PREVALENCE OF WORK RELATED MUSCULOSKELETAL DISORDERS AND ASSOCIATED FACTORS AMONG BANK STAFF IN JIMMA CITY, SOUTHWEST ETHIOPIA

BY: GULUMA ETANA (B.Sc)

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JIMMA UNIVERSITY
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INSTITUTE OF HEALTH,
FACULTY OF MEDICAL SCIENCES,
DEPARTMENT OF BIOMEDICAL SCIENCES,
ANATOMY UNIT

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A THESIS RESEARCH SUBMITTED TO JIMMA UNIVERSITY INSTITUTE OF HEALTH, DEPARTMENT OF BIOMEDICAL SCIENCES, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR MASTERS OF SCIENCE IN CLINICAL ANATOMY

ADVISORS:

PRINCIPAL ADVISOR: Mr. ASFAW GERBI (B.Sc, M.Sc, Ass. Prof)

CO-ADVISOR: Mr. MENGISTU AYELE (B.Sc, M.Sc)

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ABSTRACT

Background: *The musculoskeletal system is composed of two systems; the skeletal and muscular systems. It contains bones, muscles, joints, ligaments, and tendons. The work-related musculoskeletal disorder results from work-related exposures and is one of the most important public health problems throughout the world. It not only affects the health of workers but also creates a burden on the health system, on the economic and social costs. Hence, assessment of work-related musculoskeletal disorders and identification of risk factors could help to design prevention strategies in the future.*

Objectives: *To assess the prevalence of work-related musculoskeletal disorder and associated factors among bank staff in Jimma city, Jimma, Ethiopia.*

Methods: *Institution based cross-sectional study was conducted from July 20 to August 20, 2019, among Bank staff in Jimma city, Southwest Ethiopia. Data we recollected by pre-tested interviewer-administered standardized Nordic musculoskeletal questionnaires. Data were entered into Epi Data version 3.1 and exported to SPSS version 20. Logistic regression was conducted and an adjusted odds ratio (AOR) at a 95% confidence interval was calculated to see the association between dependent and independent variables. Independent variables with a p-value < 0.05 in the final multiple logistic regressions were considered as statistically significant.*

Results: *Data were collected from 335 professional Bank staff in Jimma city. The overall prevalence of work-related musculoskeletal disorders during the last 12-months was 245(73.1%). The most affected body parts were lower back 181(54%), neck 152(45.4%), upper back 143(42.7%) and shoulder 127(37.9%) while the least affected body parts were wrist, knee, ankle/feet, elbows and hips in47(14%), 46(13.7%), 38(11.3%), 30(9%)and 28(8.4%) respectively. It was found that work experience [AOR: 2.16, 95% CI: 1.05-4.43], alcohol consumption [AOR: 3.44, 95% CI: 1.29-9.18], awkward posture [AOR: 4.09, 95% CI:2.20-7.61], working in the same position for two or more hours [AOR: 2.02, 95% CI: 1.05-3.89] and job stress [AOR: 3.20,95% CI: 1.67-6.15] were significant predictors for work-related musculoskeletal disorder.*

Conclusions and recommendations*: The prevalence of work-related musculoskeletal disorder was common among bank staff. Work experience, alcohol consumption, awkward posture, prolonged working in the same position and job stress were independent predictors for a work-related musculoskeletal disorder. Preventive strategies such as using ergonomic guidelines and giving awareness on the effect of bad posture, avoid working in the same position for a long period and taking a break were recommended.*

Keywords: *Work -related musculoskeletal disorders, risk factors, bank staff, Jimma city, Ethiopia*

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

AB	Awash Bank
AOR	Adjusted Odds Ratio
BMI	Body Mass Index
CBE	Commercial Bank of Ethiopia
CBO	Cooperative Bank of Oromia
COR	Crude Odds Ratio
CI	Confidence Interval
CSA	Central Statistical Agency
DALYs	Disability Adjusted Life Years
DB	Dashen Bank
ETB	Ethiopian Birr
GNP	Gross National Product
LBP	Low Back Pain
MSDs	Musculoskeletal Disorders
MSS	Musculoskeletal Symptoms
OIB	Oromia International Bank
SPSS	Statistical Package for Social Sciences
SRS	Simple Random Sampling
USA	United State of America
WMCs	Work-Related Musculoskeletal Complaints
WRMSD	Work Related Musculoskeletal Disorder

1. INTRODUCTION

1.1. Background of the Study

The musculoskeletal system composed of two systems the skeletal and muscular systems. The skeletal system consists of bones, cartilages, and ligaments tightly joined to form a strong, flexible framework for the body. It may be divided into two functional parts the axial skeleton (head, neck, and trunk) and the appendicular skeleton (consists of bones of the limbs, including those forming the pectoral and pelvic girdles). The muscular system consists of all the muscles of the body. It consists of three types of muscles based on their location (soma or viscera), appearance under a microscope (striated or non-striated) and whether they are voluntary or involuntary. These are including skeletal striated muscle (voluntary somatic muscle), cardiac striated muscle (involuntary visceral muscle) and smooth muscle (non-striated involuntary visceral muscle) (1).

Generally, a musculoskeletal system consists of bone, muscle, joint, ligament, and tendon. The bones provide rigidity while protecting and supporting most of the soft tissues which provide leverage through actions of muscles, permitting the movement of the body. Bones are also connected to each other forming joints allowing various degrees of freedom, based on their structure. Some joints are stabilized by fibrous tissues while others are stabilized by tough but flexible ligaments. Muscles are attached to bones by strong and flexible yet inextensible tendons which are inserted into bones (2).

Musculoskeletal disorders (MSDs) defined as a wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels. These include clinical syndromes such as tendon inflammations and related conditions (tenosynovitis, epicondylitis, bursitis), nerve compression disorders (carpal tunnel syndrome, sciatica), and osteoarthritis (3). Musculoskeletal injury resulting from a work-related event is termed work-related musculoskeletal disorder (WRMSD) and it is an effect of overexertion which occurs when workers are repeatedly exposed to forceful and prolonged activities in awkward postures or unsympathetic environment (4). MSDs are usually characterized by musculoskeletal symptoms (MSS) of pain, paraesthesia, stiffness, swelling, redness, weakness, tingling and numbness (5). WRMSD can affect the neck, shoulders, arms,

elbows, wrists, hands, back, legs and feet. Body regions most commonly affected are the low back, neck, shoulder, forearm, and hand (6,7).

Factors such as ergonomic (awkward postures, repetition of the same movements, same posture, working hours), psychosocial (social relation, workload, job satisfaction, and job stress), individual (BMI, physical activity, smoking /drinking, systemic illness, and so on) and socio-demographic factors (age and gender) contribute to WRMSDs among workers all over the world, which will be leading cause of disability and will have a serious societal and public health implications by 2020 (8–14). Activities such as repetitive movement, awkward postures, and the same posture are the primary risk factors for the development and persistence of musculoskeletal symptoms in workers (15).

The modernization in different offices including banks has led to the introduction of information technology tools in the workplace. Computer usage has been linked to an increased risk of musculoskeletal disorders. The banking sector uses a computer for data collection, processing and programming, hence they are one of the major occupations with the potential musculoskeletal hazard (16,17). Bank workers are prone to developing MSDs because of their job often involves prolonged sitting, awkward postures, physically demanding and stressful, long working hours, a repetitive task in front of computers while typing and using a mouse without having adequate rest and recovery time (18).

According to National Institute for Occupational Safety and Health (NIOSH), in the USA there were 522,528 MSD cases, 75% of those were due to overexertion and another 11.5% were due to repetitive motion disorders (19). It also reported that the direct costs of MSDs and carpal tunnel syndrome(CTS)in the USA were $1.5 billion and $0.1 billion respectively in 2007 while the indirect costs were$1.1 billion and $0.1 billion respectively (20).

WRMSDs still occupy a top place in the record of occupational diseases in Europe and remain one of the priorities on the agenda in the occupational health and safety field between 2013 and 2020. Moreover, considerable variation was reported even among the European nations with regard to the types and magnitude of MSD complaints. For instance, back pain was reported more than twice as common in Portugal 63.8% as Ireland 25.7%, while prevalence rates of neck/upper limb pain ranged from 26.6% in Ireland to 67.7% in Finland (21,22). In Asian

populations, a high annual prevalence of WRMSDs in at least one body region is varied from 40 % to 95 % (23). In India, the occupation-specific prevalence of MSD found to be as high as 90% (24).

In many African countries, WRMSD was a problem with the prevalence of any musculoskeletal disease ranging from 15% to 93.6% (25). Of the 8–9 million South Africans in employment, about 792 000 consult health services at least once a year due to disease or injury related to or aggravated by their work (26). Another report from South Africa showed that the incidence of work-related back and neck pain and carpal tunnel syndrome is between 15-60% indicating that a high proportion of the working population is at risk of developing one or more work-related musculoskeletal disorders (27).

The banking industry is growing at an alarming rate in Ethiopia hence the commercial banks opened 500 new branches in 2017/18 alone which increased the total number of branches to 4,757 from 4,257 a year ago (28). Even though the banking sectors growing in number, there is limited data source regarding WRMSD among bank workers. Therefore, this study aimed to determine the magnitude of WRMSDs (neck, shoulder, upper back, lower back, hip/thigh, knee/leg, ankle/foot, and wrist /hand pain) and associated risk factors among bank staff in Jimma city, Southwest Ethiopia.

1.2. Statement of the Problem

Work-related musculoskeletal disorder is one of the most important public health problems and affect all persons irrespective of age and sex, and are most prevalent across a wide range of occupations (16). Globally, MSD is the largest single cause of work-related illness, accounting for over 33% of all newly reported occupational illnesses in the general population (29).

About 56% of the Brazilian bank workers evaluated had MSD symptoms affecting the upper limbs (30). In Turkey, the bank employees experienced upper extremity work-related musculoskeletal complaints anywhere in upper body area are 61.1% and the most common complaint is reported in the left neck (66.5%) and left shoulder (28.5%) areas (12). In India bank workers suffering from MSD reported the problem in the low-back pain 40.4%, upper back 39.5%, neck 38.6%, hand/wrist 36.8%, and shoulder 15.2% (15).

In developing countries, the prevalence of WRMSD is high because of the poor working environment and lack of ergonomic knowledge (18). In African countries, a few existed data sources showed that a high prevalence of WRMSD among bank workers as reported in Nigeria 71.68% and in Ghana 83.5% suffered MSD in at least one region of the body (16,17). In Rwanda, the prevalence of back pain among the bank staff was found to be 45.8% (31).

In Ethiopia, WRMSD is a problem with high prevalence as reported among nurses, garment workers, hairdressers, and office workers (13,32–34). However, information about WRMSD among bank workers is infinitesimal in Ethiopia. We were able to cite only one quantitative study conducted in Mekelle, North Ethiopia which showed that about 50% and 30% of the bank workers were occasionally and frequently seeking leave because of low back pain respectively (35). This may cause a loss of productivity and efficiency because workers are one of the stakeholders to achieve sustainable development of the country. Therefore, it is clear that there is a huge literature gap in the magnitude of WRMSDs and associated risk factors among bank workers in Ethiopia focusing on nine specific body parts. By considering this gap of information, this study was aimed to assess the prevalence of WRMSDs and associated risk factors among bank staff in Jimma city, Southwest Ethiopia.

1.4. Significance of the Study

Nowadays, WRMSD is one of the most common complaints of workers but it is given the least attention. There is a paucity of knowledge on the magnitude of WRMSDs and potential risk factors in Ethiopia, specifically among bank workers focusing on specific body parts.

Therefore, this study will provide information about the magnitude of WRMSDs in this area. It will identify the risk factor of MSD as its understanding helps in designing and taking appropriate preventive and control methods of MSD such as ergonomic training and proper education about the effect of bad posture at least in the study area by local bank managers for their staff. Besides, the affected study subjects will be advised to visit physiotherapeutic treatment to subside the pain and prevention of another episode. It will help to modify the workplace design and adjust the working environment. It serves as input information for governmental and non-governmental organizations working on occupational health and safety. It can also serve as baseline information to undertake further studies in similar settings.

2. LITERATURE REVIEW

2.1. Over View of Musculoskeletal Disorders

Musculoskeletal disorders (MSDs) are the major causes of work-related disabilities and lost-time illnesses and injuries in both developed and industrially developing countries (36). In developed countries, MSDs affect about 20–40% of the adult population while in industrially developing countries, the rate of MSDs is expected to be very high due to poor working environment and absence of effective work injury prevention program (37).

Work-related musculoskeletal disorders are a cause of concern not only because of the health effects on individual workers but also because of the economic impact on businesses and the social costs (38). For instance, according to the European Agency for Safety and Health at Work, the cost of WRMDs estimated between 0.5% and 2% of Gross National Product (GNP) in European countries. In France in 2006, MSDs have to lead to seven million workdays lost, about 710 million EUR of enterprise contributions (39). In the USA, WRMSDs account for 34% lost workdays; direct costs for worker compensations are estimated to be $20 billion, whereas indirect costs can be five times more than the direct costs (40).

2.2. Burden of Work Related Musculoskeletal Disorder

About 20 million people are experiencing various WRMSDs around the world. These are a group of painful disorders of muscles, tendons, and nerves, which occurs as a result of frequent or repetitive activities with awkward postures (41). The global prevalence of WRMSD ranges from 14% to as high as 42% (42). The 2010 global burden of disease study estimated that low back pain(LBP) was among the top 10diseases and injuries that accounted for the highest number of disabilities adjusted life years (DALYs) worldwide (43). Globally, there is a lifetime incidence of 40% of LBP (44), affecting as much as 80% of people in the developed countries (45).

According to the European Agency for Safety and Health at Work, MSDs are the most common work-related problem in Europe. Almost 24 % of the EU-25 workers report suffering from a backache and 22 % complain about muscular pains. Both conditions are more prevalent in the new Member States, 39 % and 36 % respectively (46). In Great Britain, about 469,000 workers

suffering from work related musculoskeletal disorders (new or longstanding) in 2017/18. Among these the prevalence of WRMSDs were; upper limb or neck 197,000(42%), back 186,000(40%), and lower limbs 86,000(18%). About 6.6 million working days lost due to work-related musculoskeletal disorders in 2017/18 (47). WRMSDs have a huge impact on work-related absence and a high proportion of days lost is due to MSDs (48). For instance, in the United States, Canada, Finland, Sweden, and England MSD cause more work absenteeism and disabilities than any other group of diseases (49,50).

A report from a systematic review done in Africa indicated that the average lifetime prevalence of LBP among the adolescents was 36% and among adults was 62 % (51). Another study carried out in Sub -Saharan Africa Nigeria revealed that the 12-months period and point prevalence rates of WRMSDs were 64.4% and 48.2% respectively (52). The study conducted in Egypt among computer office workers showed that the prevalence of WRMSDs as lower back pain (78%), neck complaints (68.1%) and upper musculoskeletal complaints (61.5%) (53).

In Ethiopia, study done among garment workers in Addis Ababa indicates that, one year prevalence of work-related musculoskeletal disorders was 65.4% (32). Similarly, an institutional based cross-sectional study conducted in Jimma Zone among nurses indicated that from the 301 respondents, the prevalence of WRMSD at anybody site was 183 (60.8%) and the highest report 124 (67.8%) was seen in the lower back which was followed by the neck 44 (24%) and knees 43 (23.6%)during the last 12 months (33). Another cross-sectional study conducted in Ethiopia among hair dressers who were working in Addis Ababa indicated that out of 609 respondents, the prevalence of WRMSDs was 76.6%. The most commonly affected body parts were, the lower back 71.5%, shoulder 51.6%, and hand or wrist 46.6% (13). The study done in North Showa Zone showed that about 74.92% office workers suffered MSD in upper body area (34).

2.3. Prevalence of Work Related Musculoskeletal Disorders in Bank Workers

A cross-sectional survey study carried out in India aimed to determine the prevalence of work-related musculoskeletal disorders among bankers showed that, the prevalence rate of pain was highest in lower back (50%), followed by neck pain (48.9%), shoulder (36.7%), leg (35.6%),upper back(15.6%) and least in arm (only 12.2%) (54). According to cross-sectional study investigated among bank staff in Iraq, 48% of the staff had experienced pain at least once

during the past year in one of their nine musculoskeletal body regions with the highest frequency in neck (48%), lower back (44%), and upper back (36%) (55).

A descriptive cross-sectional study done in Pakistan showed that the prevalence of neck pain in bankers was 42.4% (56). According to cross-sectional study implemented in Bangladesh, 12 months the prevalence of MSS among bank workers were neck 58.4%, upper back 30.2%, lower back 60.4%, shoulders 56.6%, elbows 6.6%, wrist 17.9%, hip 3.8%, knee 16%, and ankle 5.7% (18). Also, the prevalence of computer-related MSDs among bankers of Dhaka city found to be 75.2%, 48%, 30.8%, 22.5%, 20.5%, 19%, 11.2%, 10.8%, 8.5%, 6%, 5.2% and 4.5% of the respondents complained the neck pain, back pain, shoulder pain, upper back pain, finger pain, wrist pain, scapula pain, knee pain, elbow pain, leg pain, ankle pain, toe pain respectively (57). In the case of Korea, female bank tellers affected by WRMSDs were 51.4% for the shoulder, 38.3% for the lower back, 38.0% for the neck, 31.2% for the upper back, 21.7% for the wrist, and 13.6% for the fingers (58). A cross-sectional study conducted among bank office workers in Kuwait showed that 80% of workers suffered from at least one attack of a MSD in the previous year, while 57% suffered from attacks during the previous week. The most affected body parts were the neck (53.5%), lower back (51.1%), shoulders (49.2%) and upper back (38.4%) (7).

The study done among Nigerian bank workers reported that body parts with the highest prevalence of WRMSDs were Neck 66.8%, and shoulder 60.1%, followed by hand 32.6%, upper arm 32.0%, lower arm 31.5%, wrist 28.1%, and elbow 22.5% (59). The study conducted in South Africa showed that the prevalence of MSD among bank workers estimated any pain at 76.7%. Low back pain was the most prevalent pain at 55.5% followed by neck at 52.9% and shoulder pain at 36.6%, wrist/hand at 27.1%, knee at 26.3% and elbow pain was the least prevalent pain at 15.7% (60).

2.4. Factors Associated With Work Related Musculoskeletal Disorders

2.4.1. Socio demographic factors

According to previous study, the annual prevalence of WMSD in the female sex is slightly higher than that of the male (16). A cross sectional study done in Sweden indicated that the prevalence rate among construction workers increased by age from 18% among the youngest

ones to 35.7% in ages 55–59 years (61). In Finland, a higher rate of sick leave due to disorders of the upper limbs was found for new workers compared with experienced ones, especially in the high workload group (62).

2.4.2. Individual level factors

A cross-sectional study conducted among office workers in Indonesia showed that MSDs were related to BMI (Body Mass Index) (63). Also, a cross-sectional study done among hairdressers in Ethiopia indicated that hairdressers whose BMI was overweight had 2.25 times more odds of having self-reported work-related musculoskeletal disorder as compared to hairdressers who had normal BMI (13).

A previous cross sectional study implemented among garment workers in Ethiopia revealed that association of WRMD with doing exercise, medical history of illness, alcohol drink and recreation activities. The odds of musculoskeletal disorders among those workers not having physical exercise is about 3 times that of workers having physical exercise. And also, workers who have medical history of systemic illness had 3 times higher chance to develop disorders as compared to those without illness. Alcohol drinking habit was another factors show more than 4 times higher odds of having pain than non-drinkers (32). Smoking was also shown to be a significant predictor for MSDoccurring during the previous 12 months (7).

2.4.3. Ergonomic risk factors

The direct path from physical factors to job task and the tools/equipment suggest that job task factors such as; the number of working days, working hours, duration of computer use, the type of task, type of position assumed, the number of breaks and different type of computer equipment and tools will increase in the awkward posture, work pace, repetitiveness, and force. The increases in some working days/ hours and duration of computer use cause prolonged in sitting posture, which increases the muscular load and muscle activity around the facet joint which leads to the joint compression which in turn influences the musculoskeletal symptoms (12). According to systemic review done in Sweden, forces applied to the computer mouse and keyboard may be a risk factor for musculoskeletal symptoms (64).

According to study done among bankers in Nigeria, overwork(61.11%), not enough rest breaks during the day(60.49%), working many days in a week(58.64%), inadequate training in injury prevention (58.02%), working in the same position (54.94%) among others were the most prevalent risk factors identified (17). Another study also indicated that back pain among bank staff associated with sitting in back bent, back twisted, and having no break off (31).

2.4.4. Psychosocial factors

Psychosocial risk factors are non-biomechanical risk factors related with work. Psychosocial factors cannot be seen as risk factors that, by themselves, led to the development of WRMSD but in combination with physical risk factors, they can increase the risk of injuries, which has been confirmed by experience. This includes work pace, autonomy, monotony, work/rest cycle, task demands, social support from colleagues and management and job uncertainty (14). According to a review done in Netherland, monotonous work, high perceived work load, low control on the job and lack of social support by colleagues were positively associated with musculoskeletal disorders (65). Evidence from previous study indicated that WRMSD associated with job stress and job satisfaction. Workers stressful by their job had 6 times more odds to develop WRMSD than with no stress. In the same way, those worker who didn't satisfied by their job had more than 8 times more likely to have WRMSD compared to those satisfied by their job (32).

2.4.5. Environmental factors

According to literature review done in Malaysia, environmental factors such as temperature, noise and lighting had shown a significant relationship in the development of musculoskeletal disorders (11). Similarly, another study showed that WRMSD related to uncomfortable temperature and height nonadjustable chair (13).

2.5. Conceptual Framework

The conceptual framework is adapted after reviewing different kinds of literatures done on work-related musculoskeletal disorders among bank workers (7,11,12,15,16,31,54).This conceptual framework showed that independent factors such as socio-demographic, individual factors, ergonomic factors, working environment and psychosocial factors associated with work-related musculoskeletal disorder among bank staff (**Figure 1**).

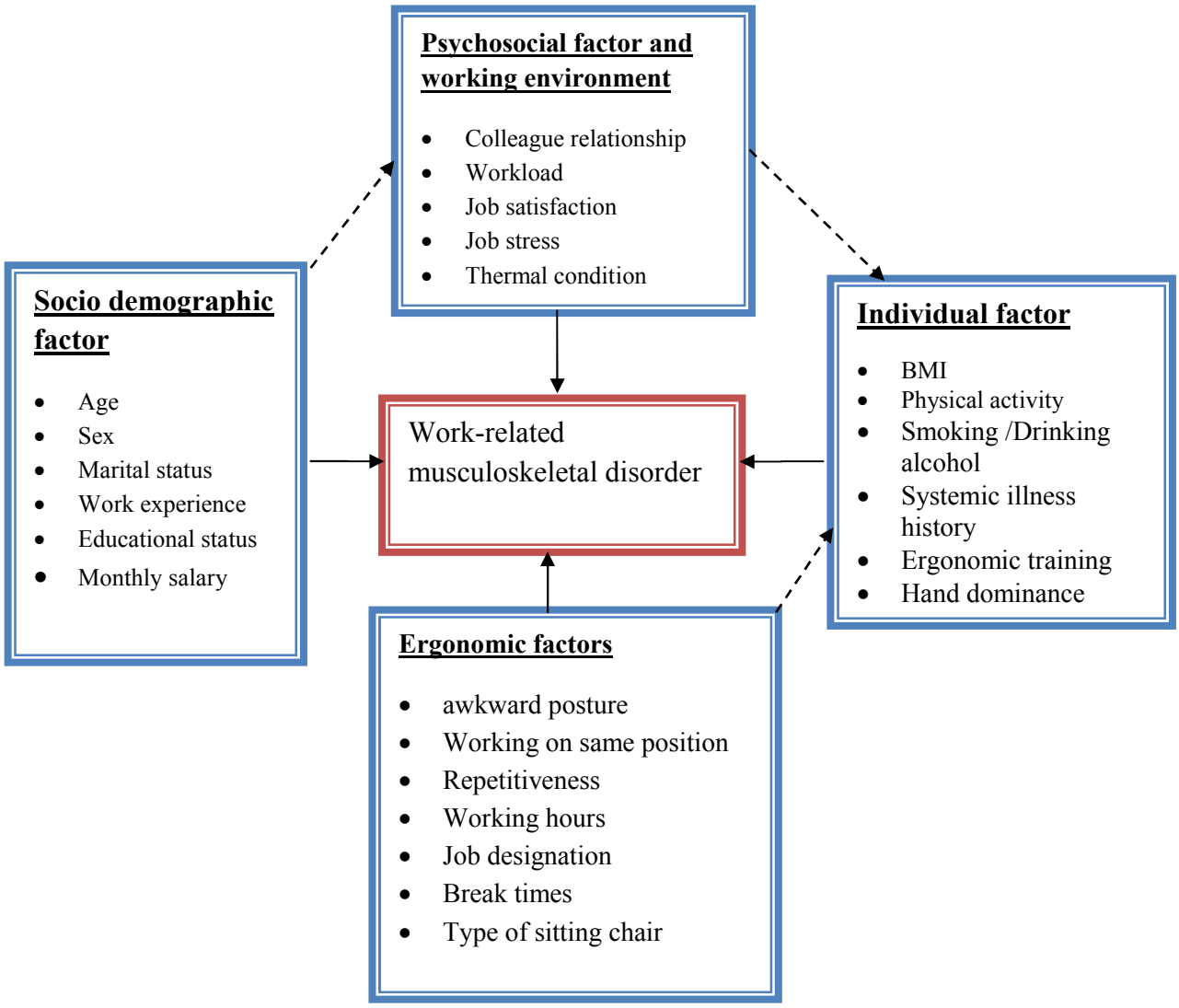

Figure 1: Conceptual Framework showing factors associated with work-related musculoskeletal disorder

3. OBJECTIVES

3.1. General Objective

To assess the prevalence of work-related musculoskeletal disorders and associated risk factors among bank staff in Jimma city, southwest Ethiopia.

3.2. Specific Objectives

- To determine the prevalence of the work-related musculoskeletal disorders among bank staff in Jimma city
- To identify the factors associated with work-related musculoskeletal disorders among bank staff in Jimma city

4. METHODOLOGY

4.1. Study Area and Period

The study was conducted in Jimma city which is located 350 Km to the Southwest of Addis Ababa. The geographical coordinates of the city are approximately 7°41′ N latitude and 36° 50′ E longitude. The city is located at an average altitude of 1,780 meters above sea level. It lies in the climatic zone locally known as "Woyna Daga" (1,500—2,400m above sea level). The city is generally characterized by a warm climate with a mean annual temperature ranging from 14 to 30°c. The annual rainfall ranges from 1138-1690 mm. The maximum precipitation occurs during the three months from June through August, with minimum rainfall occurring in December and January. According to the Ethiopian Central Statistical Agency (CSA) on population projection values of 2015, the total population of Jimma city is 177,900 and it is the 9th most populous city in Ethiopia next to Dese. Jimma city houses about 16 banks during the study. The study was conducted from July 20 to August 20, 2019.

4.2. Study Design

An institution-based cross-sectional study was conducted among bank staff in Jimma city

4.3. Population

4.3.1. Source Population

All bank staffs in Jimma City

4.3.2. Study population

All bank staffs in the banks selected by simple random sampling and who fulfilled the inclusion criteria

4.4. Eligibility Criteria

4.4.1. Inclusion criteria

- Clerical staff have worked for at least one year

4.2.2. Exclusion criteria

- Individual who had a history of accidents affecting the musculoskeletal system
- Spinal surgery and major surgery in any part of the body
- Pregnant and current ill
- Individual with congenital anomalies such as spine and limb anomaly

4.5. Sample Size Determination and Sampling Technique

4.5.1. Sample size determination

The sample size was calculated by using single population proportion formula with 71.68% of the bankers reported work-related musculoskeletal disorder in at least one region of the body in the previous one year as study report from Nigeria, with 5% margin of error (d) and 95% confidence interval (CI)(17).

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

$$n = \frac{(1.96)^2 * 0.7168(1-0.7168)}{(0.05)^2} = \mathbf{312}$$

Where

- n= sample size required for the study
- Z α/2 = Confidence level at 95% = 1.96, using level of significance of α=0.05.
- P = prevalence of musculoskeletal disorder among bankers
- d = margin of error to be tolerated = 5%

By adding 10% of non-respondent which is 31, the final sample size required for this study was 312 + 31 = **343**

4.5.2. Sampling techniques

For the selection of banks, first, we listed all the banks there in Jimma city and operating during the study period. Then, from 16 banks, five banks were randomly selected by using simple

random sampling (SRS) technique, lottery method depending upon the resource we have. These selected banks include a Commercial Bank of Ethiopia, a Cooperative Bank of Oromia, Awash Bank, Dashen Bank, and Oromia International Bank. Then the sample (343) was proportionally allocated to selected banks as a Commercial Bank of Ethiopia (186), a Cooperative Bank of Oromia (35), Awash Bank (50), Dashen Bank (47), and Oromia international Bank (25). The proportionally allocated sample, again proportionally allocated to respective branches of each bank (see **Table 1**). For the selection of study participants, the staff registrations were used as the sampling frame. Then, the lottery method of a simple random sampling technique was applied in each selected bank with their respective branches according to its proportion (**Table 1 and Figure 2**).

4.6. Data collection tools and Procedures

The staff was interviewed by using modified Standardized Nordic musculoskeletal questionnaires which developed from a project funded by the Nordic council of ministers. The questionnaire was adapted by conducting pilot testing the tool. The questionnaires are not meant to provide a basis for clinical diagnosis but screening of the MSDs may serve as a diagnostic tool for analyzing the work environment, workstation and tool design (66). The questionnaire was used as an instrument for gathering neck, shoulder, upper back, lower back, hip/thigh, knee/leg, ankle/foot, and wrist /hand musculoskeletal symptoms and it is available in English. WRMSDs in the past twelve months were asked for each one of 9 body parts (neck, shoulder, upper back, lower back, hip/thigh, knee/leg, ankle/foot, and wrist /hand). Responses to any of the questions are either a “Yes" or a "No". The questionnaire also used for assessing associated factors, which include socio-demographic characteristics, individual factors, psychosocial, environmental factors and ergonomics factors.

Table 1: Sample size proportional allocation based on size in five selected banks and their branches in Jimma City, Southwest Ethiopia, 2019.

Major banks and their branches studied	Number of eligible staff	Number of sampled staff
1. Commercial Bank of Ethiopia(CBE)	**375**	**186**
Jimma district	90	45
Jimma main branch	64	32
Hirmata branch	46	23
Mentina branch	21	10
Shanan Gibe branch	16	8
Becho Bore branch	11	6
Ginjo Guduru branch	22	11
Abba Jifar branch	21	10
Jiren branch	21	10
Ferenji-Arada branch	16	8
Bishishe branch	16	8
Awetu branch	15	7
Sedecha branch	16	8
2. Cooperative Bank of Oromia (CBO)	**70**	**35**
Hirmata branch	8	4
Abba Jifar branch	12	6
Awetu branch	9	5
Jiren branch	10	5
Shanan Gibe branch	19	9
Jimma district	12	6
3. Dashen Bank (DB)	**95**	**47**
Jimma district	33	16
Jimma branch	25	12
Jimma Menahira branch	8	4
Ferenji-Arada branch	7	4
Abba Jifar branch	22	11
4. Awash bank (AB)	**101**	**50**
Hirmata branch	19	9
Jimma branch	40	20
Jiren branch	14	7
Abba Jifar branch	16	8
Shanan Gibe branch	12	6
5. Oromia International Bank (OIB)	**51**	**25**
Abbar Jifar branch	24	12
Gibe branch	15	7
Shanan Gibe branch	12	6
Overall	**692**	**343**

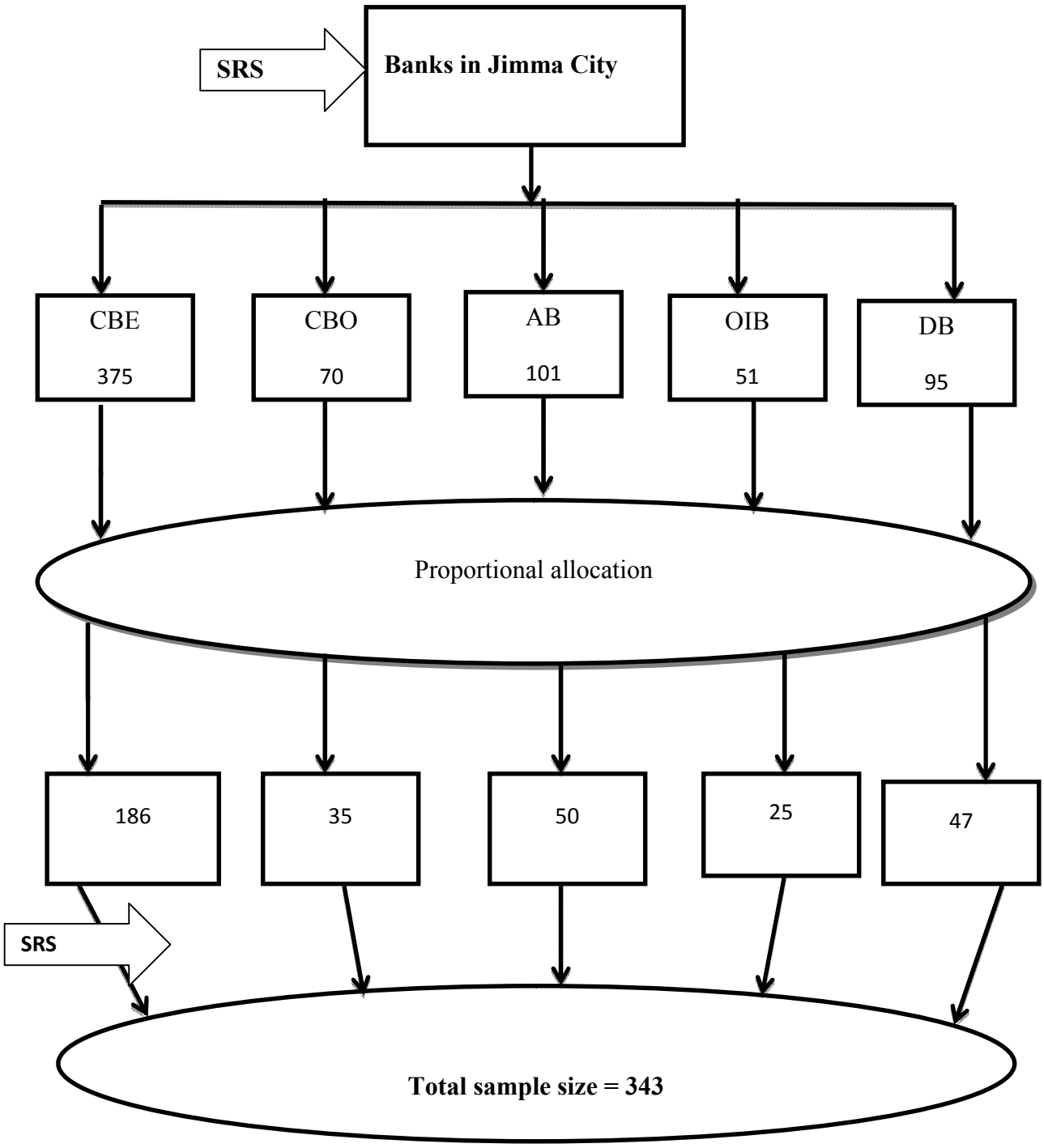

Figure 2: Schematic presentation of sampling procedure for selection of study participant in five banks in Jimma city, southwest Ethiopia, 2019.CBE, Commercial Bank of Ethiopia; CBO, Cooperative Bank of Oromia; AB, Awash Bank; OIB, Oromia International Bank; DB, Dashen Bank.

Job satisfaction was assessed using a Likert scale to identify the level of satisfaction in their work. The tool consists of ten items; each item with responses in five options (1-very dissatisfied, 2-dissatisfied, 3-neutral, 4-satisfied and 5-very satisfied). This part was computed according to the Macdonald's workplace job satisfaction scale. The workers were classified into two categories by using the demarcation threshold as yes (32-50) and no (10-31) (67). Workers' job stress was assessed by using Marlin Company and the American Institute of Stress scale calculation. It contains five options (never, rarely, sometimes, often and very often) with eight items. The workers were categorized into 'Yes' if add score (16-40) and 'No' if add score (≤ 15) (68).

Data were collected by face to face interviews from study participants using a structured questionnaire after getting ethical clearance from Jimma University and informed written consent taken from the study participants. Two BSc health officers and one nurse were recruited for data collection. One BSc health officer was involved in data collection as a supervisor. Data collectors were took a two days training before the actual data collection time about all aspects of data collection tools, questioning techniques, and ethical issues.

4.7. Study variables

4.7.1. Dependent variable

- Work-related musculoskeletal disorder: measured as "Yes" for the bank staff who reported at least one disorder in any part of neck, shoulder, upper back, lower back, elbows, wrist/hand, hip/thigh, knees and ankle/feet, and "No" for bank staff those who don't have pain, ache, and discomfort in the last 12 months.

4.7.2. Independent variables

- **Socio-demographic variables**: age, sex, marital status, educational status, work experience, and monthly salary.
- **Individual factor:** systemic illness history, BMI, physical activity, smoking, alcohol consumption, hand dominance, and ergonomic training
- **Working environment and Ergonomics factor:** Job designation, type offsetting chair, thermal condition of the workplace, bending or twisting in an awkward way, working in

the same position(sitting or standing),repetitive work , working hours(total working hours per day and week), and break times.

- **Psychosocial factors:** job satisfaction, job stress, workload, and relation with other colleagues.

4.8. Operational definitions of terms

Alcohol consumption: an employee who drinks at least five drinks per week for men and two drinks per week for women for at least one year (69).

Awkward postures (AP): working with the neck bent more than 30 degrees without support, working with a bent wrist, working with the back bent without support, squatting and kneeling for two or more hours (70).

Working in the same position (SP): Sitting or standing in a restricted space for two or more hours without changing positions (70).

Cigarette Smoking: It is the practice of smoking cigarette by an employee for at least one sticks of cigarette per day (71).

Ergonomics is defined as fitting the task, tools, materials and equipment in the workplace to the worker (72).

Job Satisfaction: A score measured using the job satisfaction scale as 'yes' if add score 32 – 50 and 'no' if adding score 10 – 31 (67).

Job stress: A score measured using the workplace stress scale as 'yes' if the total score is 16 to 40 and 'no' if the total score is lower than or equal 15 (73).

Physical exercise: Performing any kind of physical exercise at least two times per week for30 minutes (74).

Repetitive work: Work involving repeating the same motion with little or no variation every few seconds for two or more hours (70).

Systemic illnesses: Systemic conditions such as acromegaly, diabetes mellitus, hyper or hypothyroidism, renal failure, and rheumatoid arthritis (75).

Work-related musculoskeletal disorder is perceived pain, ache or discomfort for at least 2-3 workdays in last 12 months in any part of body region (neck, shoulder, upper back, lower back, hip/thigh, knee/leg and ankle/foot and wrist/hand) caused by workplace exposures (76).

Adjustable chair: Chairs have wheels or castors suitable for the floor surface; and can be corrected according to individuals' height.

Un-Comfortable thermal condition: at least two or more "yes" responses in the thermal comfort factor question that may be a risk of thermal discomfort.

4.9. Statistical analysis

Data were checked for completeness by the principal investigator and supervisor daily during data collection. The collected data also rechecked, edited, coded and entered to Epi Data version 3.1 and then exported to the Statistical Package for Social Sciences (SPSS) version 20.0 for analysis.

Descriptive analysis such as frequency distribution, mean, and cross-tabulation was conducted. Outcome variable and independent variables were entered into a binary logistic regression to explore association using the crude odds ratio (COR) with 95% C.I.

Finally, to determine the independent factors associated with WRMSD, a multivariate logistic regression was done. Variables with a P-value < 0.25 in the bivariate analysis were taken in the multivariate analysis. Multicollinearity was checked by Variable inflation factors and tolerance. The adjusted odds ratio (AOR) was computed with a 95% CI to see the strength of association. The covariates were entered into multiple logistic regression by the default enter method. Model fitting was checked by using Hosmer and Lemeshow goodness of fit test. Statistical significance was set at a p-value of < 0.05 in the multiple logistic regressions.

4.10. Data quality assurance

The questionnaire was prepared in English then translated into Amharic and Afaan Oromo then finally, retranslated back to English by independent translators to check for consistency. Two days training was given for data collectors and supervisor. A pre-test was conducted on 5% of the sample size at the Agaro branch of Commercial Bank of Ethiopia to identify potential problems in data collection tools and modification of the questionnaire. Depending upon the pretest result, a required modification was made to data collection tool. Regular supervision and support were given for data collectors by the supervisor and principal investigator. Data were

checked for completeness and consistency by the supervisor and principal investigator on a daily bases during data collection time.

4.11. Ethical Consideration

The ethical approval of the study was obtained from the Ethical Review Board of Jimma University (Ref. No: RPSCMF/0129/19). An official letter was written to selected banks present in Jimma city. The purpose of the study was explained to study participants. Data collection was started after permissions obtained from the bank manager and written informed consent taken from the study participants. Confidentiality of the information was assured and the privacy of the respondents was maintained hence the name of respondents did not include in the questionnaire.

5. RESULTS

5.1. Socio demographic characteristics of the respondents

Three hundred forty-three (343) bank staff were planned to participate in this study, 335 were included in the analysis making with a response rate of 98%. Eight bank staffs were refused to participate because of workload. Out of the total study participants, 255(76.1%) were males and 80(23.9%) were females. Of the study participants, 156(46.6%) belong to the 20-29 age group and the mean age was 31±5.27. The majority of study participants, 196(58.5%) were married. Regarding the educational status of study participants, 228(68%) were bachelors. One hundred sixty-five (49%) study participants' monthly salary was 5000-10,000Ethiopian Birr (ETB). Concerning the work experience, the majority of the study participants 173(51.6%) was served from 1-5 years. The mean of work experience was 6±3.61 with the minimum and maximum 1 and 18 respectively (**Table 2**).

Table 2: Socio-demographic characteristics of the bank staff in Jimma city, Southwest Ethiopia, 2019.

Category of Variables (N=335)		Number	Percent
Sex	Male	255	76.1
	Female	80	23.9
Age (years)	20—29	156	46.6
	30—39	152	45.4
	≥40	27	8
Marital status	Married	196	58.5
	Single	117	34.9
	Divorced	9	2.7
	Cohabited	6	1.8
	Widowed	7	2.1
Educational level completed	Bachelor's degree	228	68
	Master's degree	94	28.1
	Other	13	3.9
Monthly salary(ETB)	<5000	28	8.4
	5000-10,000	165	49.3
	≥11,000	142	42.4
Work experience in year	1—5	173	51.6
	≥6	162	48.4

5.2. Individual characteristics of study participants

Regarding body mass index, out of the study participants, 250(74.6%) staff was ranging from 18.50-24.99. The result showed that 142(42.4%) staff was doing physical exercise at least two times per week. Only 4(1.2%) of study participants smoke a cigarette. Regarding alcohol consumption, 71(21.2) of study participants consume alcohol. Only 12(3.6%) of study participants had a previous history of systemic illness. Of study participants, the majority of the 327(97.6) dominate hand was right-hand. Regarding ergonomic knowledge, only 32(9.6%) of study participants trained on an ergonomic issue (**Table 3**).

Table 3: Individual characteristics of the bank staff in Jimma city, Southwest Ethiopia, 2019(N=335)

Category of Variables		Number	Percent
BMI status (kg/m2)	<18.50	27	8.1
	18.50-24.99	250	74.6
	≥25.00	58	17.3
Doing physical exercise	Yes	142	42.4
	No	193	57.6
Smoking	Yes	4	1.2
	No	331	98.8
Alcohol consumption	Yes	71	21.2
	No	264	78.8
History of systemic illness	Yes	12	3.6
	No	323	96.4
Dominate hand	Right	327	97.6
	Left	8	2.4
Ergonomic training	Yes	32	9.6
	No	303	90.4

5.3. Prevalence of work-related musculoskeletal disorder among bank staff

Out of 335 bank staff, 245(73.1%) were reported they had pain or discomfort in any part of the neck, shoulder, upper back, lower back, elbows, hips/thigh, knees, hand/wrist and ankle/feet in the previous 12 months. The most affected body parts were lower back 181(54%), neck 152(45.4%), upper back 143(42.7%) and shoulder 127(37.9%). The least affected body parts

were wrist, knee, ankle/feet, elbows and hips 47(14%), 46(13.7%), 38(11.3%), 30(9%) and 28(8.4%) respectively (**Table 4**).

Table 4: Prevalence of the WRMSDs by specific body parts in the last 12 months among bank staff in Jimma City, Southwest, Ethiopia, 2019.

Affected body parts		**Number**	**Percent**
Neck	No	183	54.6
	Yes	152	45.4
Shoulder	No	208	62.1
	Yes	127	37.9
	Both	52	15.5
	Right	65	19.4
	Left	10	3
Upper back	No	192	57.3
	Yes	143	42.7
Elbows	No	305	91
	Yes	30	9
	Both	6	1.8
	Right	18	5.4
	Left	6	1.8
Lower back	No	154	46
	Yes	181	54
Wrist/hand	No	288	86
	Yes	47	14
	Both	16	4.8
	Right	25	7.5
	Left	6	1.6
Hips/thigh	No	305	91
	Yes	28	8.4
	Both	9	2.7
	Right	11	3.3
	Left	8	2.4
Knees	No	289	86.3
	Yes	46	13.7
	Both	18	5.4
	Right	23	6.9
	Left	5	1.5
Ankle/feet	No	297	88.7
	Yes	38	11.3
	Both	10	3
	Right	22	6.6
	Left	6	1.8

5.4. Ergonomic risk factors of the bank staff

Regarding job designation, out of all study participants, 284(84.8%) duties were customer service. The majority of the respondents 273 (81.5%) and 262(78.2%) were working less than or equal to 8 and 48 hours per day and week respectively. Regarding body posture, the majority of study participants 226(67.5%) were performed their task bending or twisting in an awkward way for two or more hours. Of study participants, 221(66%) of the bank staff perform a task in the same position for two or more hours. Regarding repetitive work, 175(52.2%) of respondents task requires repetitive motion (during typing, counting). None of the study participants had time designed for break excluding lunchtime. Concerning type of the equipment, the majority of bank staff 303 (90.4%) were used an adjustable type of sitting chair (**Table 5**).

Table 5: Ergonomic risk factors of the bank staff in Jimma city, Southwest Ethiopia, 2019(N=335)

Category of Variables		Number	Percent
Job designation	Manager	26	7.8
	Customer service	284	84.8
	Others	25	7.5
Total working hours per day	≤8	273	81.5
	≥8	62	18.5
Total working hours per week	≤48	262	78.2
	>48	73	21.8
Awkward posture	Yes	226	67.5
	No	109	32.5
Working in the same position	Yes	221	66
	No	114	34
Repetitive work	Yes	175	52.2
	No	160	47.8
Break	Yes	--	---
	No	335	100
Type of sitting chair	Adjustable	303	90.4
	Fixed	32	9.6

5.5. Working environment and psychosocial characteristics of the bank staff

Regarding the working environment, 231(69%) of respondents were working in a comfortable thermal condition. The study participants were asked about their relationship with other colleague and 249(74.3%) of them reported that they had a good work relationship with their colleagues. Concerning doing high loaded work, 167(49.9%) and 98(29.3%) of respondents were doing high loaded work sometimes and always respectively. A 184(54.9%) of respondents were satisfied in their work and one hundred fifty-one (45.1%) of them not satisfied in their work. Of the total study participants, 154(46%) had job stress and 181(54%) were not stressed (**Table 6**).

Table 6: Working environment and psychosocial factors of bank staff in Jimma city, Southwest Ethiopia, 2019(N=335)

Category of Variables		Number	Percent
Relationship with other colleague	Good	249	74.3
	Fair	55	16.4
	Poor	31	9.3
Doing high loaded work	Never	70	20.8
	Sometimes	167	49.9
	Always	98	29.3
Thermal condition	Comfortable	231	69
	Non comfortable	104	31
Job satisfaction	Yes	184	54.9
	No	151	45.1
Job stress	Yes	154	46
	No	181	54

5.6. Factors associated with work related musculoskeletal disorder

Factors such as socio-demographic characteristics, individual factors, ergonomic factors, working environment, and psychosocial factors were entered into bivariate analysis and crude odds ratio with 95%CI was computed. These factors were sex of respondents, age, monthly salary, educational status, work experience, BMI, habit of doing physical exercise, alcohol consumption, ergonomic training, job designation, total working hours per day, total working hours per week, awkward posture, same position, repeated motion, type of sitting chair, relationship with other colleague, doing high loaded work, workplace thermal condition, job satisfaction and job stress (**Table 7**).

Variables with p-value <0.25 in bivariate analysis were taken into multivariate logistic regression analysis and adjusted odds ratios were computed. In multivariate analysis, work experience, alcohol consumption, awkward posture, working in the same position for two or more hours and job stress had shown significant association independently with a work-related musculoskeletal disorder.

Bank staff with ≥6-year work experience were 2.16 times more likely to develop WRMSD compared to staff served less than 6years[AOR:2.16, 95% CI: 1.05-4.43]. Regarding alcohol consumption, bank staff those had alcohol drinking behavior were 3.44 more likely to develop WRMSD when compared to staff those not drinking alcohol [AOR: 3.44, 95% CI: 1.29-9.18]. Likewise, bank staff performing task bending or twisting in an awkward way were 4.09 times more likely to be injured by WRMSD compared to those work in neutral posture[AOR:4.09, 95% CI: 2.20-7.61]. Similarly, bank staff those work in the same position for two or more hours (sitting or standing position)were 2.02 more likely to develop WRMSD compared to those work in the variable position [AOR: 2.02, 95% CI: 1.05-3.89]. Regarding job stress, bank staff had job stress were 3.2 times more likely at risk of developing WRMSD compared to no stressed staff[AOR: 3.20, 95% CI: 1.67-6.15] (**Table 7**).

Table 7: Bivariate and multivariate analysis of factors associated with WRMSD among bank staff in Jimma city, southwest Ethiopia, 2019

Variables	Category of Responses	WRMSD		Bivariate analysis		Multivariate analysis	
		No	Yes	COR (95%CI)	p-value	AOR(95%CI)	P-Value
Sex	Male	70	185	1	1		
	Female	20	60	1.135(0.6-2.02)	0.66		
Age	20-29	54	102	1	1		
	30-39	30	122	1.15(1.28-3.61)	0.004	1.88(0.91-3.89)	0.089
	≥40	6	21	1.85(0.71-4.87)	0.21	1.90(0.49-7.29)	0.349
Educational status	Masters	20	74	1	1		
	Bachelors	65	163	0.68(0.38-1.20)	0.18	0.93(0.42-2.09)	0.865
	Other	5	8	0.43(0.13-1.47)	0.17	1.17(0.22-6.37)	0.854
Monthly salary in ETB	<5000	10	18	0.55(0.23-1.29)	0.17	0.84(0.23-3.01)	0.783
	5000-10,000	47	118	0.76(0.45-1.27)	0.29	1.19(0.51-2.41)	0.790
	>10,000	33	109	1			
Work experience	1-5	63	110	1	1		
	≥6	27	135	2.86(1.71-4.79)	0.00	**2.16(1.05-4.43)**	0.037*
BMI status	18.50-24.99	72	178	1	1		
	<18.50	10	17	0.69(0.30,1.57)	0.37	0.72(0.26-2.01)	0.534
	≥25.00	8	50	2.53(1.14-5.59)	0.22	1.89(0.74-4.79)	0.183
Doing physical exercise	Yes	44	98	1	1		
	No	46	147	1.44(0.88-2.33)	0.15	1.43(0.77-2.65)	0.253
Alcohol consumption	Yes	6	65	5.06(2.11-12.1)	0.00	**3.44(1.29-9.18)**	0.013*
	No	84	180	1	1		
Ergonomic training	Yes	8	24	1	1		
	No	82	221	0.89(0.39-2.08)	0.80		
Job designation	Manager	11	15	1	1		
	Customer service	73	211	2.12(0.93-4.82)	0.07	2.35(0.75-7.32)	0.141
	Others	6	19	2.32(0.69-7.73)	0.17	3.92(0.80-9.21)	0.092
Total working hours per day	≤8	80	193	1	1		
	>8	10	52	2.15(1.04-4.45)	0.04	2.80(0.65-2.12)	0.167
Total working hours per week	≤48	73	182	1	1		
	>48	17	63	1.49(0.82-2.71)	0.19	0.54(0.15-1.92)	0.339
Awkward posture	Yes	37	189	4.83(2.89-8.09)	0.00	**4.09(2.20-7.61)**	<0.001*
	No	53	56	1	1		
Working in the same position	Yes	41	180	3.31(2.00-5.47)	0.00	**2.02(1.05-3.89)**	0.036*
	No	49	65	1	1		
Repeated motion	Yes	33	142	2.38(1.45-3.91)	0.001	1.49(0.78-2.86)	0.232
	No	57	103	1	1		

Table 7. Cont.

Variables	Category of Responses	WRMSD		Bivariate analysis		Multivariate analysis	
		No	Yes	COR(95%CI)	p-value	AOR (95%CI)	P-Value
Type of sitting chair	Adjustable	77	226	1	1		
	Fixed	13	19	0.49(0.24-1.06)	0.69		
Relationship with other colleague	Good	70	179	1	1		
	Fair	13	42	1.26(0.64-2.49)	0.5		
	Poor	7	24	1.34(0.55-3.25)	0.52		
Doing high loaded work	Never	31	39	1	1		
	Sometimes	44	123	2.22(1.24-3.98)	0.007	1.39(0.66-2.92)	0.380
	Always	15	83	4.39(2.13-9.08)	0.00	1.99(0.81-4.94)	0.135
Thermal condition	Comfortable	66	165	1	1		
	Non comfortable	24	80	1.33(0.78-2.28)	0.29		
Job satisfaction	Yes	52	132	1	1		
	No	38	113	1.17(0.72-1,91)	0.53		
Job stress	Yes	19	135	4.59(2.61-8.07)	0.00	**3.20(1.67-6.15)**	<0.001*
	No	71	110	1	1		

COR= crude odds ratio, *significant association in multivariate analysis at p value<0.05, AOR=adjusted odds ratio, 1= reference, CI= confidence interval, Hosmer and Lemeshow test = 0.605, WRMSD = work-related musculoskeletal disorder

6. DISCUSSION

In the present study, the overall prevalence of the work-related musculoskeletal disorder among the bank workers in the last 12-months preceding data collection was 73.1%. The most affected body parts were lower back (54%), neck (45.4%), upper back (42.7%) and shoulder (37.9%). This result is slightly higher than the study done in Nigeria (71.68%) (17). But it is lower relative to the study done in Ghana (83.5%) were lower back (64.8%), upper back (61.7%), neck (47.4%) and shoulder (37.4%) were the most commonly affected body parts in the last 12 months (16). This study result also lower relative to the study done in Kuwait which showed that (80%) of bank workers were affected at least by one MSD in the last 12 months (7). The possible explanation for this disparity might be due to the difference in sample size, study setting, and workload.

Regarding specific body parts, the prevalence of MSD in the lower back (54%) and upper back (42.7%) was higher compared to the study done in Iran that showed 44% in the lower back and 36% in the upper back (55). This disparity could be due to the difference in the working environment. However, the prevalence of neck(45.4%), lower back(54%), shoulder(37.9), wrist/hand(14%) and knee(13.7%)in our study was lower compared to the study done in Bangladesh reported that neck (58.4%), lower back(60.4%), shoulders(56.6%), wrist(17.9%), and knee(16%) (18). The prevalence of elbows (9%), hips (8.4%) and ankle/feet(11.3%) in our study were lower compared to the study done in Kuwait revealed that elbows (11.5%), hips (13.3%) and ankle/feet (16.8%) (7). The plausible explanation for this difference could be due to differences in assessment tools, study design, and sample size.

When compared to the studies done among other professionals in Ethiopia, the 12-month prevalence of WRMSD in this study was lower than the study done among hairdressers professionals (76.5%) and the most affected body parts were lower back 71.5%, shoulder 51.6%, and hand or wrist 46.6% (13). But, the prevalence of WRMSD in the present study was higher than the study done among garment industry professionals (65.4%) and nurses (60.8%) (32,33). The prevalence of low back pain in this study was lower relative to the study done among full-time taxi drivers in Ethiopia (64.2%) (77). This difference could be due to the difference in sample size, working hours, workload, and nature of task they accomplish day to day.

The present study found that bank staffs who had ≥6years of work experience were 2.16 times more likely to develop WRMSD compared to lower work experience [AOR: 2.16, 95% CI: 1.05-4.43]. This result is in line with the study done in Iran showing that longer job duration associated with WRMSD (78). In the same way, another study also showed that the proportion of days of sick leave due to MSD among experienced workers was high compared to new or less experienced workers (61).This might be a long work duration have enough exposure for risk factors as compared to a low period of experience. This means work-related musculoskeletal disorder by its nature is cumulative trauma or repetitive strain.

Regarding individual characteristics, bank staff who had alcohol drinking behavior were 3 times more likely to complain WRMSD compared to non-drinking staff[AOR: 3.44, 95% CI: 1.29-9.18]. This result is in line with previous studies done in Ethiopia (69), Kuwait (7), Ghana (16), and India (79) that showed a significant association of alcohol drinking habit with self-reported WRMSD. The plausible explanation might be due to the negative effect of alcohol on the normal physiology of the body and defense mechanisms (69).

Concerning ergonomic risk factors, awkward posture and working in the same position for two or more hours had shown a significant association with a work-related musculoskeletal disorder. The odds of developing work-related musculoskeletal disorders in staff exposed to the awkward posture was 4 times more compared to staff working not exposed to awkward posture[AOR: 4.09, 95% CI: 2.20-7.61]. This is in line with the study done in India showed that working in bad posture was the predictive factor for WRMSD (54) and the study was done in Ethiopia among bank workers showed that bad posture was the leading cause of low back pain (35). This could be explained as muscles and joints involved in an activity and the amount of force generated is determined by the body posture because as the backbends, twisting or bending of the shoulders, wrists, hips, and the knees can increase the stress on the joints, muscles, nerves and cause fatigue, leading to injuries (40).

In the same way, bank staff working in the same body position for two or more hours were 2.02 more susceptible to WRMSD than their counterpart[AOR: 2.02, 95% CI: 1.05-3.89]. This result was supported by the study done in India reported that prolonged sitting associated with musculoskeletal disorder (80). The possible suggestion for this finding is our body not designed to remain static but to move about. Moreover, a prolonged working in the same position

increases the muscular load and muscle activity around the facet joint which leads to the joint compression which in turn influences the musculoskeletal symptoms (12)

In our study, statistical significance did not found between WRMSD and working hours per day or week. Likewise, another study reported that shorter or longer hours spent at work did not influence the occurrence of MSDs among bank workers (81). The possible explanation is most of the banks in Ethiopia work 8 and 48 hours per day and week respectively which is the normal working hour in this country.

Regarding psychosocial risk factors, job stress had shown a significant association with a work-related musculoskeletal disorder. Bank staff those had job stress were 3.2 more likely to develop WRMSD compared to none stressed staff [AOR: 3.20, 95% CI: 1.67-6.15]. Similarly, Agnestifa et al (63) reported that job stress associated with self-reported WRMSD. In the same way, the study done in India and Malaysia showed that psychosocial stress associated with WRMSD (81,82). It could be explained that stress causes changes in the human body that are usually centered on the nervous system and endocrine system. As a result, the human body's internal environment is constantly changing, and the body's adaptive mechanisms continually function for adjustments. Intensive and extensive stress increase muscle tension and decrease micro pauses in muscle activity results in musculoskeletal disorders (16).

6.1. Limitations of the study

- Being self-reported, there might be over or underestimation of the prevalence of work-related musculoskeletal disorder
- Lack of similar study with similar topic and methodology in the local study context
- Because of its cross-sectional nature, it is difficult to drive causal relationship

7. CONCLUSION AND RECOMMENDATIONS

7.1. Conclusion

The prevalence of the work-related musculoskeletal disorder among bank staff in Jimma city, southwest Ethiopia was high (73.1%). The four most affected body parts were lower back, neck, upper back and shoulder while wrist, knee, ankle/feet, elbows, and hips were the least affected body parts. Work experience, alcohol consumption behavior, awkward posture, working in the same position for two or more hours and job stress were significant predictors and contribute to the high prevalence of the work-related musculoskeletal disorder among bank staff.

7.2. Recommendations

Depending upon the finding from this study, the following recommendations were forwarded

To Jimma Zone Health Office Bureau

- Should promote health and safety practice for workers

To Banking Industries in Ethiopia

- Should use ergonomic guideline and give awareness on ergonomic issues such as training the workers about musculoskeletal injury risk factors at the workplace
- Break time should be designed for staff within working hours hence it is important for recovery and reduces fatigue

To Bank Staff

- Should focus on proper body posture while performing their task
- Should not spend a long period working in the same position(in sitting or standing)
- Try to reduce harmful behaviors such as alcohol consumption habits
- Should practice physical exercise at least two times per week for muscular strength

Future Direction

- Further studies should be with different design like longitudinal study and mixed assessment tools for stronger evidence.

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ANNEXES

Annex 1: Information sheet

Dear Participants: Code No: _____

Hello my name is ----------.I am here on behalf of Guluma Etana, post graduate student from Jimma University, Institute of health. I am member of research team on assessment of musculoskeletal disorders and associated factors and requesting you to participate in this study which would require your response to an interview on some related issues.

Title of the study: **Prevalence of work related musculoskeletal disorders and associated factors among bank staff in Jimma city, South West Ethiopia**.

Introduction: The musculoskeletal system composed of two systems the skeletal and muscular systems. It contains bone, muscle, joint, ligament, and tendon. Musculoskeletal disorders (MSDs) defined as a wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels. Work-related musculoskeletal disorder (WRMSDs) is one of the most important public health problems. Employees in the banking sectors are subject to long hours of static work, bad posture and activities of repetitive computer use which make them prone to WRMSDs.

Objective: The Objective of this study is to assess the prevalence of work related musculoskeletal disorders and associated factors among bank staff in Jimma city, South West Ethiopia 2019.

Benefit of the study: there is no direct benefit for participating but the study finding will be used to know the magnitude of the problem and important **to improve the working setting for all bank works including you.**

Risk of the study: The study has no any risk for the participants.

Right of the participant: Participating and not participating is your full right and participants can withdraw from the study at any time.

Confidentiality: Your name will not be written in this form and all information given by you will be kept strictly confidential.

Duration of interview: This interview will take about 15 - 20 minutes

Could I have your permission to continue?

1. If yes, continue the interview
2. If no, skip to the next participant by writing reason for his/her refusal.

Person to Contact: If you want more information and check about this study you can contact principal investigator and his advisor through the following address.

Investigator: Mr. Guluma Etana, mobile: 0917707303

Principal advisor: Mr. Asfaw Gerbi (Ph.D. fellow) JU; mobile: 0924490573

Co-advisor: Mengistu Ayele (MSc); mobile: 0929046717

Annex 2: Informed consent form

Are you voluntary to participate in the study? Yes N☐ ☐

I hereby confirm that I understand the contents of this document and the nature of the research project, and I give my full consent to participating voluntarily in the research project. I understand that I am autonomous to withdraw from the project at any time.

Signature of participant Date

_____ _____

Name and signature of data collector_____ Date_____

Name and signature of supervisor_____ Date_____

Annex 3: Questionnaire- English Version

Part one: Socio demographic characteristics'

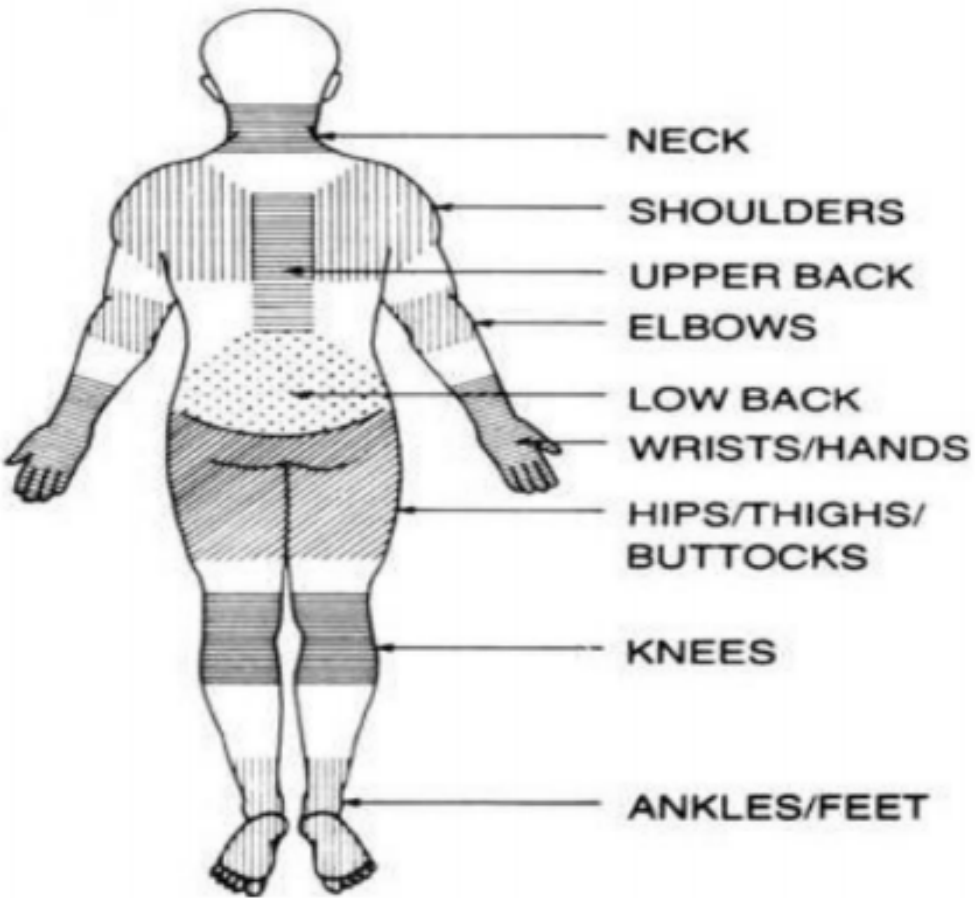
Code _____

Bank name _____

Please read each one carefully and circle the number that best describes you

No	Question	Possible response	Skip
101	Sex	1. Male 2. Female	
102	Age	---------- in years	
103	Marital status	1. Married2.Single 3.Divorced 4. cohabited 5.Widowed	
104	Educational status	1. BA 2. MA 3. Other _____	
105	Monthly salary	----------ETB/month	
106	Work experience	_____in years	

Part two: Questioners to asses work-related musculoskeletal disorders in neck, shoulder, upper back, lower back, hip /thigh, knee/leg, ankle/foot and wrist /hand. The diagram below shows the approximate position of the body parts referred to in the questionnaire.



Circle 1 if your answer is 'yes' or circle 2 if your answer is 'no'

Please this part of questionnaire should be answered, even if you have never had trouble in any parts of your body

No	Have you at any time in the last 12 months had trouble (ache, discomfort and pain)in:		
201	Neck		1. Yes 2. No
202	Shoulder	Right	1. Yes 2. No
		Left	1. Yes 2. No
203	Upper back		1. Yes 2. No
204	Elbows	Right	1. Yes 2. No
		Left	1. Yes 2. No
205	Lower back		1. Yes 2. No
206	Wrists/hands	Right	1. Yes 2. No
		Left	1. Yes 2. No
207	Hips/thighs	Right	1. Yes 2. No
		Left	1. Yes 2. No
208	Knees	Right	1. Yes 2. No
		Left	1. Yes 2. No
209	Ankles/feet	Right	1. Yes 2. No
		Left	1. Yes 2. No

Part three: individual factors associated with work-related musculoskeletal disorders

No	Questions /variables	Possible response	Skip
301	How tall are you?	--------m -----cm	
302	How much you are weighing in Kg?	----------kg	
303	Do you have Habit of doing physical exercise at least twice per week for 30 minutes?	1.yes2.No →	**305**
304	If yes for Q303 how often?	1. Two times per week 2. ≥Three times per week	
305	Do you smoke cigarette?	1. Yes2. No →	**307**
306	If your answer to Q 305 is "yes" how often and How many stick/packet of cigarette does you smoking at that time?	1. -------days/week 2. -------cigarette	
307	Do you drink alcohol?	1. Yes 2. No →	**309**
308	If your answer to Q 307 is "yes" how many drinks per week ?	_____drinks/week	
309	Do you have medical history of systemic illness?	1. Yes 2. No	

310	What is your dominate hand?	1. Right 2. Lift	
311	Training on issue of ergonomics?	1. Yes 2. No	

Part four - ergonomics factor associated with work-related musculoskeletal disorders

Questions to measure physical task (Q401-407)			
No	**Question/variables**	**Possible choice**	**Skip**
401	Job designation	1. Manager 3. Customer service 4. Other _____	
401	Total working hours	------hrs/day---hrs/week	
402	Does your job involve bending or twisting you is in an awkward way for two or more hours?	1. Yes2. No	
403	Do you work in the same position for 2 hours (Standing, bend over, sitting, kneeling, etc)?	1. Yes2. No	
404	Does your job require repeating motion with less than 30 second?	1. Yes2. No	
405	Do you take breaks during your job per day excluding lunch time?	1. Yes 2. ~~No~~ →	**407**
406	If yes in Q 406, How many time in a day and How long do you take a break each time?	-----in a day ----minutes	
407	Type of sitting chair	1. Adjustable 2. fixed	

Part five: Environmental and Psychosocial factors associated with work-related musculoskeletal disorders

No	**Question**	**Possible answer**	**Skip**
501	How do you define your relationship with other colleague?	1. Good2. Fair 3. Poor	
502	Doing high loaded work?	1. Never 2. Sometimes 3.Always	
503	Thermal condition	1. Comfortable 2. Non comfortable	

Thermal condition based on the following result	**Yes**
Does the air feel warm or hot?	
Does the temperature in the workplace fluctuate during a normal working day?	
Is there a heat source in the environment?	
Is there any equipment that produces steam?	
Is the workplace affected by external weather conditions?	
Is cold or warm air blowing directly into the workspace?	
Can employees make individual alteration to their clothing in response to the thermal environment?	
Is work rate moderate to intensive in warm or hot conditions?	
Questions to measure job stress (Q 504-511)	

No	Questions	Job stress score				
		Never	Rarely	Sometimes	Often	Very Often
504	Conditions at work are unpleasant or sometimes even unsafe	1	2	3	4	5
505	I feel that my job is negatively affecting my physical or emotional wellbeing	1	2	3	4	5
506	I have high loaded work to do and/or too many unreasonable deadlines	1	2	3	4	5
507	I find it difficult to express my opinion or feelings about my job conditions to my superiors	1	2	3	4	5
508	I feel that job pressures interfere with my family or personal life	1	2	3	4	5
509	I have adequate control or input over my work duties	5	4	3	2	1
510	I receive appropriate recognition or rewards for good performance	5	4	3	2	1
511	I am able to utilize my skills and talents to the fullest extent at work	5	4	3	2	1
	Final score					

Questions to measure job satisfaction (Q 512-521)

No	Questions	Job satisfaction score				
		Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
512	I receive recognition for a job well done.	1	2	3	4	5
513	I feel close to the people at work.	1	2	3	4	5
514	I feel good about working at this company	1	2	3	4	5
515	I feel secure about my job	1	2	3	4	5
516	I believe management is concerned about me	1	2	3	4	5
517	On the whole, I believe work is good for my physical health	1	2	3	4	5
518	My wages are good	1	2	3	4	5
519	All my talents and skills are used at work	1	2	3	4	5
520	I get along with my supervisors	1	2	3	4	5
521	I feel good about my job	1	2	3	4	5
	Final score					

QUESTIONNAIRE AFAN OROMO VERSION

Maqaan koo _____ jedhama. Kanan asitti argame barataa digirii lammaffaa muummee saayinsii fayyaa kan ta'e Gulummaa Ittaanaa bakka bu'uudhaani. Ani qaama garee qorannoo kana gaggeesu keessaa tokko yommuun ta'u, dhukkubbii maashaa fi lafee akkasumas waantoota isaan wal qabatan irratti odeeffannoo tokko isin gaafachuufi.

Seensa: dhukkubbiin maashaa fi lafee maashaa, ribuu, lafee, narvii fi hidda dhiigaa hubuu danda'a. dhibeen kun hojiin walqabatee rakkoo hawwaasa bal'aati. Hojjettoonni baankii rakkoo kanaaf baay'inaan saaxilamoodha.

Mata-duree qorannoo: Faffaca'insa dhukkubbii maashaa fi lafee hojiin dhufuu fi waantoota isaan walqabatan irratti hojjettoota baankii magaalaa Jimmaa gidduutti kan adeemsifamu

Kaayyoo qorannichaa: faffaca'insa dhukkubbii maashaa fi lafee hojiin dhufuu fi waantoota isaan wal qabatan adda baasuuf.

Faayidaa: bu'aan kallachaa nama dhuunfaaf kennamu hin jiru garuu dhibbantaa dhibee kanaafi waantoota isaan wl qabatan adda baasuun bakka hojii mijeessuuf ni fayyada.

Miidhaa: qorannoo kana irratti hirmaachuun miidhaa tokko illee hin qabu.

Qoranno kana irratti hirmaachuuf ykn hirmaachuu dhiisuuf mirga guutuu qabdu. Maqaan waan hin barreeffamnneef icciitiin nama dhuunfaa eegamaadha. Waliin dubbichi daqiiqaa 15-20 fudhachuu danda'a.Waa'ee qorannoo kanaa odeeffannoo dabalataa argachuuf lakkoofsa bilbilaa armaan gadiin argachuu dandeesu.

Qorataa: Gulummaa Ittaanaa:- 0917707303

Gorsaa 1ffaa: Asfaw Gerbi (Ph.D. fellow):- 0924490573

Gorsaa 2ffaa: Mengistu Ayele (MSc):- 0929046717

Annex II: guca heyyemamummaa agarsiisu

qorannoo kana irratti hirmaachuuf heyyemamoodhaa? eeyyee lakkii

ani qorannoon kun kaayyoon isaa maal akka ta'e addaan baasee hubachuudhaan isa irratti hirmaachuufis ta'ee dhiisuudhaa mirga guutuu qabaachuukoo beekuudhaan fedha kootii qorannoo kana

irratti hirmaachiuuf heyyemamaa/heyyemantuu ta'uukoo nan mirkaneessa

malattoo hirmaataa_____ guyyaa_____

maqaafimallattoo ogeessa odeeffannoo funaanee_____ mall_____

maqaafimallattoo to'ataa qorannichaa_____mall._____

Annex 4: Questionnaire- Afan Oromo Version

Koodii _____

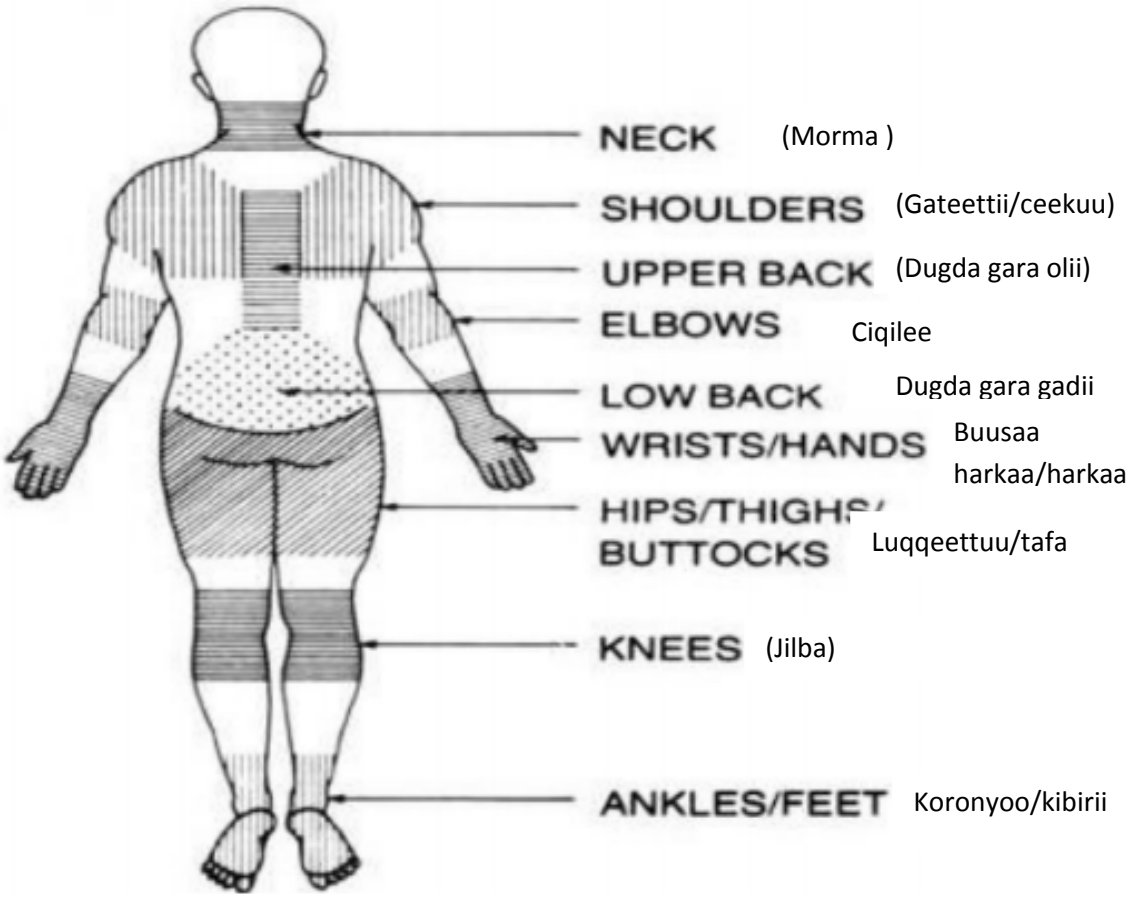
Maqaa baankii _____

Kutaa 1ffaa: odeeffannoo dhuunfaa fi maatii

Maaloo erga hubannoon dubbistee booda deebii sirriitti si ibsu filadhu

Lakk.	Gaaffiilee	Deebii	Irra tari
101	Saala	1. dhiira 2. dhalaa	
102	Umurii	---------- waggaadhaan	
103	Haala fuudhaa fi heerumaa	1. kan fuudhe/heerumte 2. Kan hin fuune/heerumne 3. wal hiikaniiru 4. Gaa'ela dura waliin jiraatu 5.kan du'aan gargar ba'an	
104	Sadarkaa barumsaa	1. Digirii jalqabaa 2. Digirii 2ffaa 3. Kan biroo _____	
105	Miindaa ji'aan	----------	
106	Muuxannoo hojii waggaadhaan	_____	

Kutaa 2ffaa: Gaaffiin kun rakkoowwan fayyaa hojiin wal qabatee namatti dhufan kan akka dhukkubbii mormaa, ceekuu, dugda gara olii, dugda gara gadii, luqqeettuu/tafa, ciqilee ,jilba, koronyoo miilaa fi buusaa harka adda baasuuf ta'a. Fakkiin armaan gadii kun kutaa qaamaa gaaffii 201-209tti jiru agarsiisa.



<u>Yoo 'Eeyyee' jette lakk. 1tti mari yoo 'Lakki' jette immoo lakk. 2tti mari</u>

Maaloo yoo dhukkubbii maashaalee, lafee fi buusaa kutaa qaama kee keessaa hin qabdu ta'e illee gaaffii kana osoo hin deebisiin bira hin darbiin

Lakk.	Ji'oota 12n darban keessaa dhukkubbiin maashaa, lafee fi buusaa kutaa qaamaa armaan gadii irratti sitti dhaga'amee beekaa?		
201	**Morma ?**		1. Eeyyee 2. Lakki
202	**Ceekuu/gateettii?**	Mirgaa	1. Eeyyee2. Lakki
		Bitaa	1. Eeyyee 2. Lakki
203	**Dugda gara olii?**		1. Eeyyee 2. Lakki
204	**Ciqilee?**	Mirgaa	1. Eeyyee 2. Lakki
		Bitaa	1. Eeyyee 2. Lakki
205	**Dugda gara gadii?**		1. Eeyyee 2. Lakki
206	**Buusaa harkaa/Harka?**	Mirgaa	1. Eeyyee 2. Lakki
		Bitaa	1. Eeyyee 2. Lakki
207	**Luqqeettuu?**	Mirgaa	1. Eeyyee 2. Lakki
		Bitaa	1. Eeyyee 2. Lakki
208	**Jilba ?**	Mirgaa	1. Eeyyee 2. Lakki
		Bitaa	1. Eeyyee 2. Lakki
209	**Koronyoo/kibirii?**	Mirgaa	1. Eeyyee 2. Lakki
		Bitaa	1. Eeyyee 2. Lakki

Kutaa 3ffaa: Gaaffiin kun odeeffannoo nama dhuunfaa dhukkubbii maashaa, lafee fi buusaa qaamaa fiduu danda'an madaaluuf qophaa'e

Lakk.	**Gaaffilee**	**Deebii**	**Irra tari**
301	Dheerinni kee meeqa?	----------m ---------cm	
302	Ulfaatinni kee kiilogiraamaan meeqa?	----------kg	
303	Sochii qaamaa yoo xiqaate torbeetti yeroo lama daqiiqaa 30f ni hojjettaa?	1.Eeyyee 2.lakki →	**305**
304	Yoo deebiin kee gaaffii 303 'Eyyee' ta'e, yeroo hagam?	1.Torbeetti yeroo lama 2.Torbeetti yeroo sadii ol	
305	Tamboo xuuxxaa?	1. Eeyyee 2. Lakki →	**307**
306	Yoo 'eeyyee' jette gaaffii 305, yeroo hagam? Tamboo meeqa?	1. ---------- guyyaa/torbee 2. ----------tamboo	
307	Alkoolii dhugdaa?	1. Eeyyee 2. Lakki →	**309**
308	Yoo deebiin kee 'eeyyee' ta'e gaaffii 307, dhugaatii meeqa torbanitti?	----------	

309	Dhukkuba sirna qaamaa kan birooqabdaa?	1. Eeyyee 2. Lakki	
310	Harki ati yeroo hunda ittiin hojjettu kami?	1. mirgaa 2. Bitaa	
311	Leenjii hubannoo wantoota bakka hojiitti fayyaa kee hubuu danda'an irratti fudhattee beektaa?	1. Eeyyee 2. Lakki	

Kutaa 4ffaa – haala hojii, bakkaa fi akkaataa hojiin wal qabatee dhukkubbii maashaa, lafee fi buusaa qaamaa kan fiduu danda'u ilaalchisee

Gaaffii akkaataa hojii madaalu(Q401-408)			
Lakk.	**Gaaffilee**	**Deebii**	**Irra tari**
401	Gosti hojii kee maali?	1.hogganaa 2.maamila tajaajiluu 3.Kan biroo _____	
401	Yeroon hojii kee walii galatti meeqa?	----------sa'atii/guyyaa ----------sa'atii/torban	
402	Hojiin kee qaamni kee akka jajallatu ni godhaa?	1. Eeyyee 2. Lakki	
403	Dhaabattee, teessee ykn jallattee sa'atii 2f ykn isaa oliif ni hojjettaa?	1. Eeyyee 2. Lakki	
404	Hojiin kee sochii saffisaa sekondii 30 gadi ni barbaadaa?	1. Eeyyee 2. Lakki	
405	Yeroo laaqanaan alatti boqonnaa ni fudhattaa?	1. Eeyyee 2. ~~Lakki~~ →	**407**
406	Eeyyee yoo jette gaaffii 406, guyyaatti si'a meeqa? Yeroo hagamiif?	----------guyyaatti ---------daqiiqaa	
407	Gosti barcumaa maalii?	1. Dheeressuu fi gabaabsuun kan danda'amu 2. Dheerachuufi gabaabbachuu kan hin dandeenye	

Kutaa 5ffaa: Naannoo hojii fi xiin-sammuu waliin wal qabatee dhukkubbii maashaa, lafee fi buusaa qaamaa fiduu kan danda'u ilaalchisee

Lakk.	**Gaaffilee**	**Deebii**	**Irra tari**
501	Hariiroo hojjettoota si wliin hojjetan waliin qabdu akkamiin ibsita?	1. Gaarii 2. Giddugaleessa 3. gadi bu'aa	

502	Hojiin sitti baay'ataa?	1. tasumaa 2. Darbee darbee 3.yeroo hunda	
503	Haalli qilleensaa fi ho'a bakka hojii akkamiin ibsita?	1. mijataa 2. hin mijatu	

Haalli qilleensaa fi ho'aa kan armaan gadii irratti hundaa'a	**Eeyyee**
Ho'i sitti dhaga'amaa?	
Haalli qilleensaa ni jijjiramaa yeroodhaa yerootti?	
Waanti ho'a maddisiisu jira naannoo sana?	
Waanti hurka maddisiisu jiraa?	
Haalli qlleens naannoo bakka hojii irratti dhiibba ni uumaa?	
Qorri ykn ho'i kallattiin bakka hojii ni argataa?	
Haala qilleensaa faana uffata ni jjiirattaa?	
Saffisni hojii yeroo ho'aa moo yeroo qorraa dabala?	

Jeequmsa/muddama sammuu hojiin dhufu ilaalchisee (Q 504-511)

Lakk	**Gaaffilee**	**Deebii**				
		Tasumaa	Akka tasaa	Darbee darbee	Yeroo baay'ee	Yeroo hunda
504	Haalli bakka hojii hin mijatu ykn miidhaa qaba jettee ni yaaddaa?	1	2	3	4	5
505	Hojiin kiyya qaamaa fi xiinsammuu kiyya ni miidha jette yaaddee beektaa?	1	2	3	4	5
506	Yeroo hojiin baa'inaan sitti kennamu jiraa?	1	2	3	4	5
507	Yeroon itti fedhii fi yaada kee hogganaa keef ibsuun sitti ulfaatu ni jiraa?	1	2	3	4	5
508	Hojiin kee jireenya kee fi maatii kee waliin walitti bu'a jettee ni yaaddaa?	1	2	3	4	5
509	Itti gaafatamummaa kee ni eeggattaa?	5	4	3	2	1
510	Hojii gaarii hojjetteef beekamtii ykn badhaasa ni argattaa?	5	4	3	2	1
511	Dandeettii fi beekumsa qabdu bakka hojiitti itti ni fayyadamtaa?	5	4	3	2	1
	Ida'ama walii gala					

Odeeffannoo hojiitti gammaduu fi gammaduu dhabuu ilaalchisee (Q 512-521)

Lakk.	**Gaaffilee**	**Deebii**				
		Baay'ee hin gammadu	Hin gammadu	Imbaa bsa	Nan gam mada	Baay'een gammada
512	Hojii qixa sirriin hojjetteef beekamtii si kennamutti hagam itti gammadda?	1	2	3	4	5
513	Walitti dhufeenya hojjettota biro waliin qabdutti hagam itti gammadda?	1	2	3	4	5

514	Dhaabbata kana keessaa hojjechuu keetti hagam itti gammadda?	1	2	3	4	5
515	Icciitiin hojii kee eegamaa ta'uu isaatti hagam itti gammadda?	1	2	3	4	5
516	Ilaalcha hogganaan kee siif qabutti hagam itti gammadda?	1	2	3	4	5
517	Hojiin kun faayyaa qaama keef gaariidha ta'uu isaatti hagam itti gammadda?	1	2	3	4	5
518	Miindaa si kaffalamuuf hagam itti gammadda?	1	2	3	4	5
519	Dandeettii fi beekumsa qabdutti fayyadamuu keetti hagam itti gammadda?	1	2	3	4	5
520	Hariiroo hogganoota kee waliin qabdu hagam itti gammadda?	1	2	3	4	5
521	Hojii keetti hagam itti gammadda?	1	2	3	4	5
	Ida'ama walii gala					

አባሪ 1 የመረጃ ወረቀት

የተከበሩ ተሳታፊዎች-ኮድ ቁጥር _____

ጤና ይስጥልኝ ስሜ - ---------- የጡንቻ እና የአካል ጉዳቶች መዛባት እና ተጓዳኝ ጉዳዮችን ለመገምገም የምርምር ቡድን አባል ነኝ ፣ እና በተዛማጅ ጉዳዮች ላይ ለቃለ መጠይቅ ምላሽዎን የሚጠይቅ በዚህ ጥናት ላይ እንዲሳተፉ እጠይቃለሁ ::

የጥናቱ ርዕስ-ከሥራ ጋር ተዛማጅነት ያለው የጡንቻ ችግር መዛባት እና በደቡብ ምዕራብ ኢትዮጵያ ጅማ ከተማ የባንክ ሠራተኞች መካከል ተያያዥ ምክንያቶች ::

መግቢያ-የጡንቻና የጡንቻ ስርዓት ሁለት ሥርዓቶችን ያቀፈ የጡንቻ ስርዓት (ስርዓት) :: እሱ አጥንት ፣ ጡንቻ ፣ መገጣጠሚያ ፣ ጅማትና ጅማት ይ containsል። በጡንቻዎች ፣ በትርችቶች ፣ በመገጣጠሚያዎች ፣ በመገጣጠሚያዎች ፣ አካባቢ ነር ,ች እና የደም ሥሮች ላይ ድጋፍ ያላቸው የጡንቻና የአካል ችግሮች (ኤም.ኤስ.ኤይ.)) ሰፋ ያለ ብግነት እና ብልሹነት ሁኔታ ተብለው ተገልጻል :: ከስራ ጋር የተዛመደ የጡንቻ ህመም (WRMSDs) በጣም አስፈላጊ ከሆኑት የህዝብ የጤና ችግሮች አንዱ ነው :: በባንክ ዘርፎች ውስጥ ያሉ ሠራተኞች ለረጅም ጊዜ የማይቆጠሩ ስራዎች ፣ መጥፎ አኳኋን እና ተደጋጋሚ የኮምፒተር አጠቃቀም ለ WRMSDs የተጋለጡ ይሆናሉ ::

ዓላማ የዚህ ጥናት ዓላማ በደቡብ ምዕራብ ኢትዮጵያ 2019 ጅማ ከተማ ውስጥ ከሥራ ጋር ተያያዥነት ያላቸው የአካል ጉዳቶች መዛባት እና ተያያዥ ሁኔታዎችን መገምገም ነው ::

የጥናቱ ጥቅም-ለመሳተፍ ቀጥተኛ ጥቅም የለም ግን የጥናቱ ግኝት የችግሩን ስፋት ለማወቅ እና እርስዎን ጨምሮ ለሁሉም የባንክ ስራዎች የስራ ሁኔታ ለማሻሻል ጠቃሚ ነው ::

የጥናቱ ስጋት-ጥናቱ ለተሳታፊዎች ምንም ዓይነት አደጋ የለውም ::

የተሳታፊው መብት-መሳተፍ እና አለመሳተፍ ሙሉ መብትዎ ነው እናም ተሳታፊዎች በማንኛውም ጊዜ ከጥናቱ መውጣት ይችላሉ ::

ምስጢራዊነት-ስምህ በዚህ ፎርም አይፃፍም እናም ለእርስዎ የተሰጠው መረጃ በሙሉ በሚስጢር የተጠበቀ ይሆናል ::

የቃለ መጠይቁ ጊዜ ይህ ቃለ መጠይቅ ከ15 - 20 ደቂቃ ይወስዳል

ለመቀጠል የአንተ ፈቃድ ሊኖርኝ ይችላል?

1. አዎ ከሆነ ፣ በቃለ መጠይቁ ይቀጥሉ

2. የለም ከሆነ ፣ ለሚፈጽመው ተሳታፊ / እሱ ውድቅ ያደረገበትን ምክንያት በመጻፍ ይዝለሉ ::

የሚያነጋግረው ሰው-የበለጠ መረጃ ከፈለጉ እና ስለዚህ ጥናት ከፈለጉ ከፈለጉ ዋና መርማሪውን እና አማካሪውን በሚከተለው አድራሻ ማነጋገር ይችላሉ ::

መርማሪ ሚስተር ጉሉማ ኤታና ፣ ሞባይል: 0917707303

ዋና አማካሪ-አቶ አስፋው ገርቢ (ፒ.ዲ. ባልደረባ) ጂዩ; ሞባይል: 0924490573

ተባባሪ አማካሪ መንግስቱ አየለ (ኤምሲሲ); ሞባይል: 0929046717

የተረጋገጠ የፈቃድ ቅጽ

በጥናቱ ለመሳተፍ ፈቃደኛ ነዎት? አዎ ☐ አይ ☐

የዚህን ሰነድ ይዘቶች እና የምርምር ፕሮጀክቱን ተፈጥሮ እንደተረዳሁ በዚህ አረጋግጣለሁ ፣ እናም በምርምር ፕሮጀክቱ ውስጥ በፈቃደኝነት ለመሳተፍ ሙሉ ፈቃድዬን እሰጣለሁ። በማንኛውም ጊዜ ከፕሮጀክቱ ለመላቀቅ እራሴ ነኝ።

የተሳታፊ ቀን ፊርማ

_____ _____

የመረጃ ሰብሳቢው ስም እና ፊርማ_____ ቀን _____

የተቆጣጣሪው ስም እና ፊርማ_____ ቀን_____

Annex 5: Questionnaire-Amharic version

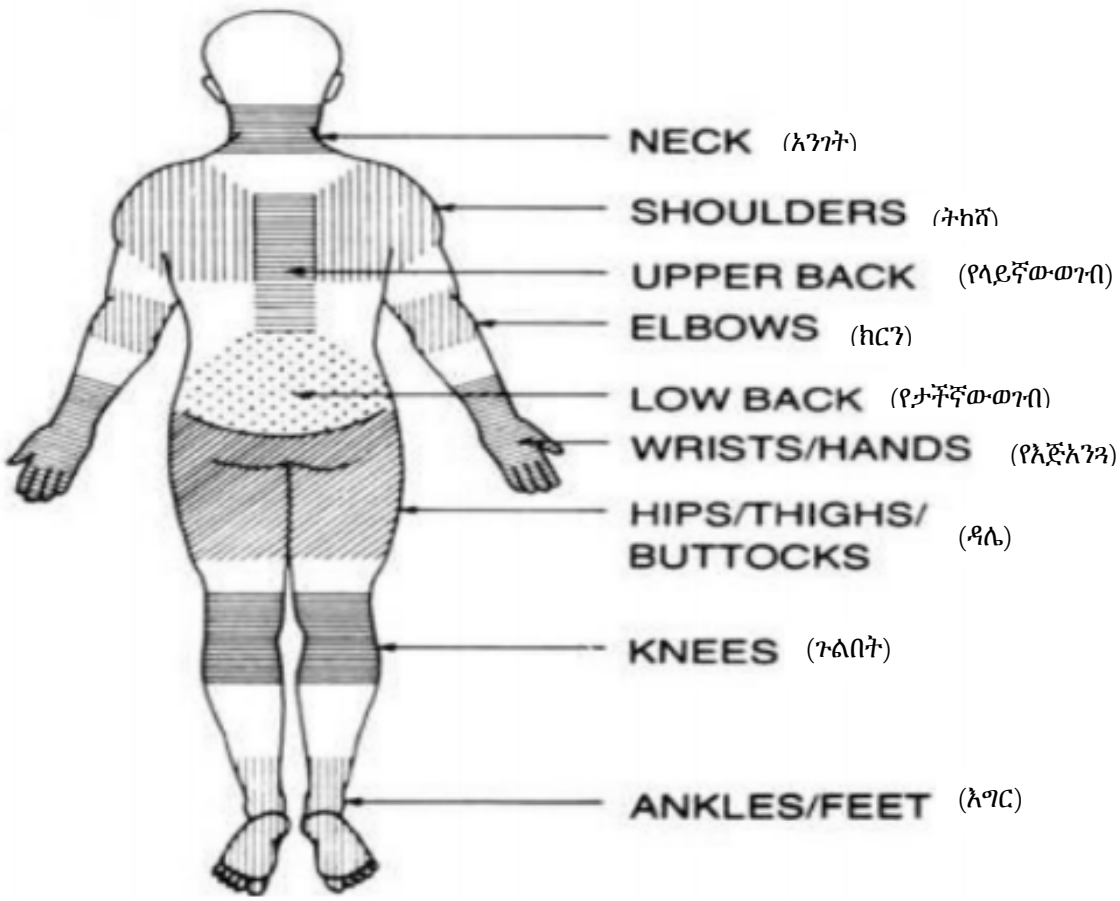
ኮድ፡ _____

የባንክስም_____

ክፍልአንድ፡ማህበራዊናስነህዝባዊመጠይቆች

ተ.ቁ	**ጥያቄወች**	**መልሶች**	**ይሻገሩ**
101	ጾታ	1. ወንድ 2. ሴት	
102	እድሜበአመት	----------	
105	የጋብቻሁኔታ	1. ያገባ/ች 4. የሞተባት 2. ያላገባ/ች 5. ሌላካለይገለጽ---------- 3. የተፋታች	
106	የትምህርትሁኔታ	1. መጀመሪያደረጃ 2. ሁለተኛደረጃ 3. ሌላ _____	
107	ወርሀዊደመወዝ	----------	
108	የስራልምድ	_____	

ክፍል ሁለት: ባለፈው12 ወራት ውስጥ በስራምክንያት የሚከሰቱ የጡንቻና የመገጣጠሚያ አካሊት ህመም መጠን ለማወቅ የተዘጋጀ መጠይቅ ኖርዲክ ስታንዳርድ (Q201-209).



በየትኛውም የሰውነትዎ ክፍል ውስጥ ችግር ቢያጋጥመዎትም እንኳን እባክዎን ይህ የጥያቄ ክፍል መልስ መስጠት አለበት

No	ባለፈው 12 ወራት ውስጥ በጡንቻና በአጥንት ላይ አስቸጋሪ የሆነ ህመም(መቆርጠም፣መደንዘዝ) ስሜት አጋጥሞት		
201	አንገት		1. አዎ2. የለም
202	ትካሻ	በቀኝ	1. አዎ2. የለም
		በግራ	1. አዎ2. የለም
203	የላይኛው ወገብ		1. አዎ2. የለም
204	ክርን	በቀኝ	1. አዎ2. የለም
		በግራ	1. አዎ2. የለም
205	የታችኛው ወገብ		1. አዎ2. የለም
206	የእጅአንጓ	በቀኝ	1. አዎ2. የለም
		በግራ	1. አዎ2. የለም
207	ዳሌና መቀመጫ	በቀኝ	1. አዎ2. የለም
		በግራ	1. አዎ2. የለም
208	ጉልበት	በቀኝ	1. አዎ2. የለም
		በግራ	1. አዎ2. የለም
209	እግር/አልቦ	በቀኝ	1. አዎ2. የለም
		በግራ	1. አዎ2. የለም

ክፍል ሶስት: የግለሰብ ሁኔታን የተመለከቱ ጥያቄወች

ተ.ቁ	**ጥያቄወች**	**መልሶች**	**ይሻገሩ**
301	ስንት ሴንትሜትር ይረዝማሉ??	----------ሴ.ሜ	
302	የሰውነትዎ ክብደት ስንት ኪሎግራም ይመዝናል?	----------ኪ.ግ	
303	የአካል ብቃት እንቅስቃሴ ያደርጋሉ?	1. አዎ 2. አላደርግም →	**ጥያቄ305**
304	ለተራቁጥር 303 መልሰዎ አዎ ከሆነ በየሳምንቱ ለምንያህል ቀናት ቢያንስ ለ30 ደቂቃ ስፖርት ይሰራሉ?	----------ቀናት	
305	ትምባሆ /ሲጃራ ያጨሳሉ ?	1. አዎ 2. አላጨስም →	**ጥያቄ307**
306	ለተራቁጥር 305 መልሰዎ አዎ ከሆነ በሳምንቱ ለምንያህል ቀን ና ምን ያህል ሺጃራ (በባኮ ወይም በነጠላ)ያጨሳሉ ?	1. ----------ቀን በሳምንት 2. ----------ሲጃራ	
307	አልኮል ይጠጣሉ ?	1. አዎ 2. አልጠጣም →	**ጥያቄ309**
308	ለ 307 ጥያቄዎ መልስዎ ‘‘አዎ’’ በሳምንት ስንት ብርጭቆነው?	_____	
309	አጠቃሊይ የጤና ችግር መኖሩን ከጡንቻ ውጭ?	1. አዎ 2. የለም	
310	ለስራ የሚጠቀሙት ቀኝ እጅነው ወይስ ግራእጅ	1. ቀኝ እጅ 2. ግራ እጅ	
311	ስለምቹ የአቋቋምና የአሰራርዘዴ ስልጠና ወስደው ያውቃሉ	1. አዎ 2. አይ	

ክፍል አራት - ከሥራ ጋር ተያያዥነት ካለው የጡንቻ የአካል ችግር ጋር የተዛመደ ergonomics ምክንያት

የአካል ብቃት እንቅስቃሴዎችን ለመለካት ጥያቄዎች (Q401-406)			
No	**ጥያቄዎች**	**ሊሆን የሚችል ምርጫ**	**ዝለል**
401	የሥራ ምድብዎ ወይም ኃላፊነትዎ ምንድነው?	1 ሥራ አስኪያጅ 2 2. የደንበኞች ግልጋሎት 3 ሌላ _____	
401	ጠቅላላ የስራ ሰዓታት።	--------- ሰዓታት / ቀን -------- ሰዓታት / ሳምንት	
402	ሥራዎ መታጠፍን ወይም እርስዎን በማዞር ያካትታል?	1. አዎ 2. አይ	
403	በተመሳሳይ ቦታ ለ 2 ሰዓታት ያህል ይቆማሉ (ቆሞ ፣ መታጠፍ ፣ ቁጭ ብሎ ፣ ተንበርክኮ ፣ ወዘተ)?	1. አዎ 2. አይ	
404	ሥራዎ ከ 30 ሴኮንዶች ጋር እንቅስቃሴን መድገም ይጠይቃል?	1. አዎ 2. አይ	
405	በምሳ ሰዓት ውስጥ ሳይካተቱ በቀን ሥራዎ ውስጥ ዕረፍትን ይወስዳሉ?	1. አዎ 2. አይ ⟶ **407**	
406	መልስዎ አዎ ከሆነ በጥያቄ 406 ፣ በቀን ውስጥ ስንት ጊዜ እና ስንት ጊዜ እረፍት ይወስዳሉ?	------- በቀን ውስጥ ------- ደቂቃ	
407	ስራ በመደበኛነት የመቀመጫ ወንበር ሁኔታ ምን ይመስሊሌ	1. ተንቀሳቃሽ(ከፍ ዝቅ ማሆት የሚችሌ) 2. ቋሚ (ከፍ ዝቅ ማሆት የማይችሌ)	

ክፍል 5: ከስራ አካባቢና ከስነልቦና ጋር ተያያዥነት ያላቸው ጥያቄወች

ተ.ቁ	**ጥያቄዎች**	**መልስ**	**ይሻገሩ**
501	ከሌላ የሥራ ባልደረባዎ ጋር ያለዎትን ግንኙነት እንዴት ይገልፃሉ?	1.ጥሩ 2. መጠነኛ 3. ጥሩ ያልሆነ	
502	በመደበኛ ስራዎ ሊይ ከፍተኛ የስራ ጫና አጋጥሞት ያውቃሌ?	1. በፍፁም 2. አንዳንዴ 3. ሁሌ ጊዜ	
503	የሥራ ቦታ ጤንነት ሁኔታ	1. ምቹ 2. ምችት የለውም	

	የሙቀት ሁኔታ መገምገሚያ ነጥቦች(በአማራጮቹ ላይ ምልክት ያድረጉ)	አዎ
	ቀዝቃዛ ወይም ሙቀት ያለው የአየር ንብረት በሳሎኑ ውስጥ ይሰማወታል ?	
	በ ውስጥ ያለው የሙቀት መጠን የሥራ ቦታ ተለዋዋጭነት ሀ መደበኛ የስራ ቀን?	
	ሙቀት ሊያመነጭ የሚችል ነገር አለ ?	
	እሰቲም ሊፈጥር የሚችል መሳሪያ አለ ?	
	የሥራ ቦታው ተጽዕኖ አለው የውጭ የአየር ሁኔታ ሁኔታዎች?	
	ቀዝቃዛ ወይም ሙቅ አየር ይነፋል በቀጥታ ወደ የስራ ቦታው ይግቡ?	
	ሰራተኞች ሙቀትን ለመከላከል አለባበሳቸውን ያስተካክላሉ ?	
	የስራ ክብደት ሙቅ በሆነ አየር ይጨምራል ?	

የስራ ድብርት የተመሆከቱ ጥያቄዎች (ጥያቄ504-511)		
ተ.ቁ		**የስራ ድብርት መሆኪያዎች**

	ጥያቄዎች	በፍፁም	አሌፎ አሌፎ	አንዳንዴ	ብዙጊዜ	ሁሌጊዜ
504	የስራ ቦታ ሁኔታዎች ደስ የማይለና አንዳንዴ ደህንነቱ ያሌተጠበቀ ነው	1	2	3	4	5
505	ስራዬ አካሊዊና ስነ-ሌቦናዊ ጉዳት እያደረሰብኝ ነው ብሇው ያስባለ?	1	2	3	4	5
506	ብዙ የስራ ጫና አሇብኝ ብሇው ያስባለ?	1	2	3	4	5
507	ስሇ ስራ ሁኔታዎ ሇአሇቆች ሇመናገር ይከብደኛሌ ብሇው ያስባለ?	1	2	3	4	5
508	የስራ ጫናው ከግሌና ቤተሰብ ህይወቴይጋጫሌ ብሇው ያምናለ?	1	2	3	4	5
509	የስራ ድርሻዬን በአግባቡ ማከናወንና መቆጣጠር እችሊሇሁ ብሇው ያምናለ?	5	4	3	2	1
510	በጥሩ ሇስራሁት ስራ እውቅና/ሽሌማት ይሰጠኛሌ	5	4	3	2	1
511	ችልታዬና ክህልቴ በስራዬ በደንብ እጠቀማሇሁ ብሇው ያምናለ ?	5	4	3	2	1
	አጠቃላይ ውጤት					

የ ስራእርካታንየተመለከቱጥያቄዎች (Q 512-521)

ተ.ቁ	ጥያቄዎች	የ ስራ እርካታ መለኪያ				
		በጣም አረካሁም	አረካሁም	ገለልተኛ	እረክቻለሁ	በጣም እረክቻለሁ
512	በጥሩ ሁኔታ ለሰሩት ስራ በተሰጥዎት እውቅና ምንያህል እረክተዋል ?	1	2	3	4	5
513	ከስራ ባልደረቦችዎ ባለወት ቅርበት ምንያህል እረክተዋል?	1	2	3	4	5
514	እዚህ በመስራትዎ ምንያህል እረክተዋል?	1	2	3	4	5
515	በስራ ደህንነት ምንያህል እረክተዋል ?	1	2	3	4	5
516	የስራ አመራሩ ስሇኔ ጥሩ ያስባሌ ብሇው ያስባለ?	1	2	3	4	5
517	በአጠቃላይ ስራ በሚሰጠው አካላዊ ጤንነቴ ምንያህል እረክተዋል ?	1	2	3	4	5
518	በሚከፈልዎት ደመወዝ ምንያህል እረክተዋል ?	1	2	3	4	5
519	ችሎታና ክህሎትዎን በመጠቀምዎ ምንያህል እረክተዋል ?	1	2	3	4	5
520	ከተቆጣጣሪዎቼ ና ከአሰሪወች ጋር ባለዎት ስምምነት ምንያህል እረክተዋል?	1	2	3	4	5
521	በስራዎ ደስተኝነት ምንያህል እረክተዋል?	1	2	3	4	5
	አጠቃላይ ውጤት					

DECLARATION

I, the undersigned, declare that this thesis is my original work has not been presented for a degree in this university or any other and that all sources of materials for the thesis have been fully acknowledged.

Name: GULUMA ETANA (BSc) Signature: _____Date_____

Name of the institution: JIMMA UNIVERSITY

This thesis has been submitted for examination with my approval as university advisor

Name and signature of principal advisor

Name: Mr. ASFAW GERBI (BSc, MSc, Asst. prof.)

Signature _____Date_____

Name and signature of co-advisor

Name: Mr. MENGISTU AYELE (BSc, MSc) Signature _____Date_____

As member of the Examining Board of the final MSc. Open Defense, we certify that we have read and evaluated the thesis prepared by Guluma Etana and examined the candidate. We recommend that the thesis be accepted as fulfilling the thesis requirement for the Degree of Master of Science in Clinical Anatomy.

Name of Chairperson	Signature	Date
Name of Internal Examiner	Signature	Date
Name of External Examiner	Signature	Date