

Musculoskeletal disorders among bank office workers in Kuwait

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الاضطرابات العضلية الهيكلية بين عاملي البنوك في الكويت

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الخلاصة: تقمّم هذا الدراسة المقطعية العرضية نمط الاضطرابات الهيكلية العضلية التي يعاني منها العاملون في البنوك في الكويت. وقد استخدم استبيان موثوق بعباً ذاتياً يحتوي على الاستبيان الهيكلي العضلي لشمال أوروبا، واستبيان صحي عام مكون من 12 بنداً. ومن بين 750 موظفاً، عانى 80٪ منهم من نوبة على الأقل من الاضطرابات العضلية الهيكلية خلال السنة السابقة، وعانى 42٪ من نوبة على الأقل من العجز. وكانت أكثر أماكن الجسم المتضررة هي العنق (53.3٪)، وأسفل الظهر (51.1٪)، والكتفين (49.2٪)، وأعلى الظهر (38.4٪). وعلى الصعيد الوطني، كانت درجات (أحراز) الاستبيان الصحي العام المكون من 12 بنداً، والتدخين، والجنس منبئات يعول عليها للاضطرابات العضلية الهيكلية خلال العام السابق، وكان شرب الخمر، والحالة الزوجية، ودرجات (أحراز) الاستبيان الصحي العام المكون من 12 بنداً، والجنس، والسنوات في الكويت منبئات يعول عليها للاضطرابات العضلية الهيكلية المسببة للعجز خلال السنة السابقة.

ABSTRACT This cross-sectional observational study assessed the pattern of musculoskeletal disorders (MSDs) suffered by bank office workers in Kuwait. A self-administered validated questionnaire was used that included the Nordic musculoskeletal questionnaire and 12-item general health questionnaire (GHQ12). Of 750 employees, 80% suffered at least 1 episode of MSD during the previous year and 42% suffered at least 1 disabling episode. The most affected body parts were the neck (53.5%), lower back (51.1%), shoulders (49.2%) and upper back (38.4%). Nationality, GHQ12 score, smoking and sex were significant predictors of MSDs during the previous year, while alcohol drinking, marital status, GHQ12 score, years in Kuwait and sex were significant predictors of disabling MSDs during the previous year.

Troubles musculosquelettiques chez des employés de banque au Koweït

RÉSUMÉ Cette étude transversale d'observation a évalué les caractéristiques des troubles musculosquelettiques (TMS) chez des employés de banque au Koweït. Nous avons utilisé un autoquestionnaire validé comprenant le questionnaire « nordique » sur les TMS et le questionnaire GHQ12 (questionnaire général de santé en 12 questions). Sur 750 employés, 80 % d'entre eux avaient connu au moins un épisode de TMS au cours de l'année précédente et 42 %, au moins un épisode invalidant. Les parties du corps les plus touchées étaient le cou (53,5 %), le bas du dos (51,1 %), les épaules (49,2 %) et le haut du dos (38,4 %). La nationalité, le score au GHQ12, le tabagisme et le sexe étaient des facteurs prédictifs significatifs de TMS au cours de l'année précédente, alors que la consommation d'alcool, l'état matrimonial, le score au GHQ12, les années passées au Koweït et le sexe étaient des facteurs prédictifs significatifs de TMS invalidants au cours de l'année précédente.

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Introduction

Rapid technological developments, especially in the use of electronic data, have affected both workers and the workplace. Electronic data are mainly displayed on visual display terminals. Improper body posture and long hours in front of these terminals can result in many health hazards, including eye strain and fatigue and musculoskeletal disorders (MSDs) [1]. It has been stated that MSDs are the most common occupational health problem [2]. Around 1.1 million people in the United Kingdom suffered from MSDs caused by or made worse by work in 2001–02 [2] and MSDs accounted for 11.6 million working days lost during 2006 [3]. In the United States, MSDs constituted 41.4% of all adult disabilities (41.2 million) during 1990 [4].

Work-related MSDs can affect shoulders, arms, elbows, wrists, hands, back, legs and feet. They are caused by forceful or repetitive movements or a poor working posture. Symptoms include tenderness, aches and pains, tingling, stiffness and swelling. Lower and upper back pain and muscle spasm could be due to incorrect seating, which also affects the cervical spine and neck muscles leading to pain [5,6]. Crawford et al. concluded that physical and psychosocial risk factors are implicated in the etiology of MSDs especially those affecting the neck and shoulder regions [7]. Jensen et al. showed that neck symptoms were the most common (53%) among female call-centre workers, followed by shoulder (42%) and hand/wrist (30%) symptoms [1].

Although many studies have dealt with MSDs among office workers in other countries, the exact nature and prevalence of this important health problem has not been studied before in Kuwait. This study was formulated to fill the gap of knowledge in this area. The aims of the study were to assess the pattern of MSDs among

bank office workers and to identify the impact of demographic, occupational, psychological and social factors on MSDs.

Methods

This study was carried out during 2006 in the 36 branches of one banking company in Kuwait, randomly selected from among the major banks in the country. An observational cross-sectional study design was adopted. All bank workers ($n = 800$) using visual display units were recruited for the study. A self-administered questionnaire was distributed personally to each employee.

Tools

A specially designed self-administered questionnaire included the following: sociodemographic characteristics (age, sex, nationality, marital status, level of education, years in Kuwait and smoking history) and occupational history (type of job and duration in that job). The modified 12-item Goldberg general health questionnaire (GHQ12) was used [8]. This questionnaire assesses psychiatric morbidity or the "inability to carry out one's normal 'healthy' functions and the appearance of new phenomena of a distressing nature". Each question is scored from 0 (better than normal) to 3 (much less than normal). The short version of the standardized Nordic musculoskeletal questionnaire was used to evaluate MSDs [6]. This 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 organ. An Arabic translation of the questionnaire was prepared. Back translation was used to ensure correct translation. The questionnaire was assessed by a jury of 6 occupational and psychiatrist consultants to ensure its validity.

A pilot study was carried out on 15 workers to assess the suitability of the questions in Kuwaiti culture and to reveal any defects in the administrative plan for data collection. Reliability of the questionnaire was studied through repeating the same questionnaire on the 15 workers included in the pilot study. The Cronbach reliability coefficient was more than 0.87 for the questionnaire.

Approval to carry out the study was obtained from the headquarters of the bank. Oral consent was also obtained from workers before filling the questionnaire. All collected data were handled confidentially.

Data analysis

The pre-coded questionnaire facilitated data entry. The Microsoft *Excel* program was used for data entry and *Epi-Info* for statistical analysis of the data. The quality of data was assured by meeting with the workers and their supervisors to explain the purpose of the study and the nature of the questionnaire, and by checking the completeness of data in the field. After data entry, both manual and electronic (frequency analysis and cross-tabulation) revisions were performed to verify data entry.

The prevalence of MSDs during the previous 12 months or attacks occurring during 7 days were calculated if any part of the body was affected. Also the mean GHQ12 score and the number of body parts affected by MSDs were calculated.

Statistical analysis of the results included both descriptive and analytic techniques. Statistical tests used for analysis of the results included the chi-squared and Fisher exact test for qualitative data and Mann–Whitney and Spearman coefficients for non-parametric data. Odds ratio (OR) and multiple logistic techniques were used to determine risk factors. The level of significance adopted for this study was $P \leq 0.05$.

Table 1 Characteristics of the sample of bank workers in Kuwait (n = 750)

Characteristic	No.	%
Sex		
Male	356	47.5
Female	394	52.5
Mean (SD) age (years)	33.2 (9.1)	
Nationality		
Kuwaiti	404	53.9
Non-Kuwaiti	346	46.1
Marital status		
Married	472	62.9
Single	278	37.1
Education level		
Secondary or less	67	8.9
Post-secondary institute	256	34.2
University	387	51.6
Higher university	40	5.3
Mean (SD) time in Kuwait (years)	19.1 (11.8)	
Smoker		
Yes	193	25.7
No	557	74.3
Alcohol drinker		
Yes	73	9.7
No	677	90.3
Job		
Clerical	43	5.7
Public relations	69	9.2
Customer services	377	50.3
Supervisor	18	2.4
Assistant manager	46	6.1
Manager	95	12.7
Other	102	13.6
Mean (SD) job duration (years)	7.6 (7.5)	
GHQ12 score		
Normal (0–12)	472	62.9
Mild distress (13–24)	263	35.1
Moderate to severe distress (25–36)	15	2.0
Mean (SD) score	11.5 (5.4)	

SD = standard deviation; GHQ12 = 12-item general health questionnaire.

Results

The questionnaire was completed and returned by 750 of the 800 bank workers, giving a response rate of 93.8%. Their mean age was 33.2 (SD 9.1) years (Table 1) and over half the respondents were females (52.5%). The predominant nationality was Kuwaiti (53.9%). Almost

all the respondents (90.2%) had higher than secondary education. A majority were married (62.9%). Only one-quarter were smokers (25.7%), while alcohol drinkers were only 9.7%. The mean duration in their job was 7.6 (SD 7.5) years. The mean score on the GHQ12 was "upper normal" [11.5 (SD 5.4)] and only a minority (2.0%) were rated

as having moderate to severe psychological distress (score 25–36).

Of all bank workers, 57% reported suffering from MSDs during the previous week, while 80% suffered such disorders during the previous year. A total of 42% of the bank workers had suffered disabling attacks of MSDs in the previous year. Table 2 shows that lower back (30.3%), shoulders (29.5%) and neck (28.0%) were the most affected body parts during the previous week. Elbow (5.1%), hips (7.5%) and ankles/feet (9.5%) were the least affected. For MSDs occurring during the previous year, the affected body parts showed a slightly different priority, as neck (53.5%), lower back (51.1%) and shoulders (49.2%) topped the list, and elbows (11.5%), hips (13.3%) and ankles/feet (16.8%) respectively had the lowest prevalence. The most disabling MSDs affecting bank workers were in the wrists/hands (28.3%) and lower back (24.5%).

Table 3 portrays the univariate analysis of factors associated with MSDs among bank workers. Factors positively associated with the occurrence of MSDs during the previous week were: being female, having Kuwaiti nationality and scoring high on the GHQ12; while factors positively associated with the occurrence of MSDs during the previous year were: being female, having Kuwaiti nationality, being younger, holding more than a secondary education certificate and having a high GHQ12 score. Factors associated with disabling MSDs were: being female, drinking alcohol, being married, longer job duration and a higher GHQ12.

Table 4 shows the significant predictors of MSDs using multiple logistic regression models. Female sex and high GHQ12 score were significantly associated with all forms of MSDs, while Kuwaiti nationality was significantly associated with attacks, whether occurring during the previous week or year. Older age, longer job duration, drinking alcohol and being married were

Table 2 Prevalence of musculoskeletal disorders (MSDs) by affected body part among bank workers in Kuwait during the previous week or year and prevalence of disabling disorders ($n = 750$)

Body part affected by MSD	Previous 7 days		Previous 12 months		Disabling attack	
	No.	%	No.	%	No.	%
Neck						
No	540	72.0	349	46.5	642	85.6
Yes	210	28.0	401	53.5	108	14.4
Shoulder						
No	529	70.5	381	50.8	622	82.9
Yes	221	29.5	369	49.2	128	17.1
Right	82	10.9	139	18.5	-	-
Left	34	4.5	57	7.6	-	-
Both	105	14.0	173	23.1	-	-
Elbow						
No	712	94.9	664	88.5	727	96.9
Yes	38	5.1	86	11.5	23	3.1
Right	14	1.9	33	4.4	-	-
Left	11	1.5	18	2.4	-	-
Both	13	1.7	35	4.7	-	-
Hand/wrist						
No	641	85.5	538	71.7	538	71.7
Yes	109	14.5	212	28.3	212	28.3
Right	69	9.2	140	18.7	-	-
Left	16	2.1	30	4.0	-	-
Both	24	3.2	42	5.6	-	-
Upper back						
No	580	77.3	462	61.6	640	85.3
Yes	170	22.7	288	38.4	110	14.7
Lower back						
No	523	69.7	367	48.9	566	75.5
Yes	227	30.3	383	51.1	184	24.5
Hips						
No	694	92.5	650	86.7	716	95.5
Yes	56	7.5	100	13.3	34	4.5
Knees						
No	649	86.5	578	77.1	674	89.9
Yes	101	13.5	172	22.9	76	10.1
Foot/ankle						
No	680	90.7	624	83.2	700	93.3
Yes	70	9.3	126	16.8	50	6.7

additional risk predictors for disabling MSDs among these bank workers.

Discussion

The increased use of computer screens, keyboards and mice in recent years

has been associated with an increased prevalence of disorders in the neck and upper extremities [9]. Poor workstation design, continuous computer use for the entire workday and repetitive computer work, such as data entry, have been associated with an increased

risk of developing symptoms related to musculoskeletal disorders [10,11].

Musculoskeletal disorders are highly prevalent and potentially disabling conditions that undermine the available health resources [4] and impose heavy costs on employers and society [2,3,12,13]. In industrialized societies,

Table 3 Relationship between characteristics of bank workers and prevalence of musculoskeletal disorders (MSDs) during the previous week or year and prevalence of disabling disorders

Characteristic	MSD in previous 7 days			Previous 12 months			Disabling attack		
	No MSD (n = 322)	MSD (n = 428)	Statistics OR (95% CI)	No MSD (n = 152)	MSD (n = 598)	Statistics OR (95% CI)	No MSD (n = 436)	MSD (n = 324)	Statistics OR (95% CI)
Female	44.7	58.4	1.74* (1.29-2.32)	39.5	55.9	1.94* (1.35-2.79)	47.2	59.9	1.67* (1.24-2.23)
Non-Kuwaiti	56.2	38.6	0.49* (0.36-0.66)	65.8	41.1	0.36* (0.25-0.53)	48.9	42.4	0.77 (0.57-1.03)
Above secondary education	90.6	91.4	1.06 (0.76-1.49)	87.5	92.1	1.72* (1.16-2.54)	90.8	91.4	1.07 (0.76-1.51)
Single	34.8	38.8	1.19 (0.88-1.60)	36.8	37.1	1.01 (0.70-1.46)	40.8	31.8	0.68* (0.50-0.92)
Smoker	26.4	25.2	0.94 (0.68-1.31)	20.4	27.1	1.45 (0.94-2.24)	23.2	29.3	1.38 (0.99-1.91)
Alcohol drinker	10.6	9.1	0.85 (0.52-1.38)	7.2	10.4	1.48 (0.76-2.89)	6.9	13.7	2.15* (1.31-3.51)
	Mean (SD)	Mean (SD)	Test (P-value)	Mean (SD)	Mean (SD)	Test (P-value)	Mean (SD)	Mean (SD)	Test (P-value)
Age (years)	33.8 (9.5)	32.8 (8.7)	t = 0.73 (0.468)	34.7 (10.4)	32.8 (8.7)	t = 2.06* (0.041)	33.4 (9.4)	33.0 (8.5)	t = 0.60 (0.546)
Job duration (years)	7.9 (7.8)	7.5 (7.2)	Z = 0.19 (0.848)	7.6 (8.1)	7.7 (7.3)	Z = 0.68 (0.495)	6.9 (7.5)	8.7 (7.3)	Z = 4.64* (<0.001)
GHQ12 (score)	10.0 (5.0)	12.6 (5.4)	Z = 6.73* (<0.001)	8.5 (4.8)	12.2 (5.3)	Z = 8.25* (<0.001)	10.2 (4.9)	13.2 (5.6)	Z = 7.88* (<0.001)

*P < 0.05.

OR = odds ratio; CI = confidence limits of odds ratio; SD = standard deviation.
GHQ12 = 12-item general health questionnaire.

MSDs are one of the most common causes of temporary work disability and the main cause of permanent work disability, accounting for high productivity losses [14,15].

The current study was formulated to assess the prevalence of MSDs among bank workers and reveal the impact of personal and psychological factors on such disorders. To achieve such aims an observational cross-sectional study was carried out in branches of one of the major banks in Kuwait. The study comprised 800 bank workers with a response rate of 93.5%. The short version of the Nordic questionnaire was used to analyse MSDs and a modified GHQ12 self-administered questionnaire was used for assessment of psychiatric disorders. The large number of studied workers and high response rate can be considered as a good representation of bank workers. However, the differences in the design of workstations in the studied branches of the bank could form one source of bias. Although in cross-sectional design only survivors are studied, the mild nature of MSDs rarely leads to high rates of turnover among bank workers.

Our study showed that 80% of workers suffered from at least 1 attack of a MSD in the previous year, while 57% suffered from attacks during the previous week. Disabling MSDs were suffered by 42%. Using the same questionnaire Woods reported the following corresponding proportions: 86%, 56% and 30% respectively [16]. The 2 studies agree with regard to ranking of commonly affected organs. Our study revealed that neck (53.5%), lower back (51.1%) and shoulders (41.6%) were the most commonly affected body parts during the previous year. Similar results were also found for MSDs occurring in the previous week. Several studies have shown an increased risk of neck disorders among office workers [17-19]. There is strong evidence supporting static or maintained postures as a risk factor for MSDs of the neck and shoulders [20] and a positive relationship has been identified with the

Table 4 Significant risk predictors of musculoskeletal disorders (MSDs) among bank workers using multiple logistic regression

Factor	Previous 7 days		Previous 12 months		Disabling attack	
	β	OR (95% CI)	β	OR (95% CI)	β	OR (95% CI)
Age	-	-	-	-	-0.062	0.94 (0.91-0.97)
Sex	0.335	1.40 (1.03-1.90)	0.477	1.63 (1.09-2.45)	0.409	1.51 (1.09-2.09)
Nationality	-0.593	0.55 (0.41-0.75)	-0.919	0.40 (0.27-0.59)	-	-
Marital status	-	-	-	-	-0.523	0.59 (0.41-0.85)
Job duration	-	-	-	-	0.079	1.08 (1.05-1.21)
Smoker	-	-	0.639	1.90 (1.18-3.06)	-	-
Alcohol drinker	-	-	-	-	0.877	2.40 (1.42-4.06)
GHQ12 score	0.09	1.09 (1.06-1.13)	0.153	1.16 (1.11-1.22)	0.101	1.11 (1.07-1.14)
Constant	-0.359	-	0.377	-	-0.617	-

Age, job duration and GHQ12 scales were quantitative variables; sex was coded: male = 1, female = 2; nationality: Kuwaiti = 1, Non-Kuwaiti = 2; marital status: married = 0, currently single = 1; smoker and alcohol drinker: yes = 1, no = 0.

OR = odds ratio; CI = confidence interval; GHQ12 = 12-item general health questionnaire.

duration of fixed sedentary posture at work [21]. Also limited breaks are a significant risk factor for neck disorders [22,23].

The current study showed that women were more likely to suffer from MSDs than men, either during the previous year (84.8% compared with 74.2%) or the previous week (63.5% compared with 50%). Furthermore they also tended to suffer more disabling attacks (47.7% compared with 35.4%). Many studies revealed a gender difference with more women being affected [7,24,25]. These gender differences could be attributed to differences in workloads or

biological and anthropometric measurements [25].

Gender differences in addition to psychological status proved to be significant predictors of all forms of MSDs detected by this study. Psychosocial status was found to be consistently related to MSDs by other workers [3,7,26].

Smoking was also shown to be a significant predictor for MSDs occurring during the previous 12 months, while drinking alcohol, duration at work and age could predict disabling attacks of MSDs.

The high prevalence of MSDs may be a symptom of "system failure" that should be addressed to improve both quality and productivity. Programmes for prevention of MSDs should be incorporated within a wider ergonomic approach to promote the health of workers. Also, a comprehensive approach including system goals, task allocation, work organization and job design is needed. Further studies are required to elaborate the relation between job demands and loads as well as other organizational and social factors on occurrence of MSDs

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