

## Original Research Article

# Study of musculoskeletal health problem among bankers in Kathmandu valley

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## ABSTRACT

**Background:** Musculoskeletal disorders affect all persons regardless of age and sex and are prevalent across a wide range of industries and jobs. In Asian populations, a high annual prevalence of Work-related Musculoskeletal Disorder in at least one body region is varied from 40% to 95%. The aim of this study was to assess the prevalence and identify the factors contributing to Musculoskeletal disorders.

**Methods:** Analytical cross-sectional and quantitative method was used. Random sampling was used to select the banks and convenience sampling was used to select the branches of those selected banks and finally, the census technique was used to collect the data from respondents. A structured questionnaire was designed and administered to study participants. Data collected from respondents were entered into Epidata 3.1 and were analysed and expressed using SPSS 26.

**Results:** The study showed the annual prevalence of Musculoskeletal disorder was 82.5% with the highest single MSDS prevalence of neck pain and the previous one-week prevalence rate was 37.6%. Gender (OR=2.543, 95% CI=1.082-5.974), age group 30-39 (OR=2.430, 95% CI=1.060-5.572), Physical activity (OR=7.379, 95% CI=3.004-18.12), Experience (OR=5.27, 95% CI=2.490-11.185), Repetitive task (OR=22.208, 95% CI= 9.744-50.617), Posture (OR=3.834, 95% CI=1.949-7.543), Working hours (OR=2.06, 95% CI=1.070-3.966) were found to be significantly associated with MSDs.

**Conclusions:** Occupational Health and safety was one of the neglected areas in Banking industry. The concept of occupational safety and health is still new in Nepal.

**Keywords:** Musculoskeletal disorder, Bankers, Kathmandu valley

## INTRODUCTION

Workers in both banking and finance sector are exposed to varying occupational health and safety issues. Poor ergonomically designed work station pose a risk to workers. A large number of staff in the banking and finance industry use computers for long periods every day. Poorly designed computer workstations, repetitive keying motion and static working postures can cause eye strain,

muscle aches and general fatigue. As well, staff engaged in phone banking, FX dealing, programming and data input may be exposed to potential health problems caused by prolonged computer operation. Hence, need for management to assess the risks to those who normally work with computers for long periods and adopt control measures accordingly.<sup>1</sup> In developing countries, though on an average, one-third of the lifetime of workers is spent in the workplace the working condition is very poor due to

lack of knowledge, attitude and behaviour among employees, employers and regulating bodies.<sup>2</sup> The work task of bankers often involves significant use of head down posture, repetitive movements, awkward posture etc which are the risk factors for developing musculoskeletal symptoms<sup>1</sup>. Musculoskeletal disorders affect all persons regardless of age and sex and are prevalent across a wide range of industries and jobs. Work-related musculoskeletal disorder (WRMD) 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. 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. In Asian populations, a high annual prevalence of WRMSDs in at least one body region is varied from 40% to 95%. In India, the occupation-specific prevalence of MSDs found to be as high as 90% 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>3-5</sup> Prevalence of musculoskeletal disorders (MSDs) have been increasingly associated with work conditions in several organizations. WRMDs shows significant burden for banking professionals therefore proper attention and preventive measures should be taken to minimize this burden. This burden is reduced through proper rest, adopting comfortable position or posture, and guidance.<sup>6</sup> The banking industry has undergone a lot of changes not only in Nepal but also worldwide. The intense competition both locally and internationally, the economic situation in most parts of the world and customer demands have put the industry in turmoil. One of the main survival strategies adopted by the banks is to cut operational costs. This has resulted to constant downsizing with a lot jobs being lost. The remaining employees work for long hours and perform a wider range of tasks comes with its own unique occupational health and safety hazards.<sup>7</sup> Although many studies have dealt with MSDs among Bank workers in other countries, the exact nature and prevalence of this important health problem has not been studied before in Nepal. The Purpose of the study was formulated to fill the gap of knowledge in this area.

## METHODS

An analytical, quantitative cross-sectional study was carried out in the Banks among the Bankers with at least two years of experience currently working in different banks inside the Kathmandu valley. The research was carried out from March 2022 to October 2022. Ethical approval was taken from the public health department of little Buddha college of health science, Purbanchal University, Nepal and the respective Banks. Verbal and written informed consent were taken from respondents after purpose and objective of the study was clearly explained to banking authorities and respondents of sample Banks. Ten A class commercial banks in Kathmandu valley were selected by lottery method. From these ten banks, 3 branches of these banks were convincingly

selected to administer the questionnaire. All bankers present during the day in the selected banks were invited to take part in the study. Bankers with less than 2 years of working experience and with prior health problems were excluded during data analysis phase. The total sample size was 263.

Standard tool was used for data collection. The tool for assessing musculoskeletal disorder was Nordic musculoskeletal questionnaire and other questionnaire prepared based on socio-demographic, socio-economic, family, Banking environment and individual factors. Self-administrative techniques were used for data collection. Nordic musculoskeletal questionnaire deals with the occurrence of MSDs during the previous 7 days and 12 months as well as their severity. It also deals with the distribution of these disorders by body parts. a general questionnaire of 40 forced-choice items identifying areas of the body causing musculoskeletal problems. Completion is aided by a body map to indicate nine symptom sites being neck, shoulders, upper back, elbows, low back, wrist/hands, hips/thighs, knees and ankles/feet. Respondents are asked if they have had any musculoskeletal trouble in the last 12 months and last 7 days which has prevented normal activity.<sup>8</sup> The collected data were input into the Epidata version 3.1 and processed, modified, and verified. Errors for inconsistency or incompleteness of responses connected to questionnaire questions were verified and corrected before labeling and analyzing the data. The entered data were exported to the statistical package for social science (SPSS) for further processing and analysis. A Chi-square test and odd ratio were used to show an association between variables. Privacy, confidentiality and anonymity of each respondent were maintained.

## RESULTS

### *Socio-demographic information*

Among 263 respondents almost three quarter (71.5%) were male and 28.5% were female respondents. More than half of them (56.7%) respondents were in the age group (30-39 years) which were highest among the total respondent. The mean age of respondents was 37 years. The distribution of age group among 263 respondents shows, minority respondents (12.2%) were in the age group 20-29. The majority of them were married (86.3%) and remaining 13.7% respondent were unmarried. Out of 263 respondents 60.8% were working in front office and 39.2% were working in back office. Over the total respondent's almost two-third (66.9%) were Brahmin/Chhetri followed by Adibasi/janajati 17.5% and Newar 15.6% (Table 1).

Out of 263 respondents more than half of them (54.4%) were exercising on a regular basis whereas 45.6% were not exercising. Among the 143 respondents who exercised nearly a third of them (36.4%) exercised less than 3 hour per week, 42.0% exercised 3-6 hours per week and remaining 21.7% exercised more than 6 hours per week.

**Table 1: Sociodemographic characteristics.**

| Characteristics                    | N   | %    |
|------------------------------------|-----|------|
| <b>Age group</b>                   |     |      |
| 20-29                              | 32  | 12.2 |
| 30-39                              | 149 | 56.7 |
| More than 40                       | 82  | 31.2 |
| Mean=36.51, Median=36.00, SD±6.394 |     |      |
| <b>Gender</b>                      |     |      |
| Male                               | 188 | 71.5 |
| Female                             | 75  | 28.5 |
| <b>Marital status</b>              |     |      |
| Married                            | 227 | 86.3 |
| Unmarried                          | 36  | 13.7 |
| <b>Job designation</b>             |     |      |
| Front office                       | 160 | 60.8 |
| Back office                        | 103 | 39.2 |
| <b>Ethnicity</b>                   |     |      |
| Brahmin/Chhetri                    | 176 | 66.9 |
| Newar                              | 41  | 15.6 |
| Adiwasi/janajati                   | 46  | 17.5 |

**Table 2: Personal Attributes and working condition.**

| Characteristics                  | N   | %    |
|----------------------------------|-----|------|
| <b>Perform physical exercise</b> |     |      |
| Yes                              | 143 | 54.4 |
| No                               | 120 | 45.6 |
| <b>Posture</b>                   |     |      |
| Poor                             | 156 | 59.3 |
| Good                             | 107 | 40.7 |
| <b>Working hour per day</b>      |     |      |
| Less than 8 hours                | 79  | 30   |
| More than 8 hours                | 184 | 70   |
| <b>Type of chair</b>             |     |      |
| Adjustable                       | 244 | 92.8 |
| Non adjustable                   | 19  | 7.2  |
| <b>Break in between the work</b> |     |      |
| Yes                              | 102 | 38.8 |
| No                               | 161 | 61.2 |
| <b>Screen time per day</b>       |     |      |
| Less than 5 hours                | 51  | 19.4 |
| 6-9 hours                        | 199 | 75.4 |
| More than 10 hours               | 13  | 4.9  |
| <b>Number of customers</b>       |     |      |
| Less than 50                     | 84  | 31.9 |
| 50-100                           | 127 | 48.3 |
| More than 100                    | 52  | 19.8 |
| <b>Repetitive task</b>           |     |      |
| Yes                              | 225 | 85.6 |
| No                               | 38  | 14.4 |

WHO recommends at least 150-300 minutes of moderate exercise per week for adults and every 143 respondents were found to have satisfying that criterion. More than half of them were found to have a poor posture (59.3%) and rest of them were found to have a good posture i.e., 40.7%.

Among the total respondents 30.0% had worked less than 8 hours a day, almost three-quarter (62.4%) worked 9-10 hours a day and tiny fraction (7.6%) worked more than 10 hours a day.

**Table 3: Prevalence of MSDs.**

| Characteristics               | N   | %    |
|-------------------------------|-----|------|
| <b>MSD Present</b>            |     |      |
| Yes                           | 217 | 82.5 |
| No                            | 46  | 17.5 |
| <b>Pain in neck</b>           |     |      |
| Yes                           | 178 | 67.7 |
| No                            | 85  | 32.3 |
| <b>Pain in right shoulder</b> |     |      |
| Yes                           | 68  | 25.9 |
| No                            | 195 | 74.1 |
| <b>Pain in left shoulder</b>  |     |      |
| Yes                           | 58  | 22.1 |
| No                            | 205 | 77.9 |
| <b>Pain in upper back</b>     |     |      |
| Yes                           | 96  | 36.5 |
| No                            | 167 | 63.5 |
| <b>Pain in wrist</b>          |     |      |
| Yes                           | 76  | 28.9 |
| No                            | 187 | 71.1 |
| <b>Pain in lower back</b>     |     |      |
| Yes                           | 124 | 46.4 |
| No                            | 139 | 52.1 |
| <b>Pain in hips</b>           |     |      |
| Yes                           | 39  | 14.8 |
| No                            | 224 | 85.2 |
| <b>Pain in thighs</b>         |     |      |
| Yes                           | 19  | 7.2  |
| No                            | 244 | 92.8 |
| <b>Pain in knee</b>           |     |      |
| Yes                           | 67  | 25.5 |
| No                            | 196 | 74.5 |
| <b>Pain in ankle/feet</b>     |     |      |
| Yes                           | 39  | 14.8 |
| No                            | 224 | 85.2 |
| <b>MSD in last 7 days</b>     |     |      |
| Yes                           | 99  | 37.6 |
| No                            | 164 | 62.4 |

Among all the respondents almost all of them (92.8%) worked in adjustable chair while minority (7.2%) worked in non-adjustable chair. 38.8% had break in between their work and majority (61.2%) did not had break in between their work.

While many of them (85.6%) had to do repetitive task everyday other 14.4% did not do repetitive task. Nearly a third (31.9%) respondents serve less than 50 customers in a day, almost half of them (48.3%) served 50-100 customer a day and 19.8% served more than 50 customer a day (Table 2).

**Table 4: Association of MSDs with socio-demographic factors.**

| Characteristics       | MSD Present | MSD Absent | P value | OR (95% CI)         |
|-----------------------|-------------|------------|---------|---------------------|
| <b>Gender</b>         |             |            |         |                     |
| Male                  | 149 (79.3)  | 39 (20.7)  | 0.032   | 2.543 (1.082-5.974) |
| Female                | 68 (90.7)   | 7 (9.3)    |         |                     |
| <b>Age group</b>      |             |            |         |                     |
| 20-29                 | 25 (78.1)   | 7 (21.9)   | 0.093   | 2.590 (0.853-7.868) |
| 30-39                 | 118 (79.2)  | 31 (20.8)  | 0.036   | 2.430 (1.060-5.572) |
| More than 40          | 74 (90.2)   | 8 (9.8)    | -       | Ref                 |
| <b>Marital status</b> |             |            |         |                     |
| Married               | 188 (82.8)  | 39 (17.2)  | 0.740   | 1.164 (0.476-2.846) |
| Single                | 29 (80.6)   | 7 (19.4)   |         |                     |

**Table 5: Individual, awareness and lifestyle factors association with MSDs.**

| Variables          | MSD Present | MSD Absent | P value | OR (95%-CI)         |
|--------------------|-------------|------------|---------|---------------------|
| Job designation    |             |            |         |                     |
| Front office       | 131 (81.9)  | 29 (18.1)  | 0.736   | 1.120 (0.580-2.162) |
| Back office        | 86 (83.5)   | 17 (16.5)  |         |                     |
| Physical activity  |             |            |         |                     |
| Yes                | 103 (72.0)  | 40 (28.0)  | <0.001  | 7.379 (3.004-18.12) |
| No                 | 114 (95.0)  | 6 (5.0)    |         |                     |
| Experience (years) |             |            | <0.001  |                     |
| <10                | 88 (71.0)   | 36 (29.0)  |         | 5.27 (2.490-11.185) |
| >10                | 129 (92.8)  | 10 (7.2)   |         |                     |

### Prevalence of MSDs

Out of 263 respondent's majority of them (82.5%) were experiencing pain in different parts of the body whereas rest 17.5% did not experience pain in any part of the body. Among the 10 body parts presented almost two third (67.7%) of them had experienced neck pain in the last 12 months. Followed by almost half of them experiencing lower back pain (46.4%), Whereas 36.5% had pain in upper back. Similarly, 28.9% had pain in wrist, almost a quarter (25.5%) had pain in knee and right shoulder pain (25.9%). Also, just under a quarter (22.1%) had left shoulder pain. The number of respondents experiencing hips and ankle/feet pain in the last 12 months were equal 14.8% and lastly tiny fraction (7.2%) had thighs pain. The prevalence of MSD in last 7 days was found to be 37.6% (Table 3).

### Analytical study

MSD and socio-demographic factors: females were 2.543 times more likely to have MSD as compared to males with (CI= 1.082-5.974). The people of aged 20-29 were 2.430 times more likely to have MSD with (95% CI 1.060-5.572) compared to age group more than 40 and age group 30-39 were 2.590 times likely to have MSD with (95% CI 0.853-7.868) compared to more than 40 age group. Similarly Married people were 1.164 times more likely to have MSD with 95%CI (0.476-2.846) as compared to singles but was not statistically significant with MSD. Upon fitting the sociodemographic factors in multivariate logistic

regression analysis gender, being 30-39 years of age were significantly associated with MSD at  $p < 0.05$ .

### MSD and individual, awareness and lifestyle factors

There was statistically significant relationship between participant MSDs and physical activity, experience at ( $p < 0.05$ ). Those respondents that worked at back office were 1.120 (CI=0.580-2.162) times more likely to have MSD as compared to those respondents that worked at front office and were not statistically significant. Respondents who were regularly doing exercise were 7.379 (CI=3.004-18.12) times less likely to have MSD as compared to those who were not involved in any physical activity. Respondents with more than 10 years of experience are 5.27 (CI=2.490-11.185) times more likely to suffer from MSDs as compared to respondents with less than 10 years of experience.

### MSDs and ergonomics, working environment

Variables under study like break, repetitive task, posture, working hours, screen time, and number of customers, were significantly associated ( $p < 0.05$ ). Those who perform repetitive task were 22.20 (CI=9.744-50.617) times more likely to has MSDs than those who do not perform repetitive tasks. Coming towards the posture of the respondents, we observed that those respondents who had a bad posture were 3.834 (CI=1.949-7.543) times more vulnerable to MSDs compared to those who had a good posture.

**Table 6: Ergonomics and working environment related factors of MSD.**

| Variables           | MSD Present | MSD Absent | P value | OR (95% CI)           |
|---------------------|-------------|------------|---------|-----------------------|
| Break               |             |            |         |                       |
| Yes                 | 77 (75.5)   | 25 (24.5)  | 0.019   | 2.16(1.137-4.119)     |
| No                  | 140 (87.0)  | 21 (13.0)  |         |                       |
| Repetitive task     |             |            |         |                       |
| Yes                 | 205 (91.1)  | 20 (8.6)   | <0.001  | 22.208 (9.744-50.617) |
| No                  | 12 (31.6)   | 26 (68.4)  |         |                       |
| Posture             |             |            |         |                       |
| Poor                | 141 (90.4)  | 15 (9.6)   | <0.001  | 3.834 (1.949-7.543)   |
| Good                | 76 (71.0)   | 31 (29.0)  |         |                       |
| Working hours       |             |            |         |                       |
| <8                  | 59 (74.7)   | 20 (25.3)  | 0.031   | 2.06(1.070-3.966)     |
| >8                  | 158 (85.9)  | 26 (14.1)  |         |                       |
| Screen time (hours) |             |            |         |                       |
| <5                  | 26 (56.5)   | 20 (43.5)  | 0.521   | 1.429(0.481-4.241)    |
| 6-9                 | 178 (90.4)  | 19 (9.6)   | 0.002   | 0.198(0.071-0.557)    |
| >10                 | 13 (65.0)   | 7 (35.0)   | -       | Ref                   |
| Number of customers |             |            |         |                       |
| <50                 | 57 (70.4)   | 24 (29.6)  | 0.015   | 3.128(1.244-7.864)    |
| 50-100              | 108 (87.8)  | 15 (12.2)  | 0.949   | 1.032(0.397-2.684)    |
| >100                | 52 (88.1)   | 7 (11.9)   | -       | Ref                   |

Also, those whose screen time was more than 10 hours were 1.42 (CI=0.481-4.241) times more at risk than those whose screen time was less than 5 hours and 0.19 (CI=0.071-0.557) times more at risk than those whose screen time was in between 6 to 9 hours. And, those respondents who attends less than 50 customers a day were 3.12 (CI=1.244-7.864) more likely to MSDs than those who attends more than 100 costumer a day whereas 1.03 (CI=0.397-2.684) times more likely than those who deals with 50-100 customer a day (Table 6).

## DISCUSSION

In spite of focused data collection effort, the response rate was low. We emailed to 800 bank employers out of which only 263 replied us back, giving us a response rate of only 32.8%. This was in contrast to what we had expected. Busy schedule and lack of interest can be cited as the major reason for such a low response rate. Question was distributed online through emails. It should be noted, however, that there are very few literatures available on the topic at present as this is an emerging topic. The major findings of the study are discussed here briefly. This study determined the prevalence of MSDs and associated factors among bankers working in Kathmandu, Nepal. The annual prevalence rate of MSDs at any body part region of this study was 82.5% where as that of previous one week was prevalence rate was 37.6%. Similar findings were found in the study done in Buryadh City, Saudi Arabia done by Al Dhuwyan et al where the annual prevalence rate of MSD was 89.7%, Kuwait carried out by QAS. Akrouf et al where the prevalence was found to be 80%, and also in India (83.5%). However, the prevalence rate was higher than than the annual prevalence rate of studies done in Dhaka city, Bangladesh (69.3%) and Tigray, Ethiopia (65.5%).

The possible reason may be attributed to socio-cultural factors, lesser job stress, or more occupational health facilities in the workplace.<sup>9-12</sup>

The highest single MSDS prevalence was of neck pain i.e., 67.7%. This finding was similar to the study done in Dhaka, Bangladesh where the neck pain was most frequent.<sup>12</sup> Poor postural habits and neck pain are increasingly common among individuals who work predominately on computer with poor postures including forward head position, protracted shoulder, and scapular winging and tipping where as keyboard and mouse were the main culprit referred for upper limb disorders. Jensen et al. showed that neck symptoms were the most common (53%) among female call-centre workers, followed by shoulder (42%) symptoms.<sup>10</sup> This finding supports my study as the highest single prevalence of MSDs was of neck. The nature of the work in the call center and bank are similar, employees of such industries frequently work on desktop, have a busy work schedule, poor postural habits which may be the reason despite the difference in industries there is common MSDs problem. This study revealed that neck, lower back, shoulder, wrist were the most commonly affected body parts during the previous year. The pattern of distribution of MSDs in different body parts was similar to Musculoskeletal disorders among bank office workers in Kuwait which showed that lower back, neck, shoulder were the most frequent body region reported by the bankers.<sup>10</sup>

This study showed that people aged 20-29 were more likely to suffer from MSDs than higher aged group. This fact is supported by the study done by Maduagwu SM in his research prevalence and patterns of Work-related musculoskeletal disorders among bankers in Maiduguri,



Northeast Nigeria.<sup>13</sup> This high likelihood of WMSDs among the participants in the lowest age group might be as a result of lower knowledge and skills. Increased work load among this age group could be another factor for this higher likelihood of WMSDs compared to other age groups. The plausible explanation in our study for the lower likelihood of WMSDs among the older age groups apart from higher professional experience, knowledge and skills, could be as a result of rise in rank. As their ranks increase, they move out of direct banking job into administrative positions, which are less physically demanding. Doing repetitive task was also found to be significant predictor of MSDs in this study which is supported by Screening of Musculoskeletal Disorders using Standard Nordic Questionnaire in Petrol Pump Workers study concluded by Pratibha Gaikwad, Zahra Motorwala and Rajashree Naik.<sup>14</sup> Those doing repetitive task were 22 times more likely to have MSDs than those who were not. According to the result, working in the poor posture was also significantly associated with the MSDs. This finding is supported by the study published in Hindwi done among the bankers in Ethiopia carried out by Alemu et al.<sup>11</sup>

### Limitations

The limitation of our study was desirability and recalled bias since the questionnaire was self-administered. Participants may have confused WMSD with other pains they were experiencing during the study. Also, some participants might have underestimated their injuries to avoid being labeled as an “illness” or being perceived negatively in the workplace, which can affect promotions and other employment opportunities. Musculoskeletal disorders may be more common among employees who frequently use their smartphones or PC for personal purposes rather than for banking duties. This issue was not measured in our study.

### CONCLUSION

Occupational Health and safety are one of the neglected areas among workplace in Nepal. The concept of occupational safety and health is still new in Nepal. This non-experimental cross-sectional study was conducted among the bankers of Kathmandu valley. It showed that 263 bankers were participated. The prevalence of Musculoskeletal disorder was found to be 82.5%. After the multi-variate logistic regression analysis gender, being more than 40 years, doctor visit, physical activity, experience, BMI, Break, Repetitive task, Posture, working hours, Screen time were found to be significantly associated with MSDs. Those who perform repetitive task were 22.20 times more likely to has MSDs than those who do not perform repetitive tasks. We observed that those respondents who had a bad posture were 3.834 times more vulnerable to MSDs compared to those who had a good posture. Respondents who were regularly doing exercise were 7.379 times less likely to have MSD as compared to those who were not involved in any physical activity.

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