2021

Work-related musculoskeletal disorders, psychosocial factors, work productivity, and work ability among Garment factory workers in Myanmar

Tun Win Oo
College of Public Health Sciences

Work-related musculoskeletal disorders, psychosocial factors, work productivity, and work ability among Garment factory workers in Myanmar

Mr. Tun Win Oo

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Public Health in Public Health
Common Course
COLLEGE OF PUBLIC HEALTH SCIENCES
Chulalongkorn University
Academic Year 2021

ความผิดปกติทางระบบโครงร่างและกล้ามเนื้อที่เกี่ยวข้องกับการทำงาน ปัจจัยด้านสังคมจิตใจ ประสิทธิภาพและความสามารถในการทำงานของพนักงานในโรงงานผลิตเสื้อผ้า ประเทศเมียนมา

นายตุน วิน โอ

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์ ไม่สังกัดภาควิชา/เทียบเท่า
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2564

Thesis Title	Work-related musculoskeletal disorders, psychosocial factors, work productivity, and work ability among Garment factory workers in Myanmar
By	Mr. Tun Win Oo
Field of Study	Public Health
Thesis Advisor	Assistant Professor NUTTA TANEEPANICHSKUL, Ph.D.

Accepted by the COLLEGE OF PUBLIC HEALTH SCIENCES, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Public Health

..... Dean of the COLLEGE OF PUBLIC HEALTH SCIENCES

(Professor SATHIRAKORN PONGPANICH, Ph.D.)

THESIS COMMITTEE

..... Chairman

(Associate Professor WATTASIT SIRIWONG, Ph.D.)

..... Thesis Advisor

(Assistant Professor NUTTA TANEEPANICHSKUL, Ph.D.)

..... External Examiner

(Assistant Professor Saowanee Norkaew, Ph.D.)

ตุน วิน โอ : ความผิดปกติทางระบบโครงร่างและกล้ามเนื้อที่เกี่ยวข้องกับการทำงาน ปัจจัยด้านสังคมจิตใจ ประสิทธิภาพและความสามารถในการทำงานของพนักงานในโรงงานผลิตเสื้อผ้า ประเทศเมียนมา. (Work-related musculoskeletal disorders, psychosocial factors, work productivity, and work ability among Garment factory workers in Myanmar) อ.ที่ปรึกษาหลัก : ณัฏฐา ฐานีพานิชสกุลPh.D.

บทนำ - ความผิดปรกติของทางระบบกระดูกและกล้ามเนื้อที่เกี่ยวข้องกับการทำงาน (Work-related musculoskeletal disorders:WMSDs) เป็นหนึ่งในปัญหาที่สำคัญในกลุ่มคนทำงานส่งผลให้เกิดจำนวนปีที่สูญเสียไปเนื่องจากความเจ็บป่วยและพิการ โดยเฉพาะในกลุ่มอายุระหว่าง 20 – 54 ปี ซึ่งความผิดปรกตินี้คิดเป็นสัดส่วนสูงถึงร้อยละ 45 ของกลุ่มคนที่เกิดความผิดปกตินี้ทั้งหมด โดยปัจจัยเสี่ยงที่ก่อให้เกิดความผิดปรกตินี้ ประกอบไปด้วยปัจจัยด้านร่างกาย และด้านจิตใจ และยังมีความสัมพันธ์กับความสามารถในการทำงาน และประสิทธิภาพของงาน เพื่อการพัฒนาคุณภาพชีวิต และประสิทธิภาพในการทำงาน การศึกษาปัจจัยที่มีความสัมพันธ์กับความผิดปกติทางระบบกระดูกและกล้ามเนื้อนั้นจึงมีส่วนสำคัญในการส่งเสริมประสิทธิภาพในการทำงาน แต่อย่างไรก็ตามการศึกษาในกลุ่มพนักงานในโรงงานผลิตเสื้อผ้าของประเทศเมียนมายังมีอยู่อย่างจำกัด การศึกษาในครั้งนี้จึงมีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ระหว่าง ปัจจัยด้านสังคมจิตใจ ประสิทธิภาพและความสามารถในการทำงาน ต่อความผิดปกติทางระบบโครงร่างและกล้ามเนื้อที่เกี่ยวข้องกับการทำงานของพนักงานในโรงงานผลิตเสื้อผ้า ประเทศเมียนมา

วิธีการศึกษา – การศึกษาภาคตัดขวางครั้งนี้ดำเนินการเก็บข้อมูลในเดือนกันยายนปี 2564 จากพนักงานในโรงงานผลิตเสื้อผ้าจำนวน 370 คน ในพื้นที่อุตสาหกรรม Shwepaukkan โดยใช้การสุ่มตัวอย่างแบบหลายขั้นตอนในการเลือกกลุ่มตัวอย่าง ในการศึกษาครั้งนี้ใช้แบบสอบถามข้อมูลทั่วไปของพนักงาน และแบบสอบถามมาตรฐานเพื่อประเมินปัจจัยด้านสังคมจิตใจ ประสิทธิภาพ ความสามารถในการทำงาน และความผิดปกติทางระบบโครงร่างและกล้ามเนื้อที่เกี่ยวข้องกับการทำงาน

ผลการศึกษา - จากพนักงานในโรงงานผลิตเสื้อผ้าจำนวน 370 คน พบว่าความชุกของความผิดปรกติของทางระบบกระดูกและกล้ามเนื้อที่เกี่ยวข้องกับการทำงานอย่างน้อย 1 ตำแหน่งคิดเป็นร้อยละ 90 ของกลุ่มตัวอย่างทั้งหมด การศึกษาความสัมพันธ์พบว่า อายุ ระกับการศึกษามีความสัมพันธ์กับความผิดปรกติฯ ในส่วนของปัจจัยด้านจิตใจพบว่าพนักงานส่วนใหญ่มีความคาดหวังจากการทำงานในระดับต่ำ ความสามารถในการควบคุมการทำงานในระดับสูง การสนับสนุนทางสังคมในระดับสูง และมีความต้องการด้านร่างกายระดับสูง แต่อย่างไรก็ตามความผิดปรกติฯ ไม่มีความสัมพันธ์กับการขาดงานของพนักงานในช่วง 1 สัปดาห์ที่ผ่านมา ความสามารถในการทำงานของพนักงานส่วนใหญ่อยู่ในระดับปานกลาง คิดเป็นร้อยละ 66.5 และอยู่ในระดับยากจนร้อยละ 18.4 จากการวิเคราะห์ความสัมพันธ์โดยการวิเคราะห์การถดถอยโลจิสติค พบว่าปัจจัยที่มีความสัมพันธ์กับความผิดปรกติคือ เพศ (AOR=0.130; 95%CI 0.020-0.969) ความเครียดจากการทำงาน (AOR=8.257; 95%CI 1.465-46.550) ความต้องการทางด้านร่างกาย (AOR=4.702; 95%CI 1.172-18.862) และประสิทธิภาพในการทำงาน (AOR=5.893; 95%CI 1.393-24.920) จากผลการศึกษาในครั้งนี้จะสามารถนำไปสนับสนุนการพัฒนาการทำงานของพนักงานในโรงงานผลิตเสื้อผ้า เพื่อส่งเสริมคุณภาพชีวิตที่ดีของพนักงานต่อไป

สาขาวิชา	สาธารณสุขศาสตร์	ลายมือชื่อนิสิต .....
ปีการศึกษา	2564	ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

6374502953 : MAJOR PUBLIC HEALTH

KEYWORD: Work-related musculoskeletal disorders, Work productivity, work ability, Psychosocial factors, Garment factory workers

Tun Win Oo : Work-related musculoskeletal disorders, psychosocial factors, work productivity, and work ability among Garment factory workers in Myanmar. Advisor: Asst. Prof. NUTTA TANEEPANICHSKUL, Ph.D.

Background - Work-related musculoskeletal disorders (WRMSD) are the most common occupational problem worldwide. The magnitude of WRMSD is worsened by the physical and psychological factors in different occupations. The global burden of WRMSD comprises the second most common cause of disability; most frequent back pain, measured by Years lived with disability (YLDs) worldwide. Workability also plays a crucial role that links with productivity and WRMSD. Musculoskeletal disorders are also one of the most common causes of YLDS in the working-age group (20-54Years) take in more than 45% of the proportion. Sewing machine operators are one of the common occupational sectors that may encounter a high prevalence of MSDs. For the quality of life of workers and national productivity, we should understand the occupational hazards and their preventive approach in this working sector. Indeed, there is very little research on the occurrence of WRMSDs related to psychosocial, work productivity, and workability among the Myanmar sewing machine operators. This study aims to find the associations among working ability, productivity status, psychosocial factors, and percentage of work-related Musculoskeletal Disorders of sewing machine operators in the garment factory.

Methodology – This is a cross-sectional study that contains personal factors questionnaire, standard questionnaires, and data is collected by self-administered type which was conducted from September to October 2021. 370 Participants were selected from Shwepaukkan Industrial Zone, Myanmar. A multistage sampling method was used and eligible participants were invited to this study. University Ethical Approved was also obtained.

Result - The study enrolled 370 sewing operators who are more than 40 years of age. The prevalence of WRMSD in at least one part of the body was reported around 90 percent of the study population. The study found a significant association between WRMSD and age, education. As regards psychosocial risk, and most of the reported cases are low psychological job demand, high job control, and high social support. In addition, sewing operators responded that their job has high physical demand. There is no significant reported absenteeism and 35% presenteeism rate within one week. The moderate workability rate is about 66.5 % followed by poor workability with 18.4%. The logistic regression model showed that gender (AOR=0.130; 95%CI 0.020-0.969), job stress (AOR=8.257; 95%CI 1.465-46.550), physical demand (AOR=4.702; 95%CI 1.172-18.862) and productivity (AOR=5.893; 95%CI 1.393-24.920) are a significant predictor of WRMSD. This findings can be helped to guide the development of the working situations of sewing operators in a garment factory and also help in developing regulations for the well-being of workers in occupational health sectors

Field of Study:	Public Health	Student's Signature .....
Academic Year:	2021	Advisor's Signature .....

ACKNOWLEDGEMENTS

This thesis became completed with the kindly guidance, support, and motivation of many individuals. I would like to express my heartfelt appreciation and gratitude to all of them. First and foremost, I express my deep sincere gratitude to my advisor, Assistant Professor Dr. Nutta Taneepanichskul, for her encouragement, guidance, suggestion, and inspiration for the completion of my work. Without her excellent suggestions and guidance, it is impossible to accomplish my MPH thesis.

I also would like to express my thankful and deep gratitude to my exam thesis committee; the chairman Associate Professor Wattasit Siriwong, Ph.D., and the external examiner Assistant Professor Saowanee Norkaew, Ph.D. who gave their precious time, valuable guidance, and remark for my thesis.

For my data collection, I do thanks sewing machine operators from the Shwepaukkan Industrial area who are participated in this study. The work will not be complete without the cooperation and support from garment factory authorities from the industrial zone.

I would like to express my gratitude to Prof. Sathirakorn Pongpanich, Ph.D., and all teachers and staff of the College of Public Health Sciences, Chulalongkorn University for providing great academic experiences in the MPH journey. I would like to thank my senior brothers and sisters, colleagues, and friends for the kindly moral support, kindness, and happiness we enjoyed together.

Last but not least, I would like to express gratitude to Professor Karasek and the professional team to give permission to the use of the Job Content Questionnaire in my thesis.

Tun Win Oo

TABLE OF CONTENTS

Page

List of tables

Page

List of figures

Page

CHAPTER 1

INTRODUCTION

1.1 Background information

Work-related musculoskeletal disorders (WRMSD) are the most common occupational problem worldwide. (Niu, 2010; Urwin et al., 1998). It refers to "conditions that involve muscles, tendons, nerves, and other soft tissue pain that could be associated with or influenced by work-related factors**.**"(Bernard & Putz-Anderson, 1997) The magnitude of WRMSD is worsened by the physical and psychological factors in different occupations. WRMSD is also the most economic cost by disease and the individual has to carry the cost, thereby loss of income leads to increasing poverty (Niu, 2010; Urwin et al., 1998). The most painful areas are in low back, shoulder, and neck. Prolong sitting, standing and repetitive jobs are the major risk factors for WRMSD (Ghasemkhani, Mahmudi, & Jabbari, 2008). Loss of productivity at work and sickness absence are usually derived from WRMSD pain and one of the significant work-related issues (C. Phillips et al., 2008).

The global burden of WRMSD comprises the second most common cause of disability; most frequent back pain, measured by Years lived with disability (YLDs) worldwide (Storheim & Zwart, 2014). In the study of the global burden of disease between 2007 and 2017, low back pain is the common cause of the increase in all-age years lived with disability (YLDs) with 17.5 percentages. Musculoskeletal

disorders are also one of the most common causes of YLDS in the working-age group (20-54Years) take in more than 45% of the proportion (Safiri et al., 2020).In the review study of 2007 to 2017, total disability-adjusted life years (DALYs) were also influenced by neck and back pain about 17%. Besides, as regards developing countries, the disease burden also ranked as one of the most common three causes of disability and non-communicable diseases overburden (Hoy et al., 2015; Hoy et al., 2014).

WHO data certifies that over 1000 million workers are comprised in small-scale industry. Physical, physiological risks are the reinforcing factors for the impairment of overall well-being. Musculoskeletal disorders and other cardiovascular, respiratory problems are also influenced by those factors. Garment factory workers are one of the common vulnerable groups that suffer several health risk factors all over the world. Low wages, poor working environment, presence of certain chemicals such as dust, mist, smoke are the common physical factors, and job stress, depression is the prominent psychological factors.(Kabir, Maple, Usher, & Islam, 2019; Steinisch et al., 2013)

For the development of economic growth, productivity plays a crucial role. The setting of productivity is broad and it can be defined as the traditional way of the interaction between input (working hours) and output (numbers of productions) (Escorpizo, 2008). A study suggested an indirect relationship between health risks,

productivity, and worker disability. Productivity loss issue can be stated that it is not only for the laborer but can be for the employer. The cost for workers' impaired well-being as a result of health risks can be regarded as the indirect cost that may impact the economic evaluation. (Burton, Conti Dj Fau - Chen, Chen Cy Fau - Schultz, Schultz Ab Fau - Edington, & Edington)

Work ability also plays a crucial role that links with productivity and WRMSD. It can be defined as the capacity of workers in performing jobs that are influenced by job demand, health, and mental resources (Sorić, Golubić, Milosević, Juras, & Mustajbegović, 2013).It is also influenced by a sum of factors that the workers can enable to control their job demand successfully. Impaired work ability is believed to be the outcome of adverse health outcomes, individual resources, and working conditions. (Airila, Hakanen, Punakallio, Lusa, & Luukkonen, 2012; Alavinia, van Duivenbooden, & Burdorf, 2007) WRMSD is one of the common health problems in most occupations. However, few data associate with work ability and WRMSD in sewing operators. (Pacheco Ferreira, 2015)

The conceptual framework of O'Donnell also verified that there is an alliance between human productivity and work performance and is also influenced by physical and emotional factors. That means that our ability to produce rely on how healthy we are (O'Donnell, 2000). Another interesting fact is that the word 'sickness presenteeism'. It means the despite the health problem, the worker turns up in a job

that should be absent in the job (Meerding, Ijzelenberg, Koopmanschap, Severens, & Burdorf, 2005). The Swedish workforce study illustrated that 'sickness presenteeism' during 12 months is suffered by about 37% of all workers (G. Aronsson, Gustafsson, & Dallner, 2000). There is also evidences that occupational stress and psychological factors influence neck and shoulder pain (Skov, Borg, & Orhede, 1996).

Sewing machine operators are one of the common occupational sectors that may encounter a high prevalence of MSDs that is often lead to repetitive arm and hand conditions, poor working postures during the whole working period. They can be overlooked by the reason of the high incidence of garment workers. (Li, Haslegrave, & Corlett, 1995)Needle prick injuries, burn, and cuts, and also due to the highly competitive nature of the world garment market, illness and risk of occupational diseases are reported in the previous study (Gupta, 2015). Usually, sewing operators need to perform fine work activities, setting up the parts for the final cloth product. The detailed nature is that the job is sometimes a complex task and highly repetitive comprising the synergism of both hands, usually over a whole working period. The functioning usually requires one to lean forward (head and trunk are forwardly inclined) to have better visual control and focus their attention on the task. The adverse outcome can lead to the progress of MSDs, mainly in the back, neck, and upper limbs (Saha, Dasgupta, Butt, & Chattopadhyay, 2010; Sealetsa & Thatcher, 2011).

Sewing operators are the major workers in that population. Studies showed that sewing operators are the common victim of MSD. Follow-up neck and shoulder pain are the most common symptoms in sewing operators in follow-up studies (Schibye et al., 1995; Wang, Harrison, Yu, Rempel, & Ritz, 2010; P.-C. Wang, D. M. Rempel, R. J. Harrison, J. Chan, & B. R. Ritz, 2007). Physical factor studies confirm that musculoskeletal incidence is also higher in garment workers of the sewing section. Increase concentration on fine works can also increase the risk of diseases (Jaffar & Rahman, 2017; Sadeghi Yarandi, Ghasemi, & Ghanjal, 2020).

Myanmar is now in the transition time to democracy and encourages the development of the economic process. Foreign investment in industrial sectors can give job opportunities for people and there is can be an economic benefit. However, rapid developments of the industrial sector need strong labor regulation, workers protection, and occupational health care. The weak labor laws in Myanmar in these sectors result in the underestimate of the health burden of workers (Burnley, December 2015).

Garment factories in Myanmar are also comprised of the country's economic growth and one of the major sectors of employment. In the recent decade, the Myanmar garment sector has been grown and approximately between 350,000 and 450,000 workers, comprising 905 are women and more than 60 percent of the industry are foreign owners. One of the Oxfam research, Low wages, and lack of

proper safety issue, long working hour, and their financial debt are the most concern problems in garment sectors. To solve their financial problem, at least 1 in 4 reported that overtime sometimes becomes their additional income. But due to poor health and labor regulation, the sad story is forced doing overtime and unpaid overtime. Their cycle of poverty and health problems cannot end (Burnley, December 2015; Htay, 2019).

For the quality of life of workers and national productivity, we should understand the occupational hazards and their preventive approach in this working sector. Indeed, there is very little research on the occurrence of WRMSDs related to psychosocial, work productivity, and work ability among the Myanmar sewing machine operators. The research findings in this area will guide the development of the working situations of those jobs regarding sewing operation in a garment factory and also help in developing regulation in preventive measures. It also has the prospective to make proper work practices in similar industrial sectors Nationwide.

1.2 Research Gap

Although there are many kinds of research about WRMSD and psychological factors. However, there is little literature linked work productivity, work ability with WRMSD. Few articles were conducted on sewing operators in garment workers by using those factors. Besides, there is little known about the situation of WRMSD in

Myanmar. Therefore, this research will identify a relationship between psychological factors, work productivity, work ability, and WRMSD.

1.3 Research Question

What are the working ability, productivity status, psychosocial factors, and percentage of work-related Musculoskeletal Disorders of sewing machine operators in the garment factory?

What is the association between psychosocial factors and WRMSD?

What is the association between work productivity and WRMSD?

What is the association between work ability and WRMSD?

1.4 Statistical Hypothesis

Statistical Hypothesis 1

Null hypothesis = there is no association between psychosocial factors and work-related musculoskeletal disorders

Alternative hypothesis = there is an association between psychosocial factors and work-related musculoskeletal disorders

Statistical Hypothesis 2

Null hypothesis = there is no association between work productivity and work-related musculoskeletal disorders

Alternative hypothesis = there is an association between work productivity and work-related musculoskeletal disorder

Statistical Hypothesis 3

Null hypothesis = there is no association between work-related musculoskeletal disorders and work ability

Alternative hypothesis = there is an association between work-related musculoskeletal disorders and work ability

1.5 Research Objective

- To find the working ability, productivity, psychosocial factors, and percentage of work-related Musculoskeletal Disorders of sewing machine operators in the garment factory.
- To find an association between psychosocial factors and work-related musculoskeletal disorders
- To find an association between work productivity and work-related musculoskeletal disorders
- To find an association between work ability and work-related musculoskeletal disorders

1.6 Conceptual framework

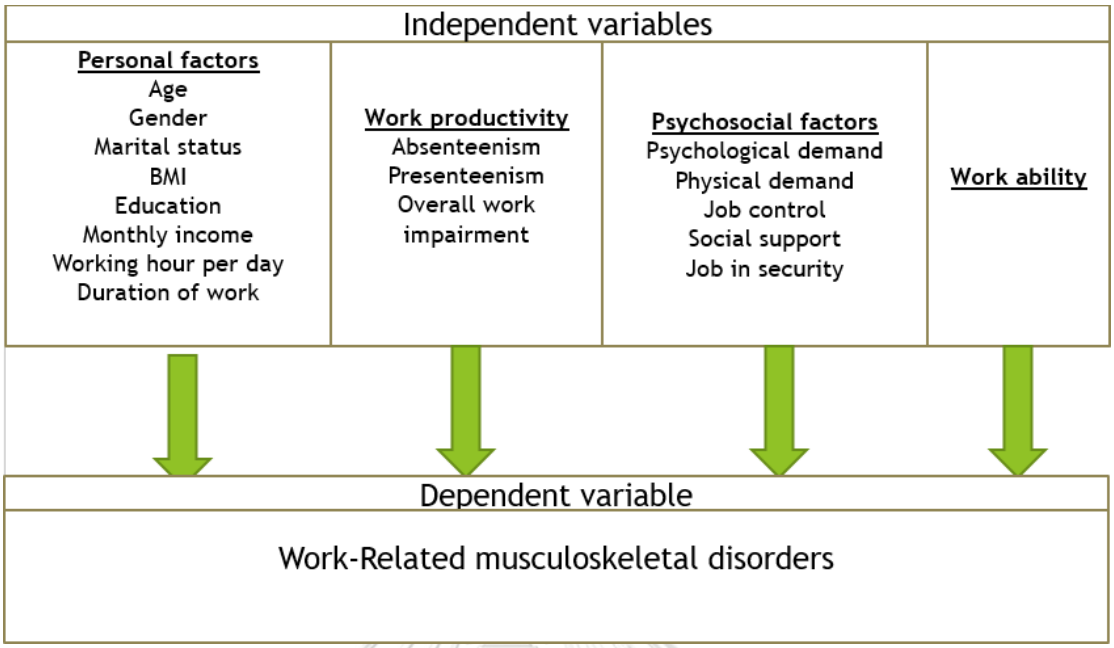


Figure 1.Conceptual Framework

1.7 Operational definition

Sewing Machine Workers = A sewing machine operator is a textile worker who sews fabric with an electronic sewing machine in the garment factory.

Age = Age is referred to the age of sewing operators in years at the time of study

Gender = Gender is preferred to male and female

Marital status = the marital status referred to single, married, separated, and widowed

BMI = It is measured by dividing body weight (kilogram) and the square of the weight (meter) at the time of data collection

Education = it is referred to the primary school, secondary school, high school, and above

Monthly income = monthly salary by the workers, measured in kyats

Working hour per day = it is referred to the number of working hours per day as sewing operators

Work experience = it is referred to the number of working years as sewing operators

Work-related musculoskeletal disorders = this referred to the pain all over the body related to work. In this study, WRMSD will be measured by Cornell Musculoskeletal Discomfort Questionnaire. It measures the frequency of the last working week by five categories(Never, 1-2 times last week, 3-4 times last week, Once every day, Several times every day), severity by three categories (slightly uncomfortable, moderately uncomfortable, very uncomfortable), interference by three categories (Not at all, slightly interfered, substantially interfered)

Work productivity = is referred to as the assessment of efficiency of workers.in this study, it will be measured by Work Productivity and Activity Impairment Questionnaire (WPAIQ). The prevalence of presenteeism, absenteeism, overall work impairment is regarded as decrease work productivity.

Presenteeism = the worker is in work but decreased production due to his illness. It is expressed in percentages by WPAIQ.

Absenteeism = lost productivity due to workers absent from the job. .It is expressed in percentages by WPAIQ.

Overall work impairment = impact on productivity due to the combination of absenteeism and presenteeism. It is expressed in percentages by WPAIQ.

Job control =" it is referred to person's ability to influence what happens in his or her work environment, in particular, to influence matters that are relevant to his or her job condition.". Scoring will be dichotomized according to the median cut-off point, High (>median score), and Low (< median score) according to the Job Content Questionnaire (JCQ).

Psychological demand= it is referred to the amount of mental strain that workers get from his/her job. Scoring will be dichotomized according to the median cut-off point, High (>median score), and Low (<median score) according to JCQ.

Physical job demand = it is referred to as the physical exertion effort by the workers. Scoring will be dichotomized according to the median cut-off point, High (>median score), and Low (<median score) according to JCQ.

Job insecurity= "it is referred perceived and an undesired possibility to lose the present job in the future, as well as the fear or worries related to the possibility of job loss." Scoring will be dichotomized according to the median cut-off point, High (>median score), and Low (<median score) according to JCQ.

Social support= is referred to as the support from supervisors and coworkers in the working environment. Scoring will be dichotomized according to the median cut-off point, High (>median score), and Low (<median score) according to JCQ.

Work ability = it is referred to the capability of workers both physically and mentally following the job demand. In this study, it is measured by Work Ability Index. It consisted of 7 items, including(item, score range), current work ability compared with the lifetime best (item 1, 0-10), work ability concerning the demands of the job (item 2, 2-10), number of current disease groups diagnosed by a physician (item 3, 1-7), estimated work impairment due to diseases (item 4, 1-6), sick leave during the past year (item 5, 1-5), the personal prognosis of work ability for 2 years from now (item 6, 1,4 or 7) and mental resources, referring to the worker's life in general, both at work and during leisure time(item 7, 1-4). The number in parentheses for each item indicates the scoring range. The total WAI score is calculated by summing up the scores of all items and is ranges from 7 to 49. The total WAI scores are categorized into 4 levels: poor (7-27), moderate (28-36), good (37-43), and excellent (44-49). (Adel, Akbar, & Ehsan, 2019)

CHAPTER 2

LITERATURE REVIEW

2.1 Definition of Work related Musculoskeletal Disorder

MSDs include pain in all musculoskeletal systems, bone, tissue, and muscle, when there is an event or exposure to the injury or illness, and body changes such as bending, climbing, crawling, reaching, twisting; overexertion; or repetitive job (Birschel, 2006). Physical, individual characteristics, mechanical and psychosocial conditions are the major contributor to the development of MSD.

The existence of awkward or fixed postures for prolonged periods during the job performance, extreme temperature, and vibration may worsen the MSD.(Bernard & Putz-Anderson, 1997) Epidemiological research showed that the onset and severity of hand and wrist in forceful and repetitive hand task overuse are the main cause of MSD. (A. E. Barr, Barbe, & Clark, 2004). Both systemic and local inflammatory responses are associated with the performance of highly repetitive tasks that may result in a decline in job speed and effectiveness of the movement. A chronic inflammatory response may develop when there is an elevated repetition rate.(Ann E. Barr, Amin, & Barbe, 2002)

Fibrosis and inflammation can result from chronic contraction of a muscle (A. E. Barr et al., 2004). Using a rat model, repeated muscle strains at fast velocities can damage the muscle and result in myopathy with the development of macrophage

and cellular protein. Another intervention in this paper also described that the low speed (25 mm/s) with persistent strains leads to fibrosis. Regarding the adaptive and compensatory response; muscle tonic repetition should be in 10mm/s velocity (A. E. Barr et al., 2004).

One study reports that the participants with upper MSD pain showed a significantly reduced pressure pain threshold in automobile production workers(Gold, Punnett, & Katz, 2006). He also reported that the depressive symptoms, higher work stress, anxiety, conflict with supervisors, higher pain threshold, enhanced sensitivity to pain feeling, and low self-confidence in handling complications have been described in epidemiological and clinical studies of patients with MSDs (Gold et al., 2006).

MSD has influenced mainly three factors (Nunes, 2009)

1. Individual factors – age, gender, physical activity, working hour, duration of working, underlying comorbidities, previous MSD, alcohol, smoking, etc.

2. Physical factors –awkward posture, repetitive movement, longer duration, vibration, forceful exertion, etc.

3. Psychosocial factors – job demand, job pace, physical workload, social support from supervisors and coworkers, job insecurity, etc.

WRMSD can be classified according to anatomical site. (Kuorinka et al., 1995)

1. Tendon - comprises inflammation of the tendon and/ or synovial sheet. They are called tendonitis and if it involved synovial sheet, it is tenosynovitis which is the result of the injuries of tendon and synovial sheath

2. Bursa - It is the inflammation of the burs space called bursitis.

3. Nerve - It is involved when compression of the nerve has occurred, e.g. carpal tunnel syndrome

4. Muscle - fatigue muscle e.g. Tension Neck Syndrome

5. Vessels - result from the impairment of vessel and blood flow due to repetitive work e.g. vibration syndrome

2.1.1 Lower limb and non-specific MSD

These are currently a problem in many job activities. They are underestimated even there are recognized activities (e.g., kneeling/ squatting, climbing stairs or ladders, heavy lifting, walking/standing) are risk factors for the lower limb(Bush, 2012). Moreover, they are worth significant concern because these are the major factors for disability and impair the quality of life (Okunribido & Excutive, 2009). The most common disorders are

Hip/thigh – Osteoarthritis (frequent), Piriformis Syndrome, and Hamstring strains, Sacroiliac Joint Pain;

Knee / lower leg – Osteoarthritis, Bursitis, Beat Knee/Hyperkeratosis, Meniscal Lesions, Patellofemoral Pain Syndrome, Pre-patellar Tendonitis, Shin Splints, Infrapatellar Tendonitis, Stress Fractures;

Ankle/foot – Achilles Tendonitis, Blisters, Foot Corns, Plantar Fasciitis, Sprained Ankle, Stress fractures, Varicose veins, venous disorders.

Non-specific WRMSD are called the ill-defined site of pain, meaning that symptoms are diffuse all over the body, no specific anatomical site, nerves, muscles, tendon, and reach into the other anatomical location. They presented with pain (worse over-activity), numbness, tingling, cramping without finding out any pathological underlying causes(Ring, 2005).

2.2 Association between Personal factors and WRMSD

Numerous studies are reported that employee personal factors are the predictor of workplace injuries and disorders. Age between 35 to 55 years of age, female, single, receiving medical treatment, lesser education, working as a operators or repair personnel of manufacturing is the risk of work-related injury and more prone to sick leave(Albert, Coutu, & Durand, 2011; Berecki-Gisolf, Clay, Collie, & McClure, 2012; V. Phillips, Hunsaker, & Florence, 2012).

A systematic longitudinal study identified that personal factors such as age, gender, body mass index, working duration, psychosocial factors are influenced to the risk of WRMSD in different parts of the body. Also, they found out that no strong

evidence for those risks and only reasonable evidence and insufficient evidence. Most of the WRMSD are related to heavy physical work, awkward positions, and repetitive jobs.(Costa & Vieira, 2009)

Researches by (S. M. Maduagwu et al., 2014) reported that WRMSD is more prevalent in young age between 20-29 years of age than the oldest age group in that study. They explained that these are due to low job experience and low professional skills during that age. Moreover, these age groups exert more workload than the other age group. This result in line with the report of (Afonso, Pinho, & Arezes, 2014) with the younger workers is more prevalent in WRMSD in the sewing sectors of the footwear industry. But some research show contradicts that old age is more vulnerable to WRMSD than young. (Aghili, Asilian, & Poursafa, 2012) showed that older age is more associated with the prevalence of WRMSD. There are also some articles that they found no association between age and WRMSD.(S. Maduagwu et al., 2015; Soe, Laosee, Limsatchapanich, & Rattanapan, 2015)

In the study of (Abaraogu, Okafor, Ezeukwu, & Igwe, 2015), they stated that the prevalence of WRMSD is increasing in old age particularly over 40 years of age. They found that the prevalence of neck, shoulder, lower back, and thigh pain is 100% in over 50 years of age. Over 40 years of age have statically similar prevalence and under 30 years of age are comparable prevalence.

Another influential factor is gender that is related to whole-body pain. (Karlqvist, Tornqvist, Hagberg, Hagman, & Toomingas, 2002) found that if both males and females are working on a similar task, females have different working postures than males. (Punnett, 2000) also, point that being female is also the "risk factor" for musculoskeletal disorders and due to the gender difference in the labor market and demand, it is important to distinguish between gender difference prevalence of WRMSD. Women are facing strong hormonal changes during menopause and pregnancy that make them suffer more WRMSD due to increased fluid retention and some physiologic conditional changes. Other factors can be muscular strength, anthropometric issues, and hormonal changes, and more risk to carpel tunnel syndrome. (Bush, 2012). Many kinds of research also proof that female is more vulnerable to WRMSD than man even though they counter the same stressor. Moreover, females tend to be different working postures and overall symptoms are more common in females. This finding also supports the research of (Abaraogu et al., 2015) that females are more symptoms in all parts of the body than males except the knee. However, gender and WRMSD association are not always the same. A (Taib, Bahn, Yun, & Taib, 2017) survey of 85 Malaysian dentists showed that age and gender are not associated with WRMSD. (Rocha & Debert-Ribeiro, 2001) study of system analysts also points to the same outcome.

Reported symptoms in all parts of the body are different between male and female. Male are more suffer pain in the upper back and females are more reported in hand/wrist symptoms. Moreover, age, gender, BMI are also significant associations with WRMSD (Dianat, Kord, Yahyazade, Karimi, & Stedmon, 2015).In the study of (Hossain et al., 2018) garment workers in Bangladesh, females more suffered from lower back and males reported the majority in neck pain of 12-month prevalence. To sum up, the association between gender and WRMSD is not clearly stated but females are more prevalent in WRMSD.

Regarding marital status, some researches showed an association and some are not. One of the research of (Soe et al., 2015)Myanmar migrant workers in Thailand fish industry showed that marital status and number of dependent people were significantly associated with WRMSD. They also explained that this can be due to working long hours such as overtime to earn more money to support their family. They did not clearly state the working hour and marital status association. This is also similar to the study in India that married seafood workers are more likely to get upper back MSD(Nag, Vyas, Shah, & Nag, 2012). Similarly, the two studies of sewing operators (Aghili et al., 2012; Jahan et al., 2015)also reported that marital status is a significant predictor of WRMSD.

(Oranye et al., 2016) research showed no association of personal factors such as age, gender, marital status, and education. But when they did the correlation

analysis, marital status is the only factor that correlates with the WRMSD. Single workers are more reported of MSD than married/divorced. They explained this association by being positivity of married person that lowers the risk of workplace injuries or disorders. The 12-month prevalence of lower back pain was significantly associated with the marital status of the participant and more married reporting in blue color labor study(Kaka et al., 2016). However, there is also numerous study that showed no association between marital status and WRMSD. (Amin, Nordin, Fatt, Noah, & Oxley, 2014; Koyuncu & Karcioglu, 2018; Tantawy, 2019) Therefore, there is uncertainty about the association between marital status and WRMSD.

Body Mass Index is also another independent factor that influences WRMSD. It is measured by weight and height and is also recognized as a risk factor for MSD(Yang, Matthews, & Chen, 2014).BMI also measured the body adipose tissue and increase BMI had tended to be more MSD than lower BMI people (Viester et al., 2013). Increasing BMI, obesity can be associates with psychological, physical, WRMSD that impair productivity (Lidstone et al., 2006). Many researches related to WRMSD include BMI regarded as one of the risk factors. An (Aghilinejad, Choobineh, Sadeghi, Nouri, & Bahrami Ahmadi, 2012) study reported that higher BMI is significantly associated with WRMSD in Iranian steelworkers. Higher BMI is related to job efficacy and is more prone to work-related trauma. Some researchers found no association between BMI and WRMSD (Amin et al., 2014; Tantawy, 2019)

Sewing operators are more likely to increase BMI because their job nature is sitting or standing without proper movement and lead to sedentary habits (Hossain et al., 2018).BMI is also important from an ergonomic point of view that is related to WRMSD. (Sibella, Galli, Romei, Montesano, & Crivellini, 2003) showed that obese workers had remarkably low trunk flexion in sit-to-stand positions and were more vulnerable to low back pain. While (Godde & Taylor, 2011) found that obese people relied on upper limbs than non-obese individuals. This can be the reason that high BMI people are more reported to upper limb WRMSD.

Many researchers found that education is not a risk factor for WRMSD among sewing operators (Rohilla, Hooda, & Mehta, 2020; Sakthi Nagaraj, Jeyapaul, & Mathiyazhagan, 2019). Reversely,(Kaka et al., 2016) found that lower back pain is related to educational attainment. They did not explain in detail about that association. But adults with higher education can lead to better health than lower education. There is much evidence that education strongly influences individual health (Zajacova & Lawrence, 2018). Not many articles were writing about education and occupational health. They only state the general comment about the heath. For the well-being of workers, education is also comprised as an important role. To look at the occupational point of view, education level is related to high income, a better job can handle social, psychological stress, likely to learn about healthy behavior. The relationship is reverse causality. Poor health not only comes from lower

education but also impair school performance (Health, 2015). It is also beneficial to economic and social resources. A higher educated individual is less likely to be unemployed and have economic hardship because it involves “access to resources that can be used to avoid risks or to minimize the consequences of the disease once it occurs”(Link, Phelan, & behavior, 1995; Zimmerman, 2014). (Kaufman & Rosenstock, 1991) study also stated that changing the educational level of workers can result in benefits in the prevention of occupational lung diseases.

Income and WRMSD are not directly related. But Myanmar garment workers are paid by day-to-day fees and they will not get income when they can’t come to work. WRMSD is one of the leading causes of absenteeism (Burnley, December 2015). MSD also the significant factor that cost workers, employers, family, and the wider economy (Bevan, 2015). Developing countries are facing health inequalities concerning occupational aspects. This is the reason due to unequal income across the population(Scotland, 2021). Although many researches did not found an association between MSD and income, monthly salary still is an important factor for the health and wellbeing of workers (Jahan et al., 2015; Soe et al., 2015). Moreover, economic/financial aspects (e.g. salary, equity, and benefit) are also comprised of psychosocial risk factors that most of the workers worry about, and it may lead to WRMSD problems.(Bernard & Putz-Anderson, 1997).

Work schedule is one of the most important factors that contribute to the MSD. The two studies (Krause, Rugulies, Ragland, & Syme, 2004) and (Engkvist, Hjelm, Hagberg, Menckel, & Ekenvall, 2000) showed that the prolonged working workers are related to low back pain in transit operators and nurses respectively. Longer duration of work without a break (e.g. sitting in the same posture without moving for 2 hours) in sewing operators are related to neck and shoulder pain (Dianat et al., 2015; P. C. Wang, D. M. Rempel, R. J. Harrison, J. Chan, & B. R. Ritz, 2007). Also, a study conducted by(Johnston, Souvlis, Jimmieson, & Jull, 2008) revealed that regular rest breaks during work reduced the prevalence of neck and shoulder pain in computer workers. They also advised taking a regular break to reduce exposure.

Sewing operators are regarded as sedentary workers. Prolong-sitting work nature is also associated with the increased risk of MSD (Nourbakhsh, Moussavi, & Salavati, 2001). The hypothesis that explained the association between MSD and long working hour is that increasing in working time also increases to workers physical demand and lead to the higher prevalence of MSD. From an ergonomic point of view, long working hours impair the recovery time of fatigue and not enough leisure time for a refresh. This complex phenomenon is directly involved in disorders of workers' musculoskeletal system and finally induces WRMSDs (Caruso et al., 2006). Many researches were proof that prolongs working hours have been regarded as a risk for WRMSD in different occupational settings (Fogleman & Lewis, 2002; Johnston

et al., 2008; Nazari, Mahmoudi, Dianat, & Graveling, 2012). The number of working hours also positively associates with knee joint pain of hand-sewn shoe workers (Dianat & Salimi, 2014).

Long ago studies are showed that years of working as sewing operators are related to upper body MSD(J. H. Andersen & Gaardboe, 1993). (Blåder et al., 1991) the study also reported that the working year as a sewing operator is the predictor of WRMSD. This statement is in line with the researches of sewing operators and computer-telephone interactive tasks workers that neck and shoulder pain are positively associated with working years (Dianat et al., 2015; Ferreira Jr & Saldiva, 2002). However, there is some debate about the researches that some are found an association and some are not. The study of (Soe et al., 2015)showed no association of working years with MSD compared between more than three years and less.

On the other hand, a big study of work organizational and personal factors of sewing operators reported that distal upper extremities pain is related to year of employment but not to neck, shoulder pain (P.-C. Wang et al., 2007). Job experiences were also associated with MSD(Ahmad et al., 2007; Hossain et al., 2018). The higher percentage of MSD was seen in municipal sewage workers is attributed to a longer duration of employment and other factors (Reddy & Yasobant, 2015). Therefore, many researches are supported that year of employment is also the independent variable that influences the MSD.

2.3 Work-related stress and psychosocial hazards

Work-related stress is defined as the "determination by work organization, work design and labor relations and occurs when the demands of the job do not match or exceed the capabilities, resources, or needs of the worker, or when the knowledge or abilities of an individual worker or group to cope are not matched with the expectations of the organizational culture of an enterprise"(ILO, 2016). The major workplace factors that induce stress at work are called psychosocial hazards.

Psychosocial factors (hazards) were defined by the ILO in 1984 as the "interactions between and among work environment, job content, organizational conditions and workers' capacities, needs, culture, personal extra-job considerations that may, through perceptions and experience, influence health, work performance, and job satisfaction".

The major causes of psychosocial factors are

1. Content of work – working environment and equipment, job design, workload and pace, work schedule

2. Context of work – Organizational and cultural function, social relation and support with supervisors and coworkers, decision latitude and job control, role and personal factors in an organization, career development, home-work interface(ILO, 2016)

It is now widely accepted that psychosocial factors and work-related stress affect the workers' health and productivity. It also contributes to the major causes of absenteeism and presenteeism. Stress itself is not a disease, but it is the first sign of a health problem. When the body suffers continuous strain over the mind, it can lead to long-term damage to the body and organs. It is also widely recognized that longer stress can induce memory loss, peptic ulcer, bowel inflammation, and musculoskeletal disorder, hypertension, cardiovascular diseases. It may also impair the immune system and finally may lead to cancer. Taken together, these chronic diseases are leading causes of disability, death, and economic cost and compensation burden all over the world. (ILO, 2021b)

The role of psychosocial factors on WRMSD has been proved in many epidemiologic studies, showing the linkage between them and increased attention in the recent decade. Overall, it is obvious that MSD is associated with high job demand, low job control, poor social support. High job stress level, low job satisfaction. Workplace violence particularly harassment, bullying, effort-reward imbalance, poor social relation with supervisors and coworkers are also proved to be associated with MSD (Forastieri, 2016).

2.3.1 Prevalence of psychosocial risk factors and stress among workers

The data on psychosocial hazards and work-related stress vary according to the extent of the region and countries across the world. Most of the

reliable data is found only available in Europe and North America, generally developed countries, and lesser available in Asia –Pacific and Latin America. However, these psychosocial hazards remain the major hazard across the world.

The regional data is mainly collected in Europe by EU agencies. The data of the 4th European working survey reported that work-related stress is suffered by an estimated 400 million people (Eurofound, 2007). The European risk Observatory report in 2009 revealed that 22% of European workers are suffered from stress, which is more prominent in new member states (30%) than older member states (20) %. Moreover, the study also confirmed that 50% to 60% of work loss days are related to psychosocial stress. More prevalent stress is seen in the education and health sector, as well as in the hunting sector, agricultural, forestry, and fishing (28%). The largest group of the occupational sector that is suffered from anxiety are in education and health (12.7%), public administration and defense sectors (11.1%), and agriculture, forestry & fishing, hunting, (9.4%). Irritability was also most common in education and health (15.5%), transport and communication (13.6%), and hotels and restaurants, and public administration and defense (12.6%)(Work, 2009).

Job intensity is also a major problem in work society. High work intensity is also associated with a negative impact on health. Numerous epidemiologic studies were also stated that a high level of job demand is also related to cardiovascular diseases, musculoskeletal diseases, and depression. The 6th European working

conditional Survey revised in 2017 reported that 36% of workers are facing working to a tight deadline and 33% are working at a high job pace around three-quarters of overall working time. The study also includes social support from the college and the supervisors. The prevalence of social support from the college in 2015 is 71% of workers in EU 28 and social support from manger is also reported high 58% but less than from the support of the college (Eurofound, 2017).

The Asia, pacific region, (Casey, 2014)showed that 32% of the stressor are related to work and impair well-being. Moreover almost half of the participants said that demanding work is the common burden to achieve a healthy lifestyle. This also supports the previous year's survey that 72% of Australians suffered from at least one of the stress can cause a physical impact on health and 17% only report that current stress may have caused strong physical health impairment. In the first Korean Working Conditions Survey in 2006, 18.4 % of males and 15.1 percent of the female workforce are suffered from work-related stress which is significantly associated with job demand and working hours. In the second time survey in 2010, the overall fatigue level of the working population uprises from 17.8% in 2006 to 26.7% in 2010. However, general depression, anxiety level, insomnia, general sleep difficulties are decreased through four years period (Kim, Park, Rhee, & Kim, 2015). One of the surveys on the Prevention of Industrial Accidents in Japan also revealed that 32.4%

of workers are experienced stress, anxiety, and distress during the previous year.(MHLW, 2011)

2.3.2 Workplace stress Theory

Workplace theory is come in attention to know furthermore. In recent decades, popular theories were tested by recent researches. These theories use different perspective views to achieve the essential parts of stress formation.

The first popular one is the transactional theory of work-related stress. This is the model developed by (R. S. J. S. Lazarus, appraisal, & coping, 1986). They proposed that stress is the result of interaction with the environment and the individual. But later years, the concept is not complete because they only state the simplicity of the interaction and not considering individual ability, perception, experiences, personality, and several factors (Harris, Daniels, Briner, & Counselling, 2004). Yet, Lazarus also stated in his later work that his transaction theory failed to meet the outcome associated with the other social context and interpersonal relationship(R. S. J. J. o. p. Lazarus, 2006). another one is the interactional theory of stress also developed by(R. S. Lazarus & Launier, 1978). It is the oldest person-environment fit theory of stress emphasis the interaction between an environmental stimulus and associated with the individual response.

2.3.3 Karasek Demand Control Support Model

The leading model to measure workplace stress and well-being is the job Demand control Support model (JDCS). It is first proposed by Robert Karasek, a sociologist at the University of Massachusetts at Lowell in 1979. The original concept mainly focuses on two important aspects of work situation; job demand and job control. In the later decade, a social aspect was added by (Johnson, Hall, Theorell, & health, 1989; Johnson & Hall, 1988) and finally became the Job Demand Control Support model.

This is mainly based on the interaction between job demand controls that results in stress and strain-related outcome. He also explained that working condition that was balanced between job demand and job control is important in a way to gain explain the connection between health and work. High job demand itself is not injurious but when it is combined with low decision latitude, job strain and stress can occur (Karasek Jr, 1979). This model also speculates that a person with high job demand, low job control, low decision latitude, and poor social support from co-workers and supervisors has the greatest risk to suffer physical and psychosocial hazards. (iso-strain hypothesis)(Johnson & Hall, 1988). Therefore, three major aspects of job factors; job demand, job control, social support are a major impact on a worker's well-being(Sargent & Terry, 2000).

Bernal et al. (2015) reported that a correlation between the high psychosocial working condition and low levels of job control with pain in the back, neck, shoulder, and knee in the systemic study. (Hauke et al) (Hauke, Flintrop, Brun, & Rugulies, 2011) Review article showed the increased upper extremities pain, low back pains are combined with high job strain and neck, shoulder symptoms are associates with low job control. High job strain and low job control are about three times higher risks to impair health status (Sundquist & Johansson, 2000).

Job demand can be defined as the effort of the person to complete the job. While physical factors are the major contributor to job demand, psychological, organizational, social factors are also determinants of job demand. These include time pressures, the amount of heavy workload, a stressful working environment, role ambiguity, work pace, and poor relationships(Bakker & Demerouti, 2007),

Job control refers that how the worker influences the job task and sometimes it is called decision latitude. It comprises two components skill discretion and decision authority. Skill discretion describes that job involves less repetition, level of skill, and creativity required for the job and occasionally arises the opportunity to learn new skills for career development. Decision authority means that the employees' ability to influence the decision about their job and also their work team, including in the decision of their respective job policymaking (Karasek Jr, 1979; Karasek et al., 1998).

Job insecurity can be defined as “the perceptive feeling that undesired possibility of losing the job in future and also the fear or possibility related to the loss of job.” In other words, it can affect both qualitative aspects such as worrying about loss of job and quantitative aspects related to the job such as health insurance, salary, and social relation, social life (De Witte, 2005; Vander Elst, De Witte, De Cuyper, & Psychology, 2014). Moreover, it has been linked with adverse health outcomes. Psychosocial stress such as anxiety, mental disorders, loss of self-esteem, minor psychiatric symptoms are associated with job insecurity. Besides, it has been found that job insecurity can lead to physical activity restriction due to the occurrence of musculoskeletal disorders such as neck and low back pain (Kivimäki et al., 2001; Lang, Ochsmann, Kraus, Lang, & medicine, 2012).

Social support refers to the support from the supervisors as well as from the college. Poor social support from both coworker and supervisor are also increase risk of psychosocial hazards.(Van der Doef, Maes, & stress, 1999) .Poor social support related to musculoskeletal diseases is already reported in many types of research. (Clays et al., 2007) studied both genders of huge sample size cohort study related to social support. A significant relationship between low back pain and poor supervisor, coworker support is found in men. This includes muscle pain at all sites as well as specifically in the lower back, neck, and shoulders. Moreover, (Hauke, Flintrop, Brun, & Rugulies, 2011) in a meta-analysis of Hauke et al. (2011) also points out that that

there is a remarkable association between poor social support and musculoskeletal problems in the neck/shoulders, upper body parts, and low back.

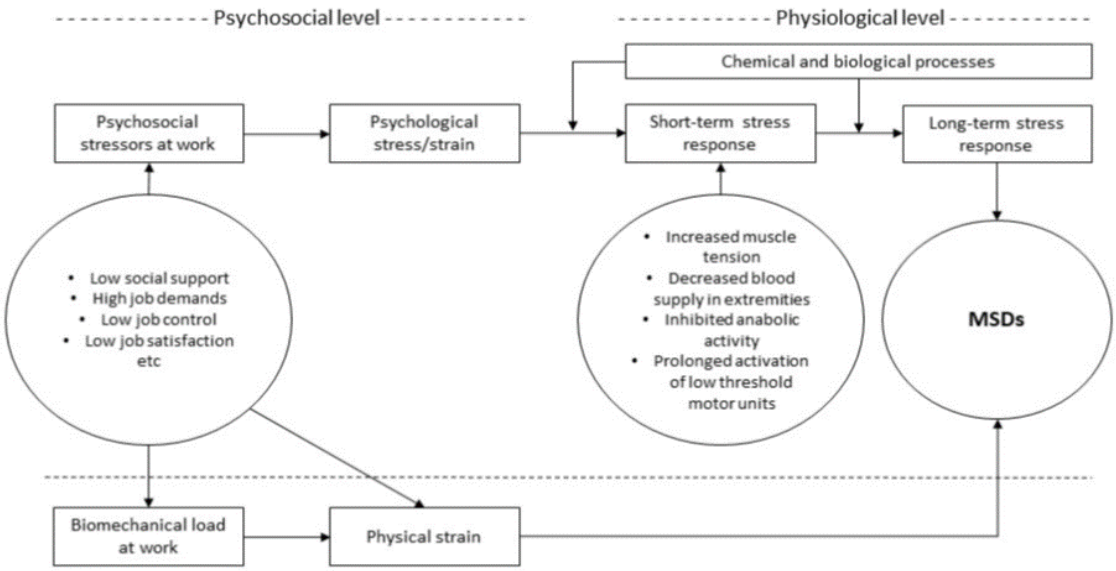


Figure 2. Association between poor social support and musculoskeletal problems
Source: Hauke et al., 2011 Burnout

The Karasek model also has a huge influence on occupational literature, designing job programs in part because it is quite spare, practical, and testable. The model hypothesis also involved that job stress is a function of how much demand the work and how much control (discretion, authority or decision latitude, etc.) that the person has depended upon responsibilities. This creates four kinds of jobs (F. Jones, Bright, & Clow, 2001).

High strain jobs

They have resulted from the combination of high psychological demand and low decision latitude (high demand, low control). Usually, the workplace situation is rigid and tense, not only in the working environment but also in the policy. This type of job can cause physical and psychological illness among workers and they found difficulty in coping with stress. E.g. garment workers, waiters, and nurse aid.

Passive jobs

A passive job is the combination of low decision latitude and low demand (low demand, low control). This kind of job does not require special skills, easy-going. They also suffer physical and mental illnesses. E.g. janitor, mining, and other manual labor jobs

Low strain jobs

Few psychological demands and a high level of control (low demand, high control) and usually required creativity and skills. In this kind of job, the employee can benefit from a high level of health and happiness. E.g. architects and natural scientists.

Active job

High psychological demand and high level of control (high demand, high control). In this working environment, the employee can develop new skills and can solve the work problem freely. By doing this, they can maintain their health and reduce the level of job stress. E.g. physicians, teachers, and engineers

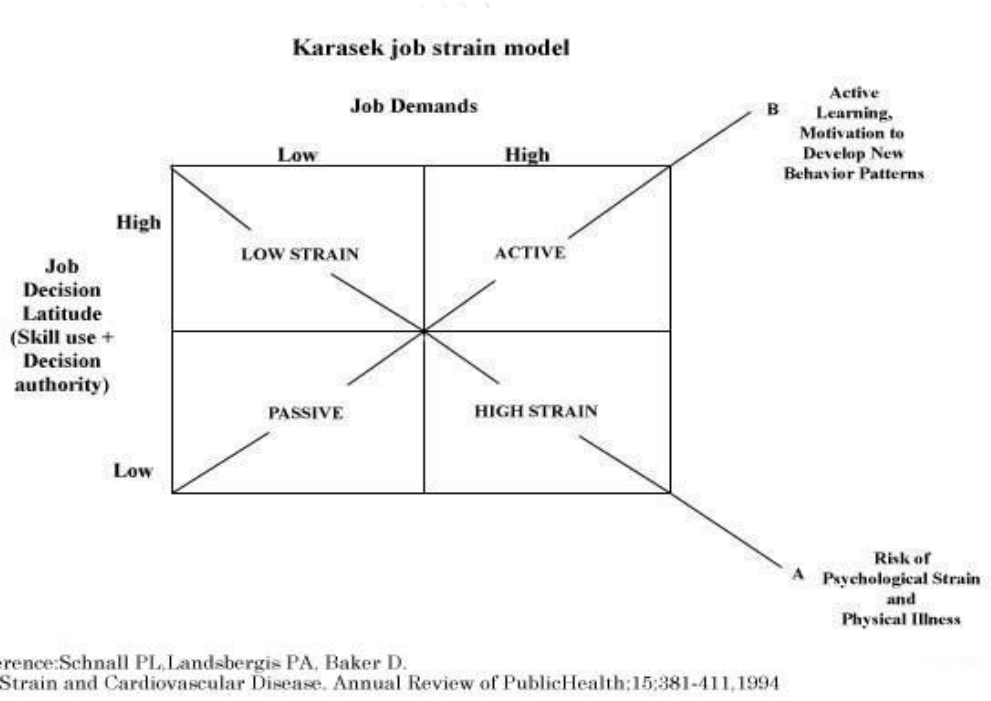


Figure 3. Karasek Job Strain Model

To sum up, the Karasek demand control support model is the world know theory to measure psychosocial hazards and job stress. The work nature of sewing operators includes high psychosocial demand and low job control. They are facing with high work pace, have to sew the clothes timely due to factory requirement and many psychosocial hazards., Moreover, we can access the type of job that sewing

operators are working on with the help of this model. Therefore, I used the Job content Questionnaire that is based on the job demand-control model by Prof Karasek which contains 27 items. Although there are many research questionnaire, JCQ is fit with the job nature of sewing operators in Myanmar.

2.4 Work Ability and WRMDS

Work ability is a multidimensional concept that shows the balance between workers' capacity and occupational physical demand. (J. J. S. j. o. w. Ilmarinen, environment & health, 2009) Multiple occupational factors affect work ability such as obesity and especially low physical capacity that suffers from WRMSD.(L. L. Andersen, Izquierdo, Sundstrup, & health, 2017; van den Berg, Elders, de Zwart, Burdorf, & medicine, 2008) Furthermore, physical work – typically involving, awkward postures, repetitive work, and heavy lifting – has been associated with increased risk of WRMSD(Da Costa & Vieira, 2010; Søgaard, Sjøgaard, & reviews, 2017) and reduced work ability(El Fassi et al., 2013; T. van den Berg et al., 2008). However, workers with MSD symptoms can still work without showing reducing work ability. (Pensola, Haukka, Kaila-Kangas, Neupane, & Leino-Arjas, 2016). The article of (Silvia Monteiro, Maria Costa Alexandre, Ilmarinen, Mendes Rodrigues, & Ergonomics, 2009) showed that there is a significant association between work ability and WRMSD but the article (Akodu & Ashalejo, 2019) showed no association between them. The study of three variables such as work ability, quality of life (QOL), and WRMSD reported that work

ability was positively associated with overall QOL, and with physical and psychological domains as well. The improvement of WRMSD in workers can enhance that work ability and quality of life of workers and they found significant association between them.(Chang et al., 2020). Therefore, to determine the work ability that associated with WRMSD can be important aspect for the sewing operators for the development well-being of workers.

2.5 Work productivity

A basic concept revealed that when a person is physically and mentally sound to be able to work, and the increased desire to work, it can lead to increase performance and overall affect the increased productivity. Health-promoting programs are also involved to target worker's health status to be improved and finally aimed to productivity enhancement and economic. To promote physical and emotional ability, mainly focus on cardiovascular and musculoskeletal problems, job condition, and ergonomic improvement and help them to cope with job stress (O'Donnell, 2000).

Mainly there can be two types of productivity loss. “Absenteeism means that the lost productivity due to workers absent from the job. Presenteeism means that the worker is in work but decreased production due to his illness.”(C. Jones, Verstappen, & Payne, 2019). These can affect productivity in altering pathways. Typically, absenteeism is easy to identify and just count the absent day but presenteeism

comprises a more complicated model (1) identifying and measuring the unproductive time and (2) valuing the impact of that unproductive time. One self-reported presenteeism study indicates that a decrease in productivity related to MSD(C. Jones, Payne, Gannon, & Verstappen, 2016).

2.5.1 Conceptual model of work productivity

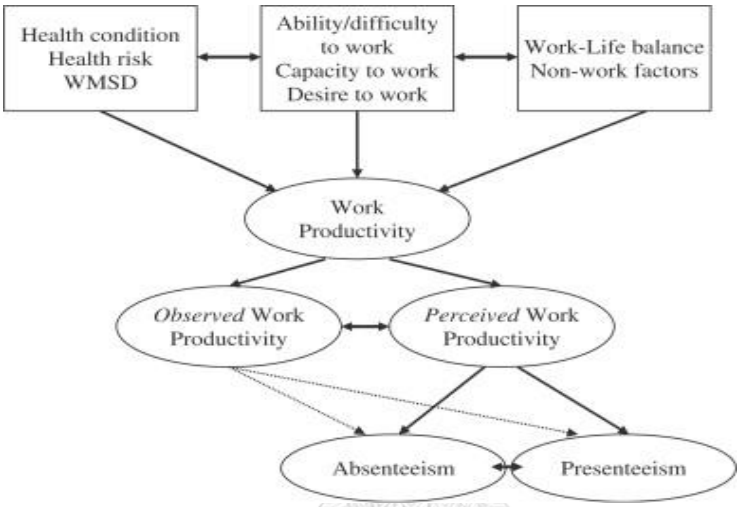


Figure 4. Conceptual model of work productivity

(Escorpizo, 2008)

The above figure is the conceptual model of work productivity that is related to MSD. The leftmost box is the health condition parameter or health risk that is associated with work productivity(WHO, 2001).WMSD is the condition that is associate with pain which is regarded as the common indicator. The inverse association between illness and work productivity is taken as an important aspect to measure absenteeism, presenteeism, and work disability. Moreover, a healthier person can be more productive(Burton, Conti, Chen, Schultz, & Edington, 1999).In other words, the

increased risk of ill health in a job is related to decrease productivity and lead to psychosocial stress (Gunnar Aronsson, Gustafsson, & medicine, 2005).

The second box is the concept of ability, capacity, and desire to work that is related to worker performance. A healthy working environment is an important factor for job performance and also a major contributor to absenteeism and presenteeism. WMSD can affect the worker's performance as a mental aspect and in turn later impair work productivity (Burton et al., 1999; Lowe, 2003).

The final box is work-life balance. It means that the non-work factors, social life is also related to productivity. Not only the work factors but also the social life outside the working environment affect the work productivity and these are also regarded as extra work factors that influence productivity (Hagberg, Tornqvist, & Toomingas, 2002). E.g. when a nurse working the night shift and picking a child from a daycare center and equal to non-work factors such as leisure activity.

Observed work productivity (OWP) means that we can count the number of units produced per working day and services that they give to the customers. A study by (Meerding et al., 2005) use OWP by counting output from construction workers. They used the size of the street (‘‘road pavers”) and floor surface (‘‘floor layers’’) per day was observed as output productivity. However, there are many limitations to use OWP in different occupational sectors. It is only can be used in certain groups of working sectors such as customer service and negotiators that work through telephones, or workers in assemble parts (Escorpizo, 2008).

Perceived work productivity (PWP) is regarded as the most useful tool to measure productivity when there is no OWP(Kessler et al., 2004). It is self-reported work activity that comprises presenteeism and absenteeism. Also (Escorpizo et al., 2007) explained the concept of work productivity that is used in musculoskeletal diseases and arthritis.

In the UK, Stress, depression or anxiety, and musculoskeletal disorders accounted for the majority of days lost due to work-related ill health, 17.9 million and 8.9 million respectively (HSE, 2020). Workplace health promotion programs that can positively affect the presenteeism and reduction of other factors are also encouraged by employers to increase productivity and further economic evaluation may need for an employer to decide whether to invest in this program (Cancelliere, Cassidy, Ammendolia, & Côté, 2011).

2.5.2 Relationship between psychosocial factors and work productivity

Working conditions, stress, Job conditions, and workers' characteristics all significantly influence work productivity. Productivity loss is influenced by those factors directly or indirectly through health impairment. People with high job demand, good social support, and high intrinsic, extrinsic reward are more likely to perceive their products as healthy men than those who lack these conditions. (Lowe, 2003) The study showed that workers who are satisfied with their working environment including psychosocial conditions are more likely to better work morale, lower absenteeism, rarely quit. Adversely, those who reported that their job

is stressful can have a higher level of presenteeism and absenteeism. (Allen, 2008) Psychosocial factors and workers' health is related to production cost. The add up cost related to sick leave, the replacement cost of labor and compensation can go up when the workers suffer turnover of psychosocial conditions. The workplace protective factor is Psychosocial Safety Climate (PSC) which is aimed to prevent and manage workplace psychosocial hazards. PSC concern with how workers value psychological health, commit and support the psychological health problems, prioritize the burden of psychological health of workers as aspect to profit and productivity.(Hall, Dollard, & Coward, 2010) The Australian research reported that depression costs approximately AUD 8 billion per annum due to productivity loss (.5 percent GDP) because of sickness absence and presenteeism (i.e., reduced performance at work) (McTernan, Dollard, LaMontagne, & Stress, 2013). The research paper of (Adib Ibrahim et al., 2019)revealed that psychosocial stressors can explain more than 50% of the variance in health care productivity. The most important factors are job influence, job role clarity, reward, and job satisfaction that is linked with productivity. Also study of private organizations in Nigeria finding reported that psychological factors have a significant contribution to perceived workers ‘productivity that is related to workers efficiency in managing resources (Oyebamiji & Akintayo, 2011).Therefore, we need to better understanding of the link between psychosocial factors and productivity and also find the relationship with WRMSD to get better achievement of worker health.

2.5.3 Sustainable Development Goal (SDGs) and productivity

According to ILO, major SDG goals that are linked with workers' productivity are

- SDG 2.3 ("By 2030 double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment")
- SDG 8.2 ("Achieve higher levels of productivity of economies through diversification, technological upgrading, and innovation, including through a focus on high value-added and labor-intensive sectors")
- SGG 9.5 ("Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending")

Working poor phenomenon such as long working hours, working in informal sectors are the major causes of productivity. Raising productivity increases higher profit in business owners, investors, and then for the workers, the result leads to higher wages and improve the working environment, more decent work, reducing

poverty. Therefore, they have circled chains linked with productivity, wage, and poverty. Governments, employers, and workers all unite together to enhance productivity because it is the primary contributor to increase living standards, to fight off working poverty. Moreover, garment sectors include in one of the ILO's five flagship programs cooperation Better Work Organization, which aim to improve working conditions and more compliance with labor standards. (ILO, 2021a)

2.6 Methodology Explanation

2.6.1 Cornell musculoskeletal Discomfort Questionnaire for WRMSD

This is the questionnaire developed by Professor Alan Hedge and Ergonomics students of Cornell University developed a well-designed data collection tool named CMDQ to access the WRMSD. It comprises a 54 item questionnaire for 18 body parts to access the musculoskeletal discomfort, pain, and aches over the last week. Scoring will be done by simply counting the numbers of people that suffer from WRMSD (Hedge, Morimoto, & Mccrobie, 1999). It also developed different questionnaires for the sedentary worker, standing workers, hand symptoms, and different gender. Cornell musculoskeletal questionnaire is more updated, more widely used, and more specific than other tools. Moreover, there are also research articles that CMDQ is fit for sewing operators and also useful in ergonomic evaluation (Nagaraj & Jeyapaul, 2018; Nagaraj, Jeyapaul, & Mathiyazhagan, 2019).

2.6.2 Work productivity and Activity Impairment Questionnaire (WPAIQ) for work productivity

This is the questionnaire developed by Margaret Reilly, President of Reilly Associates since 1989. Until the early 1990s, there was no quantitative measure of health-related work productivity loss for the employed population, i.e., there was no instrument that assessed the amount of both absenteeism (work time missed) and presenteeism (reduced on-the-job effectiveness) due to health problems. Therefore, they decided to develop tools for these measurements (Reilly, Zbrozek, & Dukes, 1993). The above literature mentions that presenteeism and absenteeism are major contributors to productivity that is related to WRMSD.WPAIQ is also mainly based on these two variables also can access the activity impairment that is not related to work. WPAIQ also developed access work productivity that is associated with certain kinds of diseases such as asthma, rheumatoid arthritis. They are also been translated to 140 languages and many validity and reliability test are done in different languages (ASSOCIATES, 2019).

2.6.3 Job Content Questionnaire (JCQ) for psychosocial factors

This is the questionnaire developed by Professor Karasek based on the Demand control support model explained in the literature part. It is based on the world's know stress theory that measures the psychosocial factors in all kinds of jobs. It covers a wide variety of job characteristics such as physical demand, psychological demand, job insecurity, social support. Moreover, the instrument is widely used in

academic and University-based research and has focused on the worker's task only. It is a short, efficient, and self-administered questionnaire in about fifteen minutes

2.6.4 Work Ability Index (WAI) for work ability

The WAI questionnaire has been developed, based on the balance model of the stress-strain concept, by the Finnish Institute of Occupational Health (FIOH) in the early 1980s. WAI is widely applied for conceptualizing the work ability by obtaining information related to diseases, functional limitations, sick leave, and mental resources. (Nygård, Savinainen, Kirsi, & Lumme-Sandt, 2011; T. I. van den Berg et al., 2008).WAI is now widely used in an international research setting and translated into 30 different languages. (J. J. S. j. o. w. Ilmarinen, environment & health, 2009) .This is the occupational and clinical research instrument that is used in workplace surveys and access work ability that is also related to health. This is the series of the questionnaire that is used to determine the score on basis of answers and contain the demands of work, the worker's health status, and resources. (J. J. O. m. Ilmarinen, 2007)

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Study Design

This study is aimed to find the association of psychosocial factors, work productivity, and musculoskeletal disease in sewing machine operators in a garment factory in Yangon, Myanmar. A cross-sectional method was used and sewing operators from respective garment factories were recruited. The interesting outcome may be psychosocial risk factors present (or) not, work productivity decrease (or) not, musculoskeletal disorders present (or) not, work ability impaired or not. Data collection was done by self-answered questionnaires.

3.2 Study Area

The study area was in Yangon, Yangon Region, and Myanmar which is one of the most industrialized areas in Myanmar and continues expanding. In the Yangon region, there are a number of industrial zones/areas situated in Hlaingtharyar, Shwepyithar, Shwepaukkan, and Mingaladon townships. Moreover, these areas are also the major employment sector in Yangon. During the semi-lockdown period due to the surge of the third wave of COVID-19 pandemic in the Yangon region, most of the industrial zones/areas were closed. Among them, I had to choose Shwepaukkan industrial zone purposively because it is also recognized as one of the densest industrial areas packed with about 15 factories including garment factories for export

purposes. Most of them are foreign owners that were invested in Myanmar. More importantly, it was the only industrial zone/area that allowed me to survey a limited number of garment factories among those which were still open and the managerial bodies were willing to accept my study in their factories. Therefore, I chose the sample factories from that study area because of the above reasons.

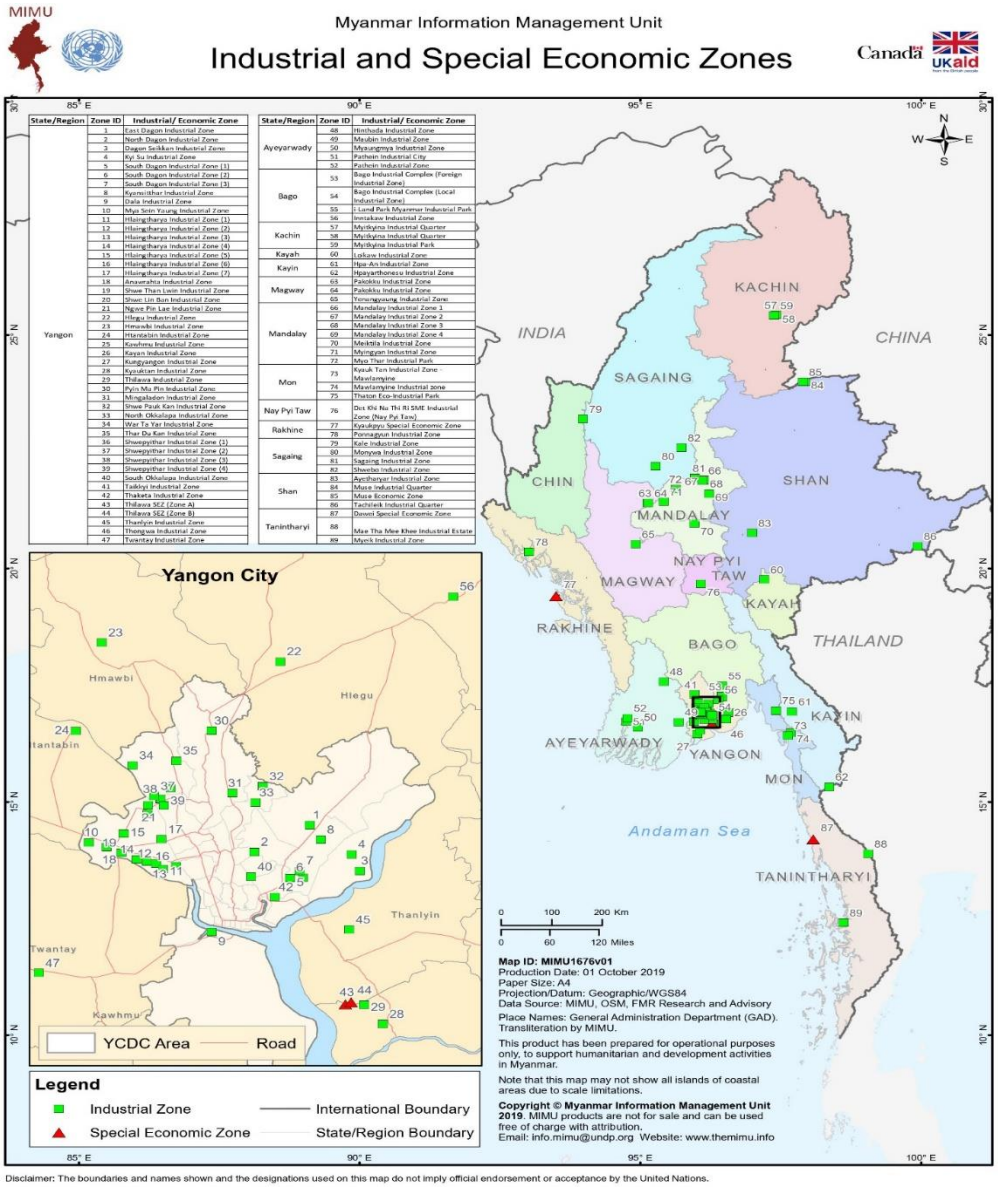


Figure 5.Industrial zone map of Yangon

3.3 Study population and inclusion, exclusion criteria

Participants were the person working as sewing machine operators roughly 4000 participants in the Shwepaukkan Industrial area, Yangon. Inclusion and exclusion criteria will be provided to the factory and they will perform these criteria and select

research participants. Moreover, during recruitment, before explaining the research process, and questionnaire, confirm again these criteria by the researcher.

Inclusion criteria

- Those who worked at least 1 year as sewing operators
- Those who are equal or more than 18 years of age
- Those who are free from disability
- Those who are willing to participate
- Those who can read and write

Exclusion criteria

- Those who suffered from injury, accident, or undergo surgery during the last 3 months
- Those who were pregnant (female respondent)
- Those who were taking any prescribed medicine by self (or) from a doctor

3.4 Sample Size Calculation

The estimated sample size was calculated from the following formula. The formula would be used for calculating the adequate sample size in the prevalence study. (Charan & Biswas, 2013; Daniel & Cross, 2018; Pourhoseingholi, Vahedi, & Rahimzadeh, 2013)

$$n = \frac{(Z\alpha/2)^2 \times p \times (1-p)}{(d)^2}$$

n= the estimated sample size

α= 0.05 (the level of statistical significance)

$(Z\alpha/2)^2$= the value from normal distribution associated with a confidence interval (1.96 with 95% confidence interval)

P= 0.5 (maximum number of prevalence decided by a researcher is used in this study because previous research prevalence is not relevant to this study)

d =0.05 (the value of maximum allowable error or desired precision)

Then, the sample size is calculated as follow:

$$n = \frac{(1.96)^2 \times 0.5 \times (1-0.5)}{(0.05)^2} = 384$$

Therefore, the minimum sample size for this study will be 384. To added to cover incomplete questionnaires or any missing data and withdrawal. Therefore, the total required sample size will be approximately 400.

3.5 Sampling Method

Among the most industrialized region in Myanmar, purposively select the Yangon region. Again in the Yangon region, the Shwepaukkan Industrial zone/area was chosen. There is a total of 15 garment factories. Then using the stratified method,

select large garment factories which a population is more than 1000. Due to the limitation of the semi-lockdown period during the third wave of the COVID-19 pandemic in Myanmar, only 2 factories agreed to be participated after approaching all factories in that industrial zone/area. 400 sample size is used according to calculation and then select 200 sample sizes from each factory. The sampling method is multi-stage sampling. In each factory, 200 participants will be selected by systematic random sampling. A list of participants will be provided by the factory. Participants with odd IDs will be included until reaching the 200 sample size.

After getting the list of workers, researcher recruit and explain about the research, benefit, and all the details about the questionnaire. All are free to participate and get informed consent.

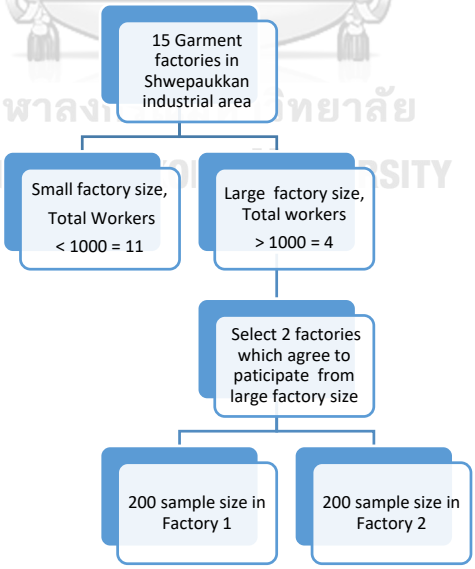


Figure 6. Sampling frame

3.6 Measurement Tools

The self-administered questionnaire was used to conduct the study. The questionnaire was prepared in the English language first and then translated into the local language, Myanmar by a language expert and then back-translated to English by the occupational and Environmental Health Specialist. The disputes between the two translators was decided by the main researcher. The questionnaire contains five parts which contain 66 including questions, items, and statements. The personal factors questionnaire contains 7 questions. CMQ contains 20 questionnaire. JCQ contains 27 questionnaire. WAI contain 7 item questionnaire and WPAI contains 5 questionnaire. These are as follow.

3.6.1. Personal factors questionnaire

This includes the baseline characteristic of the sample, including age, sex, education, marital status, height and weight, working hour per day, BMI, working experience, monthly income of the study participant.

3.6.2 Work Ability Index (WAI)

It measures the working ability of the workers using a seven-item questionnaire. It includes current work ability compared with the lifetime best (item 1, 0-10), work ability concerning the demands of the job (item 2, 2-10), number of current disease groups diagnosed by a physician (item 3, 1-7), estimated work impairment due to diseases (item 4, 1-6), sick leave during the past year (item 5, 1-

5), the personal prognosis of work ability for 2 years from now (item 6, 1,4 or 7) and mental resources, referring to the worker's life in general, both at work and during leisure time(item 7, 1-4). The number in parentheses for each item indicates the scoring range. The total WAI score is calculated by summing up the scores of all items and is ranges from 7 to 49. The total WAI scores are categorized into 4 levels: poor (7-27), moderate (28-36), good (37-43), and excellent (44-49). (J. J. O. m. Ilmarinen, 2007). For internal validity, predictive validity, and reliability now documented subjective assessment of work ability using the WAI questionnaire seems to provide a good instrument and test-retest reliability. (Cordeiro, Souza, & Araújo, 2017; de Zwart, Frings-Dresen, & van Duivenbooden, 2002) Moreover, WAI has a high level of cross-national stability and reliability. (Radkiewicz & Widerszal-Bazyl, 2005). Cronbach's alpha in this study was >0.7 for each item.

3.6.3 Cornell Musculoskeletal Discomfort Questionnaire (CMDQ)

It examines the prevalence of musculoskeletal diseases in 20 body parts including left and right that were suffered during the previous week. Questionnaire for both male and female are same as only different is figure. It includes three sections (frequencies, severity, and inference). The validity of the CMDQ has not been formally tested in the US but it has been extensively tested by Dr. Oguzhan Erdinc in Turkey with good results (Erdinc, Hot, & Ozkaya, 2011). Many other cross-cultural translation validities and reliability tests were done with a satisfactory

outcome. (Afifehzadeh-Kashani et al., 2011; Kreuzfeld et al., 2016) T-CMQ Cronbach's alpha statistic for both three scales was 0.876, 0.895, and 0.875 respectively which indicated that internal consistency was high (Erdinc et al., 2011).

3.6.4. Work productivity and Activity impairment questionnaire-general health version (WPAI-GH)

This is the measurement for productivity and activity impairment in employees in the factory. WPAI-GH revealed the 4 types of scores related to Absenteeism (work time missed), Presenteeism (impairment at work / reduced on-the-job effectiveness), Work productivity loss (overall work impairment/absenteeism plus presenteeism), and Activity Impairment. The WPAI-GH consists of six questions: 1 = current employment; 2 = missed hours due to illness of health; 3 = missed hours due to other reasons; 4 = hours worked; 5 = health status affected productivity while working, 6 = health status affected productivity in regular unpaid activities. The duration for memory recall about the questions past seven days, not including today.

Four main generated outcomes from the WPAI-GH and described in percentages by multiplying the following scores by 100: (1) Absenteeism score = Q2/(Q2 + Q4) (2), Presenteeism score = Q5/10 both for those who were currently employed and worked in the past seven days(3) Overall work productivity loss = Q2/(Q2 + Q4) + ((1 - Q2/(Q2 + Q4)) × (Q5/10) for those who were currently employed; (4) percent activity impairment due to health = Q6/10 for all respondents.

In, this study, we exclude the activity impairment part because all participants are currently working employees. This tool is translated into different languages and validity, reliability test is done and Cronbach's alpha statistic for each scoring is in >0.7. (Reilly et al., 1993). Cronbach's alpha in this study was calculated and it was >0.7 for each item.

3.6.5. Job content questionnaires (JCQ)

The psychosocial factors are measured by Job content questionnaire. In this study, we use 27 item questionnaires which include 5 scale sections, job control, psychological job demand, workplace social support, physical job demand, and job insecurity. Skill discretion, (evaluated by 6 items), and decision authority, (evaluated by 3 items) are sum up to measure the job control scale. The psychological job demand scale comprises 5 items. Supports from supervisors and from co-workers, (each includes 4 items) are combined to evaluate the social support scale. The physical job demand scale and job security scale are evaluated by 3 and 2 items each. The outcome response will be recorded for each questionnaire on a 4-point Likert-type scale, ranging from 1 (strongly disagree), 2 (disagree), 3 (agree), to 4 (strongly agree). The scales and sub-scales of Cronbach's alpha statistics (α) are also validated and range between 0.319–0.894. (Karasek et al., 1998; Sein, Howteerakul, & Jirachewee, 2010) .Cronbach's alpha in this study was calculated and it was >0.7 for each item.

3.7 Data Collection Process

Permission from the local authority and respective factories were asked. First, we select participants according to inclusion and exclusion criteria. The study procedure was explained to the participant and writing consent with signature was requested from each participant. A research team was built with one research assistant to facilitate explaining questionnaires. A research assistant will be a qualified graduate person who will relate to the medical field such as nurse or pharmacist, community health care workers. The appropriate time for data collection is also needed to be considered and requested from the factory authority, in order not to interfere with their production. Explaining about research questionnaire to the participant was done in the open area that will be provided by the factory. To avoid data contamination, collection was done only 50 samples per one day, and CMQ, JCQ, WAI, and WPAI are all explained and self-administered, set up to fill at their home, and collected the next day, allowing time for 24 hours.

3.8 Data Entry and Analysis

Statistical analysis for social science version 26 was used for data analysis. Descriptive statistics such as mean, median, standard deviation, percentage, minimum, maximum values are used for interpretation of the variable. The test of the level of statistical significance in this study is alpha (α) less than 0.05.

Table 1.Data analysis

Objectives	**Variable**	**Statistic**
-To find an association between psychosocial factors and work-related musculoskeletal Disorders - To find an association between work productivity and work-related musculoskeletal Disorders - To find an association between work ability and work-related musculoskeletal Disorders	Dependent variable - work-related musculoskeletal Disorders (Binary outcomes: “no musculoskeletal disorders at least one part of the body” / “musculoskeletal disorders at least one part of the body”) Independent variable - psychosocial factors/work productivity/work ability with continuous data - psychosocial factors/work productivity/work ability with categorical data	Independent T-test (Normally distributed data) Mann - Whitney U Test (Non-Normal distributed data) Pearson’s Chi-square
-To find out the combined effect of psychosocial factors and work	Dependent variable - work-related musculoskeletal Disorders (Binary	

productivity on work-related musculoskeletal Disorders	outcomes: “no musculoskeletal disorders at least one part of the body” / “musculoskeletal disorders at least one part of the body”) Independent variable - combine effect of psychosocial factors and work productivity Group 1 : poor psychosocial factors x poor work productivity Group 2 : good psychosocial factors x poor work productivity Group 3 : poor psychosocial factors x good work productivity Group 4 : good psychosocial factors x good work productivity	Binary logistic regressions (Odd ratio and Adjusted Odd ratio** with 95%CI will be reported) **Adjusted with some confounding factors in general characteristic
	Psychosocial factors are determined by mean	

	If > mean, High If< mean, Low Overall Psychological factors are determined by -High Psychological job demand, low job control, low social support, high job insecurity is regarded as poor psychosocial factors. - Low Psychological job demand, high job control, high social support, low job insecurity is regarded as good psychosocial factors Work productivity is determined by mean percentage. If > mean = Poor productivity If < mean = Good productivity The total WAI scores are categorized into 4 levels: poor (7-27), moderate (28-36), good (37-43), and excellent	

	(44-49)	

3.9 Ethical Consideration

The research protocol was submitted and approval obtained by the Ethical Review Committee for Human Research, Faculty of Public Health, Chulalongkorn University before collecting data. Before the data collection, the right to participate, refuse, or withdraw was informed to the respondents. All have voluntarily participated in this study.

CHAPTER 4

RESULT

The objective of the study is aimed to determine the percentage of Work-related musculoskeletal disorders, psychosocial risk factors, work productivity, work ability and to find the association with WRMSD to other factors. The study population was sewing machine operators who were more than 18 years of age and currently working in Shwepaukkan Industrial Zone, Myanmar.

There are five parts to the result section. Each section contains both descriptive and inferential statistics. The result of the study is presented as follows.

4.1 General characteristics of the participants.

4.1.1 Association of Personal factors and WRMSD

4.2 Percentages of WRMSD in sewing operators

4.3 Percentages of psychosocial risk factors

4.3.1 Association of Psychosocial risk factors and WRMSD

4.4 Work Ability Index Score of sewing machine operators

4.4.1 Association of Work ability and WRMSD

4.5 Work productivity of sewing machine operators

4.5.1 Association of Work productivity and WRMS

4.6 Binary logistic regression analysis of personal factors, psychosocial factors, Work ability, and work productivity with WRMS

4.1 General characteristics of the participants

The personal factors of garment factory workers were shown in Table 2. The table included information related to age, gender, education, marital status, monthly income, working hour per day, duration of work, and BMI.

The result showed that among 370 garment factory workers who participated in this study, the average age is 25.6 ± 4.6 years. The majority of the sewing workers (61.9 %) were in the age group 22-30 years and about 26.5 % were in the age below 22 years. The youngest responding garment workers in the study were 18 years old while the eldest was 51.Regards to gender, the majority of sewing operators were occupied by females about 95.4 % with 353 respondents.

For the educational level, secondary school level comprised majority with 54.6% followed by tertiary level and above 33.8% and primary school level 11.6%. Concerning the marital status of sewing operators, most of the portion was occupied by a single with 83.5% and then married was 13.5%. Regarding the income, the majority earn more than 200000 MMK with 65.9% and less than 200000 MMK is 34.1% with the mean value of 227151±61015. Working hour per day was cut off to 8

hours and most of the operators worked more than 8 hours with 60.8%. The average working hour was 9.25±1.3.

As for the working experiences, it was also divided to more or less than 5 years and the respondents' rate to more than 5 years is only 26.8%. The average means of working experience was 4.2± 3.2 years. If we looked at the BMI, Healthy BMI comprised with 61.6% majority followed by underweight 30.3%.

Table 2. General characteristic of participants (N=370)

		n (%)
Age	<22 years	98 (26.5)
	22 to 30 years	229 (61.9)
	>30 years	43 (11.6)
Gender	Female	353 (95.4)
	Male	17 (4.6)
Education	Primary school	43 (11.6)
	Secondary school	202 (54.6)
	Tertiary and above	125 (33.8)
Marital Status	Single	309 (83.5)
	Married	50 (13.5)

	Divorced	5 (1.4)
	Widowed	6 (1.6)
Monthly income(Myanmar kyats)	≤200000	126 (34.1)
	>200000	224 (65.9)
Working hour per day	≤8 hr	145 (39.2)
	>8 hr	225 (60.8)
Duration of work as sewing operators	≤5 yrs	271 (73.2)
	>5 yrs	99 (26.8)
BMI	<18.5	112 (30.3)
	18.5 to 24.9	228 (61.6)
	25.0 to 29.9	23 (6.2)
	>30	7 (1.9)

4.1.1 Association of Personal factors and WRMSD

To find the association with WRMSD, p-values are also presented in Table 3 with chi-square statistical analysis. Most of the personal factors are not significantly associated with WRMSD except for age and education status. Age is significantly associated with a p-value of 0.010 and an educational level of 0.01. According to the results, ≤ 30 years of age is 3.7 times more likely to develop WRMSD than >30years

of age with a p-value of 0.010. Similar to educational attainment, tertiary educational level workers are 12 times more likely to suffer WRMSD than primary and secondary education with a p-value of 0.002 as shown in Table 4.

Table 3.Personal factors of sewing machine operators related to WRMSD (N = 370)

		Work-related musculoskeletal disorders		p-value
		Yes n Row%	No n Row%	
Age	<22 years	91 (92.9)	7 (7.1)	0.011 ★(f)
	22 to 30 years	220 (96.1)	9 (3.9)	
	>30 years	36 (83.7)	7 (16.3)	
Gender	Female	332 (94.1)	21 (5.9)	0.286 (f)
	Male	15 (88.2)	2 (11.8)	
Education	Primary school	42 (97.7)	1 (2.3)	0.001 ★(f)
	Secondary school	181 (89.6)	21(10.4)	
	Tertiary and above	124 (99.2)	1(0.8)	
Marital Status	Single	288 (93.2)	21 (6.8)	0.880 (f)

	Married	48 (96.0)	2 (4.0)	
	Divorced	5 (100)	0 (0)	
	Widowed	6 (100)	0 (0)	
Monthly income(Myanmar kyats)	≤200000	117 (92.9)	9 (7.1)	0.651
	>200000	230 (94.3)	14 (5.7)	
Working hour per day	≤8 hr	135 (93.1)	10 (6.9)	0.665 (f)
	>8 hr	212 (94.2)	13 (5.8)	
Duration of work as sewing operators	≤5 yrs	258 (95.2)	13 (4.8)	0.086
	>5 yrs	89 (89.9)	10 (10.1)	
BMI	<18.5	6 (5.4)	106 (94.6)	0.661 (f)
	18.5 to 24.9	17 (7.5)	211 (92.5)	
	25.0 to 29.9	0	23 (100)	
	>30	0	7 (100)	

f = fisher exact test

Table 4.Association of Personal factors and WRMSD

	X^2	Crude OR	95% CI	p-value

>30 years	8.451	3.780	1.458 – 9.801	0.010*
≤30years				
Primary and secondary school	9.499	12.233	1.639 – 91.850	0.002*
Tertiary and above school				

Reference group - ≤30 years of age, tertiary and above school

4.2 Percentage of WRMSD in sewing operators

370 respondents of the Standard Cornell Musculoskeletal Discomfort questionnaire were administered. The following Table 5 represents the percentages of WRMSD. Sewing operators reported that pain in at least one part of the body is 347 (93.8%) and mostly occupied by a female. Most common symptoms areas are in upper back (34.3%), neck (27.6%), right shoulder (24.9%) right lower leg (23.8%) and lower back (21.9 %)

Table 5. Musculoskeletal disorders' prevalence at the recent week in our subjects with musculoskeletal disorders (N = 370)

Body Region	Frequency	Percentage
Neck	102	27.6

Shoulder (Right)	92	24.9
Shoulder (Left)	80	21.6
Upper back	127	34.3
Upper arm (Right)	70	18.9
Upper Arm (Left)	56	15.1
Lower back	81	21.9
Forearm (Right)	52	14.1
Forearm (Left)	39	10.5
Wrist (Right)	49	13.2
Wrist (Left)	29	7.8
Hip	68	18.4
Thigh (Right)	68	18.4
Thigh (Left)	49	13.2
Knee (Right)	73	19.7
Knee (Left)	45	12.2

Lower leg (Right)	88	23.8
Lower Leg (Left)	59	15.9
Foot (Right)	66	17.8
Foot (Left)	5	14.3
Work-related Musculoskeletal Disorders (WRMSD) Yes	347	93.8
No	23	6.2

4.3 Percentages of Psychosocial risk factors

Regards to psychosocial factors according to Karasek Demand Control model of Job strain. Job Demand Control Model measures psychological job demands, job control, workplace social support, physical demands, and job insecurity. It is the modification of Karasek job Content Questionnaires and all these items measure psychosocial hazards.

Table 6 shows that 41.4% have reported high psychological demand. About 29.5% of the respondents had a low score of supervisor support and 90.3 % had a high score of co-worker support. But overall 77.0 were reported high workplace support. About 75.9% of the respondents had a high score of physical demands, 55.6% has high job control, and 53.8 % response with high job insecurity. To sum up, low psychological demand, high social support, and high job control, high job insecurity are obtained. However, most of the sewing operators reported that their job requires high physical demand.

Table 7 represent the percentage of WRMSD in accordance with psychosocial factors. The total percentage of WRMSD pain in at least one part of the body is higher in low psychological demand (94.5%) than high psychological demand (91.5%). A similar result can be seen in other psychological factors such as workplace social support, coworker support, and job security. However, a nearly similar percentage of WRMSD pain was reported in job control and supervisor support with high (93.2%), low (94.5%), and high (93.9%), low (93.6%). In addition, high physical demand was recorded more percentage of WRMSD with 95.7% than low demand.

Table 6. Psychosocial risk factors (N = 370)

	The Median cut off point	High (n %)	Low (n %)

Psychological job demand	31	High (≥31)	Low(<31)
		153 (41.4)	217 (58.6)
Job control	61	High (≥61)	Low(<61)
		205 (55.4)	165 (44.6)
Workplace Social support	24	High (≥24)	Low(<24)
		285 (77.0)	85 (23.0)
Supervisor support	12	High (≥12)	Low(<12)
		261(70.5)	109 (29.5)
Coworker Support	12	High (≥12)	Low(<12)
		334 (90.3)	36 (9.7)
Physical demand	6	High (≥6)	Low(<6)
		281(75.9)	89 (24.1)
Job insecurity	8	High (≥8)	Low(<8)
		19 (53.8)	171 (46.2)
Job strain (high psychological demand, low job control)		High 75(20.3%)	Low 295(79.7%)

Table 7.Psychosocial risk factors and WRMSD according to category % (N = 370)

	High		Low	
	(MSD)Yes n %	(MSD) (No) n %	(MSD)Yes n %	(MSD) (No) n %
Psychological job demand	140 (91.5)	13(8.5)	207 (95.4)	10 (4.6)
Job control	191 (93.2)	14 (6.8)	156 (94.5)	9 (5.5)
Workplace Social support	265 (93.0)	20 (7.0)	82 (96.5)	3 (3.5)
Supervisor support	245 (93.9)	16 (6.1)	102 (93.6)	7 (6.4)
Coworker Support	311 (93.1)	23 (6.9)	36 (100)	0 (0)
Physical demand	269(95.7)	12 (4.3)	78 (87.6)	11(12.4)
Job insecurity	158 (92.4)	13 (7.6)	189 (95.0)	10 (5.0)

4.3.1 Association of Psychosocial risk factors and WRMSD

The association between psychosocial risk and WRMSD is calculated according to the chi-square test. There is no significant association between psychosocial risk and WRMSD except physical demand a shown in Table 8. Moreover, job strain also found no significant association between high and low. Physical demand is significantly associated with WRMSD with a p-value of 0.010. According to the statistical result, high physical demand is 3.161 times more likely to develop WRMSD than low physical demand, and 95 % confident to say that the range is 1.343 – 7.441.

Table 8. Psychosocial risk factors and association with WRMSD

		X^2	Crude OR	95% CI	p-value
Psychological job demand	Low	2.327	0.520	0.222 – 1.219	0.188
	High				
Job control	Low	0.296	0.787	0.332 – 1.867	0.668
	High				
Workplace Social support	Low	0.011	0.485	0.140 – 1.673	0.312
	High				
Supervisor support	Low	0.011	1.051	0.420 – 2.631	1.000

	High				
Coworker Support	Low	2.643	1.116	1.077 – 1.156	0.148
	High				
Physical demand	Low	7.586	3.161	1.343 – 7.441	0.010*
	High				
Job insecurity	Low	1.048	0.643	0.275 – 1.506	0.389
	High				
Job Strain	Low	0.513	1.422	0.541 – 3.741	0.432
	High				

Reference group – High

4.4 Work Ability Index score of sewing machine operators

Table 9 shows the individual item score of the WAI and the range score that was obtained from sewing operators according to scoring criteria. The average mean score is 34.3. Table 10 show the group criteria, categorized into four groups, and moderate work ability occupied in the majority of the respondents with 66.5 % which is needed to be improved followed by poor work ability 18.4 % which is

needed to be restored. Moreover, good work ability is 12.7% and only 2.4 % reported excellent ability score.

Table 9. WAI individual item score (N = 370)

Item	Range	Mean ± SD
1. Current work ability compared with the lifetime best	2 - 10	5.9 ± 1.3
2. Work ability with the demands of the job	4 - 10	6.9 ± 1
3. Number of current diseases diagnosed by a physician	1 - 7	6.4 ± 1.1
4.Estimated work impairment due to diseases	1 - 6	3.4 ± 2.1
5. Sick leave during the past year	2 - 5	4.7 ± 0.6
6. Own prognosis of work ability two years from now	1 - 7	4.4 ± 1.6
7.Mental resources	1 - 4	2.6 ± 0.5
Total score	7 - 49	34.3

Table 10.WAI category score (N= 370)

	n	Percentage
Poor (7 – 27)	68	18.4
Moderate (28 – 36)	246	66.5
Good (37 – 43)	47	12.7
Excellent (44 – 49)	9	2.4

4.4.1 Association of Work ability and WRMSD

The result of Table 11 explained the association of work ability and WRMSD. Poor work ability respondents reported more WRMSD percentage (95.6%) than poor work ability (91.9%). In addition, there are no reported cases of (No) WRMSD in good and excellent work ability. There is no significant association between WRMSD and work ability at the p-value of 0.166.

Table 11.WAI score and association with WRMSD

	(MSD)(Yes) N %	(MSD) (No) N %	X^2	df	p- value
Poor (7 – 27)	65(95.6)	3(4.4)	5.637	3	0.116
Moderate (28 – 36)	226(91.9)	20 (8.1)			

Good (37 – 43)	47 (100)	0 (0)			
Excellent (44 – 49)	9 (100)	0 (0)			

4.5 Work productivity of sewing machine operators

There is no significant reported absenteeism score. Only 13 respondents show absenteenism hours and show 0 percent according to WPAI calculation. The presenteeism score is about 34% and which can be considered as less impairment and good productivity. Overall work impairment is the sum of presenteeism and absenteeism. Therefore, The overall work impairment is the same as presenteeism as seen in Table 12.The total working hour during past 7 days 51±7.7. Impairment while working due to health is 3.39 according to WPAI calculation as mentioned in Chapter 2 and convert into percentage, therefore it is 34%.

Overall Activity impairment is excluded because that item only measures in non-working groups and this study, all are working groups.

Table 12. Work productivity score (n = 370)

Items	Unit Expression	WAI score with the percentage	p-value

Hours missed due to health problem (>0 hr) (Absenteeism)	Hr	N (%)	0 percent	0.150
	2Hr	3 (0.8)		
	4Hr	6 (1.6)		
	5Hr	1 (0.3)		
	8Hr	2 (0.5)		
	24Hr	1 (0.3)		
Hours actually work in past seven week	Mean= 51.7 hr , SD = 7.7 Minimum=40hr, Maximum= 70 hr			
Impairment while working due to health (Presenteenism)	Mean= 3.39 , SD = 1.9 Minimum = 0 , Maximum= 8		34 %	
Overall work impairment due to health (Presenteeism +Absenteeism)			34 %	

4.5.1 Association of Work productivity and with WRMSD

To find the association with work productivity and WRMSD, productivity score is categorized into two groups (<50% and >50%). After running the chi-square test, there is no significant difference between work productivity and WRMSD with a p-value of 0.150 as shown in Table 13.

Table 13.Association of Work productivity and WRMSD

		X^2	Crude OR	95% CI	p-value
Work productivity score	≤50%	2.192	0.382	0.102 – 1.430	0.150
	>50%				

Reference group - >50%

4.6 Binary logistic regression analysis of personal factors, psychosocial factors, Work ability, and work productivity with WRMSD

A binary logistic regression is carried out to determine the predictors of WRMS with controlling cofounders. Out of 17 variables, only 12 variables were selected as the most important variables to be entered in the logistic model. Hosmer-Lemeshow (Goodness of fit) text was used and assumptions for some variables show linear correlation with WRMSD. Only variables that meet assumptions are put into the model. Table 14 shows the final logistic regression model. The variables that were retained in the final model were age, gender, education status, duration of work,

psychological demand, job control, physical demand, job insecurity, work productivity score, and work ability index score.

The result shows that there is a significant difference between gender, physical demand, job stress, and work productivity with WRMSD. Moreover, these are the significant predictors of a regression model. Male is 87% less likely to develop than female with a p-value of 0.046, 95% CI (0.020-0.969). Concerning high job stress is 8.2 times likely to develop WRMSD than low stress with a p-value of 0.017, 95% CI (1.456 - 46.550). Also, high physical demand is 4.7 times more likely to develop WRMSD than low demand with a p-value of 0.029, 95% CI (1.172 – 18.562). A similar situation is seen in work productivity percentage, the ≥ 50 % productivity impairment is 5.8 times more likely to develop than the < 50% with a p-value of 0.016, 95% CI (1.393 – 24.920). Other variables are not significantly associated with WRMSD in regression analysis.

Table 14.Binary logistic regression analysis of personal factors, psychosocial factors, Work ability, and work productivity with WRMSD

Variable	B	S.E	Wald	df	Sig	Exp (B)	95% CI	
							Lower	Upper
Age	-1.534	0.798	3.693	1	0.055	0.216	0.045	1.031
Gender	-1.980	0.994	3.968	1	0.046★	0.130	0.020	0.969

Education status	-2.218	1.157	3.676	1	0.483	0.588	0.133	2.598
Duration of work	-0.611	0.680	0.807	1	0.369	0.543	0.143	2.058
Physical demand	1.548	0.709	4.769	1	0.029*	4.702	1.172	18.862
Job insecurity	1.229	0.886	1.922	1	0.166	3.418	0.601	19.425
Total social support	-0.451	0.820	0.302	1	0.582	0.637	0.128	3.177
Job stress	2.111	0.882	5.724	1	0.017*	8.257	1.465	46.550
Work productivity % (<50% and ≥50%)	1.774	0.736	5.813	1	0.016*	5.893	1.393	24.920
WAI	0.599	0.994	0.402	1	0.526	1.820	0.286	11.588

Note – reference groups are ≤ 30 years of age, female, primary education, ≤8 hrs of work per day, low physical demand, low job security, low social support, low job stress, < 50% work productivity impairment, poor work ability score.

CHAPTER 5

DISCUSSION

The prevalence of WRMAD among garment workers is becoming a wider occupational problem. They are the basic workers and garment factories are one of the major sectors that give employment to Myanmar people. Moreover, young age is more involved in industrial work as sewing operators and also facing physical, mental, and behavioral problems but also cause many job-related sickness and injury and make them low performance, poor job satisfaction, and poor quality of life. Much research is studied on WRMSD in developing countries over the recent decade. However, studies on WRMSD, psychosocial factors, work productivity, work ability, published research focusing on sewing machine operators are very limited in Myanmar. The workforce of garment sectors still growing in Myanmar and if major occupational problems are left undiagnosed, there will be an impact on the country's economy.

This study of “Work-related musculoskeletal disorders, psychosocial factors, work productivity, and work ability among Garment factory workers in Myanmar” is conducted to find the percentage of productivity, work ability, psychosocial factors, and percentage of work-related Musculoskeletal Disorders of sewing machine operators in the garment factory. The results can provide information about the situation of productivity, work ability, psychosocial factors, and WRMSD and

appropriate measures can be implemented based on the results of this study. In this chapter, a discussion of the result findings and a comparison of the previous research studies will be presented.

5.1 Prevalence of WRMSD

WRMSD has become a major occupational problem in the recent decade due to its growing burden not only its negative impact on the performance of workers but also on the well-being of workers.

Due to the limited number of previous studies on WRMSD in Myanmar, it was not possible to cite the literature that has the same criteria to define "Work-related musculoskeletal disorders" to obtain the appropriate comparison with the results of the present study. However, the prevalence of sewing machine operators and other factors that were studied in different countries are discussed. Moreover, most of the studies are focused on all sectors of Garment factory workers. But in this study, the discussion will only be done on studies focus only on sewing operators. The prevalence of WRMSD in this study is about 93.8 %. This finding is also similar to the study of the prevalence, of Musculoskeletal Disorders among Sewing Machine Operators in Nigeria about 92 % (Ak, Ba, & Adebisi, 2013). The finding is higher than in the study of sewing machine operators in Sir Lanka which the prevalence of WRMSD is about 81% (Nagaraj et al., 2019) and another study in Nigeria with 69% (Akinpelu, Oyewole, Odole, & Ogunbamowo, 2016). Moreover, the study of WRMSD of sewing

operators in India is far lower percentage about 43% and the reason can be due to Indian study contains only 60 participants.(E. Mehta, Mehta, Sharma, & Wellbeing, 2020) In addition, there are very few studies on sewing machine operators using 7 day prevalence of CMDQ. Most of the studies are using Nordic Musculoskeletal Questionnaire with a 12-month prevalence. As compared to the 12-month prevalence, this study is consistent with the findings of Iranian sewing operators with a prevalence rate of 91% (Dianat et al., 2015)and in Estonia study 91.2% (Merisalu, Mannaste, Hiir, & Traumann, 2016).

Most common symptoms areas are in upper back (34.3%), neck (27.6%), right shoulder (24.9%), right lower leg (23.8%) and lower back (21.9 %). The top three pain areas are consistent with the finding of sewing machine operators in the textile manufacturing industry in Botswana with the upper back (32.5%), Shoulder (21.7%), and neck (15.4%) (Sealetsa & Thatcher, 2011). These results are consistent with other studies that have highlighted problems in the shoulder and neck regions (J. H. Andersen & O. J. A. j. o. i. m. Gaardboe, 1993; Blåder et al., 1991). A large study of upper extremities WRMSD of sewing machine operators in Los Angeles, California reported that neck and shoulder mostly occupied musculoskeletal pain with 24% which is consistent with these findings (P.-C. Wang et al., 2007). Moreover, the most common pain areas are in accordance with the study of sewing machine operators in turkey reported that upper trunk pain (upper back and lower back) was 62.5.%, neck

50.5% and shoulder 50.2% (Öztürk & Esin, 2011). However, most of the studies are also reported that the low back is one of the most common pain in sewing machine operators and then followed by neck and shoulder. (Dianat et al., 2015; Nagaraj et al., 2019).In addition, a self-reported study of sewing operators in Nigeria also stated that 7 days prevalence of body pains are commonest in the lower back (31.6%), neck (21.3%), and shoulder (19.0%)(S. Maduagwu et al., 2015). Nevertheless, these three body regions- back, neck, and shoulders are frequently affected because the sewing operation is characterized by a static sitting posture for a long time, head and trunk forward inclined posture, and relatively uncomfortable ankle and knee angles (P olajnar, Leber, & Herzog, 2010).

The prevalence of WRMSD and most pain anatomical sites among sewing machine operators can be varied in different countries from different studies. The variation of the research can be due to different working environments, different geographical areas, traditions and culture, and differences, different research methodologies, sample size and population, duration of the study, study period. The instrument CMDQ is also accessed musculoskeletal pain based on their perceptions of workers. As it is the subjective measure of musculoskeletal pain, it can provide different findings in different countries. It is noted that WRMSD can be influenced by other factors such as job stress, increased demand from the competitive economy, changes in the working environment and labor market. Despite being the same

nature of work, improvement and sustainability of working environment among factory workers are different in Myanmar compared to other countries. As weak in occupational health sectors and labor law, and Myanmar sill developing countries, therefore most of the workers suffer more occupational problems compared to others.

5.2 Personal factors of sewing machine operators related to WRMSD

Regarding the age of the sewing machine operators, ≤ 30 years of age is 88.4% and > 30 years is 11.6%. In an analysis of this study, there is a significant relationship between age and WRMSD, and younger age groups are more reported than older age groups. Perhaps, this can be the younger population age of sewing machine operators. Sewing task requires more physical effort, repetitive job and younger age are more fit in sewing operators. Moreover, Myanmar is still a developing country and the major employment sector is provided by garment factories. Due to the poverty in the country, the younger age group has to work for their family earning (Burnley, December 2015; Marian Boquiren, 2019). This finding is in line with the research paper of sewing operators related to WRMSD in Nigeria which also reported that younger age is more prevalent of WRMSD than older(S. Maduagwu et al., 2015). Moreover, other research findings also support this result regards to young age groups(S. M. Maduagwu et al., 2014; Roquelaure et al., 2012). However, there is also a contradictory report that increasing age is also associated with the prevalence

of WRMSD (Aghili et al., 2012). In addition, major contributory factors that high prevalence in the younger age group can be due to lack of skill and knowledge, little experience in the work, and increase workload (Roquelaure et al., 2012).

This study also find that education is another associated factor related to WRMSD. Higher educational attainment is more likely to suffer than low education and very few studies support this relationship. (Kaka et al., 2016) found that low back pain is a significant association between low back pain and high educational attainment. Another study conducted in Japan also revealed that only ankle pain is associated with high educational attainment (Tokuda et al., 2007). But these studies did not state possible explanations on high education and WRMSD. This can be a perhaps huge different educational level of sewing operators in Myanmar and this can lead to a significant association. Most are primary and secondary level education and very few percentages are in high education (Marian Boquiren, 2019). One study suggested that low education was associated with a lower level of active coping skills against musculoskeletal pain events encountered in the workplace (Carroll, Mercado, Cassidy, & C̆té, 2002). However, many kinds of research about education and WRMSD found no significant association between them (Dianat et al., 2015; Nagaraj et al., 2019; Öztürk & Esin, 2011). Moreover, in some research findings, lower educational attainment is a risk factor for WRMSD and many articles are contradictory about these associations (J. H. Andersen & O. J. A. j. o. i. m. Gaardboe, 1993; Ming &

Zaproudina, 2003). Therefore, further studies are needed to conclude the clear-cut association and mechanism pathway between WRMSD and educational level.

Gender is no significant association with WRMSD. The possible explanation is that the majority of respondents are female in sewing machine operation and cannot conclude clearly that there is no association. Marital status, duration of work, working hours per day, income, and BMI also did not show a significant association. These findings are also consistent with the study of ergonomic risk factors of sewing operators in Turkey (Öztürk & Esin, 2011). As regards marital status, some studies find no association (Amin et al., 2014; Dianat et al., 2015; Koyuncu & Karcioglu, 2018; Tantawy, 2019), and some find a weak significant relationship (Nagaraj et al., 2019). Similarly to BMI and years of working, most studies predict that both factors are significant factors for WRMSD (Dianat et al., 2015; Nagaraj et al., 2019) and some did not(Amin et al., 2014). The study of (Soe et al., 2015) also weight the finding of no association between income, years of work, and WRMSD, but working hours per day is associated with WRMSD in that study. In addition, the study of Nigeria sewing operators found no association of working hours per day, duration of work with WRMSD and support the finding of this study (Akinpelu et al., 2016). The primary reason that these personal factors which do not find an association with WRMSD is due to the finding the overall association of whole-body pain with statistical test. In other words, these variables are sometimes only associate with certain parts of body

pain. These factors may be associated with WRMSD if we can find the individual part of the body analysis. Although, this study does not include the finding of individual body part association and therefore weakens the associated measures.

5.3 Association of Psychosocial risk factors and WRMSD

This study determines the psychosocial risk factors using the Job Content Questionnaire. It is based on the Karasek Demand control Support model. However, very few articles using this model to determine the psychosocial risks of sewing operators. Therefore, a comparison is done with studies of other industrial sectors. Although the job natures of sewing operation are the same in the garment factory, it is necessary to determine the high strain job according to the model. High strain job is determined by high psychological demand and low job control. It is more likely to be the perception of sewing operators and not depend on the job nature. In this study, 21% reported high strain jobs and 79% reported non-high strain jobs. This finding is consistent with the finding of occupational stress in Iranian car manufacturing workers about 21.3% (Soori, Rahimi, & Mohseni, 2008) and stress of dental workers in Kelantan 22.2% (Rusli, Edimansyah, & Naing, 2006). Moreover, the study of psychological stress in Korean workers using the job strain model is also 20% which is nearly similar to this study. (Rhee, 1999) . However, the prevalence of job stress in numerous studies is higher than in this study. The study of Malaysian automotive assembly plant with the prevalence of 31% (Edimansyah et al., 2008),

Thai rubber glove manufacturing company in which job strain prevalence reached 28% (Sein et al., 2010), Mohan and collaborators who measured a 25% rate of job strain among workers of a foundry company (Mohan, Elangovan, Prasad, Krishna, & Mokkapati, 2008) and Textile Company in Congo study which was showed that 28% of workers suffer from stress (Kitronza, Mairiaux, & health, 2015).

These psychosocial risk studies can be varied in different industrial sectors in different countries. There is very limited job stress study on sewing machine operators. The different methodology, different study areas, different working environments are the major contributors to obtain different job stress prevalence. Different perceives stress points are also can varied considering cultural differences, economic disparities between industrialized and emerging countries. In the European Union, 22% to 28% suffer at least one factor of psychosocial risk that may impact the well-being of mental health. (Eurofound, 2010)

The result in this study comprises seven items of psychosocial factors, namely high psychological demand(41.4%), low job control(44.6%), poor social support(23.0%), poor supervisor support(29.5%), poor coworker support(9.7%), high physical demand(75.9%), and high job insecurity(53.8%) respectively. To be summarized these factors, workplace social support is high, psychological, job control, job security are nearly equal in both high and low, and physical demand is the significant risk factor. These findings are in line with the result of Job Strain

among Rubber-Glove-Factory Workers in Central Thailand except for job security item (Sein et al., 2010). Among the seven items, physical demand is the only factor related to WRMSD.

Very few articles are conducted between psychological risk factors and WRMSD using JCQ items. This finding is coherent with the finding of work-organizational and personal factors associated with upper-body musculoskeletal disorders among sewing machine operators in Los Angeles except for psychological demand. The high job demand in that study is associated with the prevalence of neck/shoulder pain(P.-C. Wang et al., 2007). The study of (Choobineh, Motamedzade, Kazemi, Moghimbeigi, & Heidari Pahlavian, 2011) also found that significant difference means before and after the intervention is physical demand, and none of the other JCQ items show any difference between them. This finding also supports the finding of job stress in Iranian nurses that all the items show no significant relationship to MSD but surprisingly found some association when they analyzed with individual parts of the back, upper extremities, lower extremity with WRMSD (Barzideh, Choobineh, & Tabatabaee, 2014). It can be noted that psychosocial factors can be associated with each of the body parts and this analysis does not include in this study. However, this result is not in line with the study of (Gholami, Rahnavard, Sadeghzadeh, & Tahmtan, 2018) that they found a significant association between social support, job security with WRMSD. Moreover, the study of IT professionals in

India reported that psychological demand, decision latitude, job control, social support are significantly related to musculoskeletal pain (R. K. Mehta & Parijat, 2012). These contradictory findings can be due to different sample populations and different research frames.

The result in this study is high physical demand is 3.1 times more likely to develop WRMSD according to chi-square statistics. As regards physical demand, most of the studies found an association between physical demand and WRMSD. The study of (Gholami et al., 2018; Shan, Bin Adon, Rahman, Hassan, & Ismail, 2011; Wang et al., 2010) found that increases in physical exertion are more likely to get WRMSD than low physical demand. Job strain found no association with WRMSD which is not consistent with many studies (Barbieri, Nogueira, Bergamin, & Oliveira, 2012; P.-C. Wang et al., 2007). However, many researchers claimed that job strain is related to certain parts of the body such as the back, and not associated with whole-body pain which is proved by a meta-analysis study (Amiri & Behnezhad, 2020). Therefore, to get association, we need to analyze various parts of body pain and WRMSD.

5.4 Association of work ability and WRMSD

The mean work ability score is 34.3 and it can be regarded as a moderate ability score. There is no research article on the work ability of sewing machine operators using WAI scores. However, comparison can be done with other types of workers. This finding gets nearly the result of (Rostamabadi, Mazloumi, & Foroushan,

2014) with 35. Another study of work ability index in Slovenian hospital nurses also near with a mean score of 36 (Žmauc, Železnik, & Težak, 2019). However, most of the studies get higher WAI scores. The study of work ability of Iranian workers with 38.4 (Gharibi et al., 2016), computers workers in Portugal with 40.5 (A. F. Costa, Puga-Leal, & Nunes, 2011), and petrochemical workers in Iran about 39.1 (Mazloumi, Rostamabadi, Saraji, & Foroushani, 2012).In addition, the WAI score is also well validated for the need for rehabilitation if WAI scores less than 37 (Bethge, Radoschewski, & Gutenbrunner, 2012). The WAI score is also strongly associated with age and the younger age had higher scores than older age in women and should consider in this study (Monteiro, Ilmarinen, Filho, & Ergonomics, 2006).

Most of the percentages of WAI scores are occupied by poor and moderate ability with 84.9 %. It is very difficult to compare individual percentages because most of the articles did not show individual scores. Therefore comparative is done through the majority of the score. This result is consistent with the finding of work ability index (WAI) values in a sample of the working population in Poland with the majority of poor and moderate ability 65% (Juszczyk et al., 2019), and a test-retest study with 61% (Zwart, Frings-Dresen, & Duivenbooden, 2002). Moreover, another study of employees of the hospital's hygiene and cleaning sector in Brazil (90% women and 10% men) similar with age distribution with this study also reported that 68% (Monteiro et al., 2006). However, there are also contradictory findings that the

excellent and good group mostly occupied the overall percentage of WAI score. The article of Comparison of the Work Ability Status in Manual and Office Workers, an Occupational Health Survey reported that excellent, good with 90% (Hosseininejad, Mirzamohammadi, Labbafinejad, Mazhari, & Mohammadi, 2017), and a similar report can be seen in work ability of Dutch construction workers with 85% (Alavinia et al., 2007). Another Hong Kong study of construction workers also reported a very high excellent and good score of 97%. It can be noted that work ability score is based on individual perception and it can be varied with different occupations and different working environments (Ng & Chan, 2018).

In this study, workability found no association with WRMSD. This finding is consistent with the finding of a large study among a variety of professionals in the UK, no significant association was found between self-rated work performances, ability with physical health, including musculoskeletal symptoms. It is reasonable to think that physical factors can be strong predictors of work ability. But one possible explanation is that there is a strong relationship between psychological health and physical health, then it covered the priority of impact physical health – in other words, musculoskeletal pain is indirectly impacting on work ability through mental well-being (Donald et al., 2005; SIU, Cooper, & Donald, 1997). However, many studies showed that there is a significant association between work ability and MSD (Fernandes, da Silva Pataro, De Carvalho, & Burdorf, 2016; Monteiro et al., 2006;

Skovlund, Bláfoss, Sundstrup, & Andersen, 2020). But these findings are very specifically related to the certain body part and not stated the overall significant result. Therefore, further research is needed on industrial workers to determine the overall association. In addition, (Gharibi et al., 2016) study revealed that job stress is significantly associated with work ability and possible factors that should be considered when we analyze with WRMSD.

5.5 Association of work productivity and WRMSD

There is no significant reported absenteeism and overall work impairment is the same as the presenteeism score of 34%. Very few articles are conducted on garment workers and rarely use WPAI. This outcome is in line with the finding of workers' mental health and productivity of different employees in Japan with 34% (Kuroda, Yamamoto, & Economy, 2018). This result is more than the study of health problems that lead to considerable productivity loss at work among industrial workers with 21%. Moreover, that study also stated that work limitation due to WRMSD is 9% which comprised huge components of productivity impairment (Meerding et al., 2005). One of the Swedish studies demonstrated that during 12 month period, 37% of workers suffer productivity impairment (G. Aronsson et al., 2000). In addition, a large study of US employees also revealed that work impairment is 27% (Boles, Pelletier, & Lynch, 2004). Another study of American workers, a developed nation, also stated that average reported productivity losses when

working while sick range around 20% (presenteeism). A significant difference may be due to huge differences in socioeconomic and working environment between countries.

Although there is no association between WRMSD and work productivity, logistic regression analysis showed that decreased productivity is the strong predictor of WRMSD. The possible explanation can be due to the chronic non-specific pain (CMP) nature of sewing operators. The work nature of sewing operation needs long working, static work and heavy pain cannot be suffered. They may be reported that musculoskeletal pain as CMP. Some studies stated that workers can perform well with CMP in work even though they have presenteeism. (Mannion et al., 2009; Van den Heuvel, Geuskens, Hooftman, Koppes, & Van den Bossche, 2010) Presenteeism "should not necessarily be interpreted as a negative thing, either for the individual or the company". Working with pain may be regarded as a healthy coping behavior, which will help to stabilize the workers' participation in work and quality of life(Waddell & Burton, 2006). Moreover, the lack of association can be explained by working hours. This might be explained by the term "extensionism", which has been introduced to describe the situation of working extended hours beyond those expected, to compensate for productivity loss by the employer. This was confirmed in our study, where actual working hours (>8hr) exceeded the expected hours (≤ 8hr). Reduce work productivity and performance can be replaced by extending more

working hours (negative absenteeism)(de Vries, Reneman, Groothoff, Geertzen, & Brouwer, 2013; Hilton, Sheridan, Cleary, & Whiteford, 2009). However many studies and literature are reported that WRMSD is a significant risk factor for work productivity (Boles et al., 2004; Daneshmandi, Choobineh, Ghaem, Alhamd, & Fakherpour, 2017; C. Jones et al., 2019)

Univariate analysis revealed that only three variables, age education, and physical demand are significantly associated with WRMSD. After controlling confounding variables, age, gender, education status, duration of work, physical demand, job insecurity, total social support, job stress, work productivity percentage (<50% and ≥50%), work ability index scores are put into the regression analysis. The binary logistic regression model showed that gender, job stress, physical demand, and work productivity are significant predictors of WRMSD. Male is 87% less likely to develop than female with a p-value of 0.046, 95% CI (0.020-0.969). Concerning job stress, high strain job is 8.2 times likely to develop WRMSD than the low strain with a p-value of 0.017, 95% CI (1.456 - 46.550). Also, high physical demand is 4.7 times more likely to develop WRMSD than low demand with a p-value of 0.029, 95% CI (1.172 – 18.562). A similar situation is seen in work productivity percentage, the ≥ 50 % productivity impairment is 5.8 times more likely to develop than the < 50% with a p-value of 0.016, 95% CI (1.393 – 24.920). Other variables are not significantly

associated with WRMSD in regression analysis. 34% of the variables can be explained by all the combinations of independent variables of the regression model.

CHAPTER 6

CONCLUSION AND RECOMMENDATION

This cross-sectional study was conducted to determine work-related musculoskeletal disorders, psychosocial factors, work productivity, and work ability among garment factory workers in Myanmar in Shwepaukkan Industrial Zone, Yangon, Myanmar. The study was designed to be a cross-sectional descriptive study to access the prevalence of WRMSD and its association with personal factors, psychosocial factors, work productivity, and work ability among garment factory workers in Shwepaukkan Industrial Zone, Yangon, Myanmar. This study revealed the personal factors, psychosocial factors, work productivity, work ability, and WRMSD. Data were collected in 2 garment factories which are agreed to participate during the COVID situation from 10th August to 12th September 2020. 2 garment factories were selected out of 15 garment factories by convenience sampling method. The total required sample size was approximately about 400. One research assistant was recruited as a research assistant and rained for one day before data collection. Inclusion, Exclusion criteria were provided to the factory authorities then approached the respondents, introduced, and explained the nature and purpose of the study. Data collection was done through the self-administered method due to the COVID situation.

The study found out that high percentages of WRMSD with 93.8 in sewing machine operators. The prevalence rate is far higher than in other studies. Many

factors and variables are included in this study. This study found an association only with age, education, and physical demand. Moreover, the study found out that gender, job stress, physical demand, and work productivity are the significant predictor of suffering WRMSD in a high odd ratio although other factors are not significantly related.

6.1. Strengths and Limitations

6.1.1 Strengths of the study

- This is the first research that uses these four variables (psychosocial factors, work productivity, workability, and work-related musculoskeletal disorder) in Garment factory workers in Myanmar.
- This study show that the high prevalence of WRMSD, high physical demand high job stress, poor work ability are the common occupational hazards among sewing machine operators in Myanmar.
- This study can provide detailed data of all four main variables which lacks in most of the studies.
- The findings of the study will be useful to the Ministry of Health and Sports, Ministry of labor, other related Social welfare organizations, Ministry of Industry in promotion well-being of workers both physically, mentally, and socially.

- This finding can help in developing occupational health law which is still underdeveloped in Myanmar .e.g. law about working hour
- At the service provider level, public health authorities could be helped to advocate and guide in strengthening the well-being of workers in all aspects

6.1.2. Limitations of the study

Although this study contributes important findings on parenting practices in Myanmar, there are many limitations.

- Firstly, as the data used in this study are collected from a cross-sectional study, the causality of the associations cannot be elaborated, so that, interpretation is limited as associations.
- Secondly, recall bias could affect the results because the survey relied exclusively on the self-administered type.
- Moreover, recall bias can affect all variables, under-reporting and over-reporting of answers should be considered.
- Response bias should be considered because all are validated questionnaires and can lead to misleading and misunderstanding of questionnaires.
- Other workplace physical factors such as heat, noise, light, and environmental factors such as job design are not included in the study and this can be a huge influence on WRMSD prevalence.

- These findings may not represent male because 95.4% are occupied by female and focusing only on sewing machine operators and cannot represent the whole garment factory.

6.2. Recommendation

This study aimed to determine the percentages of work-related musculoskeletal disorder psychosocial factors, work productivity, workability of sewing machine operators. Based on the finding, recommendations are discussed in two components; for program implementation and further research.

6.2.1 Recommendation for program implementation

- The prevalence of WRMSD is very high compared to other studies. To reduce the prevalence of WRMSD, workers should be supported physically and mentally. For example high temperature, poor ventilation, limited working space, unpleasant odors, poor seating, and poor sanitation in toilets.
- Job stress prevalence is 20% which occupied one-fifth of the study population and it can be regarded as high job stress in sewing operators. To reduce this, self-centered stress management ways are recommended. As an example, playing music at the factory, exercise promotion during break time, building playground and creation of happy working environment by factory authorities.

- Working hours should be reduced as prolong working hours are confirmed in this study. Adjust the workload and reducing time pressure according to the action plan which will be designed by the factory authorities.
- Proper job training program to prevent WRMSD. Workers must learn about the risk factors of MSD's and how to make ergonomic changes to prevent them.
- As reported high physical demand, high WRMSD, it is better to provide ergonomic tools and chairs. Using the wrong tool can cause immense discomfort and long-term side effects.
- The work ability score is moderate and needs to be improved. Finding the factors that relate to the decrease work ability should be explored and implementation programs should start as early as possible as it can impact the country's economy.
- It is also important to strengthen the legal framework, policies, and services for the prevention and response to the well-being of workers. Hence, respective authorities should implement the occupational health law that is still underdeveloped in Myanmar.

6.2.2. Recommendation for further research

- As the study was conducted in Yangon Region, Myanmar, the percentages of WRMSD and association are different from other country regions. Therefore, it

is advisable to conduct in other regions in Myanmar to know more about the percentages of WRMSD and association.

- As the study includes only sewing operators, the other sectors of the garment factory workers should include in the further study.
- This study includes the self-administered type and many biases can contain. Therefore, other studies should be conducted with interviewed types to reduce biases.
- This study does not include physical factors such as job design, heat, noise light and should conduct in the future study using these factors.
- Both quantitative and qualitative measures should be conducted to identify the associated factors of WRMSD among sewing machine operators.
- Further prospective studies, evidence-based investigation, and research by using longitudinal study designs should be carried out based on the results and findings of this study to address the cause and effect relationship of WRMSD among sewing operators.
- Intervention programs to reduce WRMSD, reduce psychosocial factors, promote work ability and work productivity are also conducted to know the effectiveness of these programs which is valued for the well-being of the workers.

- Further study should use different instruments and different models for these factors to identify the WRMSD and associated factors.

REFERENCES

Abaraogu, U., Okafor, C., Ezeukwu, A. O., & Igwe, S. E. (2015). Prevalence of work-related musculoskeletal discomfort and its impact on activity: A Survey of Beverage Factory Workers in Eastern Nigeria. *Work (Reading, Mass.), 52*. doi:10.3233/WOR-152100

Adel, M., Akbar, R., & Ehsan, G. (2019). Validity and reliability of work ability index (WAI) questionnaire among Iranian workers; a study in petrochemical and car manufacturing industries. *Journal of occupational health, 61*(2), 165-174. doi:10.1002/1348-9585.12028

Adib Ibrahim, M., Abdul Aziz, A., Suhaili, N. A., Zahid Daud, A., Naing, L., & Abdul Rahman, H. (2019). A Study into Psychosocial Work Stressors and Health Care Productivity. *Int J Occup Environ Med, 10*(4), 185-193. doi:10.15171/ijoem.2019.1610

Afifehzadeh-Kashani, H., Choobineh, A., Bakand, S., Gohari, M., Abbastabar, H., & Moshtaghi, P. (2011). Validity and reliability of farsi version of Cornell Musculoskeletal Discomfort Questionnaire (CMDQ).

Afonso, L., Pinho, M., & Arezes, P. (2014). Prevalence of WMSD in the sewing sector of two companies of the footwear industry.

Aghili, M. M., Asilian, H., & Poursafa, P. (2012). Evaluation of musculoskeletal disorders in sewing machine operators of a shoe manufacturing factory in Iran. *J Pak Med Assoc, 62*(3 Suppl 2), S20-25.

Aghilinejad, M., Choobineh, A. R., Sadeghi, Z., Nouri, M. K., & Bahrami Ahmadi, A. (2012). Prevalence of Musculoskeletal Disorders among Iranian Steel Workers. *Iranian Red Crescent medical journal, 14*(4), 198-203.

Ahmad, S. A., Sayed, M., Khan, M. H., Faruquee, M., Yasmin, N., Hossain, Z., . . . medicine, s. (2007). Musculoskeletal Disorders and Ergonomic Factors among the Garment Workers. *26*(2), 97-110.

Airila, A., Hakanen, J., Punakallio, A., Lusa, S., & Luukkonen, R. (2012). Is work engagement related to work ability beyond working conditions and lifestyle factors? *Int Arch Occup Environ Health, 85*(8), 915-925. doi:10.1007/s00420-012-0732-1

Ak, A., Ba, T., & Adebisi, O. A. (2013). Prevalence, Pattern and Impact of Musculoskeletal Disorders among Sewing Machine Operators in Surulere Local Government Area of Lagos State, Nigeria. *Indian Journal of Physiotherapy and Occupational Therapy, 7*(2), 15-20.

Akinpelu, A., Oyewole, O., Odole, A., & Ogunbamowo, F. (2016). Work-related musculoskeletal pain and health-seeking behavior among Nigerian sewing machine operators. *Tropical Journal of Medical Research, 19*, 152.

Akodu, A. K., & Ashalejo, Z. O. (2019). Work-related musculoskeletal disorders and work ability among hospital nurses. *Journal of Taibah University Medical Sciences, 14*(3), 252-261. doi:https://doi.org/10.1016/j.jtumed.2019.02.009

Alavinia, S. M., van Duivenbooden, C., & Burdorf, A. (2007). Influence of work-related factors and individual characteristics on work ability among Dutch construction workers. *Scand J Work Environ Health, 33*(5), 351-357. doi:10.5271/sjweh.1151

Albert, V., Coutu, M.-F., & Durand, M.-J. J. C. J. o. O. T. (2011). Structure factorielle et cohérence interne de l'Échelle de mesure du sentiment d'efficacité personnelle. *78*(5), 311-317.

Allen, H. (2008). Using routinely collected data to augment the management of health and productivity loss. *J Occup Environ Med, 50*(6), 615-632. doi:10.1097/JOM.0b013e31817b610c

Amin, N. A., Nordin, R., Fatt, Q. K., Noah, R. M., & Oxley, J. (2014). Relationship between Psychosocial Risk Factors and Work-Related Musculoskeletal Disorders among Public Hospital Nurses in Malaysia. *Annals of occupational and environmental medicine, 26*, 23-23. doi:10.1186/s40557-014-0023-2

Amiri, S., & Behnezhad, S. (2020). Is job strain a risk factor for musculoskeletal pain? A systematic review and meta-analysis of 21 longitudinal studies. *Public Health, 181*, 158-167. doi:https://doi.org/10.1016/j.puhe.2019.11.023

Andersen, J. H., & Gaardboe, O. (1993). Musculoskeletal disorders of the neck and upper limb among sewing machine operators: a clinical investigation. *Am J Ind Med, 24*(6), 689-700. doi:10.1002/ajim.4700240605

Andersen, J. H., & Gaardboe, O. J. A. j. o. i. m. (1993). Prevalence of persistent neck and upper limb pain in a historical cohort of sewing machine operators. *24*(6), 677-687.

Andersen, L. L., Izquierdo, M., Sundstrup, E. J. I. a. o. o., & health, e. (2017). Overweight and obesity are progressively associated with lower work ability in the general working population: cross-sectional study among 10,000 adults. *90*(8), 779-787.

Aronsson, G., Gustafsson, K., & Dallner, M. (2000). Sick but yet at work. An empirical study of sickness presenteeism. *Journal of epidemiology and community health, 54*(7), 502-509. doi:10.1136/jech.54.7.502

Aronsson, G., Gustafsson, K. J. J. o. o., & medicine, e. (2005). Sickness presenteeism: prevalence, attendance-pressure factors, and an outline of a model for research. *47*(9), 958-966.

ASSOCIATES, R. (2019). WPAI General Information.

Bakker, A. B., & Demerouti, E. J. J. o. m. p. (2007). The job demands‐resources model: State of the art.

Barbieri, D. F., Nogueira, H. C., Bergamin, L. J., & Oliveira, A. B. (2012). Physical and psychosocial indicators among office workers from public sector with and without musculoskeletal symptoms. *Work, 41*, 2461-2466. doi:10.3233/WOR-2012-0481-2461

Barr, A. E., Amin, M., & Barbe, M. F. (2002). Dose-Response Relationship between Reach Repetition and Indicators of Inflammation and Movement Dysfunction in a Rat Model of Work-Related Musculoskeletal Disorder. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 46*(16), 1486-1490. doi:10.1177/154193120204601617

Barr, A. E., Barbe, M. F., & Clark, B. D. (2004). Work-related musculoskeletal disorders of the hand and wrist: epidemiology, pathophysiology, and sensorimotor changes. *J Orthop Sports Phys Ther, 34*(10), 610-627. doi:10.2519/jospt.2004.34.10.610

Barzideh, M., Choobineh, A., & Tabatabaee, H. J. W. (2014). Job stress dimensions and their relationship to musculoskeletal disorders in Iranian nurses. *47*(4), 423-429.

Berecki-Gisolf, J., Clay, F. J., Collie, A., & McClure, R. J. J. J. o. o. r. (2012). Predictors of sustained return to work after work-related injury or disease: insights from workers' compensation claims records. *22*(3), 283-291.

Bernard, B. P., & Putz-Anderson, V. (1997). Musculoskeletal disorders and workplace factors; a critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity, and low back.

Bethge, M., Radoschewski, F. M., & Gutenbrunner, C. J. J. o. r. m. (2012). The Work Ability Index as a screening tool to identify the need for rehabilitation: longitudinal findings from the Second German Sociomedical Panel of Employees. *44*(11), 980-987.

Bevan, S. (2015). Economic impact of musculoskeletal disorders (MSDs) on work in Europe. *Best Practice & Research Clinical Rheumatology, 29*(3), 356-373. doi:https://doi.org/10.1016/j.berh.2015.08.002

Birschel, D. J. B. Q. (2006). Lost-Worktime Injuries and Illnesses: Characteristics and Resulting Time Away From Work, 2004. *22*(2), 61.

Blåder, S., Barck-Holst, U., Danielsson, S., Ferhm, E., Kalpamaa, M., Leijon, M., . . . Markhede, G. (1991). Neck and shoulder complaints among sewing-machine operators: a study concerning frequency, symptomatology and dysfunction. *Appl Ergon, 22*(4), 251-257. doi:10.1016/0003-6870(91)90228-a

Boles, M., Pelletier, B., & Lynch, W. (2004). The Relationship Between Health Risks and Work Productivity. *Journal of Occupational and Environmental Medicine, 46*(7).

Burnley, D. G. a. J. (December 2015). MADE IN MYANMAR -Entrenched poverty or decent jobs for garment workers? *Oxfam International December 2015*.

Burton, W. N., Conti, D. J., Chen, C. Y., Schultz, A. B., & Edington, D. W. (1999). The role of health risk factors and disease on worker productivity. *J Occup Environ Med, 41*(10), 863-877. doi:10.1097/00043764-199910000-00007

Burton, W. N., Conti Dj Fau - Chen, C. Y., Chen Cy Fau - Schultz, A. B., Schultz Ab Fau - Edington, D. W., & Edington, D. W. The role of health risk factors and disease on worker productivity. (1076-2752 (Print)).

Bush, I. L. N. a. P. M. (2012). Work-Related Musculoskeletal Disorders Assessment and Prevention, Ergonomics - A Systems Approach, Dr. Isabel L. Nunes (Ed.),. doi:978-953-51-0601-2

Cancelliere, C., Cassidy, J. D., Ammendolia, C., & Côté, P. (2011). Are workplace health promotion programs effective at improving presenteeism in workers? A systematic review and best evidence synthesis of the literature. *BMC Public Health, 11*, 395-395. doi:10.1186/1471-2458-11-395

Carroll, L., Mercado, A. C., Cassidy, J. D., & Côté, P. (2002). A population-based study of factors associated with combinations of active and passive coping with neck and low back pain. *J Rehabil Med, 34*(2), 67-72. doi:10.1080/165019702753557854

Caruso, C. C., Bushnell, T., Eggerth, D., Heitmann, A., Kojola, B., Newman, K., . . . Vila, B. J. A. j. o. i. m. (2006). Long working hours, safety, and health: toward a National Research Agenda. *49*(11), 930-942.

Casey, L. P.-T. L., R. (2014). Stress and Wellbeing Survey 2014. Australia: APS. *Australian Psychological Society (APS)*.

Chang, Y.-F., Yeh, C.-M., Huang, S.-L., Ho, C.-C., Li, R.-H., Wang, W.-H., & Tang, F.-C. (2020). Work Ability and Quality of Life in Patients with Work-Related Musculoskeletal Disorders. *17*(9), 3310.

Charan, J., & Biswas, T. (2013). How to calculate sample size for different study designs in medical research? *Indian journal of psychological medicine, 35*(2), 121-126. doi:10.4103/0253-7176.116232

Choobineh, A., Motamedzade, M., Kazemi, M., Moghimbeigi, A., & Heidari Pahlavian, A. (2011). The impact of ergonomics intervention on psychosocial factors and musculoskeletal symptoms among office workers. *International Journal of Industrial Ergonomics, 41*(6), 671-676. doi:https://doi.org/10.1016/j.ergon.2011.08.007

Cordeiro, T. M. S. C. e., Souza, D. S., & Araújo, T. M. d. (2017). Validity, Reproducibility and Reliability of the Work Ability Index: A Systematic Review. *2017, 7*(1), 10 %J Revista de Epidemiologia e Controle de Infecção. doi:10.17058/reci.v7i1.7788

Costa, A. F., Puga-Leal, R., & Nunes, I. L. (2011). An exploratory study of the Work Ability Index (WAI) and its components in a group of computer workers. *Work, 39*, 357-367. doi:10.3233/WOR-2011-1186

Costa, B., & Vieira, E. (2009). Risk Factors for Work-Related Musculoskeletal Disorders: A Systematic Review of Recent Longitudinal Studies. *American Journal of Industrial Medicine, 53*, 285-323. doi:10.1002/ajim.20750

Da Costa, B. R., & Vieira, E. R. J. A. j. o. i. m. (2010). Risk factors for work‐related musculoskeletal disorders: a systematic review of recent longitudinal studies. *53*(3), 285-323.

Daneshmandi, H., Choobineh, A. R., Ghaem, H., Alhamd, M., & Fakherpour, A. (2017). The effect of musculoskeletal problems on fatigue and productivity of office personnel: a cross-sectional study. *Journal of preventive medicine and hygiene, 58*(3), E252-E258.

Daniel, W. W., & Cross, C. L. (2018). *Biostatistics: a foundation for analysis in the health sciences*: Wiley.

de Vries, H. J., Reneman, M. F., Groothoff, J. W., Geertzen, J. H. B., & Brouwer, S. (2013). Self-reported Work Ability and Work Performance in Workers with Chronic Nonspecific Musculoskeletal Pain. *J Occup Rehabil, 23*(1), 1-10. doi:10.1007/s10926-012-9373-1

De Witte, H. J. S. j. o. I. P. (2005). Job insecurity: Review of the international literature on definitions, prevalence, antecedents and consequences. *31*(4), 1-6.

de Zwart, B. C. H., Frings‐Dresen, M. H. W., & van Duivenbooden, J. C. (2002). Test–retest reliability of the Work Ability Index questionnaire. *Occupational Medicine, 52*(4), 177-181. doi:10.1093/occmed/52.4.177 %J Occupational Medicine

Dianat, I., Kord, M., Yahyazade, P., Karimi, M. A., & Stedmon, A. W. (2015). Association of individual and work-related risk factors with musculoskeletal symptoms among Iranian sewing machine operators. *Applied Ergonomics, 51*, 180-188. doi:https://doi.org/10.1016/j.apergo.2015.04.017

Dianat, I., & Salimi, A. J. E. (2014). Working conditions of Iranian hand-sewn shoe workers and associations with musculoskeletal symptoms. *57*(4), 602-611.

Donald, I., Taylor, P., Johnson, S., Cooper, C., Cartwright, S., & Robertson, S. J. I. J. o. S. M. (2005). Work environments, stress, and productivity: An examination using ASSET. *12*(4), 409.

Edimansyah, B. A., Rusli, B. N., Naing, L., Rusli, B. A. M., Winn, T., & Ariff, B. R. H. T. M. J. I. h. (2008). Self-perceived depression, anxiety, stress and their relationships with psychosocial job factors in male automotive assembly workers. *46*(1), 90-100.

El Fassi, M., Bocquet, V., Majery, N., Lair, M. L., Couffignal, S., & Mairiaux, P. (2013). Work ability assessment in a worker population: comparison and determinants of Work Ability Index and Work Ability score. *BMC Public Health, 13*(1), 305. doi:10.1186/1471-2458-13-305

Engkvist, I.-L., Hjelm, E. W., Hagberg, M., Menckel, E., & Ekenvall, L. (2000). Risk indicators for reported over-exertion back injuries among female nursing personnel. In: LWW.

Erdinc, O., Hot, K., & Ozkaya, M. J. W. (2011). Turkish version of the Cornell Musculoskeletal Discomfort Questionnaire: cross-cultural adaptation and validation. *39*(3), 251-260.

Escorpizo, R. (2008). Understanding work productivity and its application to work-related musculoskeletal disorders. *International Journal of Industrial Ergonomics, 38*(3), 291-297. doi:https://doi.org/10.1016/j.ergon.2007.10.018

Escorpizo, R., Bombardier, C., Boonen, A., Hazes, J. M., Lacaille, D., Strand, V., & Beaton, D. J. T. J. o. R. (2007). Worker productivity outcome measures in arthritis. *34*(6), 1372-1380.

Eurofound. (2007). 4th European Working Survey.

Eurofound. (2010). Fifth European Working Conditions survey 2010.

Eurofound. (2017). Sixth European Working Conditions Survey – Overview report (2017 update). *Publications Office of the European Union, Luxembourg.*

Fernandes, R. d. C. P., da Silva Pataro, S. M., De Carvalho, R. B., & Burdorf, A. J. B. P. H. (2016). The concurrence of musculoskeletal pain and associated work-related factors: a cross sectional study. *16*(1), 1-9.

Ferreira Jr, M., & Saldiva, P. H. J. A. E. (2002). Computer–telephone interactive tasks: predictors of musculoskeletal disorders according to work analysis and workers' perception. *33*(2), 147-153.

Fogleman, M., & Lewis, R. J. J. I. J. o. I. E. (2002). Factors associated with self-reported musculoskeletal discomfort in video display terminal (VDT) users. *29*(6), 311-318.

Forastieri, V. (2016). Psychosocial risks, stress and violence in the world of work. *International Journal of Labour Research, 8*(1-2).

Gharibi, V., Mokarami, H., Taban, A., Yazdani Aval, M., Samimi, K., & Salesi, M. (2016). Effects of Work-Related Stress on Work Ability Index among Iranian Workers. *Safety and health at work, 7*(1), 43-48. doi:https://doi.org/10.1016/j.shaw.2015.10.005

Ghasemkhani, M., Mahmudi, E., & Jabbari, H. (2008). Musculoskeletal Symptoms In Workers. *International Journal of Occupational Safety and Ergonomics, 14*(4), 455-462. doi:10.1080/10803548.2008.11076784

Gholami, T., Rahnavard, N., Sadeghzadeh, M., & Tahmtan, S. (2018). Application of MAPO Index and JCQ in Assessing the Risk of Musculoskeletal Disorders and Psychosocial Stressors in Nurse Aids at Fasa Hospital. *Iran-J-Ergon, 6*(2), 24-33. doi:10.30699/jergon.6.2.24

Godde, K., & Taylor, R. W. J. F. s. i. (2011). Musculoskeletal stress marker (MSM) differences in the modern American upper limb and pectoral girdle in relation to activity level and body mass index (BMI). *210*(1-3), 237-242.

Gold, J. E., Punnett, L., & Katz, J. N. (2006). Pressure pain thresholds and musculoskeletal morbidity in automobile manufacturing workers. *International Archives of Occupational and Environmental Health, 79*(2), 128-134. doi:10.1007/s00420-005-0005-3

Gupta, R. D. (2015). Occupational Health Hazards among Workers in Garment Factories in Bangladesh: A Cross-Sectional Study *IISTE, Vol.5, No.5*.

Hagberg, M., Tornqvist, E. W., & Toomingas, A. J. J. o. o. r. (2002). Self-reported reduced productivity due to musculoskeletal symptoms: associations with workplace and individual factors among white-collar computer users. *12*(3), 151-162.

Hall, G. B., Dollard, M. F., & Coward, J. J. I. J. o. S. M. (2010). Psychosocial safety climate: Development of the PSC-12. *17*(4), 353.

Harris, C., Daniels, K., Briner, R. B. J. B. J. o. G., & Counselling. (2004). How do work stress and coping work? Toward a fundamental theoretical reappraisal. *32*(2), 223-234.

Hauke, A., Flintrop, J., Brun, E., & Rugulies, R. (2011). The impact of work-related psychosocial stressors on the onset of musculoskeletal disorders in specific body regions: A review and meta-analysis of 54 longitudinal studies. *Work & Stress, 25*(3), 243-256. doi:10.1080/02678373.2011.614069

Health, C. o. S. a. (2015). Why Education Matters to Health: Exploring the Causes.

Hedge, A., Morimoto, S., & Mccrobie, D. J. E. (1999). Effects of keyboard tray geometry on upper body posture and comfort. *42*(10), 1333-1349.

Hilton, M. F., Sheridan, J., Cleary, C. M., & Whiteford, H. A. J. I. J. o. M. i. P. R. (2009). Employee absenteeism measures reflecting current work practices may be instrumental in a re-evaluation of the relationship between psychological distress/mental health and absenteeism. *18*(1), 37-47.

Hossain, M. D., Aftab, A., Al Imam, M. H., Mahmud, I., Chowdhury, I. A., Kabir, R. I., & Sarker, M. J. P. o. (2018). Prevalence of work related musculoskeletal disorders (WMSDs) and ergonomic risk assessment among readymade garment workers of Bangladesh: A cross sectional study. *13*(7), e0200122.

Hosseininejad, M., Mirzamohammadi, E., Labbafinejad, Y., Mazhari, A. M., & Mohammadi, S. J. J. P. H. (2017). Comparison of the Work Ability Status in Manual and Office Workers–an Occupational Health Survey. *2*(3), 555590.

Hoy, D. G., Smith, E., Cross, M., Sanchez-Riera, L., Blyth, F. M., Buchbinder, R., . . . March, L. M. (2015). Reflecting on the global burden of musculoskeletal

conditions: lessons learnt from the global burden of disease 2010 study and the next steps forward. *Ann Rheum Dis, 74*(1), 4-7. doi:10.1136/annrheumdis-2014-205393

Hoy, D. G., Smith, E., Cross, M., Sanchez-Riera, L., Buchbinder, R., Blyth, F. M., . . . March, L. M. (2014). The global burden of musculoskeletal conditions for 2010: an overview of methods. *Ann Rheum Dis, 73*(6), 982-989. doi:10.1136/annrheumdis-2013-204344

HSE. (2020). Working days lost in Great Britain.

Ilmarinen, J. J. O. m. (2007). The work ability index (WAI). *57*(2), 160-160.

Ilmarinen, J. J. S. j. o. w., environment, & health. (2009). Work ability—a comprehensive concept for occupational health research and prevention. *35*(1), 1-5.

ILO. (2016). Workplace stress: a collective challange.

ILO. (2021a). Decent work for sustainable development (DW4SD) Resource Platform

ILO. (2021b). Psychosocial risks and work-related stress.

Jaffar, N. A. T., & Rahman, M. N. A. (2017). Review on risk factors related to lower back disorders at workplace. *IOP Conference Series: Materials Science and Engineering, 226*, 012035. doi:10.1088/1757-899x/226/1/012035

Jahan, N., Das, M., Mondal, R., Paul, S., Saha, T., Akhtar, R., . . . Banik, P. C. J. S. m. j. (2015). Prevalence of musculoskeletal disorders among the Bangladeshi garments workers. *2*(1), 102-113.

Johnson, J. V., Hall, E. M., Theorell, T. J. S. j. o. w., environment, & health. (1989). Combined effects of job strain and social isolation on cardiovascular disease morbidity and mortality in a random sample of the Swedish male working population. 271-279.

Johnson, J. V., & Hall, E. M. J. A. j. o. p. h. (1988). Job strain, work place social support, and cardiovascular disease: a cross-sectional study of a random sample of the Swedish working population. *78*(10), 1336-1342.

Johnston, V., Souvlis, T., Jimmieson, N. L., & Jull, G. J. A. e. (2008). Associations between individual and workplace risk factors for self-reported neck pain and disability among female office workers. *39*(2), 171-182.

Jones, C., Payne, K., Gannon, B., & Verstappen, S. (2016). Economic Theory and Self-Reported Measures of Presenteeism in Musculoskeletal Disease. *Current rheumatology reports, 18*(8), 53-53. doi:10.1007/s11926-016-0600-1

Jones, C., Verstappen, S. M. M., & Payne, K. (2019). A Systematic Review of Productivity in Economic Evaluations of Workplace Interventions: A Need for Reporting Criteria? *Applied Health Economics and Health Policy, 17*(5), 591-613. doi:10.1007/s40258-019-00473-8

Jones, F., Bright, J., & Clow, A. (2001). *Stress : myth, theory and research*. Harlow, England; New York: Prentice Hall.

Juszczyk, G., Czerw, A. I., Religioni, U., Olejniczak, D., Walusiak-Skorupa, J., Banas, T., . . . Staniszewska, A. (2019). Work Ability Index (WAI) values in a sample of the working population in Poland. *26*(1), 78-84. doi:10.26444/aaem/91471

Kabir, H., Maple, M., Usher, K., & Islam, M. S. (2019). Health vulnerabilities of readymade garment (RMG) workers: a systematic review. *BMC Public Health, 19*(1), 70. doi:10.1186/s12889-019-6388-y

Kaka, B., Idowu, O. A., Fawole, H. O., Adeniyi, A. F., Ogwumike, O. O., & Toryila, M. T. (2016). An Analysis of Work-Related Musculoskeletal Disorders Among Butchers in Kano Metropolis, Nigeria. *Safety and health at work, 7*(3), 218-224. doi:https://doi.org/10.1016/j.shaw.2016.01.001

Karasek Jr, R. A. J. A. s. q. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. 285-308.

Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The Job Content Questionnaire (JCQ): an instrument for internationally comparative assessments of psychosocial job characteristics. *J Occup Health Psychol, 3*(4), 322-355. doi:10.1037//1076-8998.3.4.322

Karlqvist, L., Tornqvist, E. W., Hagberg, M., Hagman, M., & Toomingas, A. (2002). Self-reported working conditions of VDU operators and associations with musculoskeletal symptoms: a cross-sectional study focussing on gender differences. *International Journal of Industrial Ergonomics, 30*(4), 277-294. doi:https://doi.org/10.1016/S0169-8141(02)00131-2

Kaufman, J. D., & Rosenstock, L. (1991). The role of worker education in preventing occupational lung disease. *Occup Med, 6*(1), 1-9.

Kessler, R. C., Ames, M., Hymel, P. A., Loeppke, R., McKenas, D. K., Richling, D. E., . . . Medicine, E. (2004). Using the World Health Organization Health and Work Performance Questionnaire (HPQ) to evaluate the indirect workplace costs of illness. *46*(6), S23-S37.

Kim, Y., Park, J., Rhee, K. Y., & Kim, H. (2015). Second Korean Working Conditions Survey: A Comparison between the Second KWCS and the First Korean Working Conditions Survey. *Safety and health at work, 1*. doi:10.1016/j.shaw.2015.02.005

Kitronza, P. L., Mairiaux, P. J. T. m., & health. (2015). Occupational stress among textile workers in the Democratic Republic of Congo.

Kivimäki, M., Vahtera, J., Ferrie, J. E., Hemingway, H., Pentti, J. J. O., & medicine, e. (2001). Organisational downsizing and musculoskeletal problems in employees: a prospective study. *58*(12), 811-817.

Koyuncu, N., & Karcioglu, Ö. (2018). Musculoskeletal complaints in healthcare personnel in hospital: An interdepartmental, cross-sectional comparison. *Medicine, 97*(40).

Krause, N., Rugulies, R., Ragland, D. R., & Syme, S. L. J. A. j. o. i. m. (2004). Physical workload, ergonomic problems, and incidence of low back injury: A 7.5‐year prospective study of San Francisco transit operators. *46*(6), 570-585.

Kreuzfeld, S., Seibt, R., Kumar, M., Rieger, A., Stoll, R. J. J. o. O. M., & Toxicology. (2016). German version of the Cornell Musculoskeletal Discomfort Questionnaire (CMDQ): translation and validation. *11*(1), 1-12.

Kuorinka, I., Forcier, L., Hagberg, M., Silverstein, B., Wells, R., Smith, M., . . . Pérusse, M. (1995). *Work related musculoskeletal disorders (WMSDs): a reference book for prevention*: Taylor & Francis London.

Kuroda, S., Yamamoto, I. J. J., & Economy, t. W. (2018). Good boss, bad boss, workers' mental health and productivity: Evidence from Japan. *48*, 106-118.

Lang, J., Ochsmann, E., Kraus, T., Lang, J. W. J. S. s., & medicine. (2012). Psychosocial work stressors as antecedents of musculoskeletal problems: a systematic

review and meta-analysis of stability-adjusted longitudinal studies. *75*(7), 1163-1174.

Lazarus, R. S., & Launier, R. (1978). Stress-related transactions between person and environment. In *Perspectives in interactional psychology* (pp. 287-327): Springer.

Lazarus, R. S. J. J. o. p. (2006). Emotions and interpersonal relationships: Toward a person‐centered conceptualization of emotions and coping. *74*(1), 9-46.

Lazarus, R. S. J. S., appraisal,, & coping. (1986). Folkman. S.(1984). 117-180.

Li, G., Haslegrave, C. M., & Corlett, E. N. J. A. e. (1995). Factors affecting posture for machine sewing tasks: the need for changes in sewing machine design. *26*(1), 35-46.

Lidstone, J., Ells, L., Finn, P., Whittaker, V., Wilkinson, J., & Summerbell, C. J. P. h. (2006). Independent associations between weight status and disability in adults: results from the Health Survey for England. *120*(5), 412-417.

Link, B. G., Phelan, J. J. J. o. h., & behavior, s. (1995). Social conditions as fundamental causes of disease. 80-94.

Lowe, G. S. (2003). *Healthy workplaces and productivity: a discussion paper*: Minister of Public Works and Government Services Canada.

Maduagwu, S., Sokunbi, G., Bwala, M., Akanbi, O., Jajere, A., Jaiyeola, O., . . . Affairs, H. (2015). Work-related musculoskeletal disorders among self employed sewing machine operators in maiduguri, Nigeria.

Maduagwu, S. M., Maijindadi, R. D., Duniya, K. I., Oyeyemi, A. A., Saidu, I. A., Aremu, B. J. J. O. M., & Affairs, H. (2014). Prevalence and patterns of work-related musculoskeletal disorders among bankers in Maiduguri, Northeast Nigeria. 1-6.

Mannion, A. F., Horisberger, B., Eisenring, C., Tamcan, O., Elfering, A., Müller, U. J. J. o. O., & Medicine, E. (2009). The association between beliefs about low back pain and work presenteeism. *51*(11), 1256-1266.

Marian Boquiren, M. I. V. I., Thein Than Htay and Aung Myaing Htay. (2019). OccupationalSafety and Health in the MyanmarGarment Sector;EXECUTIVE SUMMARY. *ILO*.

Mazloumi, A., Rostamabadi, A., Saraji, J. N., & Foroushani, A. R. J. J. o. o. h. (2012). Work ability index (WAI) and its association with psychosocial factors in one of the petrochemical industries in Iran. 1202130234-1202130234.

McTernan, W. P., Dollard, M. F., LaMontagne, A. D. J. W., & Stress. (2013). Depression in the workplace: An economic cost analysis of depression-related productivity loss attributable to job strain and bullying. *27*(4), 321-338.

Meerding, W. J., Ijzelenberg, W., Koopmanschap, M. A., Severens, J. L., & Burdorf, A. (2005). Health problems lead to considerable productivity loss at work among workers with high physical load jobs. *Journal of Clinical Epidemiology, 58*(5), 517-523. doi:https://doi.org/10.1016/j.jclinepi.2004.06.016

Mehta, E., Mehta, M., Sharma, P. K. J. I. J. o. H., & Wellbeing. (2020). A study on work-related musculoskeletal disorders among sewing machine operators. *11*.

Mehta, R. K., & Parijat, P. J. W. (2012). Associations between psychosocial risk factors and musculoskeletal disorders: application to the IT profession in India. *41*(Supplement 1), 2438-2444.

Merisalu, E., Mannaste, M., Hiir, K., & Traumann, A. J. A. R. (2016). Predictors and prevalence of musculoskeletal disorders among sewing machine operators. *14*(4), 1417-1426.

MHLW. (2011). Survey on the Prevention of Industrial Accidents(Tokyo, MHLW).

Ming, Z., & Zaproudina, N. J. P. (2003). Computer use related upper limb musculoskeletal (ComRULM) disorders. *9*(3), 155-160.

Mohan, G. M., Elangovan, S., Prasad, P., Krishna, P. R., & Mokkapati, A. K. J. W. (2008). Prevalence of job strain among Indian foundry shop floor workers. *30*(4), 353-357.

Monteiro, M. S., Ilmarinen, J., Filho, H. R. C. J. I. J. o. O. S., & Ergonomics. (2006). Work ability of workers in different age groups in a public health institution in Brazil. *12*(4), 417-427.

Nag, A., Vyas, H., Shah, P., & Nag, P. K. (2012). Risk factors and musculoskeletal disorders among women workers performing fish processing. *55*(9), 833-843. doi:https://doi.org/10.1002/ajim.22075

Nagaraj, T. S., & Jeyapaul, R. (2018). Ergonomic Study on Work Postures of Sewing Machine Operators in Government Industry: A Case in Lean Environment Garment Industry. In *Ergonomic Design of Products and Worksystems-21st Century Perspectives of Asia* (pp. 83-101): Springer.

Nagaraj, T. S., Jeyapaul, R., & Mathiyazhagan, K. J. I. J. o. I. E. (2019). Evaluation of ergonomic working conditions among standing sewing machine operators in Sri Lanka. *70*, 70-83.

Nazari, J., Mahmoudi, N., Dianat, I., & Graveling, R. J. H. p. p. (2012). Working Conditions in Carpet Weaving Workshops and Muscu-loskeletal Complaints among Workers in Tabriz-Iran. *2*(2), 265.

Ng, J. Y. K., & Chan, A. H. S. (2018). The Work Ability of Hong Kong Construction Workers in Relation to Individual and Work-Related Factors. *Int J Environ Res Public Health, 15*(5). doi:10.3390/ijerph15050990

Niu, S. (2010). Ergonomics and occupational safety and health: An ILO perspective. *Applied Ergonomics, 41*(6), 744-753. doi:https://doi.org/10.1016/j.apergo.2010.03.004

Nourbakhsh, M. R., Moussavi, S. J., & Salavati, M. J. C. S. S. (2001). Effects of lifestyle and work-related physical activity on the degree of lumbar lordosis and chronic low back pain in a Middle East population. *14*(4), 283-292.

Nunes, I. L. J. W. (2009). FAST ERGO_X–a tool for ergonomic auditing and work-related musculoskeletal disorders prevention. *34*(2), 133-148.

Nygård, C.-H., Savinainen, M., Kirsi, T., & Lumme-Sandt, K. (2011). *Age Management during the Life Course-Proceedings of the 4th Symposium on Work Ability*: Tampere University Press.

O'Donnell, M. P. (2000). Health and Productivity Management: The Concept, Impact, and Opportunity: Commentary to Goetzel and Ozminkowski. *American Journal of Health Promotion, 14*(4), 215-217. doi:10.4278/0890-1171-14.4.215

Okunribido, O. J. H., & Excutive, S. (2009). Lower Limb MSD-Scoping work to help inform advice and research planning.

Oranye, N. O., Wallis, B., Roer, K., Archer-Heese, G., Aguilar, Z. J. W. h., & safety. (2016). Do personal factors or types of physical tasks predict workplace injury? *, 64*(4), 141-151.

Oyebamiji, M., & Akintayo, D. J. W. J. o. E. (2011). Some Psychological Factors as Predictors of Perceived Workers' Productivity in Private Organizations in Nigeria. *1*(2), 30-38.

Öztürk, N., & Esin, M. N. (2011). Investigation of musculoskeletal symptoms and ergonomic risk factors among female sewing machine operators in Turkey. *International Journal of Industrial Ergonomics, 41*(6), 585-591. doi:https://doi.org/10.1016/j.ergon.2011.07.001

Pacheco Ferreira, A. J. C. T. (2015). Work ability and psychosocial factors among hairdressers workers, Rio de Janeiro, Brazil. 83-88.

Pensola, T., Haukka, E., Kaila-Kangas, L., Neupane, S., & Leino-Arjas, P. J. S. j. o. p. h. (2016). Good work ability despite multisite musculoskeletal pain? A study among occupationally active Finns. *44*(3), 300-310.

Phillips, C., Main, C., Buck, R., Aylward, M., Wynne-Jones, G., & Farr, A. (2008). Prioritising pain in policy making: The need for a whole systems perspective. *Health Policy, 88*(2), 166-175. doi:https://doi.org/10.1016/j.healthpol.2008.03.008

Phillips, V., Hunsaker, A., & Florence, C. S. J. S. c. (2012). Return to work and productive activities following a spinal cord injury: the role of income and insurance. *50*(8), 623-626.

Polajnar, A., Leber, M., & Herzog, N. V. J. S. V. J. o. M. E. (2010). Muscular-Skeletal Diseases Require Scientifically Designed Sewing Workstations. *56*(1).

Pourhoseingholi, M. A., Vahedi, M., & Rahimzadeh, M. (2013). Sample size calculation in medical studies. *Gastroenterology and hepatology from bed to bench, 6*(1), 14-17.

Punnett, L., Herbert, R.,. (2000). Work-related musculoskeletal disorders: is there a gender differential, and so, what does it mean? In: Goldman, M., Hatch, M. (Eds.), Women & Health. Academic Press, USA, pp. 474–492.

Radkiewicz, P., & Widerszal-Bazyl, M. (2005). Psychometric properties of Work Ability Index in the light of comparative survey study. *International Congress Series, 1280*, 304-309. doi:https://doi.org/10.1016/j.ics.2005.02.089

Reddy, E. M., & Yasobant, S. (2015). Musculoskeletal disorders among municipal solid waste workers in India: A cross-sectional risk assessment. *Journal of family medicine and primary care, 4*(4), 519-524. doi:10.4103/2249-4863.174270

Reilly, M. C., Zbrozek, A. S., & Dukes, E. M. (1993). The Validity and Reproducibility of a Work Productivity and Activity Impairment Instrument. *PharmacoEconomics, 4*(5), 353-365. doi:10.2165/00019053-199304050-00006

Rhee, K. J. A.-P. N. (1999). Psychological stress in the Korean work life: a study based on the job strain model. 1-2.

Ring, D., Kadzielski, J., Malhotra, L., Lee, S.-G. P., Jupiter, J. B. (2005). Psychological Factors Asociated with Idiopathic Arm Pain. *The Journal of Bone and Joint Surgery(American), Vol. 87, No. 2, pp. 374-380*

Rocha, L. E., & Debert-Ribeiro, M. J. R. d. s. p. (2001). Work and health: a gender study on systems analysts. *35*(6), 539-547.

Rohilla, E., Hooda, R., & Mehta, M. (2020). Prevalence of Musculoskeletal Disorders Among Garment Industry.

Roquelaure, Y., LeManach, A. P., Ha, C., Poisnel, C., Bodin, J., Descatha, A., & Imbernon, E. J. O. m. (2012). Working in temporary employment and exposure to musculoskeletal constraints. *62*(7), 514-518.

Rostamabadi, A., Mazloumi, A., & Foroushan, A. R. J. J. o. o. h. (2014). Work Ability Index (WAI) and its health-related determinants among Iranian farmers working in small farm enterprises. 13-0171-OA.

Rusli, B., Edimansyah, B., & Naing, L. J. A. o. O. S. (2006). Prevalence and associated factors of stress in dental healthcare workers of a higher institution of learning in Kelantan. *1*, 51-56.

Sadeghi Yarandi, M., Ghasemi, M., & Ghanjal, A. (2020). The relationship between individual, physical and psychosocial risk factors with musculoskeletal disorders and related disabilities in flight security personnel. *International*

Journal of Occupational Safety and Ergonomics, 1-11. doi:10.1080/10803548.2020.1760528

Safiri, S., Kolahi, A. A., Hoy, D., Buchbinder, R., Mansournia, M. A., Bettampadi, D., . . . Ferreira, M. L. (2020). Global, regional, and national burden of neck pain in the general population, 1990-2017: systematic analysis of the Global Burden of Disease Study 2017. *Bmj, 368*, m791. doi:10.1136/bmj.m791

Saha, T. K., Dasgupta, A., Butt, A., & Chattopadhyay, O. (2010). Health Status of Workers Engaged in the Small-scale Garment Industry: How Healthy are They? *Indian journal of community medicine : official publication of Indian Association of Preventive & Social Medicine, 35*(1), 179-182. doi:10.4103/0970-0218.62584

Sakthi Nagaraj, T., Jeyapaul, R., & Mathiyazhagan, K. (2019). Evaluation of ergonomic working conditions among standing sewing machine operators in Sri Lanka. *International Journal of Industrial Ergonomics, 70*, 70-83. doi:https://doi.org/10.1016/j.ergon.2019.01.006

Sargent, L. D., & Terry, D. J. (2000). The moderating role of social support in Karasek's job strain model. *Work & Stress, 14*(3), 245-261. doi:10.1080/02678370010025568

Schibye, B., Skov, T., Ekner, D., Christiansen, J. U., Sjøgaard, G. J. S. J. o. W., Environment, & Health. (1995). Musculoskeletal symptoms among sewing machine operators. (6), 427-434. doi:10.5271/sjweh.58

Scotland, P. H. (2021). Income inequality.

Sealetsa, O. J., & Thatcher, A. (2011). Ergonomics issues among sewing machine operators in the textile manufacturing industry in Botswana. *Work, 38*, 279-289. doi:10.3233/WOR-2011-1131

Sein, M., Howteerakul, N., & Jirachewee, J. (2010). Job Strain among Rubber-Glove-Factory Workers in Central Thailand. *Industrial health, 48*, 503-510. doi:10.2486/indhealth.MS962

Shan, C. L., Bin Adon, M. Y., Rahman, A. B. A., Hassan, S. T. S., & Ismail, K. B. (2011). Prevalence of neck pain and associated factors with personal characteristics, physical workloads and psychosocial among male rubber workers in FELDA

settlement Malaysia. *Global journal of health science, 4*(1), 94-104. doi:10.5539/gjhs.v4n1p94

Sibella, F., Galli, M., Romei, M., Montesano, A., & Crivellini, M. J. C. b. (2003). Biomechanical analysis of sit-to-stand movement in normal and obese subjects. *18*(8), 745-750.

Silvia Monteiro, M., Maria Costa Alexandre, N., Ilmarinen, J., Mendes Rodrigues, C. J. I. J. o. O. S., & Ergonomics. (2009). Work Ability and Musculoskeletal Disorders Among Workers From a Public Health Institution. *15*(3), 319-324.

SIU, O. L., Cooper, C. L., & Donald, I. J. S. M. (1997). Occupational stress, job satisfaction and mental health among employees of an acquired TV company in Hong Kong. *13*(2), 99-107.

Skov, T., Borg, V., & Orhede, E. (1996). Psychosocial and physical risk factors for musculoskeletal disorders of the neck, shoulders, and lower back in salespeople. *Occupational and Environmental Medicine, 53*(5), 351-356. doi:10.1136/oem.53.5.351

Skovlund, S. V., Bláfoss, R., Sundstrup, E., & Andersen, L. L. (2020). Association between physical work demands and work ability in workers with musculoskeletal pain: cross-sectional study. *BMC Musculoskeletal Disorders, 21*(1), 166. doi:10.1186/s12891-020-03191-8

Soe, K. T., Laosee, O., Limsatchapanich, S., & Rattanapan, C. (2015). Prevalence and risk factors of musculoskeletal disorders among Myanmar migrant workers in Thai seafood industries. *Int J Occup Saf Ergon, 21*(4), 539-546. doi:10.1080/10803548.2015.1096609

Søgaard, K., Sjøgaard, G. J. E., & reviews, s. s. (2017). Physical activity as cause and cure of muscular pain: evidence of underlying mechanisms. *45*(3), 136.

Soori, H., Rahimi, M., & Mohseni, H. J. E.-E. M. H. J., 14 , 697-703,. (2008). Occupational stress and work-related unintentional injuries among Iranian car manufacturing workers.

Sorić, M., Golubić, R., Milosević, M., Juras, K., & Mustajbegović, J. (2013). Shift work, quality of life and work ability among Croatian hospital nurses. *Coll Antropol, 37*(2), 379-384.

Steinisch, M., Yusuf, R., Li, J., Rahman, O., Ashraf, H., Strümpell, C., . . . Loerbroks, A. (2013). Work stress: Its components and its association with self-reported health outcomes in a garment factory in Bangladesh-Findings from a cross-sectional study. *Health & place, 24C*, 123-130. doi:10.1016/j.healthplace.2013.09.004

Storheim, K., & Zwart, J.-A. (2014). Musculoskeletal disorders and the Global Burden of Disease study. *Annals of the Rheumatic Diseases, 73*(6), 949. doi:10.1136/annrheumdis-2014-205327

Sundquist, J., & Johansson, S.-E. (2000). High demand, low control, and impaired general health: working conditions in a sample of Swedish general practitioners. *Scandinavian Journal of Public Health, 28*(2), 123-131. doi:10.1177/140349480002800208

Taib, M. F. M., Bahn, S., Yun, M. H., & Taib, M. S. M. J. W. (2017). The effects of physical and psychosocial factors and ergonomic conditions on the prevalence of musculoskeletal disorders among dentists in Malaysia. *57*(2), 297-308.

Tantawy, S. (2019). Work-related musculoskeletal symptoms among employees with different tasks: Ahlia University case study. *Biomedical Research*.

Tokuda, Y., Ohde, S., Takahashi, O., Shakudo, M., Yanai, H., Shimbo, T., . . . Fukui, T. J. R. i. (2007). Musculoskeletal pain in Japan: prospective health diary study. *28*(1), 7-14.

Urwin, M., Symmons, D., Allison, T., Brammah, T., Busby, H., Roxby, M., . . . Williams, G. (1998). Estimating the burden of musculoskeletal disorders in the community: the comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Annals of the Rheumatic Diseases, 57*(11), 649. doi:10.1136/ard.57.11.649

van den Berg, T., Elders, L., de Zwart, B., Burdorf, A. J. O., & medicine, e. (2008). The effects of work-related and individual factors on the Work Ability Index: a systematic review.

van den Berg, T. I., Alavinia, S. M., Bredt, F. J., Lindeboom, D., Elders, L. A., Burdorf, A. J. I. a. o. o., & health, e. (2008). The influence of psychosocial factors at work

and life style on health and work ability among professional workers. *81*(8), 1029-1036.

Van den Heuvel, S. G., Geuskens, G. A., Hooftman, W. E., Koppes, L. L., & Van den Bossche, S. N. J. J. o. o. r. (2010). Productivity loss at work; health-related and work-related factors. *20*(3), 331-339.

Van der Doef, M., Maes, S. J. W., & stress. (1999). The job demand-control (-support) model and psychological well-being: A review of 20 years of empirical research. *13*(2), 87-114.

Vander Elst, T., De Witte, H., De Cuyper, N. J. E. J. o. W., & Psychology, O. (2014). The Job Insecurity Scale: A psychometric evaluation across five European countries. *23*(3), 364-380.

Viester, L., Verhagen, E. A., Hengel, K. M. O., Koppes, L. L., van der Beek, A. J., & Bongers, P. M. J. B. m. d. (2013). The relation between body mass index and musculoskeletal symptoms in the working population. *14*(1), 1-9.

Waddell, G., & Burton, A. K. (2006). Is work good for your health and well-being?

Wang, P.-C., Harrison, R. J., Yu, F., Rempel, D. M., & Ritz, B. R. (2010). Follow-up of neck and shoulder pain among sewing machine operators: The Los Angeles garment study. *American Journal of Industrial Medicine, 53*(4), 352-360. doi:https://doi.org/10.1002/ajim.20790

Wang, P.-C., Rempel, D. M., Harrison, R. J., Chan, J., & Ritz, B. R. (2007). Work-organisational and personal factors associated with upper body musculoskeletal disorders among sewing machine operators. *Occupational and Environmental Medicine, 64*(12), 806. doi:10.1136/oem.2006.029140

Wang, P. C., Rempel, D. M., Harrison, R. J., Chan, J., & Ritz, B. R. (2007). Work-organisational and personal factors associated with upper body musculoskeletal disorders among sewing machine operators. *Occupational and Environmental Medicine, 64*(12), 806-813. doi:10.1136/oem.2006.029140

WHO. (2001). International classification of functioning, disability, and health. ICF Introduction 2001, World Health Organization, Geneva.

Work, E. A. f. S. H. a. (2009). OSH in figures:stress at work — facts and figures.

Yang, T.-C., Matthews, S. A., & Chen, V. Y.-J. J. I. j. o. b. m. (2014). Stochastic variability in stress, sleep duration, and sleep quality across the distribution of body mass index: insights from quantile regression. *21*(2), 282-291.

Zajacova, A., & Lawrence, E. M. J. A. r. o. p. h. (2018). The relationship between education and health: reducing disparities through a contextual approach. *39*, 273-289.

Zimmerman, E. a. S. H. W. (2014). Between Education and Health. NAM Perspectives. Discussion Paper, National Academy of Medicine, Washington, DC. doi:https://doi.org/10.31478/201406a

Žmauc, T., Železnik, D., & Težak, O. (2019). Work ability index in Slovenian hospital nurses aged over fifty years. *Archives of Industrial Hygiene and Toxicology, 70*, 265-272. doi:10.2478/aiht-2019-70-3291

Zwart, B., Frings-Dresen, M., & Duivenbooden, J. (2002). Test-retest reliability of the Work Ability Index questionnaire. *Occupational medicine (Oxford, England), 52*, 177-181.

APPENDICES

APPENDIX A: Certificate of ethical approval by Chulalongkorn University

AF 02-12

The Research Ethics Review Committee for Research Involving Human Research Participants, Group I, Chulalongkorn University
Jamjuree 1 Building, 2nd Floor, Phyathai Rd., Patumwan district, Bangkok 10330, Thailand,
Tel: 0-2218-3202, 0-2218-3049 E-mail: eccu@chula.ac.th

COA No. 201/2021

Certificate of Approval

Study Title No. 156.1/64 : THE WORK-RELATED MUSCULOSKELETAL DISORDERS, PSYCHOSOCIAL FACTORS, WORK PRODUCTIVITY AND WORK ABILITY AMONG GARMENT FACTORY WORKERS IN MYANMAR

Principal Investigator : TUN WIN OO

Place of Proposed Study/Institution : College of Public Health Sciences, Chulalongkorn University

The Research Ethics Review Committee for Research Involving Human Research Participants, Group I, Chulalongkorn University, Thailand, has approved constituted in accordance with Belmont Report 1979, Declaration of Helsinki 2013, Council for International Organizations of Medical Sciences (CIOM) 2016, Standards of Research Ethics Committee (SREC) 2017, and National Policy and guidelines for Human Research 2015.

Signature: Prida Tasanapradit
(Associate Prof. Prida Tasanapradit, M.D.)
Chairman

Signature: Raveenan Mingpakanee
(Assistant Prof. Raveenan Mingpakanee, Ph.D.)
Secretary

Date of Approval : 28 September 2021 Approval Expire date : 27 September 2022

The approval documents including:

1) Research proposal
2) Participant Information Sheet and Consent Form
3) Researcher
4) Questionnaire

Protocol No. 156.1/64
Date of Approval 28 SEP 2021
Approval Expire Date 27 SEP 2022

The approved investigator must comply with the following conditions:

1. *It's unethical to collect data of research participants before the project has been approved by the committee.*
2. *The research/project activities must end on the approval expired date. To renew the approval, it can be applied one month prior to the expired date with submission of progress report.*
3. *Strictly conduct the research/project activities as written in the proposal.*
4. *Using only the documents that bearing the RECCU's seal of approval: research tools, information sheet, consent form, invitation letter for research participation (if applicable).*
5. *Report to the RECCU for any serious adverse events within 5 working days.*
6. *Report to the RECCU for any amendment of the research project prior to conduct the research activities.*
7. *Report to the RECCU for termination of the research project within 2 weeks with reasons.*
8. *Final report (AF 01-15) and abstract is required for a one year (or less) research/project and report within 30 days after the completion of the research/project.*
9. *Research project with several phases; approval will be approved phase by phase, progress report and relevant documents for the next phase must be submitted for review.*
10. *The committee reserves the right to site visit to follow up how the research project being conducted.*
11. *For external research proposal the dean or head of department oversees how the research being conducted.*

APPENDIX B: Questionnaires (English)

Personal factors Questionnaire

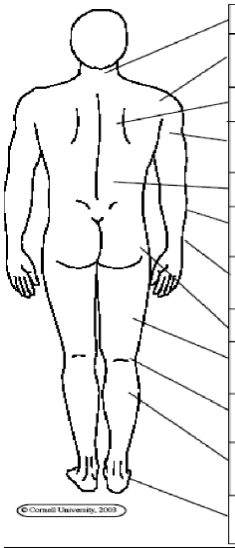
No.	Item		Option to choose
1.	Age (in Full year)	____ years	
2.	Gender	Male Female	1 2
3.	Education Level	primary school secondary school high school and above	1 2 3 4
4.	Marital status	Single Married Separated Widowed	1 2 3 4
5.	Height Weight	____ cm ____ kg	
6.	Monthly income	____ kyats	
7.	Working hour per day	____ hours	

8.	Duration of work	____years	

❄BMI calculated in SPSS using height and weight data.

Cornell Musculoskeletal Discomfort Questionnaire

The diagram below shows the approximate position of the body parts referred to in the questionnaire. Please answer by marking the appropriate box.



		During the last work week how often did you experience ache, pain, discomfort in:					If you experienced ache, pain, discomfort, how uncomfortable was this?			If you experienced ache, pain, discomfort, did this interfere with your ability to work?		
		Never	1-2 times last week	3-4 times last week	Once every day	Several times every day	Slightly uncomfortable	Moderately uncomfortable	Very uncomfortable	Not at all	Slightly interfered	Substantially interfered
Neck		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Shoulder	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Upper Back		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Upper Arm	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lower Back		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Forearm	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wrist	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hip/Buttocks		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Thigh	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Knee	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lower Leg	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Foot	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

The diagram below shows the approximate position of the body parts referred to in the questionnaire. Please answer by marking the appropriate box.		During the last work week how often did you experience ache, pain, discomfort in:					If you experienced ache, pain, discomfort, how uncomfortable was this?			If you experienced ache, pain, discomfort, did this interfere with your ability to work?		
		Never	1-2 times last week	3-4 times last week	Once every day	Several times every day	Slightly uncomfortable	Moderately uncomfortable	Very uncomfortable	Not at all	Slightly interfered	Substantially interfered
Neck		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Shoulder	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Upper Back		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Upper Arm	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lower Back		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Forearm	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wrist	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hip/Buttocks		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Thigh	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Knee	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lower Leg	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Foot	(Right)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	(Left)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Work productivity and Activity Impairment Questionnaire

The following questions ask about the effect of your health problems on your ability to work and perform regular activities. By health problems we mean any physical or emotional problem or symptom. *Please fill in the blanks or circle a number, as indicated.*

1) Are you currently employed (working for pay)? _____NO ____ YES

If NO, check "NO" and skip to question 6.

The next questions are about the **past seven days**, not including today.

2) During the past seven days, how many hours did you miss from work because of your health. Problems? *Include hours you missed on sick days, times you went in late, left early, etc., because of your health problems. Do not include time you missed to participate in this study.*

_____ HOURS

3) During the past seven days, how many hours did you miss from work because of any other reason, such as vacation, holidays, time off to participate in this study?

_____HOURS

4) During the past seven days, how many hours did you actually work?

_____HOURS *(If "0", skip to question 6.)*

5) During the past seven days, how much did health problems affect your productivity while you were working?

Think about days you were limited in the amount or kind of work you could do, days you accomplished less than you would like, or days you could not do your work as carefully as usual. If health problems affected your work only a little, choose a low number. Choose a high number if health problems affected your work a great deal.

Consider only how much health problems affected productivity while you were working.

Health had no effect on my work	0	1	2	3	4	5	6	7	8	9	10	Health problems completely prevent from working

CIRCLE A NUMBER

Work Ability Index

Is your work	
Psychologically demanding?	
Physically demanding?	
Physically and psychologically demanding?	

1. Current work ability compared to highest work ability ever:

Assume that your work ability at its best has a value of 10 points. How many points would you give your current work ability? (0 means that you currently cannot work at all) (10 work ability at its best)

0	1	2	3	4	5	6	7	8	9	10

2. Work ability in relation to demands

How do you rate your current work ability with respect to the physical demands of your work?

Very good (5)	Rather good (4)	Moderate (3)	Rather poor (2)	Very poor (1)

How do you rate your current work ability with respect to the mental demands of your work?

Very good (5)	Rather good (4)	Moderate (3)	Rather poor (2)	Very poor (1)

3. Current diseases

In the following list, mark your current diseases or injuries. Also indicate whether a physician has diagnosed or treated these diseases.		Yes, own opinion (2)	Yes, physician's diagnosis (1)	No (0)
01	Injury due to an accident	○	○	○
02	Musculoskeletal disease in back, limbs or other part of the body (e.g. repeated pain in joint muscle, sciatica, rheumatism, arthritis)	○	○	○
03	Cardiovascular disease (e.g. hypertension, coronary heart disease)	○	○	○
04	Respiratory disease (e.g. repeated infections of the respiratory tract, emphysema)	○	○	○
05	Mental disorder (e.g. depression, "burn-out", anxiety or insomnia)	○	○	○
06	Neurological or sensory disease (e.g. hearing or visual disease, migraine, epilepsy)	○	○	○
07	Digestive disease / condition (e.g. gastritis, gall stones, liver or pancreatic disease, repeated constipation)	○	○	○
08	Genitourinary disease (e.g. infection in urinary tract, gynecological disease or prostate)	○	○	○
09	Skin disease (e.g. allergic or other rash, varicose veins)	○	○	○
		○	○	○

10	Tumour or cancer			
11	Endocrine or metabolic disease (e.g. diabetes, severe obesity or gout)	○	○	○
12	Blood diseases (e.g. anemia, other blood disorder or defect)	○	○	○
13	Birth defects	○	○	○
14	Other disorder or disease	○	○	○

4. Estimated work impairment due to diseases

Is your illness or injury a hindrance to your current job? Check more than one alternative if needed.

There is no hindrance / I have no diseases.	6
I am able to do my job, but it causes some symptoms.	5
I must sometimes slow down my work pace or change my work methods.	4
I must often slow down my work pace or change my work methods.	3
Because of my condition, I feel I am able to do only part time work.	2
In my opinion I am entirely unable to work.	1

5. Illness within last year (12 months)

During the last 12 months:

how many whole days have you been off work because of illness:

None (5)	Max. 9 days (4)	10 - 24 days (3)	25 - 99 days (2)	100 - 354 days (1)

○	○	○	○	○

6. Estimation of own work ability in 2 years

Do you believe, according to your present state of health,

that you will be able to do your current job two years from now?

Unlikely (1)	Not Certain (4)	Relatively certain (7)
○	○	○

7. Mental capacities

7.1 | Considering the last three months: Have you been able to enjoy your regular daily activities?

Often (4)	Rather often (3)	Sometimes (2)	rather seldom (1)	Never (0)
○	○	○	○	○

7.2 | Considering the last three months: Have you been active and alert?

Often (4)	Rather often (3)	Sometimes (2)	rather seldom (1)	Never (0)
○	○	○	○	○

7.3 | Considering the last three months: Have you felt yourself to be full of hope about the future?

Often (4)	Rather often (3)	Sometimes (2)	rather seldom (1)	Never (0)
○	○	○	○	○

Job Content Questionnaire

	Item	Strongly disagree	Disagree	Agree	Strongly Agree
1.	My work require me to learn new things.				
2.	There are a lot of repetative task in my work.				
3.	My work require me to be creative.				
4.	My work allow me to make my own decision.				
5.	My work require a high level of skills.				
6.	On my work, I have a very little freedom to decide how I do on my work.				
7.	I can do a variety of different things on my job.				
8.	On things that happened at work ,my opinion are influencial.				
9.	My work provide rooms for me to develop my own talent.				
10.	My work requires me to do things very quickly.				
11.	My work requires me to do be very hard				

	working.				
12.	My workload is not considered excessive.				
13.	I have enough time to accomplish my work.				
14.	On my job, I am not asked by different people to do things that are contradictory.				
15.	My work require rapid physical activity.				
16.	My work make awkward body position.				
17	My work is a steady work.				
18	My work is a security work.				
19	In the future, I am likely to be lay off.				
20	My supervisor gives concern to staff's welfare.				
21.	My supervisor listen to my opinion.				
22.	My supervisor provides assistance to staff.				
23.	My supervisor organizes well the staff member as to facilitate tasks at work.				
24.	My coworkers attend their duties well.				

25.	My coworker show their care for me.				
26.	My coworker are friendly.				
27.	My coworker are helpful.				

Calculation formula and possible score of JCQ

Scale	Formula	Possible score
Job Control (9)	= skill discretion + decision authority	24–96
Skill discretion (6)	[Q1+Q3+Q5+Q7+Q9+(5–Q2)]×2	12–48
Decision authority (3)	[Q4+Q8+(5–Q6)]×4	12–48
Psychological job demand(5)	3×(Q10+Q11)+2×[15–(Q12+Q13+Q14)]	12–48
Workplace social support(8)	= supervisor support + coworker support	8–32
Supervisor support (4)	Q20+Q21+Q22+Q23	4–16
Co-worker support (4)	Q24+Q25+Q26+Q27	4–16
Physical job demand (2)	Q15+Q16	2–8
Job insecurity (3)	Q19+[10–(Q17+Q18)]	3–12

APPENDIX C: Participant information sheet and consent form (English)

1. Introduction

My name is Tun Win Oo, a postgraduate student at Chulalongkorn University in Bangkok, Thailand. As a requirement to fulfil academic requirements of the university, we are required to do a research and submit a thesis. I have decided to do my study on the association of psychosocial risk factors, work productivity and work ability on work related musculoskeletal disorders of sewing machine workers in Garment factory in Myanmar

Name of the researcher: Mr. Tun Win Oo

Phone number: +95943020529

Email address: tunwinoo430@gmail.com

Objectives of the research

i. To find out personal factors, work productivity, work ability, psychosocial factors and work related musculoskeletal disorders.

ii. To find the association between personal factors, work productivity, work ability, psychosocial factors to work related musculoskeletal disorders.

2. How to provide information by whom and how to obtain consent

You will be requested to participate in this study by the researcher by giving the questionnaire form and explained to research participant and let them self-administered. This study is entirely voluntary and if you are eligible of our inclusion criteria you can participate in this study.

3. Detail of the participants

In this study, which will include 400 sewing machine operators in Garment factory in Bago Township, Bago Region, Myanmar. You can continue on reading this information sheet and after weighing out the benefits and risk if any, you are free to decide whether to continue the study or not. If you need further clarification on anything, please do not hesitate to ask the researcher both before, during and after the study.

4. Details of screening process of inclusion/exclusion criteria or qualifications

Inclusion and exclusion criteria will provided to factory and they will perform these criteria and select research participants. Moreover, during recruitment, before explaining research process, and questionnaire, confirm again these criteria by researcher. After screening process, researcher will invite the potential participant to research projects through factory authorities. Inclusion Criteria - Those who worked at least 1 year as sewing operators - Those who are more than 18 year of age- Those who free from disability - Those who willing to participate - Those who can read and write Exclusion criteria - Those who suffered from injury, accident, or undergo surgery during the last 3 months - Those who were pregnant (female respondent) - Those who were taking any prescribed medicine by self (or) from a doctor

5. Procedure upon participants

The research involves filling out a self – administered questionnaire which will take about 30 minutes. There are five sections of questionnaire which are (1) Personal factors (2) Work related musculoskeletal disorders related to body pain due to work (3) Work productivity related to hours (4) Psychosocial Questionnaire (5) Work ability Questionnaire related to worker efficiency. The whole questionnaire uses filling blank, tickling in multiple choice and circling in boxes for the ease of the participants in response to questionnaire. Your answers are anonymous.

6. Risks and Harms

There may be a slight risk that you may share some personal or confidential information by chance or that you may feel uncomfortable about talking about some of the topics about psychosocial factors. However, we do not wish this to happen, and you may refuse to answer.

7. Benefits

The study will provide benefit to you, as the study about sewing workers. The study aim to find out the psychosocial problem, work ability, work productivity and work related musculoskeletal disorders among sewing workers. Therefore, the result of the study can provide essential research data that is needed to get better working condition, better well-being of sewing workers by occupational health intervention and better labor law.

8. Confidentiality

Any information that is linked to you will be kept confidentially. Your names or other identifying information will not be mentioned in the report or summaries of the study. The final report can be available from the researcher and this report will be used for only fulfilment of the academic requirement of the Master of Public health degree. All the data will be kept confidential and will not disclose to anyone

9. How researcher will manage with personal data after research project is completed.

The information papers will be burn and delete the input data in my computer forever that I have used within one year after completion of the study period.

10. Compensation There is nothing to give participants but only heartfelt thanks.

11. Voluntary Participation

After reading the information sheet and receiving further explanation on the unclear part of the questionnaire from the researcher if necessary, the participant will be required to give a written inform consent of the selected participant according to inclusion and exclusion criteria. The consent forms will be kept safely by researcher. If you do not want to participate in this study, you do not need to give consents and you do not need to explain anything as a reason. You can withdraw from the study at any time as you wish with no need to give reason and it will not have any negative impact upon the participants

12. Right of the participant and consent I have read the objectives of this research, what I will engage in details, benefits and risk (if there is any) of this research, and the rights and duties of the participants. I have been given the contact details of the researcher. I have read the information sheet and the researcher has explained me and guaranteed to act as indicated in the information sheet. I **clearly understand with satisfaction. I willingly agree to participate in this research** will not contain any name or identifying information of me. It will take about 30 minutes to answer questionnaire. You can also ask anything you want to know before, during and after the study conduct any time. The principal researcher can be reached at all time with given address mentioned above. If the researcher has new information regarding benefit or risk/harm, you will be informed as soon as possible.

If researcher does not perform upon you as indicated in the participant information sheet and consent form, you can report the incident to the Research Ethics Review Committee for Research Involving Human Research Participants, Group I, Chulalongkorn University (RECCU) Jamjuree 1 Bldg., 254 Phyathai Rd., Patumwan district, Bangkok 10330, Thailand, Tel./Fax. 0-2218-3202, 0-2218-3049 E-mail:

eccu@chula.ac.th". I have read the information in this consent form. Furthermore, I have received a copy of participant's information sheet and informed consent form. I, who signed here consent to participate in this study (_____)

Sign of the participant Tun Win Oo (Principal researcher)

Associate Professor Nutta Taneepanichskul (Thesis Advisor)

APPENDIX C: Questionnaire (Myanmar)

ကြွက်သားနှင့်ကျောရိုးမဆိုင်ရာမအီမသာဖြစ်ခြင်း၊ လုပ်ငန်းခွင်အတွင်းစိတ်ပိုင်း၊လူမှုရေးပိုင်းဆိုင်ရာ သွင်ပြင်လက္ခဏာများ၊အလုပ်လုပ်နိုင်စွမ်း၊လုပ်ငန်းခွင်ထုတ်လုပ်နိုင်စွမ်းနှင့် လုပ်ဆောင်မှုထိခိုက်ခြင်းမေးခွန်းလွှာ။

အပိုင်း ၁ ဖြေဆိုသူ၏နောက်ခံအချက်အလက်			
စဉ်	အကြောင်းအရာ	ရွေးချယ်ခြင်း	မှတ်ချက်
1.	အသက် (ပြည့်ပြီးနှစ်)	|___|___| နှစ်	
2.	လိင်	ကျား 1 မ 2	
3.	ပညာရေးအဆင့်	သူငယ်တန်းမှ ၄တန်းအထိ 1 ၅ တန်းမှ ၈တန်းအထိ 2 ၉တန်းနှင့်အထက် 3	
4.	အိမ်ထောင်ရေးအခြေအနေ	အိမ်ထောင်မရှိ 1 အိမ်ထောင်ရှိ 2 အိမ်ထောင်ကွဲ/ကွာရှင်း 3 အိမ်ထောင်ဖက်ကွယ်လွန် 4	
5.	စက်ရုံမှ လက်ရှိ ရရှိသော လစဉ်ဝင်ငွေ (စုစုပေါင်း)	|___|___|___|___|___|___|ကျပ်	
6.	တစ်ရက်စက်ချုပ်အလုပ်လုပ်ချိန် (နာရီ၊မိနစ်)	|___|___|နာရီ |___|___|မိနစ်	
7.	စက်ချုပ်သမားအဖြစ်လုပ်ခဲ့သော စုစုပေါင်းနှစ်ကာလ (နှစ်၊လ)	|___|___|နှစ် |___|___| လ	
8.	သင်၏ Body Mass Index (BMI) (သုတေသီမှဖြည့်စွက်ရန်)		
A.	အရပ်အမြင့် Height (cm)	|___|___|___| cm	
B.	ကိုယ်အလေးချိန် Weight (kg)	|___|___|___|.|___|___|kg	
C.	BMI	|___|___|.|___|___|	

အပိုင်း ၂ ကြွက်သားနှင့်ကျောရိုးမဆိုင်ရာမေးခွန်းလွှာ (အမျိုးသမီးဖြေဆိုသူများအတွက်)

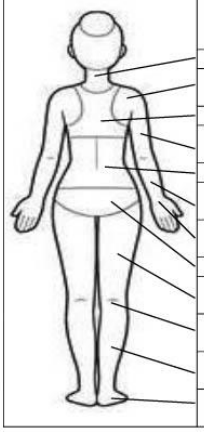
အောက်ပါပုံကမေးခွန်းပါကိုယ်ခန္ဓာ၏ယေဘူယျအစိတ်အပိုင်းများကိုရည်ညွှန်းပါသည်။
သင့်လျော်သောအကွက်များအတွင်း (■) အမှတ်အသားပြု၍ဖြေဆိုပါ။

(အမျိုးသမီးဖြေဆိုသူများအတွက်)

ပြီးခဲ့သောအလုပ်တစ်ပတ်အတွင်းသင် မည်မျှ နာကျင်၊ ကိုက်ခဲ၊ မအီမသာ ဖြစ်ခဲ့သလဲ။

သင် နာကျင်၊ ကိုက်ခဲ၊ မအီမသာ ဖြစ် ခဲ့ပါက မည်မျှဆိုးဝါးခဲ့သလဲ။

သင် နာကျင်၊ ကိုက်ခဲ၊ မအီမသာ ဖြစ် ခဲ့ပါက သင်၏အလုပ်လုပ်နိုင်စွမ်းအပေါ် အနှောက်အယှက် ဖြစ်ခဲ့ပါ သလား။



	မဖြစ်ပါ။	ပြီးခဲ့သော ၇ ရက်အတွင်း ခြောက်ကြိမ်အထိ	ပြီးခဲ့သော ၇ ရက်အတွင်း ခြောက်ကြိမ်ထက်မက	တစ်နေ့တစ်ခြိမ်	နေ့တိုင်း အကြိမ်များစွာ	အနည်းငယ်	အသင့်အတင့်	အလွန်အမင်း	မဖြစ်ပါ။	အနည်းငယ်ဖြစ်	အတော်အတန် ဖြစ်
လည်ပင်း	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ပခုံး (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ကျော (အပေါ်ဘက်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
လက်မောင်း (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ကျော (အောက်ဘက်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
လက်မျိ (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
လက်ကောက်ဝတ် (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
တင်ပါး/ တင်ပါးဆုံ	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ပေါင် (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ခြေ(ခေါင်း) (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ခြေသလုံး (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ခြေထောက် (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

အပိုင်း ၂ ကြွက်သားနှင့်ကျောရိုးမဆိုင်ရာမေးခွန်းလွှာ (အမျိုးသားဖြေဆိုသူများအတွက်)

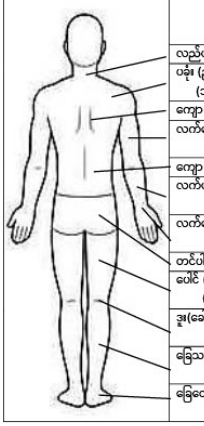
အောက်ပါပုံကမေးခွန်းပါကိုယ်ခန္ဓာ၏ယေဘူယျအစိတ်အပိုင်းများကိုရည်ညွှန်းပါသည်။
သင့်လျော်သောအကွက်များအတွင်း (■) အမှတ်အသားပြု၍ဖြေဆိုပါ။

(အမျိုးသားဖြေဆိုသူများအတွက်)

ပြီးခဲ့သောအလုပ်တစ်ပတ်အတွင်းသင် မည်မျှ နာကျင်၊ ကိုက်ခဲ၊ မအီမသာဖြစ်ခဲ့သလဲ။

သင် နာကျင်၊ ကိုက်ခဲ၊ မအီမသာ ဖြစ် ခဲ့ပါက မည်မျှဆိုးဝါးခဲ့သလဲ။

သင် နာကျင်၊ ကိုက်ခဲ၊ မအီမသာ ဖြစ် ခဲ့ပါက သင်၏အလုပ်လုပ်နိုင် စွမ်းအပေါ် အနှောက်အယှက် ဖြစ်ခဲ့ ပါသလား။



	မဖြစ်ပါ။	ပြီးခဲ့သော ၇ ရက်အတွင်း ခြောက်ကြိမ်အထိ	ပြီးခဲ့သော ၇ ရက်အတွင်း ခြောက်ကြိမ်ထက်မက	တစ်နေ့တစ်ခြိမ်	နေ့တိုင်း အကြိမ်များစွာ	အနည်းငယ်	အသင့်အတင့်	အလွန်အမင်း	မဖြစ်ပါ။	အနည်းငယ်ဖြစ်	အတော်အတန် ဖြစ်
လည်ပင်း	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ပခုံး (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ကျော (အပေါ်ဘက်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
လက်မောင်း (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ကျော (အောက်ဘက်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
လက်မျိ (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
လက်ကောက်ဝတ် (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
တင်ပါး/ တင်ပါးဆုံ	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ပေါင် (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ခြေ(ခေါင်း) (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ခြေသလုံး (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ခြေထောက် (ညာ)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
(ဘယ်)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

အပိုင်း ၃ လုပ်ငန်းခွင်အတွင်းစိတ်ပိုင်းလူမှုရေးပိုင်းဆိုင်ရာသွင်ပြင်လက္ခဏာများ					
ညွှန်ကြားချက်။ သင်လက်ခံထားမှုနှင့်နီးစပ်သည်ဟုသင်ယူဆသောအခြေအနေကို (✓) ခြစ်ပါ။					
စဉ်	အကြောင်းအရာ	အလွန် သဘော မတူ	သဘော မတူ	သဘော တူ	အလွန် သဘော တူ
1.	ကျွန်ုပ်၏အလုပ်သည် အသစ် အသစ်သောများကို သင်ကြားရန်လိုအပ်သည်။				
2.	ကျွန်ုပ်၏အလုပ်တွင် ထပ်ခါတလဲလဲလုပ်ရသော အလုပ် များ အများအပြားပါဝင်သည်။				
3.	ကျွန်ုပ်၏အလုပ်သည် တီထွင်ဖန်တီးမှုများပါဝင်ပါသည်။				
4.	ကျွန်ုပ်၏အလုပ်တွင်ကိုယ်ပိုင် ဆုံးဖြတ်ချက် များ ချမှတ်နိုင်သည်။				
5.	ကျွန်ုပ်၏အလုပ်က ကျွမ်းကျင်မှု များစွာ လိုအပ်ပါသည်။				
6.	ကျွန်ုပ်၏အလုပ်တွင် မိမိအလုပ်နှင့်ပတ်သက်၍ ကိုယ်တိုင်ဆုံးဖြတ်၍ လွတ်လပ်ခွင့် များ အနည်းငယ် သာပါဝင်ပါသည်။				
7.	ကျွန်ုပ်၏အလုပ်တွင်အလုပ်အမျိုးအစားများစွာပါဝင် အလုပ်လုပ်နိုင်ပါသည်။				
8.	မိမိ၏အလုပ်နှင့်ပတ်သက်၍တစ်စုံတစ်ခုဖြစ်ပျက်ခဲ့ပါက မိမိ၏ ပြောရေးဆိုခွင့်မှာအခရာကျပါသည်။				
9.	ကျွန်ုပ်၏အလုပ်က မိမိ၏ကိုယ်ပိုင် အရည် အသွေး များ တိုးတက်စေရန်အတွက် အခွင့်အလမ်း ကို ပေးအပ်ထားသည်။				
10.	ကျွန်ုပ်၏အလုပ်က အလုပ်ကိုလျှင်လျှင်မြန်မြန်ပြီးစီး အောင်လုပ်ရန် လိုအပ်သည်။				
11.	ကျွန်ုပ်၏အလုပ်က အလုပ်ကို အလွန်ကြိုးကြိုး စားစား လုပ်ရန် လိုအပ်သည်။				
12.	ကျွန်ုပ်၏အလုပ်သည် အလွန်များပြားလွန်းသည်ဟု မယူဆပါ။				
13.	ကျွန်ုပ်၏အလုပ်ပြီးမြောက်ရန်အချိန်အလုံအလောက် ရှိသည်။				
14.	ကျွန်ုပ်၏အလုပ်တွင် လူအမျိုးမျိုးက တစ်ခုနှင့်တစ်ခု ဆန့်ကျင်ဘက် ဖြစ်သော အရာများကိုလုပ်ရန် မိမိကိုခိုင်းစေခြင်းမျိုးမရှိပါ။				
15.	ကျွန်ုပ်၏အလုပ်က မြန်ဆန်သောကိုယ်ကာယ လှုပ်ရှားမှု မျိုးကိုလိုအပ်သည်။				
16.	ကျွန်ုပ်၏အလုပ်က သက်တောင့်သက်သာမရှိသော				

	ကိုယ်ခန္ဓာအနေအထားကိုဖြစ်စေသည်။				
17.	ကျွန်ုပ်၏အလုပ်က ပုံမှန်အေးအေးဆေးဆေး အလုပ်မျိုး ဖြစ်သည်။				
18.	ကျွန်ုပ်၏အလုပ်ပြုတ်ခြင်းနှင့် ပတ်သက်၍ မစိုးရိမ်ရပါ။				
19.	အနာဂတ်တွင်ကျွန်ုပ်သည်အလုပ်မှ အနားယူချင်ယူ (အလုပ်ထွက်) လိမ့်မည်။				
20.	ကျွန်ုပ်၏ကြီးကြပ်သူသည်အလုပ်သမားများ၏ အရေး ကိစ္စကိုအလေးထားသည်။				
21.	ကျွန်ုပ်၏ကြီးကြပ်သူသည်မိမိ၏ထင်မြင်ချက်များကို နားထောင်သည်။				
22.	ကျွန်ုပ်၏ကြီးကြပ်သူသည်အလုပ်သမားများကို ကူညီ ပေးသည်။				
23.	ကျွန်ုပ်၏ကြီးကြပ်သူသည် အလုပ်များ ပြီးမြောက် စေရန် အတွက် အလုပ်သမားအဖွဲ့ဝင်များကို ကောင်း မွန်စွာ စည်းရုံးသည်။				
24.	ကျွန်ုပ်၏လုပ်ဖော်ကိုင်ဖက်များသည်သူတို့အလုပ်ကို ကောင်းမွန်စွာလုပ်ကိုင်ကြသည်။				
25.	ကျွန်ုပ်၏လုပ်ဖော်ကိုင်ဖက်များသည် မိမိကို ဂရုစိုက် ကြောင်းထုတ်ဖော်ပြသကြသည်။				
26.	ကျွန်ုပ်၏လုပ်ဖော်ကိုင်ဖက်များသည်ဖော်ရွေကြ သည်။				
27.	ကျွန်ုပ်၏လုပ်ဖော်ကိုင်ဖက်များသည်ရိုင်းပင်းကူညီ ကြသည်။				

အပိုင်း ၄ အလုပ်လုပ်နိုင်စွမ်းအညွှန်းကိန်း			
စဉ်	အကြောင်းအရာ	ရွေးချယ်ခြင်း	မှတ်ချက်
■	သင့်အလုပ်သည်		
•	စိတ်ပိုင်းဆိုင်ရာဖိစီးမှုများရှိပါသလား။	ရှိပါသည် 1 မရှိပါ 2	
•	ရုပ်ပိုင်းဆိုင်ရာ (ခန္ဓာကိုယ်ပိုင်းဆိုင်ရာ) ကာယ အားထုတ်မှုများရှိသလား။	ရှိပါသည် 1 မရှိပါ 2	
•	စိတ်ပိုင်းဆိုင်ရာနှင့် ခန္ဓာကိုယ်ပိုင်းဆိုင်ရာ နှစ်ခုစလုံးဖိစီးမှုများရှိသလား။	ရှိပါသည် 1 မရှိပါ 2	
1.	လက်ရှိအလုပ်လုပ်နိုင်စွမ်းရည်နှင့် အမြင့်မားဆုံးလုပ်နိုင်စွမ်းရည်ကိုနှိုင်းယှဉ်ခြင်း		
	သင်၏အကောင်းဆုံးလုပ်လုပ်နိုင်စွမ်းကို အမှတ် (၁၀) ဟုဆိုပါစို့။ သင်၏လက်ရှိ အလုပ်လုပ် နိုင်စွမ်းကို (၀ မှ ၁၀အထိ) ပေးရမည်ဆိုပါက သင်အမှတ်မည်မျှ ပေးမည်နည်း။ 0 1 2 3 4 5 6 7 8 9 10		
	0 လုံးဝအလုပ်ကောင်း ကောင်းမလုပ်နိုင်ပါ။ — 10 အကောင်းဆုံးလုပ်နိုင်ပါသည်။		
	နံပါတ်တစ်ခုကိုသာကွင်းပါ။		
2.	**လိုအပ်ချက်အရအလုပ်လုပ်နိုင်စွမ်းရည်**		
A.	သင်၏ လက်ရှိအလုပ်လုပ်နိုင်စွမ်းကို သင့်အလုပ်၏ကာယပိုင်းဆိုင်ရာအားထုတ်မှုနှင့် နှိုင်းယှဉ် လျှင် သင်မည်သို့သတ်မှတ်မည်နည်း။		
	အလွန်ကောင်းမွန်စွာလုပ်နိုင်သည်။ (5) / ကောင်းမွန်စွာလုပ်နိုင်သည်။ (4) / အသင့်အတင့်သာလုပ်နိုင်သည်။ (3) / ကောင်းကောင်းမလုပ်နိုင်ပါ။ (2) / အလွန်ဆိုးဝါးနေပါသည်။ (1)		
B.	သင်၏ လက်ရှိအလုပ်လုပ်နိုင်စွမ်းကို သင့်အလုပ်၏စိတ်ပိုင်းဆိုင်ရာဖိစီးမှုနှင့် နှိုင်းယှဉ် လျှင် သင်မည်သို့သတ်မှတ်မည်နည်း။		
	အလွန်စိတ်ချမ်းသာစွာလုပ်ကိုင်နိုင်ပါသည်။ (5) / စိတ်ချမ်းသာစွာလုပ်နိုင်ပါသည်။ (4) / အသင့်အတင့်စိတ်ချမ်းသာပါသည်။ (3) / စိတ်ဆင်းရဲစွာလုပ်နေရပါသည်။ (2) / အလွန်စိတ်ဆင်းရဲစွာလုပ်ကိုင်နေရပါသည်။ (1)		
3.	**ရောဂါအခြေအနေနှင့်လုပ်နိုင်စွမ်းအားကျဆင်းမှု**		
	သင်၏ရောဂါဝေဒနာ သို့မဟုတ် ထိခိုက်ဒဏ်ရာရမှုက သင်၏လက်ရှိ အလုပ်ကို ထိခိုက် နေ ပါသလား။ အောက်ပါအခြေအနေများကိုစစ်ဆေးကြည့်ပါ။ ညွှန်ကြားချက်။ သင်လက်ခံထားမှုနှင့်နီးစပ်သည်ဟုသင်ယူဆသောအခြေအနေတစ်ခု (တစ်ခုထက် ပိုနိုင်သည်) ကို ကွင်းပြပါ။		

•	ကျွန်ုပ်တွင်ရောဂါမရှိပါ။ ကောင်းစွာအလုပ်လုပ်နိုင်သည်။	6
•	ကျွန်ုပ်အလုပ်လုပ်နိုင်သည်။သို့သော်ရောဂါလက္ခဏာများခံစားနေရသည်။	5
•	တစ်ခါတစ်ရံကျွန်ုပ်၏အလုပ်ပုံစံကြောင့်တစ်ခါတစ် လေအလုပ်လုပ်နိုင်နှုန်း ကို လျှော့ချ ရပါသည်။	4
•	ရံဖန်ရံခါကျွန်ုပ်၏အလုပ်လုပ်နိုင်နှုန်းကိုလျှော့ချ လိုက်ရ၍ အလုပ်လုပ်သည့်ပုံစံကို ပြောင်းလဲပစ်လိုက်ရပါသည်။	3
•	ကျွန်ုပ်၏ရောဂါအခြေအနေများကြောင့်ကျွန်ုပ်သည်အချိန်ပိုင်းအလုပ်များသာလုပ်နိုင်သည်ဟု ခံစားရပါသည်။	2
•	ကျွန်ုပ်၏အခြေအနေအရကောင်းမွန်စွာအလုပ်လုပ် နိုင်ခြင်းမရှိပါ။	1

4. ပြီးခဲ့သောနှစ်ကနေမကောင်းဖျားနာမှုများ (၁၂ လအတွင်း)

ကျွန်ုပ်သည်လွန်ခဲ့သော (၁၂) လအတွင်း နေမကောင်းဖျားနာရောဂါများကြောင့် အလုပ်ရက် မည်မျှ ပျက်ကွက်ခဲ့သနည်း။

မရှိပါ။	အများဆုံး ၉ ရက်	၁၀ မှ ၂၄ ရက်	၂၅ မှ ၉၉ ရက်	၁၀၀-၃၅၄ ရက်
5	4	3	2	1

5. လာမည့် (၂) နှစ်ကာလ အလုပ်လုပ်နိုင်စွမ်းခန့်မှန်းချက်

ယခုလက်ရှိကျန်းမာရေးအခြေအနေအရ နောက် (၂) နှစ်ကြာခဲ့လျှင် ယခုလက်ရှိ အလုပ်ကို ဆက်လက်လုပ်ကိုင်နိုင်မည်လား။

မလုပ်နိုင်ပါ။	မသေချာပါ။	လုပ်နိုင်ပါမည်။
1	4	7

6. စိတ်ပိုင်းဆိုင်ရာစွမ်းဆောင်နိုင်ခြင်း

A. လွန်ခဲ့သော (၃) လ အတွင်း နေ့စဉ်ပုံမှန် အလုပ် များကို စိတ်ပျော်ရွှင်စွာလုပ်ကိုင်နိုင်ပါသလား။

ခဏခဏ	မကြာမကြာ ဆိုသလို	တစ်ခါတစ်လေ	ဖြစ်တောင့်ဖြစ်ခဲ	ဘယ်သောအခါမျှ
4	3	2	1	0

B. လွန်ခဲ့သော (၃) လ အတွင်း သင်တက်တက်ကြွကြွ လန်းလန်း ဆန်းဆန်းရှိပါသလား။

ခဏခဏ	မကြာမကြာ ဆိုသလို	တစ်ခါတစ်လေ	ဖြစ်တောင့်ဖြစ်ခဲ	ဘယ်သောအခါမျှ
4	3	2	1	0

C. လွန်ခဲ့သော (၃) လ အတွင်းသင်၏အနာဂတ်နှင့် ပတ်သက်၍မျှော်လင့်ချက်ပြည့်ဝစွာရှိပါသလား။

ခဏခဏ	မကြာမကြာ ဆိုသလို	တစ်ခါတစ်လေ	ဖြစ်တောင့်ဖြစ်ခဲ	ဘယ်သောအခါမျှ
4	3	2	1	0

7.	**လက်ရှိရောဂါများ**			
	သင့်တွင်အောက်ဖော်ပြပါရောဂါများရှိပါသလား။ ဆရာဝန်ပြောကြား၍ကုသမှုများပါဝင်ပါသည်။ သင်လက်ခံထားမှုနှင့်နီးစပ်သည်ဟုသင်ယူဆသောအခြေအနေတစ်ခုကို (✓) ခြစ်ပါ။	ရှိပါသည်။ မိမိအထင်။ (ဆရာဝန်နှင့်မပြပါ) **2**	ရှိပါသည်။ ဆရာဝန်မှပြောကြားထားပါသည် **1**	မရှိပါ။ **0**
•	(၁) မတော်တဆထိခိုက် ဒဏ်ရာရခြင်း			
•	(၂) ခန္ဓာကိုယ်နေရာအနှံ့(ခြေ၊လက်၊ကျောနှင့် အခြားနေရာများ) နာကျင်ကိုက်ခဲသည့်ရောဂါ (ဥပမာ အဆစ်အမြစ်၊ ကြွက်သားများ အဆက် မပြတ်ကိုက်ခဲ ယောင်ယမ်းခြင်း၊ လေးဘက်နာ အဆစ်အမြစ် ရောဂါ)			
•	(၃) နှလုံးနှင့်သွေးကြောဆိုင်ရာရောဂါ (ဥပမာ၊ သွေးတိုး၊ နှလုံး သွေးကြောကျဉ်း)			
•	(၄) အသက်ရှူလမ်းကြောင်းဆိုင်ရာရောဂါများ (ဥပမာ၊အသက်ရှူလမ်းကြောင်းပိုးဝင်ခြင်း၊ အဆုတ်ပူခြင်း)			
•	(၅) စိတ်ပိုင်းဆိုင်ရာပြဿနာများ (ဥပမာ၊ စိတ်ဓာတ် ကျခြင်း၊ ခြေကုန်လက်ပန်းကျခြင်း၊စိုးရိမ်စိတ်လွန်ကဲ ခြင်း၊အိပ်မပျော်ခြင်း)			
•	(၆) အာရုံကြောဆိုင်ရာရောဂါများ (ဥပမာ၊ အကြား အမြင် ချို့တဲ့ခြင်းခေါင်းတစ်ခြမ်းကိုက်ခြင်း၊ အတက်ရောဂါ))			
•	(၇) အစာလမ်းကြောင်းရောဂါများ (ဥပမာ အစာမကြေခြင်း၊သည်းခြေကျောက်တည်ခြင်း၊ အသည်း သို့မဟုတ် ပန်ကရိယရောဂါများ၊ အဆက်မပြတ် ဝမ်းချုပ်ခြင်း)			
•	(၈) မျိုးပွားနှင့်ဆီးလမ်းကြောင်းရောဂါများ (ဥပမာ၊ ဆီးလမ်းကြောင်းပိုးဝင်ခြင်း၊အမျိုးသမီးရောဂါ၊ ဆီးကျိတ်ရောဂါ)			
•	(၉) အရေပြားရောဂါများ (ဓာတ်မတည့်ခြင်း ၊ အနီစက်များထွက်ခြင်း)			
•	(၁၀) အကျိတ် (သို့မဟုတ်) ကင်ဆာရောဂါ			
•	(၁၁) အတွင်းထုတ်ဂလင်း သို့မဟုတ် ဇီဝကမ္မ ဆိုင်ရာရောဂါများ (ဥပမာ၊ ဆီးချိုရောဂါ၊ အဝလွန်ရောဂါ သို့မဟုတ် ဂေါက်ရောဂါ)			
•	(၁၂) သွေးရောဂါများ (ဥပမာ၊ သွေးအားနည်းခြင်း၊ အခြားသွေးရောဂါများ သို့မဟုတ် ချို့ယွင်းမှုများ)			
•	(၁၃) မွေးရာပါချို့ယွင်းမှုများ			
•	(၁၄) အခြားပုံမမှန်မှုများ သို့မဟုတ် ရောဂါများ			

အပိုင်း ၅ လုပ်ငန်းခွင်ထုတ်လုပ်နိုင်စွမ်းနှင့်လုပ်ဆောင်မှုထိခိုက်ခြင်းမေးခွန်းလွှာ။ အထွေထွေကျန်းမာရေး

အောက်ပါမေးခွန်းများသည်သင်၏အလုပ်လုပ်နိုင်စွမ်းနှင့်ပုံမှန်လှုပ်ရှားမှုများအပေါ်သင်၏ကျန်းမာရေးပြဿနာများ၏သက်ရောက်မှုအကြောင်းမေးမြန်းသွားမည်ဖြစ်သည်။ကျန်းမာရေးပြဿနာဆိုသည်မှာမည်သည့်ရုပ်ပိုင်းဆိုင်ရာ၊စိတ်ခံစားမှုပိုင်းဆိုင်ရာပြဿနာ၊ဝေဒနာများကိုရည်ညွှန်းပါသည်။ လိုအပ်သလိုကွက်လပ်များ ကိုဖြည့်ပါ။နံပါတ်များကိုဝိုင်းပါ။

စဉ်	အကြောင်းအရာ	ရွေးချယ်ခြင်း	မှတ်ချက်
1.	လက်ရှိသင်အလုပ်ရှိပါသလား။ (လုပ်ခလွှေကြေးအတွက်အလုပ်လုပ်နေပါသလား။)	မဟုတ်ပါ။ 1 ဟုတ်ပါသည်။ 2	"မဟုတ်ပါ။" ဟု ဖြေဆိုပါက **စစ်ဆေးပြီး မေးခွန်း 6. သို့သွားပါ။**
	အောက်ပါမေးခွန်းများသည်လွန်ခဲ့သော (၇) ရက် (ယနေ့မပါ) အတွင်းမှအကြောင်းများ ဖြစ်သည်။		
2.	ပြီးခဲ့သော(၇) ရက်အတွင်း သင်၏ကျန်းမာရေး ပြဿနာကြောင့်သင်လုပ်ငန်းခွင်မှ နာရီပေါင်း မည်မျှ ပျက်ကွက်ခဲ့သလဲ။ သင်နေအကောင်းသဖြင့် ခွင့်ယူခဲ့သောရက်များ၊ အလုပ်ထဲနောက်ကျ ရောက် ရှိခြင်းများ၊ အလုပ်မှ စောပြန်ခြင်းများ စသည့် နာရီ များအားလုံးပါဝင်သည်။ (ဤသုတေသနတွင် ပါဝင်ရန်ပျက်ကွက်ရသည့် အချိန်များမပါဝင်ပါ။)	_____ နာရီပေါင်း	
3.	ပြီးခဲ့သော (၇) ရက်အတွင်း ဥပမာ အားလပ်ရက်များ၊ အလုပ်ပိတ်ရက်များ၊ ဤသုတေသနတွင်ပါဝင်ရခြင်း စသည့် အခြားသောအကြောင်းများကြောင့် သင် လုပ်ငန်းခွင်မှ နာရီပေါင်း မည်မျှပျက်ကွက်ခဲ့သလဲ။	_____ နာရီပေါင်း	
4.	ပြီးခဲ့သော (၇) ရက်အတွင်းသင်အမှန် တကယ် နာရီပေါင်း မည်မျှအလုပ်လုပ်ခဲ့ရသလဲ။	_____ နာရီပေါင်း	အကယ်၍ "၀" (သုည) ဖြေပါက **မေးခွန်း 6. သို့သွားပါ။**
5.	ပြီးခဲ့သော (၇) ရက်အတွင်း သင်၏ကျန်းမာရေးပြဿနာများက သင်အလုပ်ခွင်အတွင်း သင်၏ထုတ်လုပ်နိုင်မှုအပေါ်မည်မျှထိခိုက်မှုရှိသလဲ။အလုပ်လုပ်ရသည့် နေ့များအတွင်း သင်လုပ်နိုင်သောအလုပ်အမျိုးအစားနှင့်ပမာဏအကန့်အသတ်ဖြစ်ခြင်းကိုစဉ်းစားပါ။ သင်လုပ်နိုင်သည့်နေ့အရေအတွက်ထက် လျော့နည်းစွာ လုပ်ကိုင်နေရမှု၊ အလုပ်ချိန်အတွင်း သင်ခါတိုင်းကဲ့သို့ သေသေချာချာအာရုံစူးစိုက်၍ မလုပ်နိုင်ခြင်းစသည်။အကယ်၍ ကျန်းမာရေး ပြဿနာသင်၏အလုပ်အပေါ်အနည်းငယ်သာထိခိုက်မှုရှိပါက နံပါတ်အငယ်များကိုရွေးပါ။ အကယ်၍ ကျန်းမာရေးပြဿနာများက သင်၏အလုပ်အပေါ်အလွန်အမင်းထိခိုက်မှုရှိပါက နံပါတ်အကြီး ကိုရွေးပါ။ **<u>ကျန်းမာရေးပြဿနာများက</u> <u>သင်အလုပ်လုပ်နေစဉ်</u>** **ကုန်ထုတ်လုပ်နိုင်စွမ်းရည်ကိုမည်မျှထိခိုက်နေသည်ကိုသာစဉ်းစားပါ။** 0 1 2 3 4 5 6 7 8 9 10		

	0 ကျန်းမာရေးပြဿနာများမိမိအလုပ်အပေါ် အကျိုးသက်ရောက်မှုမရှိပါ။		**10** ကျန်းမာရေးပြဿနာများမိမိကိုလုံးဝအလုပ်မလုပ်နိုင်အောင်တားဆီးထားသည်။
	နံပါတ်တစ်ခုကိုသာကွင်းပါ။		
6.	ပြီးခဲ့သော (၇)ရက်အတွင်း သင်၏ကျန်းမာရေးပြဿနာများက သင်နေ့စဉ်ပုံမှန်လှုပ်ရှားမှုများ (လုပ်ခရသောအလုပ်အကိုင်ကိုမဆိုလို) ကိုလုပ်ကိုင်နိုင်စွမ်း အပေါ် မည်မျှထိခိုက်မှုရှိသလဲ။ ပုံမှန်လှုပ်ရှားမှုဆိုသည်မှာသင်နေ့စဉ်နေအိမ်တွင်နေထိုင်စဉ်လုပ်နေရသော ဈေးဝယ်ခြင်း၊ ကလေးထိန်းခြင်း၊လေ့ကျင့်ခန်းလုပ်ခြင်း၊စာဖတ်ခြင်းစသည်။ သင်လုပ်နိုင်သော ပုံမှန် လှုပ်ရှားမှု အမျိုးအစားနှင့်ပမာဏအပေါ်အကန့်အသတ်ဖြစ်မှုများ။မလုပ်နိုင်ခြင်းစသည်။ အကယ်၍ ကျန်းမာရေးပြဿနာကသင်၏လှုပ်ရှားမှုများ အပေါ် အနည်းငယ်သာ ထိခိုက်မှု ရှိပါက နံပါတ် အငယ်များကိုရွေးပါ။ အကယ်၍ကျန်းမာရေးပြဿနာများက သင်၏လှုပ်ရှားမှု များ အပေါ် အလွန် အမင်းထိခိုက်မှုရှိပါက နံပါတ်အကြီးကိုရွေးပါ။ **<u>ကျန်းမာရေးပြဿနာများ</u>ကြောင့် သင်၏နေ့စဉ်ဝတ်ပုံမှန်အလုပ်များလုပ်နိုင်မှုစွမ်းရည်အပေါ် ထိခိုက်မှုများကိုသာစဉ်းစားပါ။ လုပ်ငန်းခွင်အတွင်းအလုပ်လုပ်သည့်အခြေအနေ မဟုတ်ပါ။**		
	0 1 2 3 4 5 6 7 8 9 10		
	0 ကျန်းမာရေးပြဿနာများမိမိ၏နေ့စဉ်လှုပ်ရှားမှုများအပေါ် အကျိုးသက်ရောက်မှုမရှိပါ။		**10** ကျန်းမာရေးပြဿနာများမိမိ၏နေ့စဉ်လှုပ်ရှားမှုများလုံးဝလုပ်ကိုင်၍မရအောင်တားဆီးထားပါသည်။
	နံပါတ်တစ်ခုကိုသာကွင်းပါ။		

ပါဝင်ဖြေဆိုခြင်းအတွက်ကျေးဇူးတင်ပါသည်။

APPENDIX D: Participant information sheet and consent form (Myanmar)

သုတေသနတွင်ပါဝင်သူများကိုအသိပေးစာနှင့်သဘောတူညီချက်ပုံစံ

အပိုင်း ၁ သုတေသနနှင့်ပတ်သက်သောအသိပေးစာ

<u>၁။ နိဒါန်း</u>

ကျွန်တော်သည် ထိုင်းနိုင်ငံ၊ ဘန်ကောက်မြို့ချူလာလောင်ကွန်းတက္ကသိုလ်တွင် ပြည်သူ့ကျန်းမာရေး မဟာဘွဲ့ကို ဆည်းပူးနေသောကျောင်းသားတစ်ယောက်ဖြစ်ပါသည်။ တက္ကသိုလ်၏ပညာရေးလိုအပ်ချက်များအရကျွန်တော် သည်သုတေသနတစ်ခုလုပ်ပြီးစာတမ်းကျမ်းတစ်စောင်တစ်ခုတင်ပြရန်လိုအပ်သည်။ကျွန်တော်၏ မဟာဘွဲ့ အတွက်ပြုစုနေသောစာတမ်းကျမ်းမှာ **မြန်မာနိုင်ငံရှိအထည်ချုပ်စက်ရုံမှ စက်ချုပ် လုပ်သားများ ၏ စိတ်ပိုင်းလူမှုရေးပိုင်းဆိုင်ရာသွင်ပြင်လက္ခဏာများ၊လုပ်ငန်းခွင်ထုတ်လုပ်နိုင်စွမ်း၊လုပ်ငန်းခွင် အလုပ်လုပ်နိုင်စွမ်း နှင့်ကြွက်သားနှင့်ကျောရိုးဆိုင်ရာမအီမသာဖြစ်ခြင်းတို့၏ဆက်နွယ်မှု** အကြောင်း ဖြစ်ပါသည်။

သုတေနပြုလုပ်သူအမည် – မစ္စတာထွန်းဝင်း ဦး

ဖုန်းနံပါတ်: ၀၉-၄၃၀-၂၀-၅၂၉

အီးမေးလ်လိပ်စာ: tunwinoo430@gmail.com

လေ့လာမှု၏ခေါင်းစဉ် –

မြန်မာနိုင်ငံရှိအထည်ချုပ်စက်ရုံမှ စက်ချုပ်လုပ်သားများ၏စိတ်ပိုင်းလူမှုရေးပိုင်းဆိုင်ရာ သွင်ပြင် လက္ခဏာများ၊ လုပ်ငန်းခွင်ထုတ်လုပ်နိုင်စွမ်း၊လုပ်ငန်းခွင်အလုပ်လုပ်နိုင်စွမ်းနှင့်ကြွက်သားနှင့်ကျောရိုးဆိုင်ရာမအီမသာဖြစ်ခြင်း တို့၏ဆက်နွယ်မှု

ဤသုတေသနတွင်ပါဝင်ရန်သင့်ကိုလေးစားစွာဖိတ်ခေါ်ပါသည်။ ဤသုတေသနတွင် မြန်မာနိုင်ငံရှိ စက်ချုပ် လုပ်သားပေါင်း (၄၀၀) ခန့်ပါဝင်မည်ဖြစ်ပါသည်။ အောက်တွင် ဖော်ပြမည့် အချက်အလက်များကို ဆက်လက် ဖတ်ရှု၍ မရှင်းလင်း သည် ကိုမေးမြန်းနိုင်ပါသည်။ဤသုတေသနတွင် သင်ပါဝင်မည်/မပါဝင်မည်ကို သင် လွတ်လပ်စွာ ဆုံးဖြတ်နိုင်ပါသည်။ သင်မည်သည့်အရာကိုထပ်မံရှင်းလင်းလိုလျှင်၊ လေ့လာမှုမပြုလုပ်မီနှင့်၊ အပြီး၌သုတေသနပြုလုပ်သူအား မေးမြန်းရန်မတွန့်ဆုတ်ပါနှင့်။

<u>၂။ မေးခွန်းလွှာတွင်ပါဝင်သောအကြောင်းအရာများ</u>

ဤမေးခွန်းလွှာတွင်မိမိဖာသာဖြေဆိုရမည့်အပိုင်း (၅)ပိုင်းပါဝင်၍ကြာမြင့်ချိန် မိနစ် (၃၀)ခန့်ဖြစ်ပါသည်။ အပိုင်း (၅)ပိုင်းမှာ

(၁) ဖြေဆိုသူ၏နောက်ခံအချက်အလက်များ
(၂) ကြွက်သားများနှင့်ကျောရိုးဆိုင်ရာမအီမသာဖြစ်မှုမေးခွန်းလွှာများ
(၃) စိတ်ပိုင်း၊လူမှုရေးပိုင်းဆိုင်ရာသွင်ပြင်လက္ခဏာမေးခွန်းလွှာများ
(၄) ထုတ်လုပ်နိုင်စွမ်းနှင့်ပတ်သက်သောမေးခွန်းလွှာများ
(၅) အလုပ်လုပ်နိုင်စွမ်းနှင့်ပတ်သက်သောမေးခွန်းလွှာများ ပါဝင်ပါမည်။

မေးခွန်းလွှာတစ်ခုလုံးသည် ဖြည့်စွက်ရခြင်း၊ ရွေးချယ်စရာများအပေါ်အမှတ်ခြစ်ပေးရခြင်း၊ ဖြေဆိုသူ အဆင်ပြေစေရန် ပေးထားသည့် အဖြေများပေါ်တွင်ဝိုင်းပေးရခြင်းများပါဝင်ပါမည်။ သင်၏ဖြေဆိုမှုများကို မည်သူဖြေကြားမှန်း မသိအောင် လျှို့ဝှက်ပေးထားမည်ဖြစ်ပါသည်။

၃။ သုတေသန၏ရည်ရွယ်ချက်

(၁) စက်ချုပ်လုပ်သားများ၏နောက်ခံအချက်အလက်များ၊ ထုတ်လုပ်နိုင်စွမ်း၊ အလုပ်လုပ်နိုင်စွမ်း၊ စိတ်ပိုင်းဆိုင်ရာ လူမှုရေးဆိုင်ရာအချက်များနှင့် ကြွက်သားများနှင့် ကျောရိုးဆိုင်ရာမအီမသာဖြစ်မှုများကိုရှာဖွေဖော် ထုတ်ရန်။

(၂) ပုဂ္ဂိုလ်ရေးအချက်များ၊ ထုတ်လုပ်နိုင်စွမ်း၊ အလုပ်လုပ်နိုင်စွမ်း၊ စိတ်ပိုင်းဆိုင်ရာ လူမှုရေးဆိုင်ရာ အချက်များနှင့် ကြွက်သားများနှင့်ကျောရိုးဆိုင်ရာမအီမသာဖြစ်မှုများ အကြား ဆက်စပ်မှုကိုသိရှိရန်။

၄။ လုပ်ထုံးလုပ်နည်း

ဤအသိပေးစာကိုဖတ်ရှုပြီး၊ လိုအပ်ပါက မေးခွန်းလွှာမှမရှင်းလင်းသည့်အချက်များကို သုတေသန ပြုလုပ်သူမှထပ်မံရှင်းလင်း ပြောကြားပေးပြီးသည့်နောက် ပါဝင်ခြင်းနှင့် ဖယ်ထုတ်ခြင်း ဆိုင်ရာ စံသတ်မှတ်ချက်များအရ ပါဝင်မည့်သူများသည်မိမိတို့ပါဝင် ရွေးချယ်ခံရမှု အတွက် သဘောတူညီ ကြောင်းကိုစာဖြင့် အသိပေးရန်လိုအပ်လိမ့်မည်။ သဘောတူညီကြောင်းစာကို သုတေသနပြုလုပ်သူက လုံခြုံစွာသိမ်းဆည်း ထား မည်ဖြစ်သည်။

သင်သည်ဤလေ့လာမှုတွင်မပါဝင်လိုပါက သဘောတူညီချက်ပေးရန်မလိုအပ်ပါ။ အကြောင်းပြချက် တစ်ခုခုပေးရန်လည်းမလိုအပ်ပါ။ အကြောင်းပြချက်ပေးရန်မလိုဘဲသင်ဆန္ဒရှိသည့် အတိုင်းအချိန်မရွေး သင်နှုတ်ထွက်နိုင်ပြီးယင်းသည်ပါဝင်သူများအပေါ်မည်သည့်ဆိုးကျိုးတစ်စုံတစ်ရာသက်ရောက်မှုမျှရှိလိမ့်မည်မဟုတ်ပေ။

၅။ အကျိုးကျေးဇူးများ

ဤလေ့လာမှုသည်စက်ချုပ်လုပ်သားများအကြောင်းလေ့လာမှုဖြစ်၍သင့်အတွက်အကျိုးကျေးဇူးရှိပါလိမ့်မည်။ အဆိုပါလေ့လာမှုသည်စက်ချုပ်လုပ်သားများအကြားစိတ်ပိုင်းလူမှုရေးပိုင်းဆိုင်ရာပြဿနာများ၊ထုတ်လုပ်နိုင်စွမ်း၊ အလုပ်လုပ်နိုင်စွမ်းနှင့် အလုပ်နှင့်ဆက်စပ်သောကြွက်သားများနှင့် ကျောရိုးဆိုင်ရာ မအီမသာဖြစ်မှုများကိုရှာဖွေရန်ရည်ရွယ်သည်။ ထို့ကြောင့်လေ့လာမှုရလဒ်သည်စက်ချုပ်လုပ်သားတို့အတွက် ပိုမိုကောင်းမွန်သောလုပ်ငန်းခွင်အခြေအနေ၊ ကျန်းမာရေးအတွက်လုပ်ငန်းခွင်ကျန်းမာရေးစောင့်ရှောက်မှုများနှင့် အလုပ်သမားဥပဒေများပြဋ္ဌာန်းနိုင်ရန် လိုအပ်သည့်မရှိမဖြစ်သုတေသနအချက်အလက်များကိုပေးစွမ်းနိုင်မည်ဖြစ်သည်။

၆။ အချက်အလက်များကိုလျှို့ဝှက်ထိန်းသိမ်းထားမှု

သင်နှင့်ဆက်စပ်သောနေသောမည်သည့်သတင်းအချက်အလက်ကိုမဆိုလျှို့ဝှက်ထားပါမည်။ သင်၏နံမည်များ (သို့မဟုတ်) တစ်စုံတစ်ယောက်ဟုသိရှိနိုင်သော အခြားအချက်အလက်များကိုအစီရင်ခံစာ (သို့မဟုတ်) လေ့လာမှု၏ အနှစ်ချုပ်တွင်ဖော်ပြမည်မဟုတ်ပါ။ နောက်ဆုံးအစီရင်ခံစာကိုသုတေသနပြုလုပ်သူထံမှရရှိနိုင်ပြီး ဤအစီရင်ခံစာကိုပြည်သူ့ကျန်းမာရေးမဟာဘွဲ့၏ပညာရေးလိုအပ်ချက်ကိုဖြည့်ဆည်းရန်သာသုံးလိမ့်မည်။

အချက်အလက်အားလုံးကိုလျှို့ဝှက်ထိန်းသိမ်းထားရှိမည်ဖြစ်ပြီးမည်သူတစ်ဦးတစ်ယောက်ကိုမျှထုတ်ဖော်ပြောကြားသွားမည်မဟုတ်ပါ။

၇။ ပါဝင်ခွင့်နှင့်သဘောတူညီချက်

ကျွန်ုပ်သည်ဤသုတေသန၏ရည်ရွယ်ချက်များ၊ ဤသုတေသန၏ အကြောင်းအရာများ၊ အကျိုးကျေးဇူးများနှင့်အန္တရာယ်အလားအလာများ/ထိခိုက်နစ်နာမှုများ (တစ်စုံတစ်ရာရှိခဲ့ပါက) ပါဝင်သူများ၏ အခွင့်အရေးနှင့် တာဝန်များကို ဖတ်ရှုပြီးဖြစ်ပါသည်။ ကျွန်ုပ်သည်သုတေသနပြုလုပ်သူနှင့် ဆက်သွယ်နိုင်မည့်အချက်အလက်အသေးစိတ်ကိုလည်း ရရှိထားသည်။ ကျွန်ုပ်သည်အသိပေးစာကို ဖတ်ရှုအပြီး သုတေသနပြုလုပ်သူက ကျွန်ုပ်ကိုရှင်းပြပြီးနောက် အသိပေးစာတွင်ဖော်ပြထားသည့်အတိုင်းဆောင်ရွက်ရန် ကတိပြုပါသည်။ ကျွန်ုပ်သည် ကောင်းမွန်ကျေနပ်စွာနားလည်သဘောပေါက်ပါသည်။ ဤသုတေသနတွင်ပါဝင်ရန် ကျွန်ုပ်ဆန္ဒရှိကြောင်း သဘောတူပါက ဤလေ့လာမှုတွင် ကျွန်ုပ်၏အမည်နှင့်အခြားတစ်စုံတစ်ယောက်ဟု သိရှိနိုင်သော မည်သည့် အချက်အလက်များမှပါဝင်မည်မဟုတ်ပါ။ ဤသည်မှာ ဖိနစ် (၃၀) ခန့်ကြာမြင့်မည်ဖြစ်သည်။

လေ့လာမှုမစမီ၊ သင်ပါဝင်လုပ်ဆောင်နေစဉ်နှင့်ပါဝင်မှု အပြီးတွင် သင်သိလိုသည့် မည်သည့် အကြောင်းအရာကိုမဆိုမေးမြန်းနိုင်သည်။ အဓိကသုတေသနပြုလုပ်သူ သည်အထက်ဖော်ပြပါ လိပ်စာနှင့် အတူ အချိန်မရွေးဆက်သွယ်နိုင်ပါသည်။ သုတေသနပြုလုပ်သူသည်အကျိုးကျေးဇူး (သို့မဟုတ်) အန္တရာယ်/ ထိခိုက်နစ်နာမှုနှင့် ပတ်သက်သောသတင်းအချက်အလက်အသစ်များရှိပါက သင်ကိုအမြန်ဆုံး အကြောင်းကြားပါလိမ့်မည်။

ပါဝင်သူများအတွက်သတိပေးစာ နှင့် သဘောတူညီချက်ပုံစံတွင်ဖော်ပြထားသည့် အတိုင်းသုတေသနပြုလုပ်သူက မလုပ်ဆောင်ပါက၊ သင်သည်အဖြစ်အပျက်ကို ထိုင်းနိုင်ငံ၊ ဘန်ကောက်မြို့၊ချူလာလောင်ကွန်းတက္ကသိုလ်ရှိ **သုတေသနကျင့်ဝတ်သုံးသပ်ရေးကော်မတီ** Research Ethics Review Committee for Research Involving Human Research Participants (RECCU), Group I, Chulalongkorn University (RECCU) Jamjuree 1 Bldg., 254 Phyathai Rd., Patumwan district, Bangkok 10330, Thailand, တယ်လီဖုန်းအမှတ်/ဖက်(စ်) ၀-၂၂၁၈-၃၂၀၂၊ ၀-၂၂၁၈-၃၀၄၉ အီးမေးလ်၊ eccu@chula.ac.th" သို့အကြောင်းကြားတိုင်ကြားနိုင်ပါသည်။

ဤသဘောတူညီချက်ပုံစံမှအချက်အလက်တွေကိုကျွန်ုပ်ဖတ်ရှုပြီးပါပြီ။ ထို့ပြင်၊ ကျွန်ုပ်သည်ပါဝင်သူ၏ အသိပေးစာ နှင့် သဘောတူညီချက်ပုံစံမိတ္တူကိုလက်ခံရရှိခဲ့သည်။

ကျွန်ုပ်သည်ဤလေ့လာမှုတွင်ပါဝင်ရန်သဘောတူသည်။

(_____)

သုတေသနတွင်ပါဝင်သူ၏လက်မှတ်

ထွန်းဝင်း ဦး (အဓိကသုတေသနပြုလုပ်သူ)
တွဲဖက်ပါမောက္ခ Nutta Taneepanichskul (စာတမ်းအကြံပေး)

VITA

NAME	Tun Win Oo
DATE OF BIRTH	9.7.1991
PLACE OF BIRTH	Yangon,Myanmar
INSTITUTIONS ATTENDED	College of Public Health Science, Chulalongkorn University
HOME ADDRESS	No. (29), Aungzayar 1st street Yangonthit Quarter, Thingangyun Township, Yangon, Myanmar