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Abstract

Relationship of Burdened Work and Musculoskeletal Symptoms in Small-to-medium-sized Enterprises.

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Objective: This study was performed to evaluate relationship of burdened work and musculoskeletal symptoms in small-to-medium sized enterprises.

Method: After a questionnaire survey was administered to 9,950 workers in 122 workplace, 7,626 workers(76.6%) were finally selected for the study analysis.

Industrial hygienists visited 122 small-to-medium sized enterprises to investigate the presence of burdened works within the workplace. The selection of jobs with significant burden was based on the Ministry of Labor 's recent notification in 11 types of job description associated with musculoskeletal disorders. The subjects of this study were then divided into three categories. 1) non-burdened white collar workers, 2) non-burdened blue collar workers, and 3) burdened workers (include some VDT workers). Multiple logistic regression was used to evaluate the relationship between burdened work and musculoskeletal symptoms.

Results: The burdened workers reported significantly more musculoskeletal symptoms than non-burdened white collar workers and non-burdened blue collar workers(OR:1.57, 95% CI: 1.314-1.875). There was no significant difference in reports of musculoskeletal symptoms between non-burdened white and blue collar workers.

Conclusion: To prevent or diminish musculoskeletal disorders in small-to-medium sized enterprises, we need to better manage burdened works.

Key Words: Musculoskeletal symptom, Burdened works

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Table 1. General characteristics

Item		Musculoskeletal symptom(-) N*(%)	Musculoskeletal symptom(+) N*(%)	p-value
Sex	male	3845 (70.0)	1648 (30.0)	0.000
	female	1194 (56.6)	917 (43.4)	
Age	<30	1325 (62.6)	791 (37.4)	0.000
	30-39	1518 (67.3)	739 (32.7)	
	40-49	1330 (65.5)	700 (34.5)	
	50	855 (72.0)	333 (28.0)	
Marital status	non-married	1581 (65.0)	852 (35.0)	0.274
	married	3148 (66.3)	1602 (33.7)	
BMI	<20	535 (60.4)	351 (39.6)	0.000
	20.0-24.9	3058 (67.5)	1470 (32.5)	
	25.0	1039 (66.5)	524 (33.5)	
Drinking	none	1607 (64.0)	904 (36.0)	0.034
	2-3/month	1493 (67.6)	717 (32.4)	
	1-2/week	1436 (67.3)	697 (32.7)	
	3/week	395 (65.0)	213 (35.0)	
Smoking	non-smoker	2197 (63.9)	1243 (36.1)	0.001
	ex-smoker	527 (69.3)	234 (30.7)	
	current smoker	2202 (67.7)	1050 (32.3)	
Domestic affair (hr/day)	2hr	4200 (67.1)	2058 (32.9)	0.000
	>2hr	463 (55.4)	373 (44.6)	

*Some responses were omitted

Table 2. Work-related characteristics

Item		Musculoskeletal symptom(-) N*(%)	Musculoskeletal symptom(+) N*(%)	p-value
Shift work	no	2977 (65.0)	1603 (35.0)	0.013
	yes	1370 (68.2)	640 (31.8)	
Extra work	no	1251 (70.3)	529 (29.7)	0.000
	yes	2505 (62.0)	1533 (38.0)	
Job tenure(yr)	<1	981 (69.6)	428 (30.4)	0.000
	1-4	1879 (62.9)	1107 (37.1)	
	5-9	599 (61.4)	376 (38.6)	
	10	652 (67.0)	321 (33.0)	
Worktime(hr)/day	8	2628 (66.9)	1301 (33.1)	0.000
	>8	1430 (62.0)	878 (38.0)	
Work load change	not changed	2998 (69.2)	1333 (30.8)	0.000
	decreased	376 (64.9)	203 (35.1)	
	increased	1146 (57.4)	850 (42.6)	
Job strain	low strain	1365 (75.8)	435 (24.2)	0.000
	passive	776 (67.4)	376 (32.6)	
	active	1103 (63.8)	627 (36.2)	
	high strain	903 (55.6)	721 (44.4)	

*Some responses were omitted

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(Kna ve et al, 1985; Park et al, 1989) , 1-9 가 , 10 (Park et al, 1996) (Ong et al, 1995; Kwon et al, 2004) , (Sim et al, 2002).

(Park et al, 2004; Moon et al, 1991; Kim et al, 1995; Park et al, 1995; Choi et al, 1996) 가 (strain) 가

가 가 (Moon et al, 1991; Choi et al, 1996)가 (Bonger et al, 1993; Evanoff et al, 1994; NIOSH, 1997). 가 (Yim et al, 1997) (Kim et al, 2003) 가 (Han et al, 2003) (Park et al, 2004) 30 가

30 가 (healthy worker effect)가 가

Table 3. Musculoskeletal symptoms and Body region according to burdened work Unit: N (%)

Body region	Neck*	Shoulder*	back*	arm /elbow*	wrist /finger*	knee*	leg /foot*	more than one*
White collar workers (no burden) (N=1638)	253 (21.5)	318 (19.4)	214 (13.1)	46 (2.8)	127 (7.8)	91 (5.6)	76 (4.6)	542 (33.1)
Blue collar workers (no burden) (N=3530)	310 (8.8)	532 (15.1)	467 (13.2)	197 (5.6)	312 (8.8)	250 (7.1)	231 (6.5)	1006 (28.5)
Burdened workers (N=2458)	287 (11.7)	542 (22.1)	447 (18.2)	265 (10.8)	396 (16.1)	251 (10.2)	266 (10.8)	1022 (41.6)

*p<0.01 by Chi-square test

Table 4. Odds ratio of musculoskeletal symptoms according to burdened work

Burdened work	Odds ratio*	95% Confidence interval
White collar workers(no burden)	1	-
Blue collar workers(no burden)	0.955	0.809 - 1.128
Burdened workers	1.570	1.314 - 1.875

*adjusted by sex, age, BMI, shift work, extra work, job tenure, work load change, job strain

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