

PREVALENCE OF MUSCULOSKELETAL DISORDER AMONG OFFICE WORKERS IN LEMBAGA TABUNG HAJI KUALA LUMPUR

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ABSTRACT

Background: Musculoskeletal disorders (MSDs) are considered an important occupational health problem with consequences for workers, employers, and society. Musculoskeletal diseases (MSDs) are on the rise in Malaysia as the country moves towards industrialization coupled with the rising average age of workers. Staffs working in Lembaga Tabung Haji (LTH) are considered as office workers and play roles either in the administration or support system and high accident reported under the public administration and defence/compulsory social security compared to manufacturing. Disease of the musculoskeletal system and connective tissue were the second top cause from 45 lists of diseases for invalidity scheme under SOCSO.

Objective: The objective of this study is to determine the prevalence of musculoskeletal disorders among office workers in Lembaga Tabung Haji Kuala Lumpur.

Materials and Methods: A cross-sectional study was carried out among 393 office workers who are working at the Lembaga Tabung Haji during the duration of the study. Sampling was conducted using universal sampling from the name lists obtained from the headquarters. A pre-tested self-administered questionnaire was used to collect data on socio-demographic factors, individual factors, occupational characteristics, work physical factors and psychosocial factors. Data were analysed using SPSS version 22.

Results: The prevalence of musculoskeletal disorders among office workers was 82.3%. The results found that the highest prevalence of MSDs for the last twelve months was on the shoulder (68.1%), followed by neck (63.8%), lower back (56.0%), upper back (54.3%), knee (39.7%), wrist/hand (30.6%), hip (24.6%), ankle (22.0%), and elbow (15.5%). Shoulder (25.4%), upper back (22.4%), lower back (20.3%) and neck (18.5%) were identified as body parts which restricted the respondents' activities in the past 12 months.

Conclusion: In conclusion, the office workers at LTH are exposed to the risk of musculoskeletal disorders especially on the upper limbs proved by the high prevalence of

MSDs. The study provides insight in developing the ergonomic intervention module in reducing the musculoskeletal disorders among office workers.

Keywords: prevalence, musculoskeletal disorders, office workers

1.0 Introduction

Musculoskeletal disorders (MSDs) are a significant and costly occupational health problem with consequences for workers, employers, and society. About 40 million workers are affected by work-related MSDs. Almost a quarter of the European workforce reported that they had experienced muscular pain in their neck, shoulders, and upper limbs, and about one in every three suffered from low back pain (LBP). Within the European Union, MSDs are the single most common cause of sickness absence from work, early retirement, and disability payments. It is estimated that the annual direct costs of the MSDs account for 2% of the European gross domestic product every year (Bevan et al. 2015). In Malaysia, MSDs are on the increasing trend as shown in the SOCSO report in 2014. Following the annual report of SOCSO in 2014, the number of cases increased sharply from 15 cases in 2006 to 517 cases in 2013 which considered about 34 times increments within seven years (SOCSO, 2014). Based on the annual report of SOCSO, the number of cases rose to 1,607 in 2016 (SOCSO, 2016).

According to WHO definition in 1985, musculoskeletal disorders can be defined as injuries and disorders that affect the human body's movement or musculoskeletal system (i.e., muscles, tendons, ligaments, nerves, discs, blood vessels). According to NIOSH in 1997, the term is interchangeable with work-related musculoskeletal disorders (WRMDs) which are considered compensable and work-related. In Malaysia, MSDs is listed as notifiable occupational diseases in the third schedule of Factories and Machinery Act 1967 and need to be notified under notification of accidents, dangerous occurrence occupational poisoning and occupational diseases (NADOPOD) by Malaysian Department of Occupational Safety and Health. It is considered work-related musculoskeletal when the diseases are related to the ergonomic risk factors and compensable. Researchers have reported that a causal relationship between office workers and the musculoskeletal disorders occurred (Leyshon et al. 2010; Faryza et al. 2015).

Musculoskeletal complaints are commonly reported among office workers worldwide, and these can have detrimental effects on workers' health and productivity. A study done in 2009 showed 33% of office workers in the government sector suffered from MSDs in their upper extremities and the majority of them were computer users (Zairina, 2009). Factors that predict the risk of developing musculoskeletal complaints can be divided into individual, ergonomic, and psychosocial factors. The risk of developing musculoskeletal complaints is higher among workers who have high work strain, longer mouse, and keyboard use, perceived high muscle tension, previous musculoskeletal complaints in the neck and shoulder, as reported by several longitudinal studies with follow-up from 3 months to 5.4 years. A retrospective study was done by Pope et al. in 2001 in the United Kingdom, looking at the prevalence of musculoskeletal cases found that 66% of the MSDs reported were related to the upper limb locations, and office worker (clerical and secretarial workers) were second largest group been affected following craft occupation. A recent study done among Malaysian public university

office staffs showed 69.7% of office workers complained of the severity of pain in the neck, shoulder and lowered back (A. Shariat et al. 2016).

Musculoskeletal disorders lead to decreased work performances, absenteeism from work or increased sick leaves which put a financial burden on the employee as well as their families. Literature suggests that physical and mental health-related quality of life is worse for individuals with musculoskeletal discomforts compared to those without musculoskeletal discomforts (Velde et al., 2010). In a study done by Bevan in 2009, MSDs is considered a leading cause of temporary work disability amongst Ireland's working population and giving a significant impact on work performance (Bevan, 2009; Pope et al. 2010). The MSDs is also considered one of the essential factor which leads to early retirement; 21% of the total workforce (Miranda et al. 2010). Repetitive strain injury (RSI) is recorded to be the highest risk factor for days away from work with average 21 days in 2013 followed by overextension with 11 days away from work (BLS, 2015). Absenteeism among public employees related to MSDs is the highest compared to private sectors with the prevalence of 53 per 10,000 workers (BLS, 2015). The study was carried out to determine the prevalence of musculoskeletal disorders among office workers at Lembaga Tabung Haji Kuala Lumpur.

2.0 Materials and Methods

2.1 Study design and Study Population

This study was part of cluster randomized controlled trials study involving the effectiveness of the ergonomic intervention on the intensity of pain among office workers with musculoskeletal disorders in Lembaga Tabung Haji, Kuala Lumpur. LTH play a major role in the management of all its branches in Malaysia and overseas as in Mecca, Saudi Arabia and situated in the heart of Kuala Lumpur. Initial stage involving a cross-sectional study conducted among office workers at LTH from April to May 2017. In the enrolment phase, a universal sampling method was used involving all 13 departments in LTH. The list of TH staffs was obtained from the headquarters by floor and department. The questionnaire was circulated to all departments in the yielded list. After repeated reminders, follow-ups through phone and mail, only 282 respondents from 393 respondents replied, constituted about 71.8% of the population in TH headquarters. The inclusion criteria for the study were Tabung Haji permanent staffs and full time working status, staffs are working in the administration and support services, have the presence of musculoskeletal disorders within the past 12 months during the study period. Based on Lemeshow, Hosmer, Klar, and Lwanga, (1990), the sample size was 238 after adjusting for 20% non-response.

2.2 Data collection and Study Instrument

A pre-tested questionnaire was used as the instrument for the study. A pilot study was carried out at five Tabung Haji branches involving 40 participants for face validity, constructive validity and internal consistency of the questionnaire. The questionnaire consisted of six parts namely; part I, II, III, IV, V and VI. Part I consists of questions on socio-demographic characteristics of the respondents. Part II covered questions related to individual factors and occupational characteristics followed by part III which enclosed ergonomic knowledge. Part IV contained work-related physical factors and part V covered psychosocial factors. Part VI

consisted of questions related to musculoskeletal disorders. The questionnaire for Part I and Part II was adopted from the National Institute for Occupational Safety and Health Questionnaire (NIOSHQ). Part III is taken from the previous literature reviews while part IV – V was adapted from Maastricht Upper Extremity Questionnaire (MUEQ) by Eltayeb (2007) and part VI was taken from Nordic Musculoskeletal Questionnaire (NMQ) for the assessment. In the study, the questionnaire was considered as a self-administered instrument. The questionnaire was being explained to the TH safety and health committee in March 2017. They were guided through each section to ensure they understand the significance of each question delivered, which lead to the ability for them to convey the information to all TH staffs. This was done to prevent missing data from happening. Data involving part III – part V was analysed and explained in another related article.

The results of the reliability test of the questionnaire on 40 respondents showed that the internal consistency was acceptable with Cronbach's alpha ranging from 0.576 – 0.786. The questionnaire was translated from English to Malay and was back translated. The Malay version was used for the respondents' better understanding.

2.3 Data analysis

All data collected was entered and analyzed using IBM Statistical Package of Social Sciences (SPSS) version 22. Descriptive analysis such as frequency, percentage, median, and interquartile range, were used to summarize and explain characteristics of independent and dependent variables.

3.0 Result

3.1 Response rate

The total number of respondents that was managed to be approached was 393 respondents. However, only 282 respondents consented to be involved in the study conducted. The overall response rate for this study was 71.76%. The non-responses were mainly due to reluctance in participating (7.2%), not around during the interview (58.6%) as the majority of them were involved in the pilgrim related programs, pregnant (11.7%), medical leave (7.2%), annual leave (7.2%), history of trauma (6.3%) and malignancy (1.8%).

3.2 Prevalence of musculoskeletal disorders among office workers

Of the 282 respondents involved in the study, 232 of them were found to have musculoskeletal disorders and 50 of them did not have musculoskeletal disorders. The prevalence of musculoskeletal disorders among office workers in the Lembaga Tabung Haji was 82.3%.

3.3 Characteristic of the respondents

In the characteristic of the respondents, we looked into the distribution of respondents by socio-demographic factors, individual factors and occupational characteristics.

3.3.1 Socio-demographic characteristics

Table 1. The distribution of respondent by socio-demographic characteristics (N=232)

Respondent	N (%)	Mean (sd)
Gender		
Male	95 (40.9)	
Female	137 (59.1)	
Age		
≤ 25 years old	4 (1.7)	40.09 (8.9)
26 – 35 years old	86 (37.1)	
36 – 45 years old	72 (31.0)	
≥ 46 years old	70 (30.2)	
Race		
Malay	232 (100)	
Educational level		
Secondary education	71 (30.6)	
Tertiary education	161 (69.4)	
Marital status		
Single	27 (11.6)	
Married	205 (88.4)	
Monthly income (N=110)		
< RM 5000	61 (55.5)	5049.94 (2651.3)
≥ RM5000	49 (44.5)	

The mean age of the respondents was 40.09 (\pm 8.9) years old. The respondents' age is ranged between 23 to 59 years old and the majority of them were in the age group of 26 to 35 years old (37.1%). There were 95 (40.9%) male respondents and 137 (59.1%) female respondents. In term of ethnicity, the all respondents were Malays (100%) and the majority of the respondents has achieved tertiary level education (69.4%). Two-hundred and five (88.4%) of the respondent were married and 61 (55.5%) of 110 respondents have monthly income less than RM5000.

3.3.2 Individual factors characteristics

Table 2. The distribution of respondent by individual factors characteristics (N=232)

Individual factor characteristic	N (%)	Mean (sd)
Body mass index		
<18.5	11 (4.8)	26.91 (5.1)
18.5 – 24.9	72 (31.0)	
25.0 – 29.9	96 (41.4)	
≥ 30.0	53 (22.8)	

Individual factor characteristic	N (%)	Mean (sd)
Physical activity		
Sedentary lifestyles	64 (27.6)	
Active lifestyles	168 (72.4)	
Smoking		
Non-smoker	224 (96.6)	
Smoker	8 (3.4)	
Medical problem		
Yes	51 (22.0)	
No	181 (73.0)	

Table 2 depicts the distribution of respondents by individual factors characteristics. Overweight category for BMI constitutes 41.4% of all respondents, more than half respondents were having active lifestyles (72.4%), 96.6% of respondents are a non-smoker and 73.0% of the total respondents don't have any medical illness.

3.3.3 Occupational characteristics

Table 3. The distribution of respondent based on an occupational characteristic (N=232)

Occupational characteristic	Mean (sd)	95% CI
Duration of work (month)	147.97 (105.4)	134.33 - 161.60
Maximum work days per week (day)	5.05 (0.3)	5.01 - 5.09
Maximum work hours per day (hours)	8.29 (0.8)	8.19 - 8.40
Average hours per day with a computer (hours)	7.04 (1.3)	6.85 - 7.24

Duration of working, maximum work days per week, maximum work hours per day and average hours per day the respondents working with the computer were analysed and the result was shown in table 4.3 above. As overall, mean of work duration of TH workers was 147.97 (\pm 105.4). Mean of work days per week of TH workers was 5.05 (\pm 0.3). Mean of work hours per day of TH workers was 8.29 (\pm 0.8) hours and mean of respondents working with a computer was 7.04 (\pm 1.3) hours.

3.4 Distribution musculoskeletal disorders among office workers

Table 4 depicts the distribution of musculoskeletal disorders following the body parts. There are 9 anatomical locations asked during the baseline data collection and the majority of the respondents were having shoulder pain (68.1 %) followed by neck pain (63.8%), lower back (56.0%), upper back (54.3%), knee pain (39.7%), wrist/hand (30.6%), hip (24.6%), ankle (22.0%), and elbow (15.5%). Sixty-seven-point seven per cent of the respondents having shoulder pain developed the pain on both sides of the shoulder. Sixteen (44.5%) were having pain on the right elbow and 40 (56.3%) respondents have wrist/hand pain developed the pain on the right side respectively. From the analysis done, shoulder (25.4%), upper back (22.4%), lower back (20.3%), neck (18.5%) were identified as body parts which restricted the

respondents' activities in the past 12 months and recurs for the past 7 days followed by knees (12.1%), wrist/hand (7.3%), hip (6.0%), elbow (4.7) and ankle (5.2%).

Table 4. Distribution of musculoskeletal disorders among office workers (N=232)

Anatomy	Pain in 12 months		Activities restricted in 12 months		Pain in the past 7 days	
	Yes N (%)	No N (%)	Yes N (%)	No N (%)	Yes N (%)	No N (%)
Neck	148(63.8)	84(36.2)	43(18.5)	189(81.5)	62(26.7)	170(73.3)
Shoulder	158(68.1)	74(31.9)	59(25.4)	173(74.6)	89(38.4)	143(61.6)
Right	32(20.3)					
Left	19(12.0)					
Both	107(67.7)					
Elbow	36(15.5)	196(84.5)	11(4.7)	221(95.3)	13(5.6)	219(94.4)
Right	16(44.5)					
Left	8(22.2)					
Both	12(33.3)					
Wrist/hand	71(30.6)	161(69.4)	17(7.3)	215(92.7)	16(6.9)	216(93.1)
Right	40(56.3)					
Left	15(21.1)					
Both	16(22.6)					
Upper back	126(54.3)	106(45.7)	52(22.4)	180(77.6)	68(29.3)	164(70.7)
Lower back	130(56.0)	102(44.0)	47(20.3)	185(79.7)	72(31.0)	160(69.0)
Hip	57(24.6)	175(75.4)	14(6.0)	218(94.0)	26(11.2)	206(88.8)
Knee	92(39.7)	140(60.3)	28(12.1)	204(87.9)	47(20.3)	185(79.7)
Ankle	51(22.0)	181(78.0)	12(5.2)	220(94.8)	18(7.8)	214(92.2)

4.0 Discussion

The overall response rate for this study was 71.8% during the general survey. All efforts were made to maximize the response rate during the enrolment phase. Twenty-eight-point two per cent of the Tabung Haji staffs did not respond to the questionnaires given during the enrolment. Engaging the non-response participants are considered a challenge in ensuring maximum participation in the study. Lembaga Tabung Haji is considered the main player in administrating and managing Hajj pilgrims in Malaysia. The busiest months for them are from the fasting month until 2 months the Hajj finished. At the same time, the TH staffs involved in the management of their branches, whereby they should replace any TH staffs, especially on the administration section if the officers on leave or went to courses.

Prevalence of the musculoskeletal disorders among office workers was 82.3% in the study conducted. This has been supported by the previous studies conducted among office workers (Riihimaki 2005, Kaila-Kangas, 2007, Bevan et. al. 2009 and Mahmud, 2011). Due to the

advancement and fast-pacing technology in the millennium, computerization levels in the office work environment have dramatically increased and all office workers at the LTH were provided with a tabletop computer. The job tasks involving data entering are done using computers, and all predisposing factors including individual, ergonomic such as the workstation design, breaks and psychosocial are related to the development of MSDs. Prolonged sitting can cause an unnecessary force to the lower back. Generally, posture and movement play a central role in ergonomics especially in reducing or preventing MSDs. Biomechanical, physiological and anthropometric background were interrelated and all these factors contributing in MSDs especially biomechanical aspects. In the biomechanical background, once the joints not in a neutral position ie; bending forward while typing, sitting with twisted trunk and no alternation in postures, these can lead to stress on the muscles, joints and discs of the bodies. In the study, there was a significant association between improper body posture and the risk of developing MSDs. The study supports the biomechanical background and the necessities in improving the ergonomic risk factors to reduce the MSDs.

This study showed a high prevalence of MSDs in body parts such as shoulder, neck, lower back and upper back among office workers. According to numerous studies, neck pain is in the leading position in the population of office workers [Kaliniene, 2003, Cagnie, 2007, Mahmud, 2011, Wu, 2012, Oha, 2014]. However, the prevalence of shoulder pain in this study was also high (68.1%) and this is in line with a study conducted among Dutch population (Eltayeb, 2007) and Iran (Sadeghian, Raei & Amiri, 2014). It is worth noting that some epidemiological studies report the prevalence of neck and shoulder complaints or complaints in the arm, neck, and shoulder areas together because of similar aetiology factors. From the epidemiological studies, we can conclude prevalence of MSDs among office workers are always involving the upper part of the body (neck, shoulder, arm, elbow, wrist/hand) and lower back.

5.0 Conclusion and recommendation

The findings of this study suggest that in general, the prevalence of musculoskeletal disorders among office workers is near to the prevalence retrieved during a general survey in 2015 (unpublished). Throughout the study, we manage to demonstrate the distribution of musculoskeletal disorders based on the anatomical locations. It is recommended that further research is undertaken such as to look for the associated factors and ergonomic risk factors that lead to the musculoskeletal disorders.

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Declaration

The authors declare that:

- i. The article mentioned above has not been published or submitted for publication in any other journal.
- ii. We also declare that the authorship of this article will not be contested by anyone whose name is not listed here.
- iii. We have contributed significantly towards the research study, i.e., conception, design, analysis and interpretation of data and to the drafting of the article or revising it critically for important intellectual content.
- iv. There is no conflict of interest in this article.

Authors contribution

The 1st author carried out the research, analyzed the data and prepared draft of the manuscript, while the 2nd, 3rd, and 4th author supervised the research, corrected the data analysis and edited the manuscript.

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