Original Article :

Prevalence of common work-related musculoskeletal disorders among population of Najran University, Saudi Arabia

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Abstract

Background:

Work related musculoskeletal disorders are the most common occupational problems, which mostly affect the neck, upper and lower back. The objective of this study was to identify the musculoskeletal disorders among the employees of Najran University, KSA.

Methods:

This cross-sectional study was conducted among the two sixty nine employees of Najran University during the period of January 2019 to September 2019. Data were collected by using a self-administered questionnaire and a standardized Nordic questionnaire.

Results:

269 employees of Najran University participated in this study; the mean age of participants was 39.35 ± 7.2. Most of participants 56.1% were overweight. The mean value of working experience was 6.8 ± 3.0, mean value of pain in off days past three year was 2.06 ± 8.7. Working hour was counted with mean value 7.13 ± 1.80. Mean value of walking activity was 33.45 ± 32.07 and exercise was 10.07 ± 21.4. Mean value of daily uses of computer was 5.01 ± 2.2 and cellphone was 4.65 ± 3.0, Upper and lower extremity multiple problem was found significant with qualification of participants.

Conclusion:

Most of the participants have musculoskeletal pain/ discomfort. The most affected region identified was low back and participants reported pain in this region. Few participants complained of neck pain. However, the other regions such as shoulder, wrist/ forearm, upper back, knee and ankle were found to be minimally affected. Association was found in personal and working place characteristics in different region of pain.

الملخص

الخلفية:

الاضطرابات العضلية الهيكلية المرتبطة بالعمل هي أكثر المشاكل المهنية شيوعًا، والتي تؤثر في الغالب على الرقبة وأعلى الظهر وأسفل الظهر. الهدف من هذه الدراسة هو التعرف على آلام / اضطرابات العضلات والعظام بين العاملين في جامعة نجران بالمملكة العربية السعودية

طريقة البحث:

أجريت هذه الدراسة المسحية بين اثنين وستون من موظفي جامعة نجران خلال الفترة من يناير ٢٠١٩ إلى سبتمبر ٢٠١٩. تم جمع جميع البيانات باستخدام استبيان النوردك الذي يستخدم لمعرفة أعراض الاضطرابات العضلية الهيكلية

النتائج:

كان متوسط عمر المشاركين ٣٩,٣ عامًا، الانحراف المعياري ٧,٣، مؤشر كتلة الجسم للمشاركين ٠,٧٪ اقل من الوزن الطبيعي، ٢٦,٨٪ من الوزن الطبيعي، ٥٦,١٪ من المشاركين يعانون من زيادة الوزن، ١٦,٤٪ يعانون من السمنة المفرطة. من بين اثنين وستين مشاركًا يعانون من اضطرابات مختلفة مثل آلام أسفل الظهر ٣٢,٣٪، آلام الرقبة ١٣٪، آلام مفصل الركبة ٨,٢٪، آلام الكتف ٧,٨٪، مشاكل متعددة في الاطراف العلوية ٧,١٪، مشاكل متعددة في الأطراف السفلية ٥,٦٪، آلام الظهر العلوية ٣,٧٪ ، آلام الاقدام ١,٩ ٪ ، آلام المعصم ٠,٧ ٪ ، ألم مفصل الكاحل ٠,٧ ٪ ، ألم اليد ٠,٤ .

الخلاصة:

استنتج من الدراسة أن غالبية المشاركين وجد أنهم يعانون من زيادة في الوزن، ولهذا السبب وجد أنهم يعانون من آلام العضلات والعظام. وكانت المنطقة الأكثر تضررا التي تم تحديدها هي منطقة أسفل الظهر. عدد قليل من المشاركين اشتكوا أيضًا من آلام الرقبة، ومع

Key words:
Work related musculoskeletal disorders, chronic pain, occupational problem

ذلك، تم العثور على مناطق أخرى من الجسم مثل الكتف والمعصم والساعد وأعلى الظهر والركبة والكاحل حيث كانت متأثرة بشكل طفيف.

Introduction

Work-related musculoskeletal disorder is defined as damage to the musculoskeletal system resulting from work-related events, and it is one of the most general causes of chronic pain and physical disorders occurring among modern workers. Health systems are immensely affected because of work-related musculoskeletal disorders among the working population [1]. About 2/3 of the working time of these population remain in a sitting posture, and their sitting sessions typically lasts at least 30 minutes [2, 3].

Inactive behavior has been well-defined as when a person uses their energy expenditure while in a reclining or sitting posture of ≤1.5 METs while in a sitting or reclining posture" [4]. In office workplaces increase the risk of type 2 diabetes, cardio-metabolic disease obesity, musculoskeletal disorders, coronary artery disease, different kinds of cancer, and early death. [5-7] Musculoskeletal discomfort or pain is a huge burden nowadays and mostly population are facing the difficulties in their jobs or tasks of daily routine.

The purpose of this study was to identify the prevalence of common work-related musculoskeletal disorders among population of Najran University

Methods

This cross-sectional study was conducted among the employees of Najran University to assess musculoskeletal disorders. A Standardized Nordic questionnaire and self-administered questionnaires were distributed among the employees of Najran University.

Self-administered questionnaire had 15 questions to ask about the personal data of the participants such as height, weight (BMI), qualification, experience, working hours, about walk, heavy exercises, about diabetes and hypertension or any other health problems, use of computers and cell phones.

Standardized Nordic questionnaires, which is very authentic and common questionnaire about the symptoms of WMSD's. This questionnaire covered the areas of body causing WMSD's: neck, shoulder, elbow, wrist/forearm, hand, upper back, lower back, hips, knees, ankle, and foot. This questionnaire contains 5 questions in each section and last question of each section has further three separate parts about the degree of pain or discomfort interfered

with your work, your life outside of work, your sleep, and how many days in the past years did participants stop the activities.

All participants were male. The participants of this study were working in different sections of Najran University, like administration, dentistry, pharmacy, physiotherapy, nursing, computer, Engineering, English department, accounts, sharia, and medicine. The teaching staff and employees who work in the offices Najran University were included.

The employees of Najran University, who don't work in the offices like security guards and cleaners, were excluded. All participants read the information sheet and signed the consents form. Statistical analysis was performed with the SPSS (version-24), Descriptive summary statistics including mean, frequencies, and percentages. The Ethics committee of Najran University granted the ethics approval and all data will be kept confidential.

Results

300 questionnaires were randomly distributed among the population of Najran University, 269(89.6%) participants responded to the questionnaire. Table -1 shows the descriptive statistics of participants in which Mean age of participants was 39.35 ± 7.2. Most of participants 56.1% were overweight and 93.3% have not any diabetic/hypertensive problem but 16.4% were found obese.

Table 1: Personal Characteristics

Personal Characteristics n=269	Mean±std
Age of participants	39.35±7.2
BMI	Frequency (%)
Underweight	2(0.7)
Healthy weight	72(26.8)
Overweight	151(56.1)
Obese	44(16.4)
Qualification	
Matric	6(2.2)
Higher Secondary	28(10.4)
Graduation	72(26.8)
Masters	97(26.8)
PhD	66(24.5)
Diabetic/Hypertensive	
No Problem	251(93.3)
Diabetic	15(5.6)
Hypertensive	1(0.4)
Other Problems	2(0.7)

The mean value of working experience was 6.8 ± 3.0, mean value of pain in off days past three year was 2.06 ± 8.7. Working hour was counted with mean value 7.13 ± 1.80. Mean value of walking activity was 33.45 ± 32.07 and exercise was 10.07 ± 21.4. Mean value of daily uses of computer was 5.01 ± 2.2 and cellphone was 4.65 ± 3.0, (table2).

Table 2: Workplace characteristics

Workplace characteristics n=269	Mean±std
Working experience	6.8±3.0
How many days off in the past 3 years because of pain	2.06±8.7
Working hours	7.13±1.08
Walking activity	33.45±32.07

Workplace characteristics n=269	Mean±std
Exercise	10.07±21.4
Daily uses of computer	5.01±2.2
Daily uses of cellphone	4.65±3.0

Out 269 most of participants (87) had pain in lower back, 35 had in neck region, 22 were reported in knee, 19 were in upper extremity multiple problem 15 had in lower extremity in multiple problem and rest of participants in different regions but no one reported in shoulder and elbow region, (shown in Table. 3).

Upper and lower extremity multiple problem was found significant with qualification of participants <0.001 and <0.017 respectively. Upper extremity multiple problem also found significant with BMI in p value <0.001 and Diabetic/ Hypertensive found significant with neck pain with value 0.002, (shown in table 4).

Table 3: common work-related musculoskeletal disorders (n=269)

MSDs	frequency of affected person
Pain in lower back	87
Pain in neck	35
Pain in knee	22
Upper extremity multiple problem	19
Lower extremity multiple problem	15
Pain in upper back	10
Pain in foot	5
Pain in wrist	2
Pain in ankle	2
Pain in hand	1

Table 4: Association between personal characteristics with Prevalence of MSD's

personal characteritics n=269	Pain in neck		Pain in lower back		Pain in knee		Pain in ankle		Upper extremity multiple problem		Lower extremity multiple problem	
	No. (%)	p	No. (%)	p	No. (%)	p	No. (%)	p	No. (%)	p	No. (%)	p
Qualification		0.599		0.455		0.35		0.47		<0.001		0.017
Matric	0(0.0)		2(0.7)		0(0.0)		0(0)		2(7)		0(0)	
Higher 2ry	3(1.1)		5(1.9)		2(7)		0(0)		9(3.3)		5(1.9)	
Graduate	11(4.1)		24(8.9)		7(2.6)		0(0)		4(1.5)		2(0.7)	
Master	10 (3.7)		31(31)		11(4.1)		2(7)		4(1.5)		7(2.6)	
PhD	11(4.1)		25(9.3)		2(7)		0(0)		0(0.0)		1(0.4)	

personal characteritics n=269	Pain in neck		Pain in lower back		Pain in knee		Pain in ankle		Upper extremity multiple problem		Lower extremity multiple problem	
	No. (%)	p	No. (%)	p	No. (%)	p	No. (%)	p	No. (%)	p	No. (%)	p
BMI												
Under-weight	0(0.0)	0.305	0(0)	0.08	0(0.0)	0.407	0(0.0)	0.4	2(0.7)	<0.001	0(0)	0.695
Healthy weight	5(1.9)		23(8.6)		9(3.3)		1(0.4)		6(2.2)		3(1.1)	
Overweight	23(8.6)		43(16)		11(4.1)		0(0.0)		11(4.1)		8(3)	
Obese	7(2.6)		21(7.8)		2(0.7)		1(0.4)		0(0)		4(1.5)	
Diabetes/ Hypertension												
No	30(11.2)	0.002	81(30.1)	0.607	21(7.8)	0.995	2(0.7)	0.986	19(7.1)	0.690	14(5.2)	0.976
Diabetes	3(1.1)		6(2.2)		1(0.4)		0(0)		0(0)		1(0.4)	
Hyperten-sion	0(0.0)		0(0.0)		0(0.0)		0(0)		0(0)		0(0)	
Others	2(7)		0(0.0)		0(0.0)		0(0)		0(0)		0(0)	

Lower extremity multiple was found significant with walking activity with p value 0.021, association was found in pain in upper back with age of participants, off days in past three year because of pain and working hours with p value 0.07, 0.006, and 0.009 respectively. Association was found of knee pain with working hours, daily uses of computer and exercise with p value 0.00, 0.45 and 0.006 respectively. And association of upper extremity multiple problem was found with age of participants, walking activity and exercise with p value 0.00, 0.007 and 0.037 respectively, (Table. 5)

Table 5: Association between workplace characteristics and MSDs, n=256

characteristics	Pain in lower back		Lower extremity multiple problem		Pain in upper back		Pain in neck		Pain in knee		Upper extremity multiple problem	
	Mean ±SD	P	Mean ±SD	P	Mean ±SD	P	Mean ±SD	P	Mean ±SD	P	Mean ±SD	P
Age												
yes	40.31 ±7.03	.137	38.5 ±8.7	.653	33.3 ±2.63	.007	40.11 ±7.3	.510	41.09 ±7.0	.244	33 ±3.1	.000
No	38.91 ±7.36		39.4 ±7.2		39.59 ±7.3		39.2 ±7.3		39.20 ±7.3		39.8 ±7.3	

characteristics	Pain in lower back		Lower extremity multiple problem		Pain in upper back		Pain in neck		Pain in knee		Upper extremity multiple problem	
	Mean ±SD	P	Mean ±SD	P	Mean ±SD	P	Mean ±SD	P	Mean ±SD	P	Mean ±SD	P
Working experience of participants												
yes	6.80 ±3.18	.994	6.0 ±2.7	.285	6.5 ±1.71	.743	6.97 ±2.4	.728	6.86 ±3.2	.926	6.9 ±3.0	.833
No	6.80 ±2.91		6.8 ±3.0		6.81 ±3.04		6.7 ±3.1		6.8 ±3.0		6.8 ±3.0	
How many days off in the past 3 years because of pain												
yes	2.86 ±9.0	.294	1.8 ±2.6	.905	9.4 ±18.7	.006	1.11 ±3.3	.490	1.81 ±5.8	.892	1.9 ±2.6	.953
No	1.67 ±8.5		2.0 ±9.0		1.77 ±18.69		2.2 ±9.1		2.08 ±8.8		2.1 ±8.9	
Working hours												
yes	7.09 ±1.06	.689	7.4 ±0.6	.320	8 ±1.24	.009	7.34 ±0.5	.212	6.36 ±1.2	.000	7.1 ±0.5	.917
No	7.14 ±1.09		7.1 ±1.1		7.1 ±1.1		7.1 ±1.1		7.19 ±1.0		7.1 ±1.1	
Walking activity												
yes	30.86 ±31.04	.361	52 ±33.0	.021	18 ±21.0	.121	41 ±41.7	.136	36.36 ±25.1	.658	52.3 ±37.3	.007
No	34.69 ±32.56		32.3 ±31.7		34.05 ±32.3		32.3 ±30.3		33.19 ±32.6		32.0 ±31.3	
Daily uses of cellphone												
yes	5.04 ±3.02	.141	6 ±11.0	.450	5.6 ±3.20	.313	5.7 ±3.3	.022	12.2 ±20.2	.616	4.2 ±10.1	.217
No	4.46 ±3.0		10.3 ±21.9		4.61 ±3.0		4.4 ±2.9		9.87 ±21.5		10.5 ±22.0	
Daily uses of computer												
yes	4.93 ±2.33	.674	4 ±2.5	.073	6 ±1.56	.160	5.37 ±2.2	.317	4.1 ±1.2	.045	4.31 ±2.6	.162
No	5.05 ±2.22		5.0 ±2.2		4.98 ±2.27		4.9 ±2.2		5.1 ±2.3		5.0 ±2.2	
Exercise												
yes	8.39 ±19.07	.374	3.6 ±2.6	.192	14 ±20.7	.556	10 ±20.5	.982	3.0 ±1.2	.006	3.2 ±2.7	.037
No	10.88 ±22.47		4.7 ±3.0		9.92 ±21.48		10.08 ±21.6		4.8 ±3.1		4.7 ±3.0	

Discussion

Many studies showed that increase in the sitting time ultimately increases the chances of obesity and diabetes by 5% and 7 %[8], whereas musculoskeletal disorders particularly low back pain was also found to be increased with extended sitting time [9].

Most studies had also shown that musculoskeletal problems are also common in office workers especially in the low back, upper limb, shoulder, and neck [10]. And the prevalence of musculoskeletal disorders ranged 40- 80% in office workers [11].

Similar results were observed in our study. The most affected region identified was low back, upper back, knee pain, lower and upper extremity found associated with characteristics of working place. Participants reported pain in these regions.

Findings of the Sherise Epstein conducted a study on the incidence of work-related musculoskeletal disorders among Interventionists and surgeons. Results showed that 17% of the population suffered from cervical spine disorders, 18% tend to have rotator cuff problems, 19% is suffering from lumbar spine diseases and 9% population is suffering from carpel tunnel syndrome [12]. Another study conducted by Meisha DE et al who studded the prevalence of work-related musculoskeletal disorders among dentists and found 70% of the population were affected by WMSDs. The most region affected was lower back (85%), 84.6% of them reported neck was the commonest affected region. Female population was found to be more affected as compared to males because of the lack of physical activity or exercise. Carpal Tunnel Syndrome was also identified in 9% of the population working in private sectors and its chances increases with age. Whereas the least reported work-related musculoskeletal disorders were found in orthodontists maxillofacial surgeons [13]. However, in our study few of the participants also complained about the neck pain. However, the other regions such as shoulder, wrist/ forearm, upper back, knee, and ankle were found to be minimally affected. Another study by Liping Li showed that prevalence of work-related musculoskeletal disorders was found to be common among teachers. The regions mostly affected are shoulder, low back, elbow, wrist/ hand [14].

A study by Ashiyat K.Akodu showed that lower back pain was found to be the most prevalent work-related musculoskeletal disorder among the respondents [15].

A study was conducted in Saudi Arabia to find the patterns of MSD patterns and its associated factor of risk among the higher education academicians MSDs found lower among the occupations of higher academic. However, neck, knee pain and back

found common and also highlighted that it was significant association with these regions of body [16].

Another study was conducted on the faculty members of Majmaah University, to find the prevalence of WMSDs. Most of participated were found affected with WMSDs, the neck was found mostly affected of WMSD. There was lack of training of ergonomic and using computer associated with WMSDs in most of body regions [17]. Whereas in our study the findings revealed that majority of the participants have musculoskeletal pain/discomfort whereas only few numbers of participants are suffering from this condition. The most affected region identified was low back and participants reported pain in this region.

Conclusion

It has been concluded from the study that majority of participants have musculoskeletal pain/discomfort. The most affected region identified was low back and participants reported pain in this region. Few of the participants also complained about neck pain. However, the other regions such as shoulder, wrist/ forearm, upper back, knee, and ankle were found to be minimally affected. Association was found in personal and working place characteristics in different region of pain.

References

1. Sin Ho Chung, Jin Gang Her, Taesung Ko, Jooyeon Ko, Heesoo Kim, Ju Sang Lee,et.al, phys. Work-related Musculoskeletal Disorders among Korean Physical Therapists. Ther. Sci.2013. 25: 55–59,

2. Evans RE, Fawole HO, Sheriff SA, Dall PM, Grant PM, Ryan CG.et.al Point-of-choice prompts to reduce sitting time at work: a randomized trial. Am J Prev Med. 2012; 43:293–7. doi: 10.1016/j.amepre.2012.05.010.

3.Thorp AA, Healy GN, Winkler E, Clark BK, Gardiner PA, Owen N et.al, Prolonged sedentary time and physical activity in workplace and non-work contexts: a cross-sectional study of office, customer service and call centre employees. Int J Behav Nutr Phy. 2012; 9:128. doi: 10.1186/1479-5868-9-128.

4. Cart L. Letter to the editor: standardized use of the terms “sedentary” and “sedentary behaviours” Appl Physiol Nutr Metab. 2012; 37:540. doi: 10.1139/h 2012-024.

5. Kazemi SS, Javanmardi E, Ghazanfari E. Relationship between general health and musculoskeletal disorders among tarbiat modares university students. Int J Musculosk Pain Prev. 2017;2(3):287-91.

6. Thorp AA, Owen N, Neuhaus M, Dunstan DW. Sedentary behaviors and subsequent health outcomes in adults: a systematic review of longitudinal studies, Am J Prev Med. 1996–2011. 2011; 41:207–15. doi: 10.1016/j.amepre.2011.05.004.

7. Tremblay MS, Colley RC, Saunders TJ, Healy GN, Owen N. Physiological and health implications of a sedentary lifestyle. Appl Physiol Nutr Metab. 2010; 35:725–40. doi: 10.1139/H10-079.

8. Paixão MS, Tassiano RM, Siqueira GR. Prevalence of musculoskeletal discomfort and associated factors in college students. Rev Bras Promoção Saúde. 2013;26(2):242-50.

9. Gianoudis J, Bailey C, Daly R. Associations between sedentary behavior and body composition, muscle function and sarcopenia in community-dwelling older adults. Osteoporosis Int. 2015; 26:571–9. doi: 10.1007/s00198-014-2895-y.

10. Lorusso A, Bruno S, L'Abbate N. Musculoskeletal disorders among university student computer users. Med Lav. 2009; 100:29–34

11. Almhdawi KA, Mathiowetz V, Al-Hourani Z, Khader Y, Kanaan SF, Alhasan M. Musculoskeletal pain symptoms among allied health professions' students: prevalence rates and associated factors. J Back Musculoskelet Rehabil. 2017;30(6):1291-1301.

12. Sherise Epstein; Emily H. Sparer, ScD; Bao N. Tran, MD; Qing Z. Ruan, MD; Jack T. et al. Prevalence of Work-Related Musculoskeletal Disorders Among Surgeons and Interventionists A Systematic Review and Meta-analysis. JAMA Surgery February 2018 Volume 153, Number 2: 1-11.

13. Meisha DE1, Alsharqawi NS2, Samarah AA3, Al-Ghamdi MY . Prevalence of work-related musculoskeletal disorders and ergonomic practice among dentists in Jeddah, Saudi Arabia. Clin Cosmet Investig Dent. 2019 Jul 5;11:171-179.

14. Li L, Yue P, Liu F. Work-related musculoskeletal disorders among schoolteachers in China, prevalence, and occupational factors. Injury Prevention 2012; 18: A162.

15. Ashiyat K.Akodu .Zainab O.Ashalejo. Work-related musculoskeletal disorders and work ability among hospital nurses. Journal of Taibah University Medical Sciences. Volume 14, Issue 3, June 2019, Pages 252-261A.

16. Algarni FS, Kachanathu SJ, Al-Abdulwahab SS. A Cross-Sectional Study on the Association of Patterns and Physical Risk Factors with Musculoskeletal Disorders among Academicians in Saudi Arabia. BioMed Research International. 2020 Aug 15;2020.

17. 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. International journal of health sciences. 2018;12(4):18-25.