Work-Related Musculoskeletal Symptoms among Academicians in Malaysian Universities

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Abstract

Work-related musculoskeletal disorder is (WMSD) defined as injuries or disorders of the musculoskeletal system, which includes muscles, nerves, tendons, joints, cartilages, and spinal discs that may be associated with exposure to risk factors in the workplace. This study is to determine the prevalence of work-related musculoskeletal symptoms and analysis of risk factors among the academicians of university in Malaysia. Index Terms–Academician, Work-related Musculoskeletal Symptom Work-related musculoskeletal symptoms (WMS) has been identified as "occupational cramps" or "occupational myalgia", in relation to an occupation or work-related activities.

Keywords: *Musculoskeletal Symptoms, muscles, nerves, tendons, joints, cartilages.*

Introduction

This study is to determine the prevalence of work-related musculoskeletal symptoms and analysis of risk factors among the academicians of university in Malaysia. Index Terms–Academician, Work-related Musculoskeletal Symptom Work-related musculoskeletal symptoms (WMS) has been identified as "occupational cramps" or "occupational myalgia", in relation to an occupation or work-related activities[1]. Work-related musculoskeletal symptoms that can be presented in an occupation are pain, ache, numbness, tingling or any discomfort[2]. The symptoms are arising from repetitive, continuous, and unnatural movements in relation to work[3]. The prevalence of work-related musculoskeletal symptoms present in different anatomical areas are differs from each field of profession. Those musculoskeletal symptoms could be a sign of WMS. Those symptoms often occur as a consequence of their interaction with the working environment in fulfilling the demands of task in physical, psychosocial, environmental, and cognitive demands[4]. It has been suggested that a linkage exists between work-related musculoskeletal symptoms and risk factors involving one's occupational conditions and physicality[5] suggest these symptoms causing difficulties in performing job-related tasks and activities of daily living (ADL). According to the statistics from Ministry of Education Malaysia (2019)[6], it shown that the academicians in higher learning institutions throughout Malaysia in 2010 are 64,882 and it has increased to 90,483 in 2017[7]. The roles of academicians are significant in the higher learning academic system of Malaysia to deliver knowledge and to produce qualified students. Since the population is getting larger and the various studies shown that prevalence of work-related musculoskeletal symptoms of other teaching profession is also high, the academicians is needed to be studied on this issue[8]. As Conclusion, the academicians in Malaysia might at risk of having work-related musculoskeletal symptoms as other teaching professional. It cause various disadvantage towards the academicians, university and healthcare system[9] .However, there is paucity of the prevalence of work-related musculoskeletal symptoms among academicians of universities in Malaysia. Thus, the prevalence of musculoskeletal symptoms among academicians in university is conducted[10].

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Methodology

This study utilized a quantitative approach, non-experimental, Cross-sectional research design7. This research design use to describe the result in quantitative or numeric data, which is prevalence of work-related musculoskeletal symptoms by study the population of academicians in university.It is the most suitable to use for the aim to measure the prevalence of a problem which is work-related musculoskeletal symptoms in this study, by taking a cross-section of the population of the academicians in a university [11]. The survey is designed by using Microsoft Word 2010 for printed form and also prepared in online form through Google Forms Website at https://docs.google.com/forms/u/0/. The questionnaire is distributed via email given the internet link of online form or in printed form to the academicians. The targeted population is full time academicians of both genders, from 23 to 60 years old, with minimum one year of teaching experience. Teaching experience is required for at least a year as this study is going to investigate whether they have any trouble from the past 12 months in any region of the body[9]. Exclusion criteria Subjects who reported any musculoskeletal injuries such as fracture and soft tissues injuries and recent surgery in any of the regions of the body within 12 months were excluded. Any neurological condition, systemic disorder and cardiovascular condition are also excluded from the study[12]. This is to minimize the individual cause that might be affecting the result of the study rather than the occupational factor. The subject is academicians recruited from a university from six faculties by using non-probability sampling method convenience sampling that whoever passed the study's inclusion and exclusion criteria[13]. The six faculties are Business, Dentistry, Engineering, Medicine and Biomedical Science, Pharmacy and Physiotherapy. The sample size is determined by using the sample size calculator powered by Survey Monkey Website [14]. The final sample size is able to reach as much as 84 subjects. This study reviewed by the Faculty of Health & Sport Sciences Research Review Committee, MAHSA University (FRRC)[15]. All procedures, assessment, tools that used in this study have been approved by the FRRC. Informed Consent Form is provided to each subject stating their willingness to participate in the study[16]. The main tool of this survey study is the general type of Nordic Musculoskeletal Questionnaire (NMQ)[17]. The questionnaire was prepared in two forms which are printed and uploaded in Google From. The subject was identified as the academicians in a university based on the targeted population needed with a sufficient amount of sample size, the convenient of the location and time for researcher to travel to the research site. After filling of the questionnaire was carried out into two ways, either through Google Form Website or through a questionnaire filling session in the academicians' office. For faculty of physiotherapy, medicine and biomedical science and business, the responses are collected through Google Form Website, while faculty of medicine and biomedical science, pharmacy and dentistry are having a questionnaire filling session in the office. For those faculties that were having a questionnaire filling session in the office of the academicians the researcher would brief the academicians about the study aims, study process, questionnaires and to obtained informed consent before the questionnaire begin. The subject was also allowed to ask question to the researcher if having doubts. The variables under the descriptive data are age, gender, faculty, years of teaching, hours of working per week, preferred teaching instrument, and the prevalence of work-related musculoskeletal symptoms were collected. All the data, statistics is analyzed by using statistic software IBM SPSS Version 21.

Results

The main result of this study shows that the general prevalence of work-related musculoskeletal symptoms among academicians in university is as high as (n=62) 73.8%. This result involves symptoms in any nine region of the body as stated in the general Nordic Musculoskeletal Questionnaire; nearly three quarters of the academicians are having the work-related musculoskeletal symptoms. Only (n=22) 26.2% academicians are free from any WRSS from all the nine body regions.

Table No. 1: Demographical Data Collected

Gender	**Frequency**	**Percentage (%)**	**Mode**	
Female	39	46.4	Male	
Male	45	53.6		
Total	**84**	**100.0**		
Age (years)	**Frequency**	**Percentage (%)**	**Mode**	**Median**
23-30	13	15.5	31-40	31-40
31-40	45	53.6		
41-50	12	14.3		
51-60	14	16.7		
Total	**84**	**100.0**		

The table shows the total number of subjects are 84 academicians .Table 4.1 shows that Age range of the academicians is from 23 to 60 years; there are 13 academicians (15.5%) at 23-30 years, (53.6%) 45 academicians at 31-40 years,(14.3%) 12 academicians at 41-50 years, and (16.7%)14 academicians 51-60 years. The mode and median of age is at 31-40 years. These show that most of the subjects are in 31-40 age groups (53.6%), while age 41-50 years is the least (14.3%). The table illustrate about the prevalence of the work-related musculoskeletal symptoms at any time during the last 12 months from the highest to the lowest. It is followed by shoulder (42.9%), neck (40.5%), lower back (27.4%), knees (26.2%), ankle/feet (22.6%), wrists/hand (15.5%), hip/thigh (11.9%) and elbow (6.0%). The highest prevalence of work-related musculoskeletal symptoms for the last 12 months is at the shoulder (40.5%), while the lowest is at elbow (6.0%). The top three regions highest in prevalence is shoulder (42.9%), neck(40.5%), lower back (27.4%). The least three region in prevalence is elbow (6.0%), hip/thigh (11.9%) and wrists/hand (15.5%). The body region that has the highest symptoms at any time during the last 7 days is Neck (23.8%) while the lowest is also elbow again (2.4%) among all the regions. The top three regions highest in prevalence is neck (23.8%), shoulder (22.6%) and lower back (21.4%). The least three region in prevalence is elbow (1.2%), hip/thigh (6.0%) and wrists/hand (6.0%).By comparing this result with studies on school teachers, this result (73.8%) is within the range of school teachers which is 40% to 95%. This results suggest that most of the academicians in university is at high risk of develop WMSD according to the relative body regions. The results investigating the body region that have work-related musculoskeletal symptoms at any time during the last 12 months, whether that symptom affects normal activity and whether it presents during the last seven days. Shoulder, neck and lower back had commonly become the top three highest regions. The three common body regions of top three highest ranking are similar with the systemic review of WMSD among school teachers12. Both the academicians and the primary and secondary school teachers are having the same three common work-related musculoskeletal symptoms on shoulder, neck and lower back with slight difference in the ranking. The contributed factors are prolonged sustained sitting during reading, marking assignment, office meeting; prolonged standing up during teaching sitting13. The second result is the prevalence of the work-related musculoskeletal symptoms at any time during the last 12 months. From the 73.8% of academicians, the top three regions that having the highest ranking is shoulder (42.9%), neck (40.5%) and lower back (27.4%). Next, the body region that has the highest symptoms at any time during the last 7 days is neck (23.8%), shoulder (22.6%), and lower back (21.4%). Erick and Smith (2011) stated that the neck region is the first most common region to have symptoms . The ranking result of the body region that has the highest symptoms at any time during the last 7 days which is neck (23.8%) is parallel to the finding of Erick and Smith12. The ranking for the result during the last 12 months is slightly different due to different methodology used in various articles. Some articles investigate whole body region, some just specifically check

Table 2

Have you at any time during the last 12 months have trouble in :			
Parts of body	**Frequency**	**Percentage (%)**	**Ranking**
Neck	34	40.5	2
Shoulder	36	42.9	1
Upper Back	23	27.4	4
Elbow	5	6.0	9
Wrists/Hand	13	15.5	7
Lower Back	32	38.1	3
Hips/Thigh	10	11.9	8
Knees	22	26.2	5
Ankle/Feet	19	22.6	6

During the last 12 months,have you been prevented from carrying out normal activity because of this trouble in:			
Parts of body	**Frequency**	**Percentage (%)**	**Ranking**
Neck	10	11.9	2
Shoulder	8	9.5	3
Upper Back	7	8.3	4
Elbow	1	1.2	7
Wrists/Hand	5	6.0	6
Lower Back	17	20.2	1
Hips/Thigh	5	6.0	6
Knees	7	8.3	4
Ankle/Feet	6	7.1	5
Have you at any time during the last 7 days have trouble in:			
Parts of body	**Frequency**	**Percentage (%)**	**Ranking**
Neck	20	23.8	1
Shoulder	19	22.6	2
Upper Back	12	14.3	4
Elbow	2	2.4	8
Wrists/Hand	5	6.0	7
Lower Back	18	21.4	3
Hips/Thigh	5	6.0	7
Knees	6	7.1	6
Ankle/Feet	10	11.9	5

Discussion

There is also a lot of study which presented similar prevalence. Shoulder and neck pain among the academicians also can contribute by writing on the whiteboard, sometimes overhead and using computer[14]. This study found most of the academicians preferred using both projector and whiteboard (63.1%). Besides, there are more academicians choose to used projector (29.8%) than whiteboard (7.1%). The use of projector compare to writing on whiteboard might be able to reduce the incidence of shoulder and neck pain during teaching. The teaching instrument among the academicians and teacher in Malaysia most likely is different. The academician writing on the board is comparatively lesser but more on using the projector while teaching. The usage of computer might be more for the academicians such as typing in repetitive movement and reading assignments compare to manual marking on paper. The prevalence of neck pain among school teachers is significant positive associated with improper and static postures, sustained sitting and standing[15]. Other risk factors that were significant associated with neck pain are age, female, years of teaching, regular exercise and job satisfaction. Besides that, chronic neck pain was associated with multiple joint pain and daily living activity limitation. Incidence of neck pain increased with the amount of neck flexion. Regarding the low back pain, academicians found to have lower prevalence (27.4%) compare with primary school teachers of Klang valley, Malaysia (40.4%) in a similar cross-sectional study by using Nordic Questionnaire[16]. The main factor that contribute to low back pain among the primary school teachers is lifting load (28.0%);second is prolonged sitting (25.2%).Besides, poor mental health (OR 1.11, 95% CI 1.06-1.15) was also is the risk factor to low back pain. This might indicate that the academicians have a lesser or different risk factor of low back pain .Next, the academicians probably have lesser lifting load factor compare to primary school teachers. The used of teaching and assignment material of university are mostly in electronic form while the school in Malaysia mostly used books. The needs of carrying

books and students assignments probably are higher compare to academicians in university. The student age group for academicians and primary school teachers is much different as the university students are relatively independent compare to young children. The risk lifting load might be reduce for academicians as it could be assisted by the students in university during teaching or co-curriculum activities. The lifting work most likely need to be done by the teachers themselves in school as the students are still young children . The availability of the office also found to be significantly associated with low back pain[13]. Teacher who does not have their own office in the school are more likely to develop low back pain compare to those who have (AOR=0.52, 95%CI: 0.33, 0.81). This explained other reason for the lower prevalence of lower back pain among academicians compare to teachers. The working environment of the academicians in private university most likely is better compare to usual government school in Malaysia. Design and type of the chair and table size could affect the sitting posture increase risk of low back pain. Better ergonomic design of chair would provide better rest for the academicians in sitting and after teaching in standing. In terms of psychological factor, teachers who were unhappy with their working culture and environment were 1.82 times more likely to experience LBP (AOR=0.55, 95%CI: 0.36, 0.86)[13]. According to the previous symptoms presented, the next finding is the body region that has been prevented from carrying out normal activity at any time during the last 12 months. Lower back (20.2%), neck (11.9%), shoulder (9.5%) is the top three body region that are disabling among the academicians in university. These three regions again ranked as the top three as the first result. However, lower back is the most disabling region among all. Low back pain disability was significant associated with female gender (OR: 2.47, 95% CI: 1.52-3.99, $p<0.001$) and history of low back injury (OR: 3.01, 95% CI: 1.92-4.74, $p<0.001$) among teachers in Botswana. Besides, low back pain disability was also associated with psychosocial job demands, job insecurity and supervisor support. However, not all factors remained statistically significant when evaluated in the logistic regression model[12]. In terms of activity limitation, standing and ADLs are found to be more disabling compare to other activities among the teachers[16]. The work performance and activity limitation related to low back pain among the academicians should be studied in future. Next, elbow, wrist/hand and thigh/hips are commonly rank as three lowest prevalence among all nine regions. The elbow is the least among all nine regions at any time during the last 12 months (6.0%), last seven days (2.4%) and affecting normal activity during the last 12 months (1.2%)17. also found that elbow and wrist have lower prevalence. For thigh/hips, the pain of this region and the lower extremities are least to be concern even among the teachers as there is no study specifically study about the work-related musculoskeletal symptoms in thigh/ hips. The might explained by the prevalence of thigh/ hips is relatively low compare to other regions.

Conclusion

The main result shows the prevalence of work-related musculoskeletal symptoms among academicians in university is as high as 73.8%. This findings suggest that most of the academicians in university is at high risk of develop work-related musculoskeletal disorder especially on shoulder, neck and lower back region with slight variance in ranking. Shoulder is the highest at any time during the last 12 months .Neck has the highest prevalence at any time during the last seven days. Lower back is found to be affecting normal activity at any time during the last 12 months. Next, elbow, wrist/ hand and thigh/hips are three common region ranked as the lowest prevalence. Elbow is the least among all nine regions at any time during the last 12 months, last seven days and affecting normal activity .As conclusion, the academicians in university Malaysia is at risk of having work-related musculoskeletal symptoms as other teaching professional. This study presented the prevalence of the work-related musculoskeletal symptoms among academicians in university .It might use to apply to other academicians and other educators in Malaysia as well. According to the result in this study, we will be able to identify that shoulder, neck and lower back region that academicians suffer from work-related musculoskeletal symptoms . The information analyzed under this study would be useful in understanding the prevalence and given a direction to investigate the possible risk factor among academicians in develop evidence based practice for education on preventive measures in workplace and ergonomic guideline for academicians to prevent work-related musculoskeletal symptoms.

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