





# Prevalence of Work Related Musculoskeletal Disorders and Associated Factors Among Bank Staff in Jimma City, Southwest Ethiopia, 2019: An Institution-Based Cross-Sectional Study

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**Background:** Work-related musculoskeletal disorder is one of the most important public health problems throughout the world. However, there is a paucity of knowledge on work-related musculoskeletal disorders among bank staff in Ethiopia. Therefore, this study aimed to assess the prevalence of work-related musculoskeletal disorders and associated factors among bank staff in Jimma city, Ethiopia.

**Methods:** Institution-based cross-sectional study was conducted from July 20 to August 20, 2019. A simple random sampling technique was used. Data were collected by pre-tested interviewer-administered standardized Nordic musculoskeletal questionnaires. Data were entered into Epi Data version 3.1 and exported to SPSS version 20 for analysis. A logistic regression analysis was done. A variable having a p-value <0.25 in a bivariate analysis was taken into multivariate analysis to avoid the potential effects of confounders. Adjusted odds ratios (AOR) were calculated at a 95% confidence interval to see the strength of association. A significant association was set at a p-value <0.05.

**Results:** Data were collected from 335 study participants. 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%). 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 factors associated with work-related musculoskeletal disorders.

**Conclusion:** The prevalence of work-related musculoskeletal disorders was common among bank staff. Preventive strategies such as using ergonomic guidelines and giving awareness on the effect of bad posture, avoiding prolonged working in the same position were recommended. Using ergonomic guideline is helpful to create a suitable working environment that fit employee's physical capability.

**Keywords:** prevalence, musculoskeletal disorders, risk factors, bank staff

## Introduction

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),

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nerve compression disorders (carpal tunnel syndrome, sciatica), and osteoarthritis.<sup>1</sup> Musculoskeletal injury resulting from a work-related event is termed work-related musculoskeletal disorder (WRMSD).<sup>2</sup> MSDs are usually characterized by musculoskeletal symptoms of pain, paraesthesia, stiffness, swelling, redness, weakness, tingling, and numbness.<sup>3</sup> WRMSDs 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.<sup>4,5</sup>

Multiple 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/behavioral (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.<sup>6–11</sup> 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.<sup>12</sup> The modernization in different offices including banks has led to the introduction of information technology tools in the workplace. 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 without having adequate rest and recovery time.<sup>13,14</sup>

Work-related musculoskeletal disorder is one of the most important public health problems that not only affect the health of workers but also creates a burden on the health system, economic and social costs.<sup>13</sup> Globally, MSDs are the largest single cause of work-related illness, accounting for over 33% of all newly reported occupational illnesses in the general population.<sup>15</sup> In the USA, there were 522,528 MSD cases<sup>16</sup> and the direct costs of MSDs and carpal tunnel syndrome in the USA were \$1.5 billion and \$0.1 billion, respectively, while the indirect costs were \$1.1 billion and \$0.1 billion respectively.<sup>17</sup> About 56% of the Brazilian bank workers evaluated had MSD symptoms affecting the upper limbs.<sup>18</sup>

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.<sup>19</sup> 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.<sup>8</sup> In Asian populations, a high annual prevalence of WRMSDs in at least one body region is varied from 40% to 95%.<sup>20</sup> In India, the occupation-specific prevalence of MSDs found to be as high as 90%<sup>21</sup> and the bank workers suffering from MSDs 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%.<sup>12</sup>

In many African countries, WRMSDs was a problem with the prevalence of any musculoskeletal disease ranging from 15% to 93.6%.<sup>22</sup> For instance, in South Africa, the incidence of work-related back pain, neck pain, and carpal tunnel syndrome are between 15% and 60% indicating that a high proportion of the working population is at risk of developing one or more work-related musculoskeletal disorders.<sup>23</sup> The prevalence of WRMSDs among bank workers was high as reported in Nigeria 71.68%<sup>14</sup> and in Ghana 83.5%.<sup>13</sup> In Rwanda, the prevalence of back pain among the bank staff was found to be 45.8%.<sup>24</sup>

However, information about WRMSDs among bank workers is infinitesimal in Ethiopia. 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. Identification of risk factors and magnitude of WRMSDs helps the governmental and non-governmental organizations working on occupational health and safety to modify the workplace design and adjust the working environment. It also provides information for therapists and enables the affected study subjects to visit physiotherapeutic treatment to subside the pain and prevention of another episode. It can also serve as baseline information to undertake further studies in similar settings. Therefore, this study was aimed to assess the prevalence of WRMSDs and associated risk factors among bank staff in Jimma city, Southwest Ethiopia.

## Methods

### Study Design and Setting

An institution-based cross-sectional study was conducted among bank staff in Jimma city. Jimma city 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 1780 meters above sea level. It lies in the climatic zone locally known as “Woyna Daga” (1500–2400m 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 to 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.

## Source and Study Population

All bank staffs in Jimma City were the source population. All bank staffs in the banks selected by simple random sampling were our study population.

## Eligibility Criteria

The clerical staff has worked for at least one year prior to data collection was included. A staff those had a history of accidents affecting the musculoskeletal system (fracture of spine or limbs due to car accident or fall), spinal surgery, and major surgery in any part of the body, congenital anomalies such as spine and limb anomaly, Pregnant and current ill were excluded.

## Sample Size Determination and Sampling Techniques

The sample size was calculated by using single population proportion formula<sup>25</sup> 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).<sup>14</sup> By inserting in the formula  $n = ((Z\alpha/2)^2 p (1-p)) \div d^2$ ,  $n = ((1.96)^2 * 0.7168 (1-0.7168)) \div (0.05)^2 = 312$ . By adding 10% of non-respondent which is 31, the final sample size required for this study was  $312 + 31 = 343$ .

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. 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.

## Data Collection Tools and Procedures

An interviewer-administered questionnaire was used to collect data. The prevalence of work-related musculoskeletal disorders was gathered by using modified Standardized Nordic musculoskeletal questionnaires which developed from a project funded by the Nordic council of ministers.<sup>26</sup> Responses to any of the questions are either a “Yes” or a “No”. The Nordic musculoskeletal questionnaire (NMQ) is one of the measuring instruments often used to assess musculoskeletal disorders worldwide. The questionnaire was tested for its validity and reliability. Many studies indicated that translation and cross-cultural adaptations to the English version of NMQ did not reduce its validity or reliability for taking information about the musculoskeletal disorders.<sup>27–30</sup> Job satisfaction was assessed using a Likert scale to identify the level of satisfaction in their work.<sup>31</sup> 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). The response scales were added and summarized out of 50. The workers were classified into two categories by using the demarcation threshold as “yes” if the added score 32–50 and “no” if the added score 10–31. Workers’ job stress was assessed by using Marlin Company and the American Institute of Stress scale calculation.<sup>32</sup> It contains five options (never, rarely, sometimes, often, and very often) with eight items. The response scales score summarized out of 40. The workers were categorized into “Yes” if the added score 16–40 and “No” if the added score  $\leq 15$ .

The other contents of the questionnaire were developed from previous literature. The questionnaire was categorized into five parts. The first part includes socio-demographic characteristics such as age, sex, marital status, educational status, work experience, and monthly salary. The second part comprises individual/behavioral factors like systemic illness history, BMI (kg/m<sup>2</sup>), physical activity, smoking (yes/no), alcohol consumption (yes/no), hand dominance (right/left), and ergonomic training. The third

part covered ergonomics factors including Job designation, type of sitting chair, 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. The fourth part of the questionnaire encloses the working environment and psychosocial factors like the thermal condition of the workplace, job satisfaction, job stress, workload, and relation with other colleagues.

## 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.<sup>33</sup>

**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.<sup>34</sup>

**Working in the same position (SP):** Sitting or standing in a restricted space for two or more hours without changing positions.<sup>34</sup>

**Repetitive work:** Work involving repeating the same motion with little or no variation every few seconds for two or more hours.<sup>34</sup>

**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.<sup>35</sup>

## Data Processing and 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 into 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. The association between outcome variable (WRMSDs) and independent variables was explored by binary logistic regression analysis and the crude odds ratio (COR) was computed at a 95% C.I. Finally, to determine the independent factors associated with WRMSDs, a multivariate logistic regression analysis was done. Variables having a P-value <0.25 in the bivariate analysis were taken in the multivariate analysis to avoid potential of the effect of confounders. The covariates were entered into multiple logistic regression by the default enter method.

Multicollinearity was checked by Variable inflation factors and tolerance. Model fitting was checked by using Hosmer and Lemeshow goodness-of-fit test which is 0.605. The odds ratios with a 95% CI were calculated to see the strength of association. The significant association was set at a p-value of <0.05 in the multiple logistic regression analysis.

## 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. A pre-test was conducted on 5% of the sample size at the Agaro town which is 45km far from Jimma city on Commercial Bank of Ethiopia to identify potential problems in data collection tools and modification of the questionnaire. The training was given for data collectors and supervisor about all aspects of data collection tools, questioning techniques, and ethical issues. Regular supervision was done by supervisor and data were checked for completeness and consistency on a daily bases during data collection time.

## Results

### 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. Of the study participants, 156 (46.6%) belong to the 20–29 age group and the mean age was 31±5.27 years. Concerning the work experience, the majority of the study participants 173 (51.6%) was served from 1 to 5 years. The mean of work experience was 6±3.61 with the minimum and maximum 1 and 18, respectively (Table 1).

### Individual/Behavioral Characteristics of Study Participants

Regarding body mass index, out of the study participants, 250 (74.6%) staff was ranging from 18.50 to 24.99 kg/m<sup>2</sup>. 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

**Table 1** 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

majority of the 327 (97.6%) dominant hand was right-hand. Regarding ergonomic knowledge, only 32 (9.6%) of study participants trained on an ergonomic issue.

## 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 (see [Table 2](#)).

### Ergonomic Factors

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 ([Table 3](#))

### Working Environment and Psychosocial Factors

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.

### Factors Associated with Work-Related Musculoskeletal Disorders

Variables with p-value <0.25 in bivariate analysis were taken into a multivariate logistic regression analysis to identify independent predictors of work-related musculoskeletal disorders ([Table 4](#)). In multivariate analysis: work experience, alcohol consumption, awkward posture, working in the same position for two or more hours, and job stress were factors significantly associated with WRMSDs among bank staff ([Table 4](#)).

Bank staff with ≥6-year work experience were 2.16 times more likely to develop WRMSDs compared to staff served less than 6 years [AOR:2.16, 95% CI: 1.05–4.43]. Regarding alcohol consumption, bank staff who had alcohol consumption behavior were 3.44 more likely to develop WRMSDs when compared to staff those not consuming alcohol [AOR: 3.44,

**Table 2** 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

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 WRMSDs 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 WRMSDs 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 WRMSDs compared to no stressed staff [AOR: 3.20, 95% CI: 1.67–6.15] (see Table 4).

## Discussion

In the present study, the overall prevalence of the work-related musculoskeletal disorder among the bank staff in the last 12-months preceding data collection was 73.1%

**Table 3** Ergonomic Risk Factors of the Bank Staff in Jimma City, Southwest Ethiopia, 2019

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

indicating that more than half of the study participants were experiencing pain. This result is slightly higher than the study done in Nigeria (71.68%).<sup>14</sup> But it is lower relative to the study done in Ghana (83.5%)<sup>13</sup> and in Kuwait which showed that (80%) of bank workers were affected at least by one MSD in the last 12 months.<sup>5</sup> The possible explanation for this disparity might be due to the difference in perception of study participants on reporting of pain or discomfort, sample size, work setting, and workload.

Regarding specific body parts, the most affected body parts in this study were lower back (54%), neck (45.4%), upper back (42.7%), and shoulder (37.9%). The prevalence of MSDs 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.<sup>36</sup> However, the prevalence of neck (45.4%), shoulder (37.9%), wrist/hand (14%) and knee (13.7%) in our study was lower compared to the study done in India reported that neck (48.2%), shoulders (40.2%), wrist/hand (35%), and knee (25%).<sup>10</sup> 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%).<sup>5</sup> The plausible explanation for this difference could

be due to differences in assessment tools, workplace health and safety practices, study design, and sample size.

This study identified some risk factors of WRMSDs. Bank staffs who had long work duration (≥6 years of work experience) were at risk of developing WRMSDs than those of lower work experience. This result is in line with the study done in Iran showing that longer job duration associated with WRMSDs.<sup>37</sup> In the same way, another study also showed that the proportion of days of sick leave due to MSDs among experienced workers was high compared to new or less experienced workers.<sup>38</sup> 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 strains that develop gradually as a result of overuse.

In this study, alcohol consumption behavior was also identified as a risk factor of WRMSDs. This result is in line with previous studies done in Ethiopia,<sup>33</sup> Kuwait,<sup>5</sup> Ghana,<sup>13</sup> and India<sup>39</sup> that showed a significant association of alcohol drinking habit with self-reported WRMSDs. The plausible explanation might be due to the harmful effect of alcohol on the normal physiology of the body and defense mechanisms. Moreover, alcohol consumption

**Table 4** Multivariate Analysis of Factors Associated with WRMSD Among Bank Staff in Jimma City, Southwest Ethiopia, 2019

Variables	WRMSDs		COR (95% CI)	AOR(95% CI)	P-value
	No	Yes			
Age (years)	20-29	102	1	1	
	30-39	30	1.15(1.28-3.61)	1.88(0.91-3.89)	0.089
	≥40	6	1.85(0.71-4.87)	1.90(0.49-7.29)	0.349
Educational level completed	Masters	20	1	1	
	Bachelors	65	0.68(0.38-1.20)	0.93(0.42-2.09)	0.865
	Others	5	0.43(0.13-1.47)	1.17(0.22-6.37)	0.854
Monthly salary in ETB	<5000	10	0.55(0.23-1.29)	0.84(0.23-3.01)	0.783
	5000-10,000	47	0.76(0.45-1.27)	1.19(0.51-2.41)	0.790
	>10,000	33	1	1	
Work experience	1-5	63	1	1	
	≥6	27	2.86(1.71-4.79)	2.16(1.05-4.43)	0.037*
BMI status (kg/m2)	18.50-24.99	72	1	1	
	<18.50	10	0.69(0.30,1.57)	0.72(0.26-2.01)	0.534
	≥25.00	8	2.53(1.14-5.59)	1.89(0.74-4.79)	0.183
Doing physical exercise	Yes	44	1	1	
	No	46	1.44(0.88-2.33)	1.43(0.77-2.65)	0.253
Alcohol consumption	Yes	6	5.06(2.11-12.1)	3.44(1.29-9.18)	0.013*
	No	84	1	1	
Job designation	Manager	11	1	1	
	Customer service	73	2.12(0.93-4.82)	2.35(0.75-7.32)	0.141
	Others	6	2.32(0.69-7.73)	3.92(0.80-9.21)	0.092
Total working hours per day	≤8	80	1	1	
	>8	10	2.15(1.04-4.45)	2.80(0.65-2.12)	0.167
Total working hours per week	≤48	73	1	1	
	>48	17	1.49(0.82-2.71)	0.54(0.15-1.92)	0.339
Awkward posture	Yes	37	4.83(2.89-8.09)	4.09(2.20-7.61)	<0.001*
	No	53	1	1	
Working in the same position	Yes	41	3.31(2.00-5.47)	2.02(1.05-3.89)	0.036*
	No	49	1	1	



	Yes		No		OR (95% CI)	P-value
	Count	%	Count	%		
Repeated motion	33	23.2	142	76.8	1.49 (0.78–2.86)	0.232
	57	39.7	103	60.3		
Doing high loaded work	31	23.2	39	29.6	2.38 (1.45–3.91)	0.001*
	44	33.0	123	90.0		
	15	11.2	83	61.5		
Job stress	19	14.3	135	100.0	3.20 (1.67–6.15)	<0.001*
	71	52.7	110	81.3		

Notes: \*Significant association in multivariate analysis, I = reference.  
Abbreviations: COR, crude odds ratio; AOR, adjusted odds ratio; CI, confidence interval.

might influence the behavior of the people that often proscribe them from practicing a healthy lifestyle.<sup>33</sup>

An awkward posture is another risk factor influencing the occurrences of WRMSDs among bank staff in this study. This finding is in line with the study done in India showed that working in bad posture was the predictive factor for WRMSDs<sup>40</sup> and the study was done in Ethiopia among bank workers showed that bad posture was the leading cause of low back pain.<sup>41</sup> 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.

In our finding, working in the same body position for two or more hours was significantly associated with WRMSDs. This result was supported by the study done in India reported that prolonged sitting associated with musculoskeletal disorder.<sup>42</sup> 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 joint compression which in turn influences the musculoskeletal symptoms.<sup>8</sup> In the present study, a significant association did not found between WRMSDs 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.<sup>10</sup> 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, the present study identified job stress as a significant predictor of work-related musculoskeletal disorders. Similarly, Agnestifa et al<sup>43</sup> reported that job stress associated with self-reported WRMSDs. In the same way, the study done in India<sup>10</sup> and Malaysia<sup>44</sup> showed that psychosocial stress associated with WRMSDs. 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 increases muscle tension and decreases micro pauses in muscle activity results in musculoskeletal disorders.<sup>13,14</sup>

As strength, this cross-sectional study is the first study to explore the prevalence of work-related musculoskeletal disorders and potential risk factors among bank staff in Ethiopia. The identification of these risk factors is important for

government and other stakeholders to implement the preventive strategies. However, being self-reported, there might be over or underestimation of the prevalence of work-related musculoskeletal disorders. In addition to this, because of its cross-sectional nature, it is difficult to drive the causal relationship. Therefore, further studies should be with a different design like longitudinal study and mixed assessment tools for stronger evidence.

## Conclusions

The prevalence of work-related musculoskeletal disorders among bank staff in Jimma city, southwest Ethiopia was high (73.1%). 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 work-related musculoskeletal disorders among bank staff. Eradication of these risk factors by giving awareness on ergonomic issues like giving awareness on the effect of bad posture, avoiding prolonged working in the same position, and promoting health and safety practice for workers may reduce the high prevalence of WRMSDs in this population.

## Abbreviations

AOR, Adjusted Odds Ratio; BMI, Body Mass Index; COR, Crude Odds Ratio; CI, Confidence Interval; ETB, Ethiopian Birr; MSDs, Musculoskeletal Disorders; SPSS, Statistical Package for Social Sciences; USA, United State of America; WRMSDs, Work Related Musculoskeletal Disorders.

## Data Sharing Statement

The datasets analyzed during the current study are available from the corresponding author on reasonable request.

## Ethical Approval and Consent to Participate

The ethical approval of the study was obtained from the Ethical Review Board of Jimma University. 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 were taken from the study participants. Confidentiality of the information was assured and the privacy of the respondents was maintained. This study was conducted in accordance with the Declaration of Helsinki.

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## Disclosure

The authors report no conflicts of interest in this work.

## References

1. Punnett L, Wegman DH. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. *J Electromyogr Kinesiol.* 2004;14(1):13–23. doi:10.1016/j.jelekin.2003.09.015
2. Sirajudeen MS, Alaidarous M, Waly M, Alqahtani M. Work-related musculoskeletal disorders among faculty members of college of applied medical sciences, Majmaah University, Saudi Arabia: a Cross-Sectional Study. *Int J Health Sci (Qassim).* 2018;12(4):18–25.
3. Zakaria D, Robertson J, MacDermid J, Hartford K, Koval J. Work-related cumulative trauma disorders of the upper extremity: navigating the epidemiologic literature. *Am J Ind Med.* 2002;42(3):258–269. doi:10.1002/ajim.10100
4. Aini NAHB. Prevalence of musculoskeletal symptoms and its associated risk factors among bus drivers. *Int J Public Health Clin Sci.* 2015;2(1):34–45.
5. Akrouf QAS, Crawford JO, Al-Shatti AS, Kamel MI. Musculoskeletal disorders among bank office workers in Kuwait. *East Mediterr Health J.* 2010;16(1):94–100. doi:10.26719/2010.16.1.94
6. Farioli A, Mattioli S, Quagliari A, Curti S, Violante FS, Coggon D. Musculoskeletal pain in Europe: the role of personal, occupational, and social risk factors. *Scand J Work Environ Health.* 2014;40(1):36–46. doi:10.5271/sjweh.3381
7. Shettar D, Sherkhane MS. Assessment of risk factors for the development of musculoskeletal disorders among working women. *Int J Community Med Public Health.* 2017;4(3):718. doi:10.18203/2394-6040.ijcmph20170746
8. Ozvurmaz S, Mandiracioglu A. Prevalence of upper extremity musculoskeletal complaints and its relationship with risk factors for bank employees working with computer. *Ulutas Med J.* 2017;3(2):39. doi:10.5455/umj.20160922084115
9. Vinothini P, Halim I, Umar RZ, Too YW. A future framework for musculoskeletal disorders symptoms among computer office workers. *Int J Phys.* 2018;5(6):167–177.

10. Sulaiman SK, Kamalanathan P, Ibrahim AA, Nuhu JM. Musculoskeletal disorders and associated disabilities among bank workers. *Int J Res Med Sci.* 2015;3(5):1153–1158. doi:10.5455/2320-6012.ijrms20150523
11. Mekonnen TH, Kekeba GG, Azanaw J, Kabito GG. Prevalence and healthcare seeking practice of work-related musculoskeletal disorders among informal sectors of hairdressers in Ethiopia, 2019: findings from a Cross-Sectional Study. *BMC Public Health.* 2020;20(718):1–10. doi:10.1186/s12889-020-08888-y
12. Moom RK, Singh LP, Singh H. Impact of personal and work related factors on prevalence of musculoskeletal disorder- a case study among bank employees in Punjab (India). 2014;(September 2015).
13. Abledu K. Multiple logistic regression analysis of predictors of musculoskeletal disorders and disability among bank workers in Kumasi, Ghana. *J Ergon.* 2013;02(04):10–13.
14. Maduagwu M. Prevalence and patterns of work-related musculoskeletal disorders among bankers in Maiduguri, Northeast Nigeria. *Occup Med Health Aff.* 2014;2:3.
15. Bodhare T, Bele S, Valsangkar S. An epidemiological study of work-related musculoskeletal disorders among construction workers in Karimnagar, Andhra Pradesh. *Indian J Community Med.* 2012;36(4):304. doi:10.4103/0970-0218.91420
16. Waters TR. National efforts to identify research issues related to prevention of work-related musculoskeletal disorders. *J Electromyogr Kinesiol.* 2004;14(1):7–12. doi:10.1016/j.jelekin.2003.09.004
17. Bhattacharya A. Costs of occupational musculoskeletal disorders (MSDs) in the United States. *Int J Ind Ergon.* 2014;44(3):448–454. doi:10.1016/j.ergon.2014.01.008
18. Lacerda EM, Nacul LC, Augusto LGDS, Olinto MTA, Rocha DC, Wanderley DC. Prevalence and associations of symptoms of upper extremities, repetitive strain injuries (RSI) and “RSI-like condition”. A cross sectional study of bank workers in Northeast Brazil. *BMC Public Health.* 2005;5(1):1–10. doi:10.1186/1471-2458-5-107
19. European Agency for Safety and Health at Work. *Priorities for Occupational Safety and Health Research in Europe: 2013–2020;* 2013. doi:10.2802/25457
20. Nur Azma BA, Rusli BN, Oxley J, Quek K. Work related musculoskeletal disorders in female nursing personnel: prevalence and impact. *Int J Collab Res Intern Med Public Health.* 2016;8(3):294–315.
21. Kumar S, Fernandes J. An evaluative commentary on physical therapy intervention in headache physiotherapy. *J Indian Ass Phys.* 2017;11(1):8–11.
22. Wanyonyi NEN, Frantz J. Prevalence of work-related musculoskeletal disorders in Africa: a systematic review. *Physiotherapy.* 2015;101:e1604–e1605. doi:10.1016/j.physio.2015.03.1616
23. Collins RM, Janse Van Rensburg DC, Patricios JS. Common work-related musculoskeletal strains and injuries. *S Afr Fam Pract.* 2011;53(3):240–246. doi:10.1080/20786204.2011.10874091
24. Kanyenyeri L, Asiimwe B, Mochama M, Nyiligira J, Habtu M. Prevalence of back pain and associated factors among bank staff in selected banks in Kigali, Rwanda: a Cross Sectional Study. *Health Sci J.* 2017;11(3):1–7.
25. Daniel WW, Cross CL. *Biostatistics: A Foundation for Analysis in the Health Sciences.* 11th ed. Wiley; 2018.
26. Kuorinka I, Jonsson B, Kilbom A, et al. Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. *Appl Ergon.* 1987;18(3):233–237. doi:10.1016/0003-6870(87)90010-X
27. Legault ÉP, Cantin V, Descarreaux M. Assessment of musculoskeletal symptoms and their impacts in the adolescent population: adaptation and validation of a questionnaire. *BMC Pediatr.* 2014;14(1):1–8. doi:10.1186/1471-2431-14-173
28. Ramdan IM, Duma K, Setyowati DL. Reliability and validity test of the Indonesian version of the Nordic musculoskeletal questionnaire (NMQ) to measure musculoskeletal disorders (MSD) in traditional women weavers. *Glob Med Health Commun.* 2019;7(2):123–130. doi:10.1152/ajplegacy.1975.229.6.1641
29. Gupta G, Bhavana R, Rishikesh R. Reliability and validity of hindi version of Nordic musculoskeletal questionnaire. *EC Orthop.* 2018;9(8):533–538.
30. Mesquita CC, Ribeiro JC, Moreira P. Portuguese version of the standardized Nordic musculoskeletal questionnaire: cross cultural and reliability. *J Public Health.* 2010;18(5):461–466. doi:10.1007/s10389-010-0331-0
31. Macdonald S, MacIntyre P. The generic job satisfaction scale: scale development and its correlates. *Empl Assist Q.* 1997;13(2):1–16. doi:10.1300/J022v13n02\_01
32. The Marlin Company by Harris Interactive. Attitudes in the American workplace VII the seventh annual labor day survey. *Thinking.* 2001;1–11.
33. Mekonnen TH, Abere G, Olkeba SW. Risk factors associated with upper extremity musculoskeletal disorders among barbers in Gondar Town, Northwest Ethiopia, 2018: a Cross-Sectional Study. *Pain Res Manag.* 2019;2019. Article ID 6984719.
34. Kunda R. Prevalence of and risk factors for work-related musculoskeletal injuries (WMSIs) amongst underground mine workers in Kitwe, Zambia. *J Occup Health.* 2008;3(55):211–217.
35. Aghilinejad M, Choobineh AR, Sadeghi Z, Nouri MK, Ahmadi AB. Prevalence of musculoskeletal disorders among Iranian steel workers. *Iran Red Crescent Med J.* 2012;14(4):198.
36. Darvishi E, Meimanatabadi M. The rate of subjective mental workload and its correlation with musculoskeletal disorders in bank staff in Kurdistan, Iran. *Procedia Manuf.* 2015;3(Ahfe):37–42. doi:10.1016/j.promfg.2015.07.105
37. Noroozi MV, Hajibabaei M, Saki A, Memari Z. Prevalence of musculoskeletal disorders among office workers. *Jundishapur J Health Sci.* 2015;7(1):1–5.
38. Häkkinen M, Viikari-Juntura E, Martikainen R. Job experience, work load, and risk of musculoskeletal disorders. *Occup Environ Med.* 2001;58(2):129–135. doi:10.1136/oem.58.2.129
39. Kumar R, Pal L, Moom N. Prevalence of musculoskeletal disorder among computer bank office employees in Punjab (India): a Case Study. *Procedia Manuf.* 2015;3(1):6624–6631. doi:10.1016/j.promfg.2015.11.002
40. Sharma DM, Attrey DP. The prevalence of musculoskeletal disorders among bankers. *Indian J Appl Res.* 2018;8(4):5–6.
41. Singh K, Gebrekidan HG. Associated factors of low back pain among the Commercial Bank of Ethiopia: workers in Mekelle, North Ethiopia. *J Med Sci Technol.* 2014;3(2):17–21.
42. Kaur H, Bindra S, Gourang A, Sinha K. Epidemiological features of low back pain in bank employees of north India. *Int J Health Rehabil Sci.* 2014;3(1).
43. Agnestifa D, Susilowati IH, Azwar A, Indriyani K, Wirawan M. Analysis of ergonomic risk factors in relation to musculoskeletal disorder symptoms in office workers. *KnE Life Sci.* 2018;4(5):16. doi:10.18502/kls.v4i5.2536
44. Nasrull M, Rahman A, Masood I. Ergonomic risk factors associated with musculoskeletal disorders in computer workstation. *Int J Appl Eng Res.* 2017;12(7):1355–1359.

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