The research proposal was approved by the Ethical Review Board of SAIC College of Medical Science and Technology. This was cross sectional type of descriptive study carried out with the objective of exploring the occupation related musculoskeletal disorders among the surgeons working in Dhaka city. The aims and objectives of the research were explained to every participant before interview and asked for their response. The respondents who gave informed verbal consent included in the study. No physical examination or any invasive technique was applied to the participants for the present study. The participant was also informed of his/her right to discontinue at any point of interview.

The collected data from the participants were entered into the computer and later on analyzed according to the objective of the study using SPSS program. The data were kept with strict confidentiality.

3.13 Limitations of the study:

The following limitations should be considered for this study.

1. The calculated sample size for the present study was 216. But due to time constraints data could not be collected from the original sample size. The researcher had to collect data from 159 surgeons working in Dhaka city. Due to small number of participants the result might be affected statistically.
2. Convenience sampling technique was used to select study participant for the present study. So the representativeness of the sampling units could not be ensured. As a result, it affected the quality of the study.
3. The result could not be generalized due to small sample size and lack of representativeness.
4. The allotted time is short for the study. So the researcher had to compromise with the quality of the study.
5. Doing dissertation is a huge work and this was the first time the researcher conducted this by her own efforts. The study is not free from limitations and weakness in the analysis of the data.

CHAPTER-IV RESULTS

The present study was a cross sectional type of descriptive study. The objective of the study was to determine the occupation related musculoskeletal disorders among the surgeons in Dhaka city. Data were collected from a sample of 159 surgeons working in different hospitals in Dhaka city. The collected data were analyzed with the help of SPSS 25.0 version software program. The result of the study has been presented in the following section by frequency tables, charts and description.

Sociodemographic information:

Table no. 1: Frequency distribution of the respondents by age.

Age group in year	Frequency	
	N	%
28 - 37	104	65.4
38 - 47	43	27.0
48 - 57	12	7.5
Total	159	100.0

Mean = 35.82 and SD = 6.95

Regarding frequency distribution of the respondents by age, it was found that out of 159, 104(65.4%) respondents belonged to the age group of 28 - 37 years. It was also found that 43 (27.0%) participants were in the age group 38 - 47 years and 12 (7.5%) were age group in the 48 - 57 years. The mean age of the participants was 35.82 years and standard deviation was 6.95 (Table no.1).

Gender of the participants

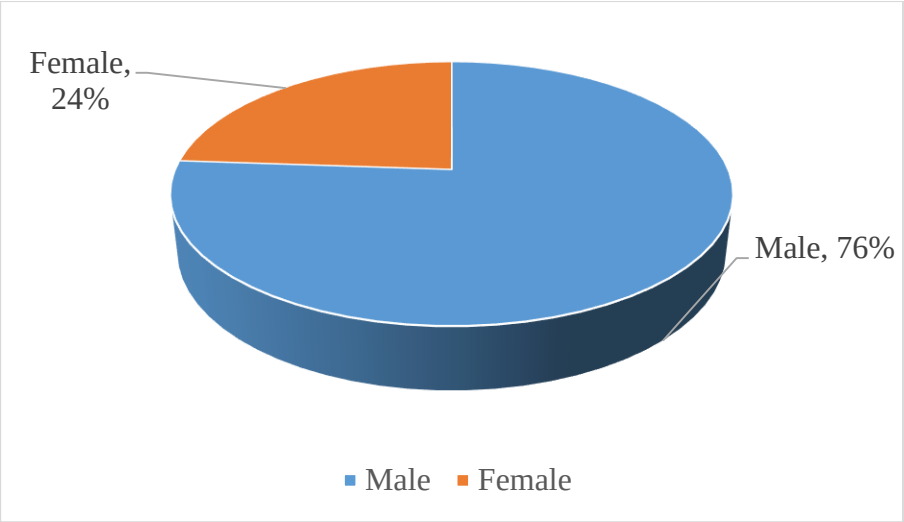


Figure no.1: Frequency distribution of the participants by gender.

The study showed that, out of 159 surgeons, 121 (76.1%) respondents were male and 38 (23.9%) surgeons were female (Fig.no.1).

Table no. 2: Frequency distribution of the participants by BMI.

BMI of the participants	Frequency	
	N	%
Under Weight (< 18.50)	2	1.3
Normal Weight (18.50 – 24.99)	55	34.6
Over Weight (> 25.0)	102	64.2
Total	159	100.0

Mean = 26.24 and SD = 3.41

About frequency distribution of the respondents by BMI, it was revealed that 102 (64.2%) surgeons were overweight. It was also found that 55 (34.6%) surgeons had normal body weight. The mean BMI was 26.24 and SD was 3.41 (Table no.2).

Table no. 3: Frequency distribution of the participants by professional year.

Professional year of the participants	Frequency	
	N	%
1 - 10	104	65.4
11 - 20	35	22.0
21 - 31	20	12.6
Total	159	100.0

Mean = 9.82 and SD = 6.96

The study showed that the professional year of 104 (65.4%) participants was 1 -10 years. It was also revealed that 35 (22.0%) surgeons had professional year of 11 – 20 years (Table no.3).

Table no. 4: Frequency distribution of the respondents by working hour.

Working Hours of the participant	Frequency	
	N	%
6 - 8	68	42.8
8 - 12	66	41.5
>12	25	15.7
Total	159	100.0

Mean = 10.31and SD = 2.3

Regarding frequency distribution of the respondents by working hours, it was found that 68 (42.8%) participants had 6 - 8 hours of working hour. The study also showed that the working hours of 66 (41.5%) respondents were 8 – 12 hours. The mean working hours was 10.31 and SD was 2.3 (Table no. 4).

Working Position of the Participants

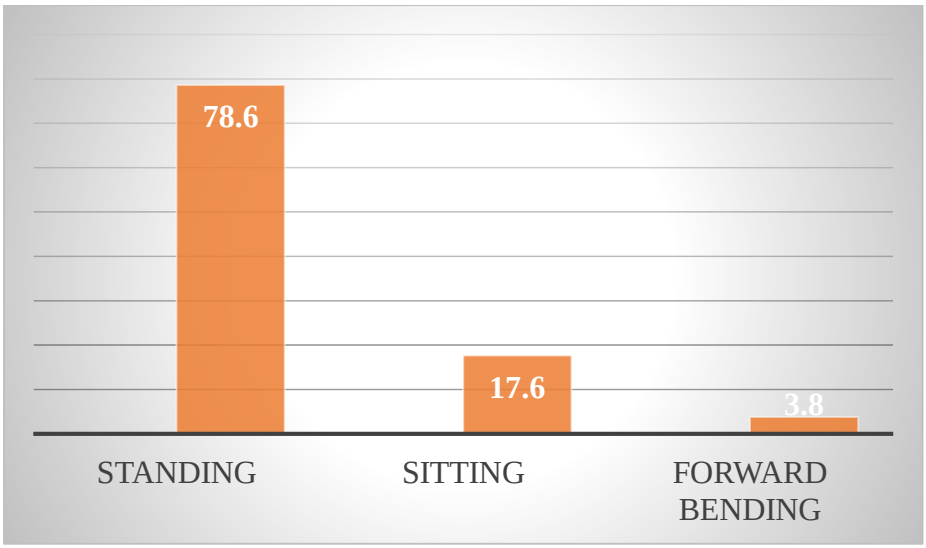


Figure no.2: Frequency distribution of the participants by working position

The study revealed that the working position of 125 (78.6%) participants was standing. It was also found that the working position of 28 (17.6%) participants was sitting and working position 6(3.8%) participants was forward bending (Figure no.2).

Rest at workplace

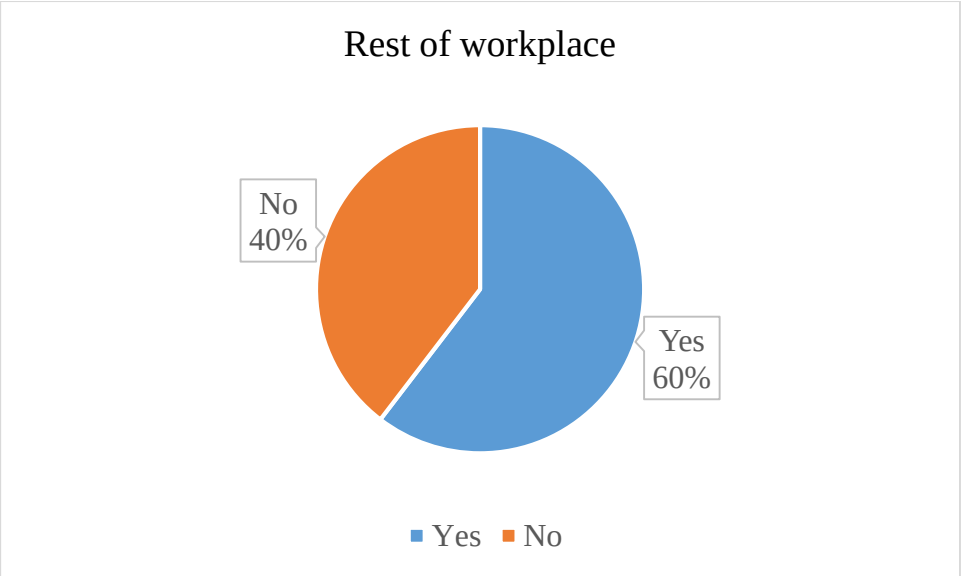


Figure no.3: Frequency distribution of the participants by rest at workplace

Regarding frequency distribution of the participants by rest at workplace, it was found that 96 (60.4%) participants took rest during their work time and 63 (39.6%) participants did not take rest during work (Figure.no.3).

Feelings of Participants

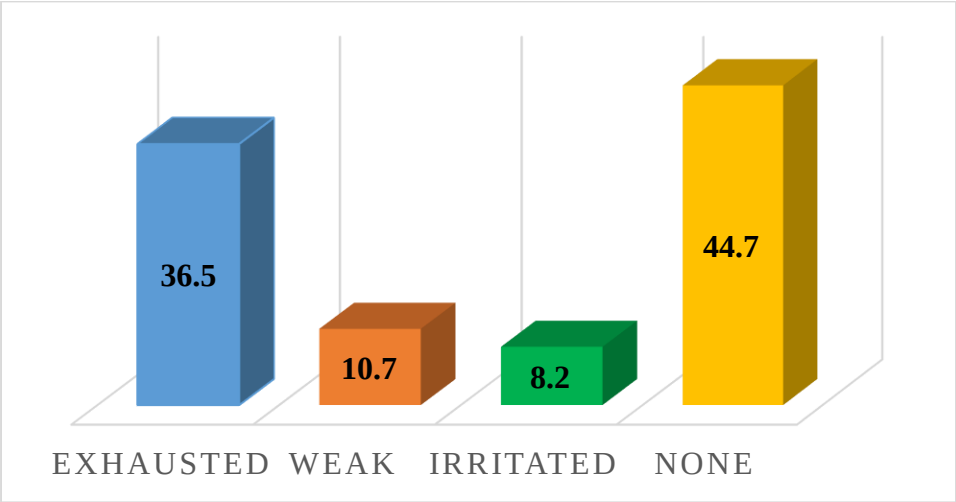


Figure no.4: Frequency distribution of the participants by feelings during working hour

The study showed that 58 (36.5%) subjects felt exhausted, 17(10.7%) respondents told they felt weak and 13 (8.2%) participants become irritated during their work time. It was also revealed that 71 (44.7%) surgeons were fit at their workplace (Figure no.4).

Nordic Musculoskeletal Questionnaire:

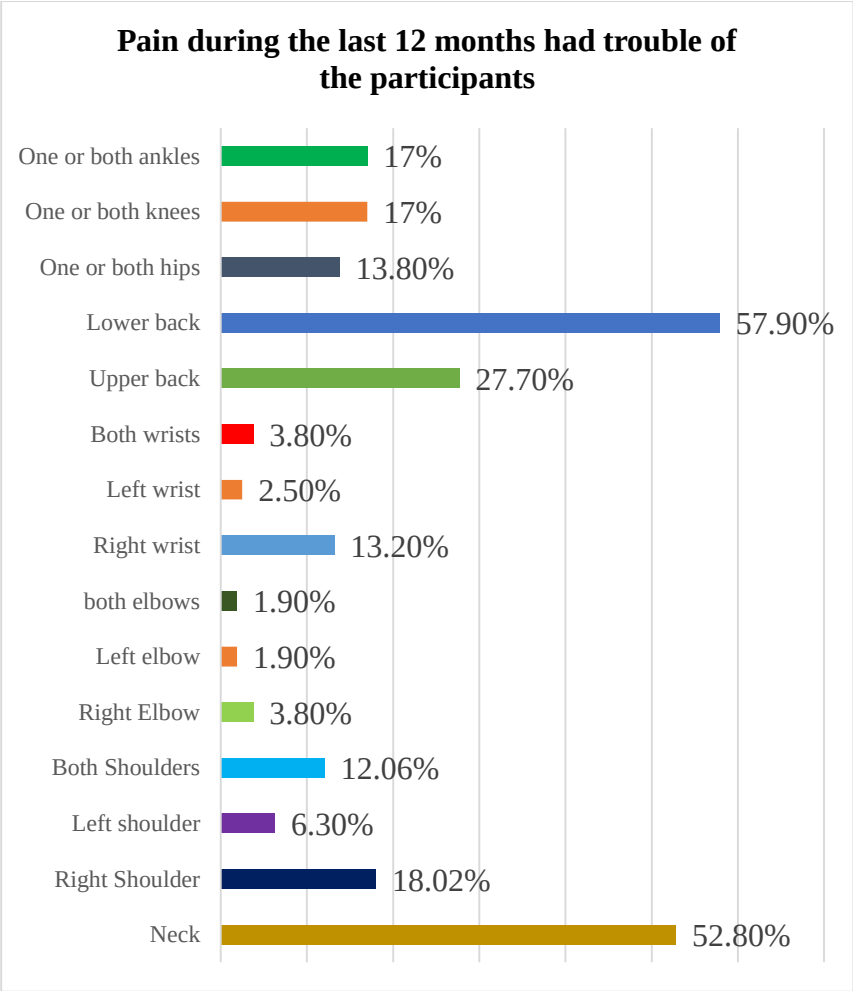


Figure no.5: Pain during the last 12 months of the participants

Regarding frequency distribution of the participants by pain during last 12 months, it was found that 92 (57.90%) participants had lower back pain. It was also found that 84 (52.80%) subjects had neck pain. It was reported by 27.7% respondents had suffered from upper back pain (Figure no.5).

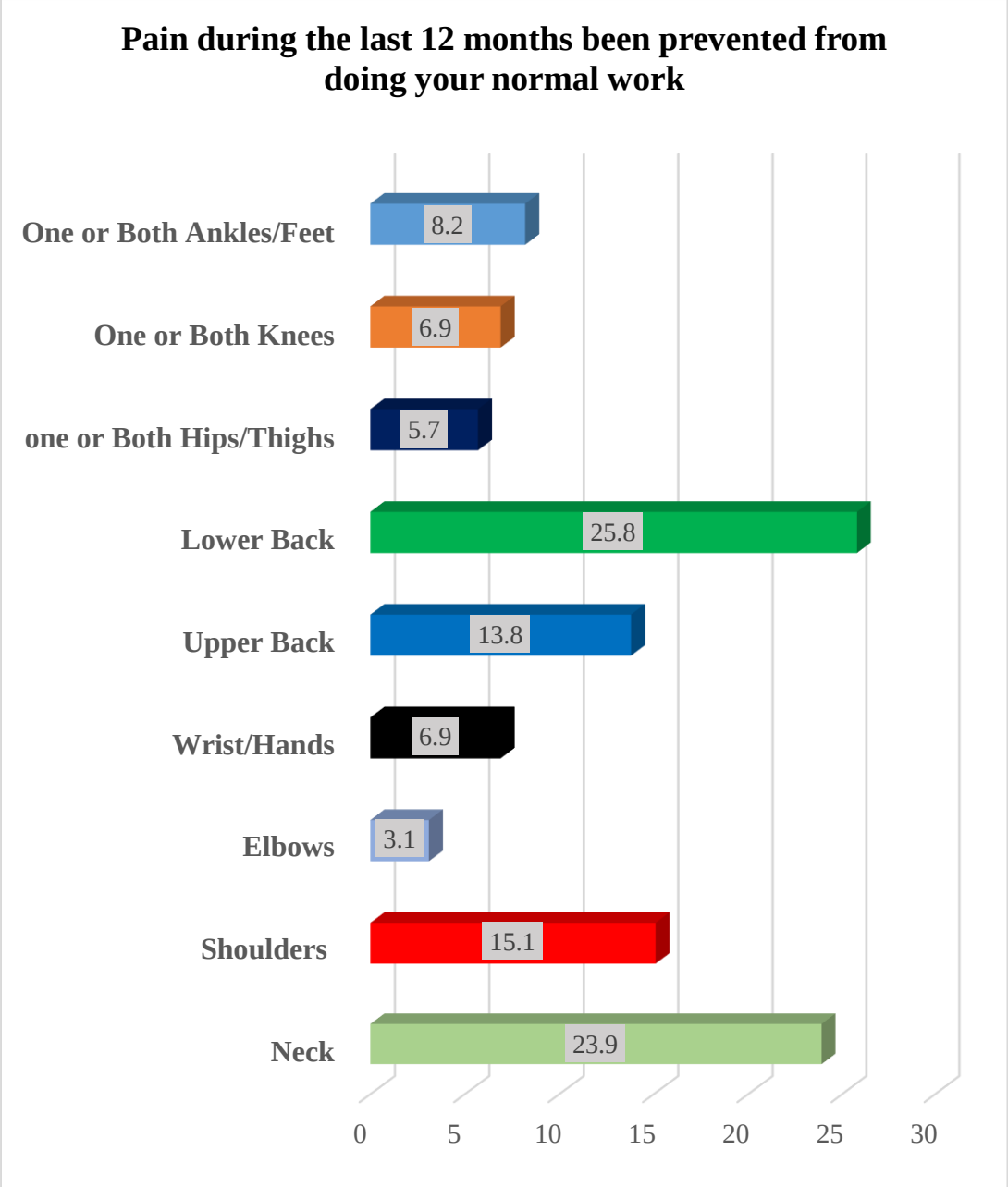


Figure no.6: Pain during last 12 months been prevented from doing your normal work

It was revealed from the study that 23.9% participants had been prevented from doing their normal work due to neck pain during last 12 months. The study further showed that 25.8% surgeons could not do their work due to lower back pain. Shoulder pain prevented 15.1% study subjects from doing normal activities in last 12 months (Figure no.6).

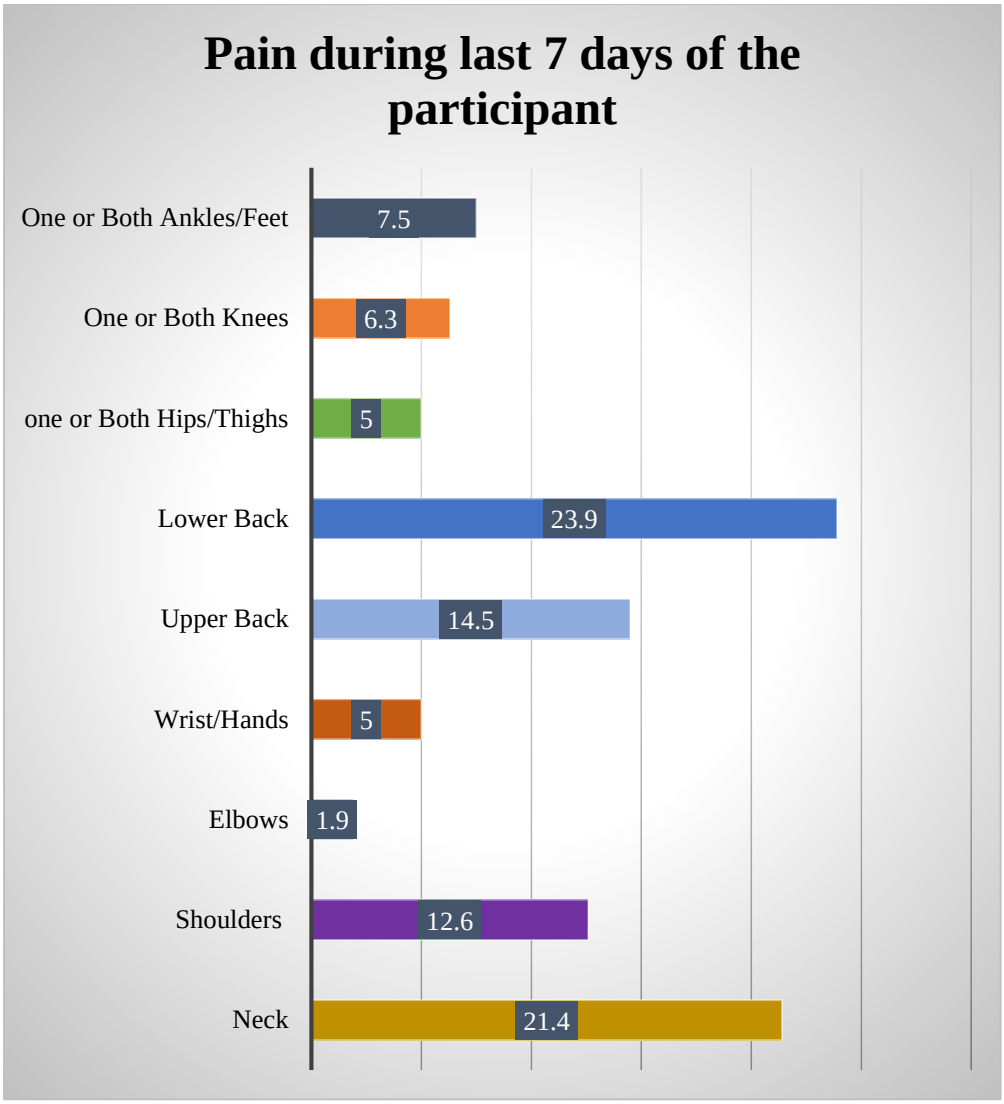


Figure no.7: Pain during last 7 days of the participant.

Regarding pain during last 7 days of the participants, it was found that 38 (23.9%) participants suffered from lower back pain. It was also revealed that 34 (21.4%) respondents told about their sufferings from neck pain. The study showed that 23 (14.5%) suffered from upper back pain, 20(12.6%) persons suffered from shoulders pain, 10(6.3%) subjects suffered from one or both knees pain and 12 (7.5%) participants suffered from both ankles/feet pain respectively (Figure no.7).

Table no.5: Frequency distribution of the participants by severity of pain.

Severity of pain	Frequency	
	N	%
No Pain	65	40.9
Moderate Pain	88	55.3
Severe Pain	6	3.8
Total	159	100.0

Mean = 3.31 and SD = 2.14

It was reported that 88 (55.3%) participants had moderate pain. It was also found that 65 (40.9%) respondents had no pain and 6 (3.8%) participants suffered from severe pain. The mean was 3.31 and standard deviation was 2.138 respectively (Table no.5).

Table no.6: Frequency distribution of the participants by working hour and severity of pain.

Working hour of the participants	Severity of pain						Total	
	No pain		Moderate pain		Severe pain			
	N	%	N	%	N	%	N	%
6-8	30	44.1	37	54.4	1	1.5	68	42.77
8-12	27	40.9	37	56.1	2	3.0	66	41.50
>12	8	32.0	14	56.0	3	12.0	25	15.72
Total	65	40.88	88	55.34	6	3.77	159	100.00

$\chi^2 = 6.2$ and $p = 0.184$

The study showed that**,** out of 159 surgeons, 68 participants had to work for 6-8 hours per day. Among them, 30 (44.1%) participants suffered from no pain, 37 (54.4%) suffered from moderate pain and 1.5% suffered from severe pain. It was found that 66 participants worked for 8 – 12 hours. Among them 27 (40.9%) surgeons had no pain, 37 (56.1%) complained of moderate pain and 3.0% participants had severe pain. In case of surgeons working more than 12 hours, 8 (32.0%) out of 25 surgeons had no pain, 14

(56.0%) subjects had moderate pain and 3 (12.0%) suffered from severe pain. The study showed that the association between working hours of the surgeons and severity of pain was found not statistically significant ($\chi^2 = 6.2$ and $p = 0.184$) [Table no. 6].

Table no.7. Frequency distribution of the respondents by BMI and severity of pain.

BMI of the participants	Severity of pain						Total	
	No pain		Moderate pain		Severe pain			
	N	%	N	%	N	%	N	%
Under Weight (18.50)	1	50.0	1	50.0	0	0	2	1.25
Normal Weight (18.50-24.99)	28	50.9	27	49.09	0	0	55	34.59
Over Weight (25.00)	36	35.29	60	58.82	6	5.88	102	64.15
Total	65	40.88	88	55.34	6	3.77	159	100.00

$\chi^2 = 6.12$ and $p = 0.188$

About frequency distribution of the respondents by BMI and severity of pain, it was found that 55 surgeons had normal weight. Among them, 28 (50.9%) participants had no pain and 27 (49.09%) participants had moderate pain. The study also revealed that 102 surgeons were overweight. Among them, 36 (35.29%) had no pain, 60 (58.82%) had moderate pain and 3.77% respondents had severe pain. The association between BMI of the participants and the severity of pain was found not statistically significant ($\chi^2 = 6.12$ and $p = 0.188$) [Table no. 7].

CHAPTER-V DISCUSSION

The present study was a cross sectional type of descriptive study. The objective of the study was to determine the occupation related musculoskeletal disorders among the surgeons working in Dhaka city. The relevant data were collected from a sample of 159 surgeons working in different hospitals in Dhaka city. The collected data were analyzed with the help of SPSS 25.0 version software program. The discussion part of the present study has been presented in the following section.

The study revealed that 65.4% surgeons belonged to the age group of 28- 37 years and 27.0% participants were in the age group 38 - 47 years. The mean age of the participants was 35.82 years and standard deviation (SD) was 6.95 (Table no.1). In a similar study in India it was found that the mean age of the surgeons was 42.07 years and SD was 12.35 (Vaghela et al., 2019).

The study showed that 76.1% participants were male and 23.9% surgeons were female (Fig.no.1). A study conducted by ALGHADIR et al revealed that 47% participants were females and 52% participants were males (ALGHADIR et al., 2015). The study revealed that 64.2% surgeons were overweight and 34.6% surgeons had normal body weight. The mean BMI was 26.24 and SD was 3.41 (Table no.2). In a study in Saudi Arabia, it was found that the mean BMI of the Saudi orthopedic surgeons was 27.8 (Al-Mohrej et al., 2020).

It was found that the professional year of majority of the participants (65.4%) was within 1 - 10 years and 22.0% surgeons had professional year 11 – 20 years (Table no.3). It indicated that majority surgeons were young. The study showed that 42.8% participants had 6 - 8 hours of working hour and 41.5% respondents had 8 – 12 hours. The mean working hour was 10.31 hours and SD was 2.3 (Table no.4). A study conducted by Vaghela et al, showed that the mean working years of the surgeons was 15.14 years with the mean hours of 8 hours per day (Vaghela et al.,2019).

The study revealed that working position of most of the participants (78.6%) was standing and 17.6% participants' position was sitting (Figure no.2). On the other hand, the Saudi Arabia research showed that the working position of majority of the participants was sitting (79%) and 16% participants' working position was standing (Alghadir et al., 2015).

About rest at workplace, it was found that 60.4% participants took rest during their work time and 39.6% participants did not take rest during work (Figure no.3). It was revealed that 36.5% study subjects felt exhausted and 10.7% respondents told they felt weak (Figure no.4). A study in Gujarat showed that 41.86% surgeons said their work schedule is very unpredictable, and 34.87% surgeons said they don't have time for breaks because of everything that needs to be done by the end of the day. It was revealed that 34.88% respondents said they were physically exhausted, and 25% participants said they put a lot of pressure on themselves (Vaghela et al., 2019).

The study showed that during last 12 months, 57.90% participants had lower back pain, 52.80% subjects had neck pain and 27.7% respondents had upper back pain (Figure no.5). It was found that 23.9% participants had been prevented from doing their normal work due to neck pain during last 12 months. Shoulder pain prevented 15.1% and Elbow-3.1%, Wrist/Hand-6.1%, Both hips/thighs - 5.1%, Both knees - 6.9%, Ankle/feet-8.2% study subjects from doing normal activities in last 12 months (Figure – 6).

A study in Gujarat, it was found that 30.2% Surgeons suffered from neck pain, 23.3% surgeons suffered shoulder pain, 6.98% participants affected by knee pain and 2.32% surgeons had ankle-elbow and wrist pain (Vaghela et al., 2019). It was also found in another study 26.7% orthopedic surgeons were suffering from low back pain, 17.4% surgeons from wrist or forearm tendinitis, 15.1% surgeons had elbow lateral epicondylitis, 14.0% doctors had plantar fasciitis, 12.8% subjects had carpal tunnel syndrome, 12.8% participants had shoulder pain or tendinitis, and 9.3% surgeons had knee osteoarthritis (Al Qahtani et al., 2016). In a study conducted by Al-Mohrej et al, showed that 74.0% trauma surgeons had lower back pain, the second highest reported prevalence was neck pain (58.2%). It was found that 40.4% surgeons complained of having shoulder pain or elbow pain. Hand or wrist pain was prevalent among 32.2% respondents, while knee pain and foot pain or ankle pain composed of 27.4%, 21.2 % of the responses respectively and 11.6% of the respondents experienced hip or thigh pain (Al-Mohrej et al., 2020).

The study revealed that 25.8% surgeons could not do their work due to lower back pain and 23.9% participants had been prevented from doing their normal work due to neck pain during last 12 months (Figure no.6). The findings suggested that musculoskeletal disorders interfered daily activities of the participants.

About pain during last 7 days, it was found that 23.9% participants suffered from low back pain and 21.4% respondents had neck pain. It was also found that 14.5% participants suffered from upper back pain, 12.6% surgeons suffered from shoulder pain, 16.3% study subjects suffered from one or both knee pain and 7.5% participants suffered from both ankles/feet pain respectively (Figure no.7). The result indicated that majority of the surgeons had low back pain. It was very common among the surgeons.

The study showed that 55.3% participants had moderate pain. It was also found that 40.9% respondents had no pain and 3.8% participants suffered from severe pain (Table no.5). It was evident from the study that more than half of the participants had moderate pain. Only few suffered from severe pain. The result also indicated that a good percentage (40.9%) of surgeons had no pain.

It was revealed in the study that**,** out of 159 surgeons, 68 participants had to work for 6-8 hours per day. Among them, 44.1% participants had no pain, 37 (54.4%) surgeons had moderate pain and 1.5% participants had severe pain. It was found that 66 participants worked for 8 – 12 hours. Among them 40.9% surgeons had no pain, 56.1% participants complained of moderate pain and 3.0% participants had severe pain. In case of surgeons working more than 12 hours, 32.0% out of 25 surgeons had no pain, 56.0% subjects had moderate pain and 12.0% surgeons suffered from severe pain. The study showed that the association between working hours of the surgeons and severity pain was found not statistically significant ($\chi^2 = 6.2$ and $p = 0.184$) [Table no. 6].

Regarding BMI and severity of pain, it was found that 55 surgeons had normal weight. Among them, 50.9% participants had no pain and 49.09% participants had moderate pain. The study also revealed that 102 surgeons were overweight. Among them, 35.29% surgeons had no pain, 58.82% surgeons had moderate pain and 3.77% respondents had severe pain. The result indicated that the association between BMI of the participants and the severity of pain was found not statistically significant ($\chi^2 = 6.12$ and $p = 0.188$) [Table no. 7]. Al-Mohrej et al., showed that the relationship between rising BMI levels (30±59) and the onset of knee, foot, or ankle pain was statistically significant and ($p = 0.03$) [Al-Mohrej et al., 2020].

CHAPTER-VI CONCLUSION AND RECOMMENDATIONS

Conclusion:

The study titled "Occupation related musculoskeletal disorders among the surgeons in Dhaka city" was a cross sectional type of descriptive one. The chief objective of the study was to determine the occupation related musculoskeletal disorders among the surgeons working in Dhaka city. The required data were collected from a sample of 159 surgeons working in different hospitals in Dhaka city. The collected data were analyzed with the help of SPSS 25.0 version software program.

The study revealed that majority of the surgeons (65.4%) belonged to the age group of 28 - 37 years and 27.0% participants were in the age group of 38- 47 years. The mean age of the participants was 35.82 years. The result indicated that majority of the participants (65.4%) were young. About gender, 76.1% participants were male and 23.9% surgeons were female. The male participants were higher proportionately than that of female. It was found that 64.2% surgeons were overweight and 34.6% surgeons had normal body weight. The mean BMI was 26.24. The study showed that higher proportion of surgeons (64.2%) was overweight than that of surgeons with normal weight. The surgeons should take initiatives such as avoiding fatty rich food to reduce body weight. It is well known that they might develop diseases. Overweight is associated with various musculoskeletal disorders.

The study showed that the professional year of majority of the participants (65.4%) was within 1 - 10 years and 22.0% surgeons had professional year 11 – 20 years. It indicated that majority surgeons were young. It was found that 42.8% participants had 6 - 8 hours of working hour and 41.5% respondents had 8 – 12 hours. The result showed that a good proportion of the surgeons (41.5%) had to work for 8 – 12 hours daily. Long working hours might cause musculoskeletal problems among the surgeons in near future. Surgeons should maintain optimum working hours daily. Overworking should be avoided by the surgeons to prevent development of musculoskeletal disorders.

About working position, most of the participants (78.6%) had to work on standing and 17.6% participants' position was sitting. It was found that 60.4% participants were able to take rest during their work time. The study showed that 36.5% study subjects felt exhausted and 10.7% respondents told they felt weak. It was revealed

in the study that majority of the participants (78.6%) had to work on standing position. It indicated that working on standing position and without rest made them exhausted and weak. The surgeons should not do work on standing continuously. Resting time or a brief break during work should be allowed inside the hospital for the surgeons. Provision of this type of facilities during work for the doctors would certainly help to prevent diseases especially musculoskeletal disorders.

The study showed that during last 12 months, 57.90% participants had lower back pain, 52.80% subjects had neck pain and 27.7% respondents had upper back pain. It was found that 23.9% participants could not do normal work due to neck pain during last 12 months. Shoulder pain prevented 15.1% and Elbow-3.1%, Wrist/Hand-6.1%, both hips/thighs - 5.1%, both knees - 6.9%, Ankle/feet-8.2% study subjects from doing normal activities in last 12 months.

The study revealed that a good percentage of the participants (57.90%) had low back pain and 52.8% respondents had neck pain. Due to these musculoskeletal problems the participants could not do their work in the hospital. So, the hospital patients were deprived of their services. It is evident that physiotherapy could play important role in the management of musculoskeletal disorders of the surgeons. The findings of the study recommend the need for early diagnosis and management of the musculoskeletal problems of the working surgeons.

The study revealed that 25.8% surgeons could not do their work due to lower back pain and 23.9% participants had been prevented from normal work due to neck pain during last 12 months. The findings suggested that musculoskeletal disorders interfered daily activities of the participants.

About pain during last 7 days, it was found that 23.9% participants suffered from low back pain and 21.4% respondents had neck pain. It was also found that 14.5% participants suffered from upper back pain, 12.6% surgeons suffered from shoulder pain, 16.3% study subjects suffered from one or both knee pain and 7.5% participants suffered from both ankles/feet pain respectively. The result indicated that majority of the surgeons had low back pain. It was very common among the surgeons.

The study showed that 55.3% participants had moderate pain. It was also found that 40.9% respondents had no pain and 3.8% participants suffered from severe pain. It was evident from the study that more than half of the participants had moderate pain.

Only few suffered from severe pain. The result also indicated that a good percentage (40.9%) of surgeons had no pain.

It was revealed in the study that out of 159 surgeons, 68 participants had to work for 6-8 hours per day. Among them, 44.1% participants had no pain, 54.4% had moderate pain and 1.5% had severe pain. It was found that 66 participants worked for 8 – 12 hours. Among them 40.9% surgeons had no pain, 56.1% complained of moderate pain and 3.0% participants had severe pain. In case of surgeons working more than 12 hours, 32.0% out of 25 surgeons had no pain, 56.0% subjects had moderate pain and 12.0% participants suffered from severe pain. The study showed that the association between working hours of the surgeons and severity of pain was found not statistically significant ($\chi^2 = 6.2$ and $p = 0.184$). This might be due to small sample size. In reality it is observed that working hour is associated with severity of pain among the patients suffering from musculoskeletal problems. The concerned authority should take necessary measures about optimum working hour suitable for health of the surgeons.

Regarding BMI and severity of pain, it was found that 55 surgeons had normal weight. Among them, 50.9% participants had no pain and 49.09% participants had moderate pain. The study also revealed that 102 surgeons were overweight. Among them, 35.29% participants had no pain, 58.82% participants had moderate pain and 3.77% respondents had severe pain. The result indicated that the association between BMI of the participants and the severity of pain was found not statistically significant ($\chi^2 = 6.12$ and $p = 0.188$). It was due to small sample size of the present study. All surgeons should be aware about their body weight. They should develop the habit of taking balanced diet regularly and do physical exercise. So, they can prevent musculoskeletal disorders.

Recommendations

The following recommendations are made on the basis of the findings of the present study.

1. The male participants (76.1%) were higher proportionately than that of female (23.9%). It was found that 64.2% surgeons were overweight and 34.6% surgeons had normal body weight. The mean BMI was 26.24. The study showed that higher proportion of surgeons (64.2%) was overweight than that of surgeons with normal weight. The surgeons should take initiatives such as avoiding fatty rich food to reduce body weight. It is well known that people with overweight might develop many diseases. Over weight is associated with various musculoskeletal disorders.
2. The result showed that a good proportion of the surgeons (41.5%) had to work for 8 – 12 hours daily. Long working hours might be the causal factor related to musculoskeletal problems among the surgeons. Surgeons should maintain optimum working hours daily. Over working should be avoided by the surgeons to prevent development of musculoskeletal disorders.
3. It was revealed in the study that majority of the participants (78.6%) had to work on standing position. About 60% surgeons were able to take rest during their work and 36.5% surgeons felt exhausted. It indicated that working on standing position and without rest made them exhausted and weak. The surgeons should not do work on standing continuously. They should be allowed to take rest during work inside the hospital. Provision of rest during work for the doctors would certainly help to prevent diseases especially musculoskeletal disorders.
4. The study revealed that a good proportion of the participants (57.90%) informed of having low back pain and 52.8% respondents had neck pain. Due to these musculoskeletal problems the participants could not do their work in the hospital. So, the patients admitted into the hospital were deprived of their services. It is evident that physiotherapy could play a vital role in the management of musculoskeletal problems of the surgeons. The findings of the study recommend for early diagnosis and management of the musculoskeletal problems of the concerned surgeons.
5. The sample size for the present study was small. On the other hand, convenient sampling technique was used to select the study participants (surgeons) from different hospitals. So, the result could not be generalized. It is recommended

that a well-planned research should be conducted to explore the occupation related musculoskeletal disorders among the surgeons with a statistically calculated representative sample size. It would certainly bring out the true findings of the surgeons.

6. The time period for the study was not adequate. It affected the quality of the present study. In order to ensure the quality of the research, sufficient time should be allotted for planning and implementation of the various processes and steps of the study.

REFERENCES:

1. Ganer, N., (2016). Work Related Musculoskeletal Disorders among Healthcare Professional and their Preventive Measure: A Report. International Journal of Scientific Research in Science, Engineering and Technology (ijsrset.com), 2(4), pp-693-698.

2. Vaghela, N., Parekh, S., Ganjiwale, D., and Mehta, J.N., (2019). Work-related musculoskeletal disorder among surgeons in Gujarat. Journal of Education and Health Promotion, 8, pp-1-5.

3. Trigar, A., Khallaghi, S., and Taghipour, M., (2013). A study on musculoskeletal disorders and personal and occupational risk factors among surgeons. Iranian journal of health sciences, 1(1), pp-50-57.

4. Dabholkar,T., Yardi,S., Dabholkar,Y.G., and Khanvilkar,A., (2015). Work-related Musculoskeltal Disorders in Surgeons Performing Minimal Invasive Procedures in Mumbai & Mumbai India. International Journal of Health Sciences and Research, 5(8), pp-347-355.

5.AlQahtani, S.M., Alzahrani, M.M., and Harvey, E.J., (2016). Prevalence of musculoskeletal disorders among orthopedic trauma surgeons: an OTA survey. Canadian journal of surgery, 59(1), pp-42-47, doi: 10.1503/cjs.014415.

6. Al-Mmmohrej, O.A., Elshaer, A.K., Al-Dakhil, S.S., Sayed, AB.I., Aljohar, S., AlFattani, A.A., and Alhussainan, T.S., (2020). Work-related musculoskeletal disorders among Saudi orthopedic surgeons: a cross sectional study, 1(4), pp-47-54, doi: 10.1302/2633-1462.14.BJO-2020-0005.

7. Alexandre, P.C.B., Silva, I.C.M., Souza, L.M.G., Camara,V.D.M., Palacios,M., and Meyer,A., (2011). Musculoskeletal Disorders Among Brazilian Dentists. The Journal of Archives of Environmental & Occupational Health, 66(4), pp-231-235.

8. Kim-FIne, S., Woolley, S.M., Weaver, A.L., Killian, J.M., and Gebhart, J.B., (2013). Work- Related Musculoskeletal disorders among vaginal surgeons. The International Urogynecological Association, 24, pp-1191-1200, doi: 10.1007/s00192-012-1958-x.

9. Alshanberi, A.M., Mousa, A.H., and Jamour, A.H., (2021). Prevalence of Work-Related Muscular and Skeletal Disorder among Surgeons and Nurses in Saudi Arabia: A cross-sectional study among 4 Tertiary care centers. Journal of EC ORTHOPAEDICS, 12(9), pp-08-13.

10. Senosy, S.A., Anwar, M.M., and Elareed, H.R., (2019). Profession-related musculoskeletal disorders among Egyptian physicians and dentists. Journal of Public Health: From Theory to Practice, https://doi.org/10.1007/s10389-019-01016-0.

11. Damayanti, S., Zorem, M., and Pankaj, B., (2017). Occurrence of Wortk Related Musculoskeletal Disorders among School Teachers in Eastern and Northeastern Part of India. International Journal of Musculoskeletal Pain prevention, 2(1), pp-187-192.

12. Riberio, T., Serranheira, F., and Loureiro, H., (2017). Work related musculoskeletal disorders in primary health care nurses. journal of Applied Nursing Research, 69, pp-72-77, http://dx.doi.org/10.1016/j.apnr.2016.09.003.

13. Mozafari, A., Vahedian, M., Mohebi, S., and Najafi, M., (2014). Work-Related Musculoskeletal Disorders in Truck Drivers and Official Workers. Journal of Acta Medica Iranica, 53(7), pp-432-438.

14. Khansa, I., Khansa, L., Westvik, T.S., Ahmad, J., Lista, F., and Janis, J.E., (2017). Woek-Related Musculoskeletal Injuries in Plastic Surgeons in the United States, Canada, and Norway. Journal of American Society of Plastic Surgeons, DOI: 10.1097/PRS.0000000000003961.

15. Senosy, S.A., Anwar, M.M., and Elareed, H.R., (2019). Profession-related musculoskeletal disorders among Egyptian physicians and dentists. Journal of Public Health: From Theory to Practice, https://doi.org/10.1007/s10389-019-01016-0.

16. Banerjee, A., Jadhav, Sl., Bhawalkar, Js., (2012**).** Limitation of Activities in Patients with Musculoskeletal Disorders. Journal of Annals of Medical and Health Scieemce Research, 2(1), pp-5-9, doi: 10.4103/2141-9248.96928.

17. Huang, C., Kim, W., Zhang, Y., and Xiong, S., (2020). Development and Validation of a Wearable Inertial Sensors-Based Automated System for Assessing Work-Related Musculoskeletal Disorders in the Workplace. International journal of Environmental Research and Public Health, 17(6050), doi:10.3390/ijerph17176050.

18. ALGHADIR, A., ZAFAR, H., and IQBAL, Z.A., (2015). Work-related musculoskeletal disorders among dental prof3essionals in Saudi arabia. Journal of....., 27, pp.1107-1112.

19. Grant, K.M.K., Vo, T., and Tiong, L.U., (2020). The painful truth: work-related musculoskeletal disorders in Australian surgeons. Journal of Occupational Medicine, 70 (1), pp.60-63.

20. Chinedu, O.O., Henry, A.T., Nene, J.J., and Okwudili, J.D., (2020). Work- Related Musculoskeletal Disorders among Office Workers in Higher Education Institutions: A

Cross-Sectional Study. AFRICAN JOURNALS ONLINE, 30(5), pp.715-724, DOI**:** 10.4314/ejhs.v30i5.10.

21. Henry, L.J., Esfehani, A.J., Ramil, A., Ishak, I., Justine, M., and Mohan, V., (2015). Patterns of Work-Related Musculoskeletal Disorders Among Workers in Palm Plantation Occupation. Asia-Pacific Journal of Public Health, 27(2), pp.1785-1792, DOI: 10.1177/1010539513475657.

22. Bulduk, E.O., Bulduk, S., Suren, T., and Ovali, F., (2014). Assessing exposure to risk factors for work- related musculoskeletal disorders using Quick Exposure Check (QEC) in taxi drivers. International Journal of Industrial Ergonomics, 44(6), pp.817-820, http://dx.doi.org/10.1016/j.ergon.2014.10.002 .

23. Afari, M.F.A., Li,H., Edwards, D,j., Parn, E.A., Seo, J., Wong,A,Y,L., (2017).Biomechanical analysis of risk factors for work-related musculoskeletal disorders during repetitive lifting task in construction workers. Journal of Automation in Construction, 83, pp-41-47, http://dx.doi.org/10.1016/j.autcon.2017.07.007.

24. Ayub,Y., and Shah, Z.A., (2018). Assessment of Work Related Musculoskeletal Disorders in Manufacturing Industry. Journal of Ergonomics, 8(3), pp.1-5,DOI: 10.4172/2165-7556.1000233.

25. Anap, D.B., Iyer, C., and Rao, K., (2013). Work related musculoskeletal disorders among hospital nurses in rural Maharashtra, India: a multi centre survey. International Journal of Research in Medical Sciences, 1(2), pp.101-107, DOI: 10.5455/2320-6012.ijrms20130513.

APPENDIX-I

Consent form

Respondent ID | | | |

Dear participant.

I am Puja Kundu student of B.sc in physiotherapy program in the Department of Physiotherapy at SAIC College of Medical Science and Technology affiliated by University of Dhaka conducting the study entitled Occupation-related musculoskeletal disorders among the Surgeons: A cross-sectional study as a part my thesis work for the partial fulfillment of Bachelor degree. I am requesting you to participate in this study. I will ask you questions on musculoskeletal problems. There will also be some questions related to your work and your socio-demographic status. For spending your time to participate in this interview which will take around 10 - 15 minutes. The information gained from the interview will be used for academic purpose and will be kept confidential. Your participation in this study is totally voluntarily and you have the right to withdraw from the interview without any clarification at any moment. You can ask any question to the researcher regarding the study to meet up your query. Looking forward to your kind cooperation.

Declaration of the participant

I have been answered in this survey. The foregoing information has been read to me and that have been answered to my satisfaction. I have noticed that my participation in this study is totally voluntary and I have the right to withdraw from the interview at any clarification. I give my consent voluntarily to be participants in this study.

Respondent name: ……

Signature and date: ……..

APPENDIX-II

QUESTIONNARE

Title

OCCUPATION RELATED MUSCULOSKELETAL DISORDERS AMONG THE SURGEONS IN DHAKA CITY

Respondent ID:

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

Name of respondent .....

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

Section 01: Socio-Demographic Related Question

Q.No	Questions	Answer
1.	How old are you?	
2.	Gender of participant 1. Male 2. Female 3. Others	
3.	What is your BMI? 1. Height = 2. Weight =	

Section 02: Work Related Information

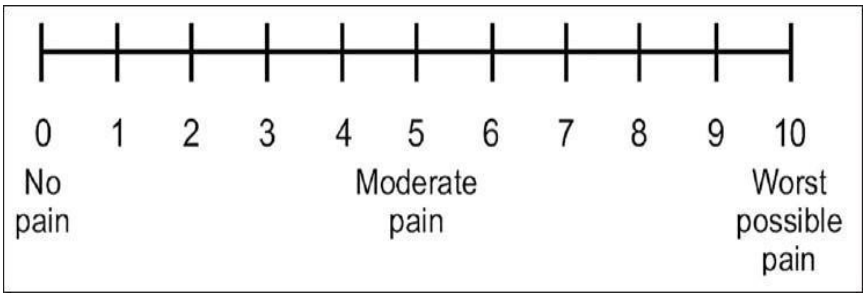
Q. No.	Questions	Answer
4.	How many years have you been in this profession?	
5.	How long do you work at daily? 1. 6-8 hours 2. 8-12 hours 3. >12 hours	
6.	Which position do you work? 1. Standing 2. Sitting 3. Forward bending 4. Slouched sitting	
7.	Do you take rest at your workplace? 1. Yes 2. No	

8.	How do you feel while working? 1. Exhausted 2. Weak 3. Irritated 4. None	

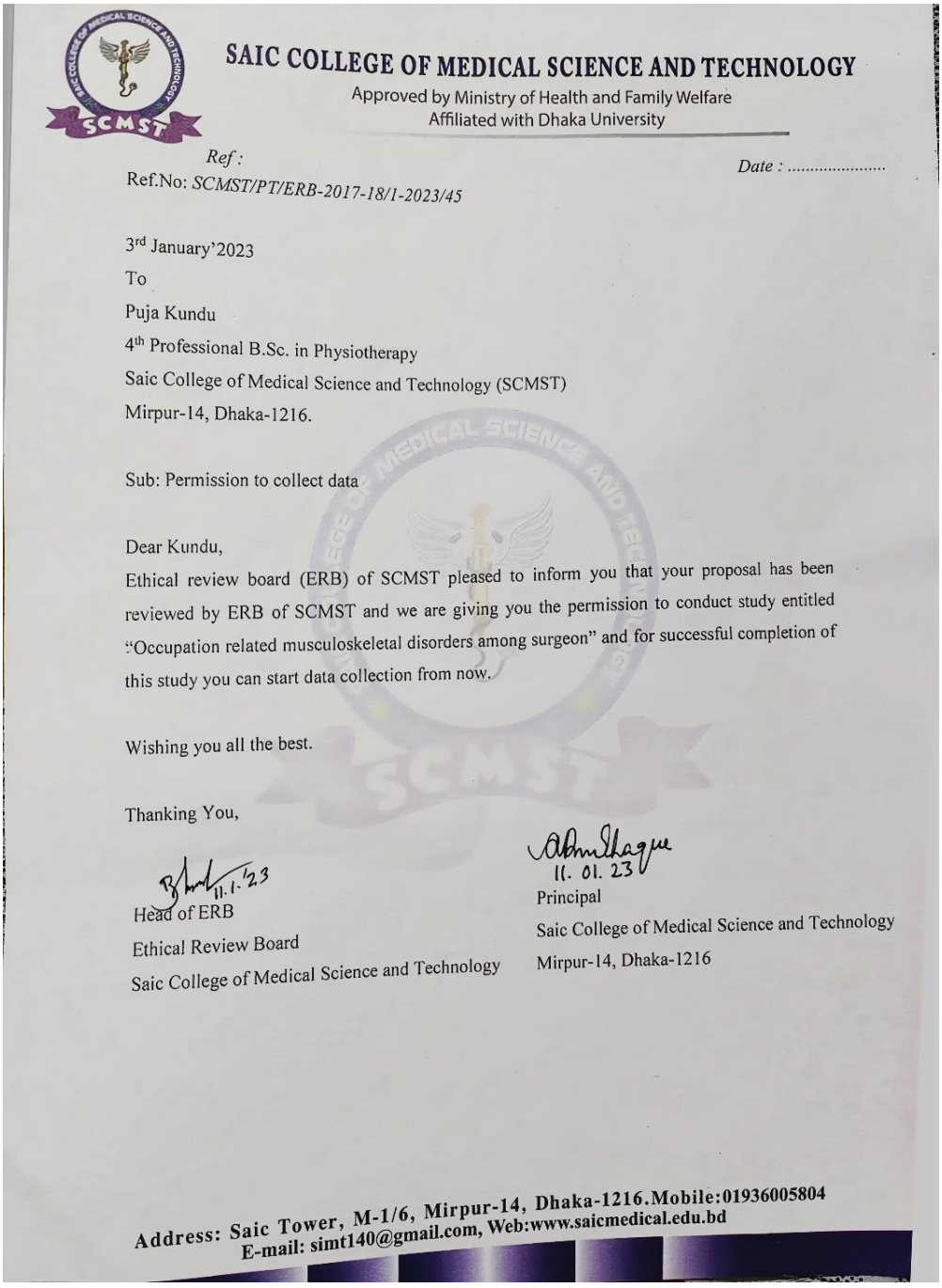
Section 03: Nordic Musculoskeletal Questionnaire

To be answered by everyone	**To be answered by those who have had trouble**	
Have you at any time during the last 12 months had trouble (ache, pain, discomfort, numbness) in:	Have you at any time during the last 12 months been prevented from doing your normal work (at home or away from home) because of the trouble?	Have you had trouble at any timing during the last 7 days?
Neck ☐No ☐Yes	☐No ☐Yes	☐No ☐Yes
Shoulders ☐ No ☐ Yes, right shoulder ☐ Yes, left shoulder ☐ Yes, both shoulders	☐ No ☐ Yes	☐ No ☐ Yes
Elbows ☐ No ☐ Yes, right elbow ☐ Yes, left elbow ☐ Yes, both elbows	☐ No ☐ Yes	☐ No ☐ Yes
Wrist/Hands ☐ No ☐ Yes, right wrist/hand ☐ Yes, left wrist/hand ☐ Yes, both wrists/hands	☐ No ☐ Yes	☐ No ☐ Yes
Upper back ☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
Lower Back (small of back) ☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
One or Both Hips/Thighs ☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
One or Both Knees ☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
One or Both Ankles/Feet ☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes

Section 04: Pain Related Question

How much pain is your felt after work/rest? Severity of pain (According to NPRS scale): 1. No Pain 2. Moderate 3. Severe 	

APPENDIX-III



SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

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

Ref :

Date : .....

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/45*

3rd January'2023

To

Puja Kundu

4th Professional B.Sc. in Physiotherapy

Saic College of Medical Science and Technology (SCMST)

Mirpur-14, Dhaka-1216.

Sub: Permission to collect data

Dear Kundu,

Ethical review board (ERB) of SCMST pleased to inform you that your proposal has been reviewed by ERB of SCMST and we are giving you the permission to conduct study entitled "Occupation related musculoskeletal disorders among surgeon" and for successful completion of this study you can start data collection from now.

Wishing you all the best.

Thanking You,

11.1.'23

Head of ERB

Ethical Review Board

Saic College of Medical Science and Technology

11. 01. 23

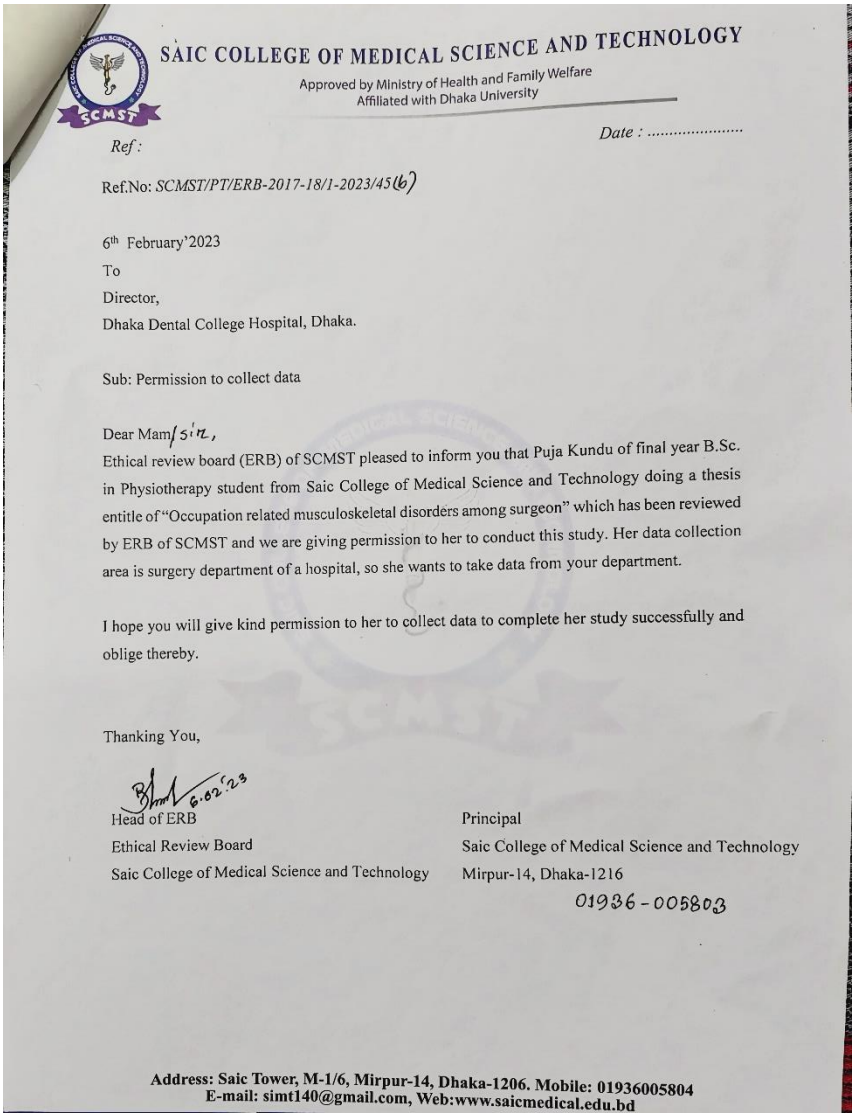
Principal

Saic College of Medical Science and Technology

Mirpur-14, Dhaka-1216

Address: Saic Tower, M-1/6, Mirpur-14, Dhaka-1216.Mobile:01936005804
E-mail: simt140@gmail.com, Web:www.saicmedical.edu.bd

APPENDIX-IV



SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

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

Ref :

Date : .....

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/45(6)*

6th February'2023

To

Director,

Dhaka Dental College Hospital, Dhaka.

Sub: Permission to collect data

Dear Mam/Sir,

Ethical review board (ERB) of SCMST pleased to inform you that Puja Kundu of final year B.Sc. in Physiotherapy student from Saic College of Medical Science and Technology doing a thesis entitle of "Occupation related musculoskeletal disorders among surgeon" which has been reviewed by ERB of SCMST and we are giving permission to her to conduct this study. Her data collection area is surgery department of a hospital, so she wants to take data from your department.

I hope you will give kind permission to her to collect data to complete her study successfully and oblige thereby.

Thanking You,

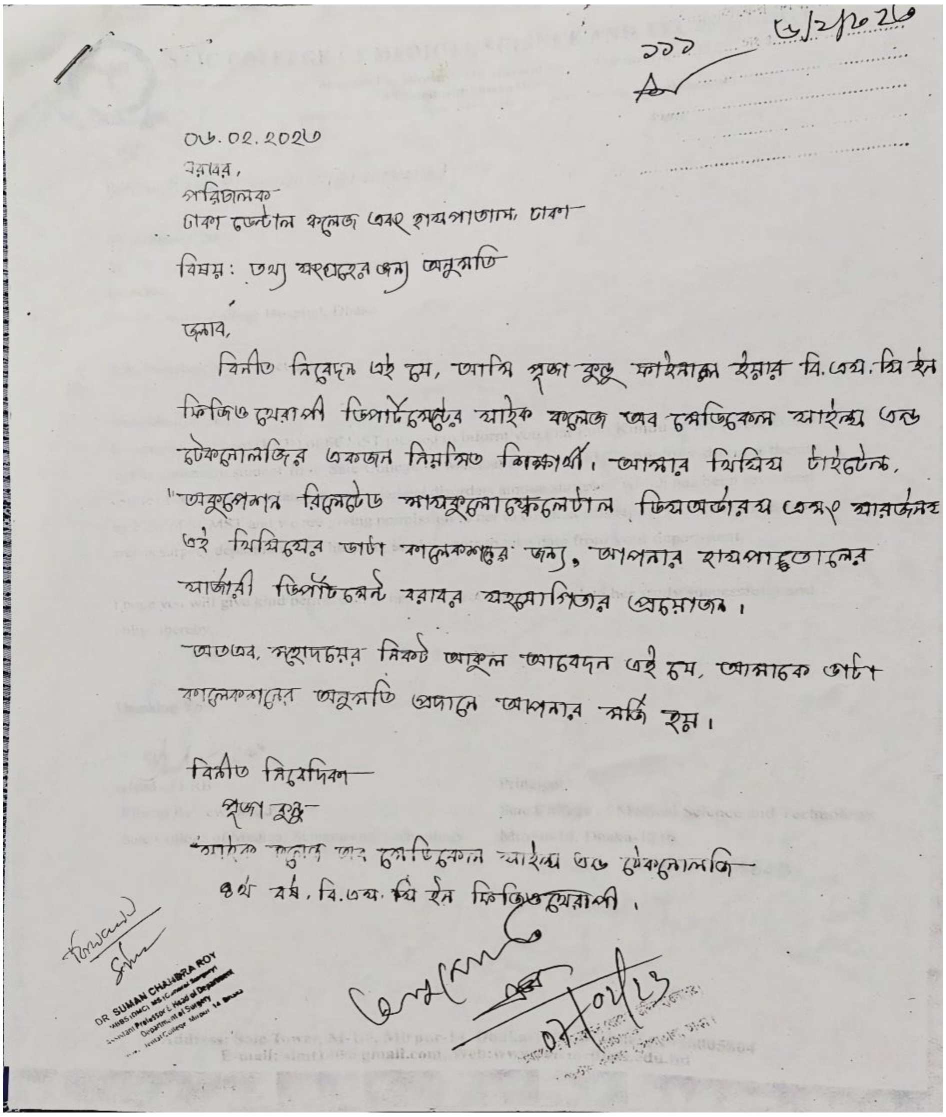
6.02.'23

Head of ERB
Ethical Review Board
Saic College of Medical Science and Technology

Principal
Saic College of Medical Science and Technology
Mirpur-14, Dhaka-1216
01936-005803

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

APPENDIX-V



১১১ ৬/২/২০২৩

০৬.০২.২০২৩

বরাবর,
পরিচালক
ঢাকা ডেন্টাল কলেজ এবং হাসপাতাল, ঢাকা

বিষয়: তথ্য সংগ্রহের জন্য অনুমতি

জনাব,

বিনীত নিবেদন এই যে, আমি প্রজ্ঞা কুন্ডু ফাইনাল ইয়ার বি.এস.সি ইন ফিজিওথেরাপী ডিপার্টমেন্টের সাইক কলেজ অব মেডিকেল সাইন্স এন্ড টেকনোলজির একজন নিয়মিত শিক্ষার্থী। আমার থিসিস টাইটেল, "অকুপেশন রিলেটেড মাসকুলোস্কেলেটাল ডিসঅর্ডারস এমং সার্জনস" এই থিসিসের ডাটা কালেকশনের জন্য, আপনার হাসপাতালের সার্জারী ডিপার্টমেন্ট বরাবর সহযোগিতার প্রয়োজন।

অতএব, মহোদয়ের নিকট আকুল আবেদন এই যে, আমাকে ডাটা কালেকশনের অনুমতি প্রদানে আপনার মর্জি হয়।

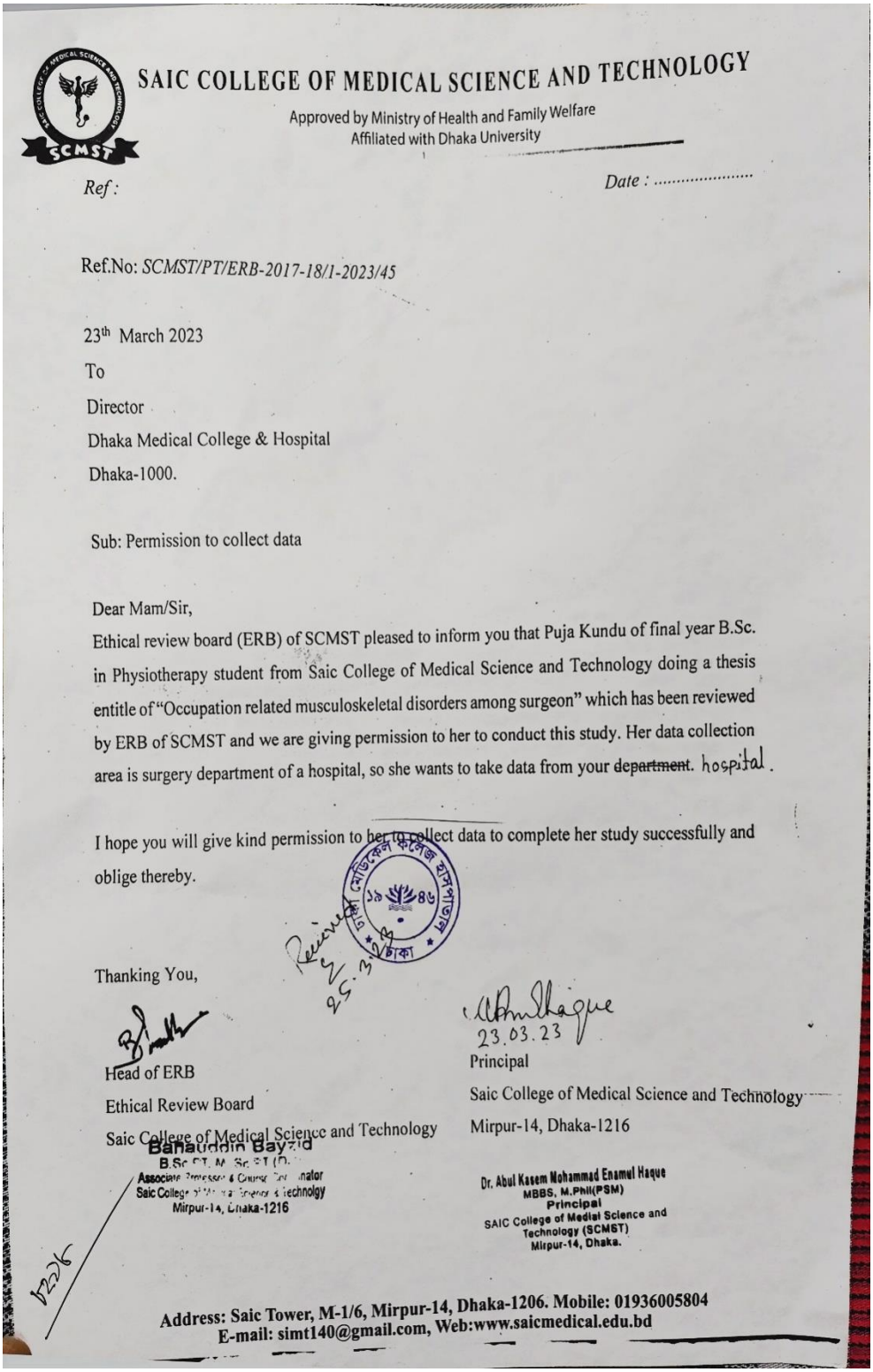
বিনীত নিবেদিকা
প্রজ্ঞা কুন্ডু
সাইক কলেজ অব মেডিকেল সাইন্স এন্ড টেকনোলজি
৪র্থ বর্ষ, বি.এস.সি ইন ফিজিওথেরাপী।

Forward

DR. SUMAN CHANDRA ROY

07/02/23

APPENDIX-VI



SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

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

Ref : *Date :* .....

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/45*

23th March 2023

To

Director

Dhaka Medical College & Hospital

Dhaka-1000.

Sub: Permission to collect data

Dear Mam/Sir,

Ethical review board (ERB) of SCMST pleased to inform you that Puja Kundu of final year B.Sc. in Physiotherapy student from Saic College of Medical Science and Technology doing a thesis entitle of "Occupation related musculoskeletal disorders among surgeon" which has been reviewed by ERB of SCMST and we are giving permission to her to conduct this study. Her data collection area is surgery department of a hospital, so she wants to take data from your ~~department~~. hospital.

I hope you will give kind permission to her to collect data to complete her study successfully and oblige thereby.

Thanking You,

Head of ERB
Ethical Review Board
Saic College of Medical Science and Technology

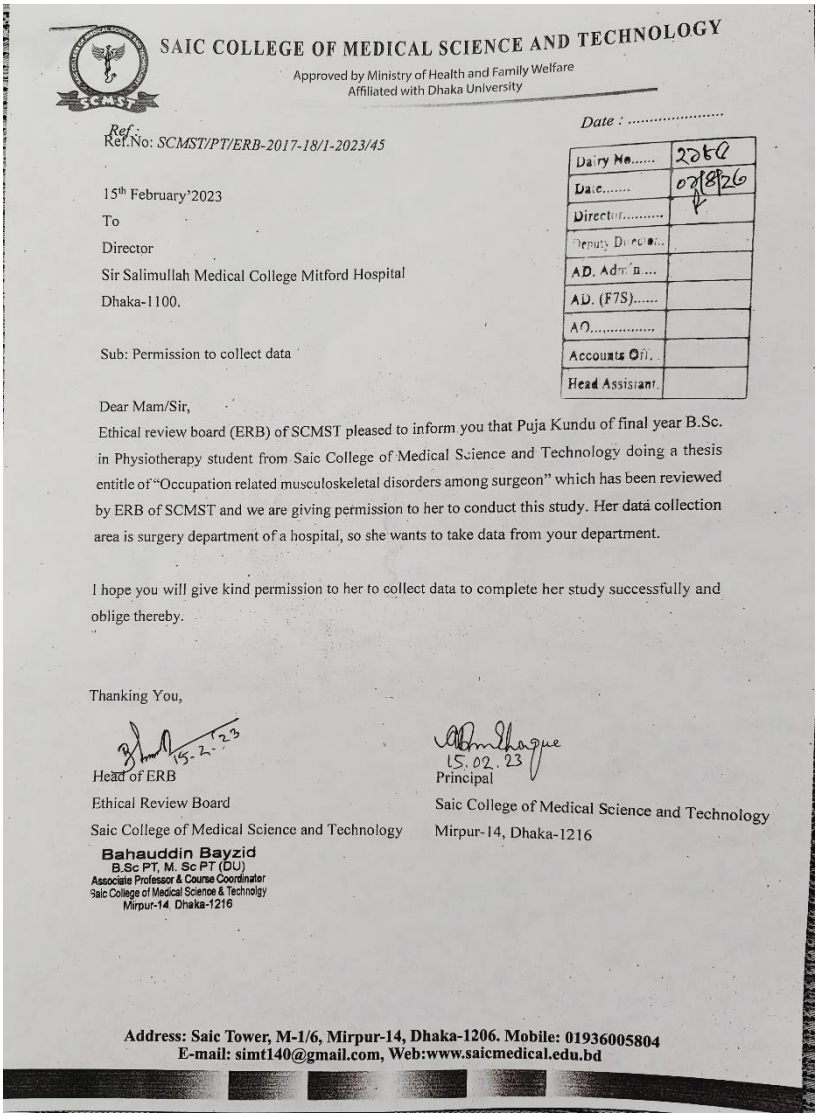
Banauddin Bayzid
B.Sc PT, M. Sc PT (D...
Associate Professor & Course Co...nator
Saic College of Medical Science & Technology
Mirpur-14, Dhaka-1216

23.03.23
Principal
Saic College of Medical Science and Technology
Mirpur-14, Dhaka-1216

Dr. Abul Kasem Mohammad Enamul Haque
MBBS, M.Phil(PSM)
Principal
SAIC College of Medial Science and Technology (SCMST)
Mirpur-14, Dhaka.

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

APPENDIX-VII



SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

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

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/45*

Date : .....

Dairy No.....	2260
Date.....	07/02/26
Director.....	
Deputy Director...	
AD. Admin....	
AD. (F7S).....	
AO.....	
Accounts Off.	
Head Assistant	

15th February'2023

To

Director

Sir Salimullah Medical College Mitford Hospital

Dhaka-1100.

Sub: Permission to collect data

Dear Mam/Sir,

Ethical review board (ERB) of SCMST pleased to inform you that Puja Kundu of final year B.Sc. in Physiotherapy student from Saic College of Medical Science and Technology doing a thesis entitle of "Occupation related musculoskeletal disorders among surgeon" which has been reviewed by ERB of SCMST and we are giving permission to her to conduct this study. Her data collection area is surgery department of a hospital, so she wants to take data from your department.

I hope you will give kind permission to her to collect data to complete her study successfully and oblige thereby.

Thanking You,

15-2-'23

Head of ERB

Ethical Review Board

Saic College of Medical Science and Technology

Bahauddin Bayzid
B.Sc PT, M. Sc PT (DU)
Associate Professor & Course Coordinator
Saic College of Medical Science & Technolgy
Mirpur-14, Dhaka-1216

15.02.23

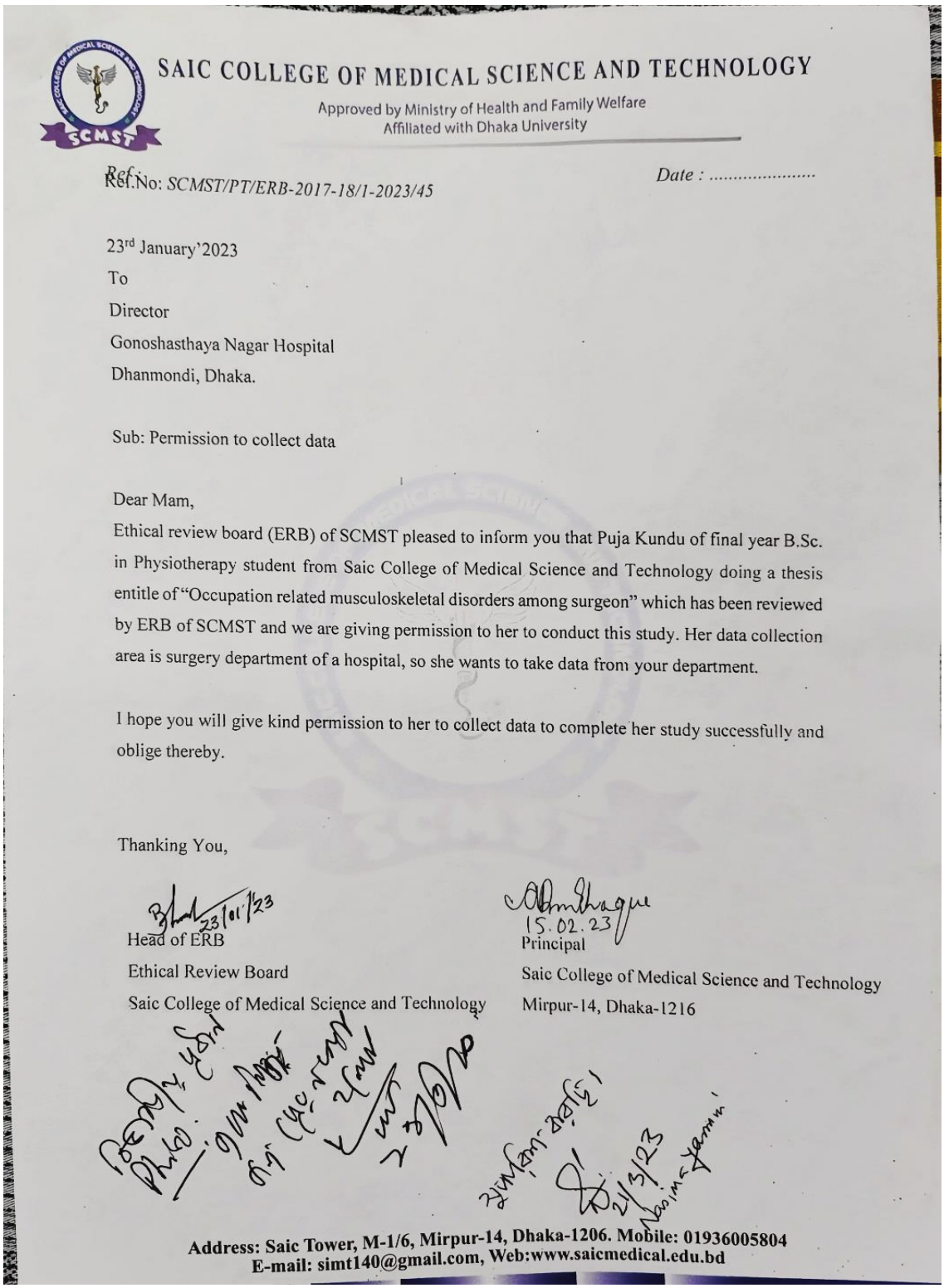
Principal

Saic College of Medical Science and Technology

Mirpur-14, Dhaka-1216

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

APPENDIX-VIII



SAIC COLLEGE OF MEDICAL SCIENCE AND TECHNOLOGY

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

Ref.No: *SCMST/PT/ERB-2017-18/1-2023/45*

Date : .....

23rd January'2023

To

Director

Gonoshasthaya Nagar Hospital

Dhanmondi, Dhaka.

Sub: Permission to collect data

Dear Mam,

Ethical review board (ERB) of SCMST pleased to inform you that Puja Kundu of final year B.Sc. in Physiotherapy student from Saic College of Medical Science and Technology doing a thesis entitle of "Occupation related musculoskeletal disorders among surgeon" which has been reviewed by ERB of SCMST and we are giving permission to her to conduct this study. Her data collection area is surgery department of a hospital, so she wants to take data from your department.

I hope you will give kind permission to her to collect data to complete her study successfully and oblige thereby.

Thanking You,

23/01/23
Head of ERB
Ethical Review Board
Saic College of Medical Science and Technology

15.02.23
Principal
Saic College of Medical Science and Technology
Mirpur-14, Dhaka-1216

21/3/23

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

APPENDIX-IX

Gant Chart

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