

LOW BACK PAIN AMONG OFFICE WORKERS IN A PUBLIC UNIVERSITY IN MALAYSIA

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Abstract:

Introduction

Low back pain (LBP) is a leading cause of disability and interferes with quality of life and work performance. This research aimed to determine the prevalence and associated factors of LBP among office workers in a public university in Malaysia.

Methods

This is a cross-sectional study. A self-constructed questionnaire was administered on office workers in Universiti Putra Malaysia, Serdang who have worked for at least 1 year. Workers who were pregnant or known to have back or spine disorder were excluded. Data was analyzed using SPSS version 21.0 for windows.

Results

We obtained 155 (response rate 81.0%) respondents who were mostly female (78.1%), aged less than 40 years (77.3%), Malays (98.7%) and never attended office ergonomics course (90.3%). Prevalence of LBP was 37% where majority were female (78.9%), Malay (98.2%), young (80.7%) and had poor knowledge on office ergonomics (62.5%). LBP was highest among those who worked for 10 years or less (66.1%), not attended office ergonomics course (91.2%), used non-ergonomic chair (98.2%) and leave their working chair infrequently (62.5%) and in short duration (74.1%). However, there were no statistically significant association for the factors ($p > 0.05$).

Discussion

Low back pain affects more than one third office workers in UPM who are generally young, relatively new and those who have never attended office ergonomics course. All office workers should be trained on office ergonomics. The management should provide a conducive environment for good office ergonomics in order to prevent and control the occurrence of low back pain among office workers.

Key words: office workers, public university, low back pain

1.0 Introduction

Low back pain (LBP) has become the most prevalent musculoskeletal condition in developing nations (Louw et al., 2007). Prevalence of LPB was reported to be 12% to 44% at any given time among the general population (Koes & Tulder, 2006). A study in Malaysia found that 42.4% of office workers in public university experienced back pain (Mahmud et. al., 2011a). Radas & Mackey et al. (2013) found that prolonged sitting is one of the occupational hazards for office workers. Low back pain (LBP) is a leading cause of disability and interferes with quality of life and work performance (Ehrlich, 2003). Li et al (2012), stated that low back pain is one of the most common work related musculoskeletal disorders with concomitant disability. LBP causes limitation of activity and work absence to most workers (Hoy et al., 2010). Daruis (2014) stated that LBP in Malaysia is considered new compared to other countries and to enhance the awareness level to all Malaysian, this issue is still being promoted by professionals especially the Occupational Safety and Health (OSH) practitioners. Thus, the aim of this research is to determine the prevalence and associated factors of LBP among office workers in a public university in Malaysia. It is hope that based on the outcome of this research, recommendations on prevention and control of LBP among office workers can be made to the management.

2.0 Methodology

The study was conducted in Universiti Putra Malaysia (UPM), Serdang campus. UPM is located in the state of Selangor (Serdang campus) in Malaysian peninsular and in the state of Sarawak (Bintulu campus) which is located in East Malaysia. Serdang campus has 16 faculties and 9 institutes. The sampling population was only from the faculties. It was a cross sectional study on administrative office workers who performed general clerical tasks in all the faculties in UPM, Serdang. All office workers aged 18 and above, who has worked in the current position for at least 1 year was included except for those who were pregnant or had back or spine disorder. Simple random sampling was used to select the respondents. A pre-tested self-constructed, questionnaire in Malay language was used. The questionnaire was administered through guided interview by the researches and collected immediately after filling. It consisted of two sections. Section A included questions on socio-demographic factors (age, gender, ethnicity, level of education and smoking) and job factors (years of working and duration of sitting per day). The questions were a combination of closed-ended questions and open questions. One question was on the type of chair used at work, where respondents had to choose from 4 photos, of different types of office chairs, of which only 1 was the ergonomic type for office work. There were 3 questions to assess low back pain and its severity. Respondents who answered 'yes' for having low back pain in the past 1 week were further asked on the frequency of pain, the severity and whether the pain disturbed their daily work. Section B of the questionnaire contained questions on knowledge on office ergonomics. In this section, for each question, respondents needed to answer either one of 3 options - "Right", "Wrong" or "Not sure". The maximum obtainable score was 18 for all correct answers. Data was analysed using SPSS version 21.0 for Windows. Descriptive statistics were computed for all the variables and prevalence of low back pain was determined. Median cut-off point (14) was used to categorize the respondents into good knowledge (score of 14 and above) and poor knowledge (score of less than 14) on office ergonomics. Chi-square test was used to assess association of independant variables, which were the sociodemographic factors and job factors with low back pain. Level of significance was set at $p < 0.05$.

3.0 Results

Table 1: Distribution of office workers by socio-demographic characteristics (N=155)

Sociodemographic Characteristics	Frequency	Percentage	Median (IQR)
Gender			
Male	34	21.9	
Female	121	78.1	
Age			33(10)
20-29	42	27.3	
30-39	77	50.0	
40-49	10	6.5	
50-59	25	16.2	
Ethnicity			
Malay	153	98.7	
Non Malay	2	1.3	
Education level			
SPM	40	25.8	
Diploma	46	29.7	
Degree	50	32.3	
Others	19	12.3	
Smoking			
No	143	92.3	
Yes	12	7.7	
Knowledge on office ergonomics			
Good	67	44.1	
Poor	85	55.9	

Of 191 eligible office workers, 155 participated in this research giving a response rate of 81%. Majority (78%) of the respondents were female, aged 30-39 years (50%), at least had a degree (44.6%) and did not smoke (92.3%). Most (98.7%) are the respondents were of Malay ethnic. Majority (55.9%) office workers did not have good knowledge on office ergonomics (Table 1).

Table 2: Distribution of office workers by job factors (N=155)

Job Factors	Frequency	Percentage	Median (IQR)
Years of working (Years)			7(8)
1 - 10	102	66.7	
11-20	26	17.0	
> 20	25	16.3	
Work status			
Permanent	100	64.5	
Contract	55	35.5	

Type of chair

Ergonomic Chair	4	2.6
Non Ergonomic Chair	151	97.4

Attended Ergonomics courses

Yes	15	9.7
No	139	90.3

Duration of sitting per day (hours)

0 - 4	14	9.2	7(2)
4 >	139	90.8	

Leave chair per day (number of times)

0 - 10	100	65.8	10(7)
> 10	52	34.2	

Duration of each Leaving (minutes)

Less or equal 10	98	66.7	10 (10)
> 10	49	33.3	

Table 2 shows the distribution of workers according to job factors. Majority (66.7%) office workers have worked in the current job for 1-10 years, 64.5% were permanent workers while 35.5% worked on contract basis. Most (97.4%) workers were provided with non-ergonomic chair in their workstation. Only 9.7% had ever attended office ergonomics course during their job tenure. Majority (90.8%) of the workers sit more than 4 hour per day at work, 65.8% leave their office chair only 10 time or less at work each day and majority (66.7%) leave their chair for only 10 minutes or less each time.

Table 3: Prevalence of low back pain among office workers (N=155)

Variable	Frequency	Percentage
Low Back Pain		
Yes	57	37.0
No	97	63.0

Table 3 shows the distribution of low back pain (LBP) and its severity among office workers. The prevalence of LBP among office workers in Universiti Putra Malaysia was 37%, that is about one third of the office workers population.

Table 4: Association between socio-demographic characteristics and low back pain (N=155)

Socio-demographic characteristics	Low Back Pain		χ^2 - value	df	p-value
	Yes	No			
	n(%)	n(%)			
Gender					
Male	12(35.3)	22(64.7)	0.06	1	0.81
Female	45(37.5)	75(62.5)			

Age (n=153)						
20-29	17 (40.4)	25 (59.5)	1.47	3	0.69	
30-39	29 (37.7)	48 (62.3)				
40-49	2 (20.0)	8 (80.0)				
50-59	9 (37.5)	15 (62.5)				
Ethnicity						
Malay	56 (36.8)	96 (63.2)	2.91	2	*1.00	
Non Malay	1 (50.0)	1 (50.0)				
Level of Education						
SPM	16 (40.0)	24 (60.0)	0.27	3	0.97	
Diploma	17 (39.6)	29 (63.0)				
Degree	17 (34.7)	32 (65.3)				
Others	7 (36.8)	12 (63.2)				
Smoking						
No	50 (35.2)	92 (64.8)			*0.13	
Yes	7 (58.3)	5 (41.7)				
Knowledge on office ergonomics			1.39	1	0.24	
Good	21(31.8)	45(68.2)				
Poor	35(41.2)	50(58.8)				

*Fisher's exact test

Table 4 shows the association between socio-demographic characteristics and low back pain. More female (37.5%) office workers had low back pain as compared to males (35.3%), aged 20-29 years (40.4%) and were smokers (58.3%). A higher percentage (41.2%) of office workers who had poor level of knowledge on office ergonomics had low back pain as compared to those with good knowledge. However, there were no significant associations between sociodemographic characteristics and low back pain.

Table 5 : Association between job factors and low back pain (N=155)

Job factors	Low Back Pain		χ^2 - value	df	p-value
	Yes n(%)	No n(%)			
Years of working (years) (n=152)			0.13	2	0.94
1-10	37 (66.1)	65 (67.7)	0.22	1	0.64
11-20	9 (16.1)	16 (16.7)			
> 20	10 (17.9)	15 (15.6)			
Work status (n=154)			0.11	1	0.74
Permanent	38 (66.7)	61 (62.9)	0.11	1	0.74
Contract	19 (33.3)	36 (37.1)			
Attended Ergonomic courses (n=153)			0.11	1	0.74
Yes	5 (8.8)	10 (10.4)			
No	52 (91.2)	86 (89.6)	1.00	1	*1.00
Type of Chair (n=154)					
Ergonomic Chair	1 (1.8)	3 (3.1)			
Non Ergonomic chair	56 (98.2)	94 (96.9)			

Duration of sitting (hours) (n=152)			1.57	1	0.21
0-4	3 (5.4)	11 (11.5)			
> 4	53 (95.6)	85 (88.5)			
Frequency of leaving chairs (n=151)			0.37	1	0.54
0-10	35 (62.5)	64 (67.4)			
> 10	21 (37.5)	31 (32.6)			
Duration of each leaving (minutes) (n=146)			2.24	1	0.13
0-10	40 (74.1)	57 (62.0)			
> 10	14 (25.9)	35 (38.0)			

*Fisher's exact test

Majority of the office workers who had low back pain had worked in the present job for 1-10 years (66.1%), permanent workers (66.7%) and had not attended office ergonomics course (98.2%). Most (98.2%) of the respondents who had LBP used non-ergonomic chair, sat for more than 4 hours daily (95.6%), leave their office chair 10 times or less per day (62.5%) and left their chair for only about 10 minutes or less each time. However, there was no significant association between job factors and LBP. (Table 5)

4.0 Discussion

The response rate in this research was 81%. This is higher than a study done in another public university in Malaysia that had a response rate of only 59.9% (Mahmud et. Al., 2011). In this study, the majority of office workers was female (78.1%), Malays (98.7%) and aged between 30-39 years (50%). This is in line with the distribution of office workers in public universities in Malaysia where generally young female Malays were the major workforce. Majority (64.5%) of respondents have worked for 1 to 10 years in the current position and most (90.3%) of them have never attended any office ergonomics course. This is comparable to study by Burdorf and Janson (2006) where 84% of the study population were female, and workers who have mean age of 41 with 9 years of employment in their current job. Another interesting finding is that most (97.4%) office workers used non-ergonomic chair while at work in the office.

The prevalence of low back pain (LBP) among 155 of the office workers was about one-third of the respondents (37.0%). This is comparable with findings by Janwantanakul et.al., (2008) and Juul-Kristensen et. Al. (2004) who stated that the prevalence of low back pain was 23% and 38% respectively. It would be expected that the prevalence in this study is lower than that of the previous studies as our research was done 10 years after. This similarity might be because our respondents were provided with non-ergonomic chair despite the development of various designs of ergonomics chair over the years. Malay ethnicity had the highest prevalence (98.2%) of LBP and it is supported by Veerapen et al (2007) who found high prevalence among Malay ethnic group. In addition, the prevalence of good level of knowledge on office ergonomic among the respondents was only 44.1%. This could be because most (90.3%) of the office workers studied have not undergone training on office ergonomics. Those who had the knowledge might have obtained it from other sources.

Our findings did not show any significant association between socio-demographic characteristics and LBP. Based on gender, we found that more female (37.5%) had LBP compared to men (35.3%). However, a systematic review done by Hoy et al. (2014), stated that prevalence of low back pain was higher in men (10.1%; 95% CI 9.4-10.7) compared to women (8.7%; 95% CI 8.2-9.3). The difference in findings might be due to the distribution of our sampling population where most (78.1%) were female. Our study showed there was no significant association between age and LBP. Similarly Abanobi et al. (2014) and Rezaee et al. (2011) showed no significant association between age and LBP. By contrast, a systematic review by Andersson (1999) stated that the risk of having chronic back pain increases with age.

Our study showed that there was a higher proportion (40.0%) of respondents who attained secondary education (SPM) had LBP compared to those with tertiary education (diploma, degree or others) however, there was no significant association between level of education and LBP. Similarly, Alexander (2008) stated that there was significant association where he found people with elementary education in Norway had 2.29 times more prone to have LBP compared with university education. Our study showed that there was no significant association between smoking and LBP although we found that there was a higher percentage of LBP among smokers (58.3%) compared to non-smokers. It is assumed that we could not establish significant difference due to the fact that only a small proportion (7.7%) of our respondents were smokers. However, it could be expected that there is a probability of unreliable response of office workers as they preferred to deny smoking (Rezaee et al., 2011). Similarly, Omokhodion & Sanya (2003), in their research on office workers in Nigeria showed that the prevalence of LBP was higher among smokers (57%) and Biglarian et. al., (2012) showed that there was significant association (OR 1.40 95% CI 1.27-1.53.)

We found that a higher proportion (41.2%) of office workers who had poor level of knowledge on office ergonomics had LBP compared to those with good level of knowledge. A study by Sikiru & Hanifa (2010) showed that 73.3% nurses with low back pain had no knowledge on back care. According to Khan et. al. (2012), knowledge on office ergonomics is essential for computer users to prevent the development of musculoskeletal symptoms and musculoskeletal disorders (MSDs) which include LBP. In addition, Mahmud et. al. (2011) stated that awareness and knowledge on office ergonomics, computer usage and MSDs are vital to prevent MSDs from increasing in severity among office workers.

Our findings showed that majority of the office workers who had LBP have worked for 10 years or less in their current job and were permanent workers. We also found that most (91.2%) who had LBP had not attended any office ergonomics course. Based on types of chairs, Janwantanakul et al. (2011) stated that office workers who do not use ergonomic chair have a higher association with LBP. Our study found that majority who had LBP used non-ergonomic chair. However, there was no significant association probably due to the homogeneity of our respondents where most workers studied used non-ergonomic chair. We also found that LBP was higher among those who seldom leave their chair while at work daily and those who leave their chair for a very short duration each time. Janwantanakul et. al (2011) stated that sitting position for more than 2 hours per day is associated with LBP reason being, the pressure exerted on the vertebral disc, especially lumbar 3 was greater during sitting than standing. Prolonged sitting has been identified as a potentially significant occupational health concern (Van Uffelen et. al., 2010) and sitting for more than half a work day combined with working with awkward posture or frequently working in bent position had

been shown to increase the likelihood of having LBP (Lis et. al., 2007; Spyropoulos et. al., 2007).

5.0 Conclusion and recommendation

Low back pain affects more than one third office workers in UPM thus; it should be an issue of concern. Low back pain is more prevalent among young and new workers and those who had never attended office ergonomics course. All office workers should be trained on office ergonomics. The management should provide a conducive environment for good office ergonomics in order to prevent and control the occurrence of low back pain among office workers. This research is limited by the homogeneity of the respondents especially in the aspects of gender, exposure to training on occupational ergonomics and use of non-ergonomics chair during work; thus, we could not show any statistically significant difference in the findings. It is suggested that future studies should involve more public universities and a heterogeneous sampling population to enable generalization of the research findings to all office workers in public universities. The implications of use of ergonomic chair at work, adequate frequency and duration of leaving one's working chair and provision of training on office ergonomics in reducing the occurrence of LBP among office workers should be further studied.

Ethics

Ethical approval had been obtained from Ethics Committee for Research Involving Human Subjects UPM (UPM/TNCPI/RMC/1.4.18.1 (JKEUPM)/F2 before conducting this study. In addition, permission to conduct the study was obtained from deans of all faculties involved. Written consent was obtained from all respondents prior to answering the questionnaire and confidentiality was assured.

Declaration of conflict of interest

We authors of the article declare that there is no conflict of interest regarding publication of this article.

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