



## Assessment of Work-Related Musculoskeletal Disorders among office workers in Shahid Beheshti University of Medical Sciences in Tehran, Iran

Mohammad Hossein Delshad<sup>1</sup>, Sedigheh Sadat Tavafian<sup>2\*</sup>, Anoshirvan Kazemnejad<sup>3</sup>

1. Department of Health education and health promotion, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran.
2. Department of Health Education, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran.
3. Department of Biostatistics, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran.

**Background:** Work-Related Musculoskeletal Disorders (WRMSD) is one of most prevalent health problem among individuals with limited physical activity. This study aimed to assess this problem among office workers in Shahid Beheshti University of Medical Sciences in Tehran, Iran.

**Methods and Material:** Totally, 42 eligible office workers from three health centers related to Shahid Beheshti University of Medical Sciences (SBUMS) between May, 2016-September, 2016 were recruited in this cross-sectional study. Of all these individuals, 420 office workers (response rate 99.2%) were satisfied to participate in this study. In Standard Nordic questionnaire were used to collect data. Collected data were entered to SPSS 16 and analyzed through descriptive and analytical tests.

**Results:** Totally, 420 office workers with mean age of  $37.1 \pm 8.03$  were examined in this study. The most prevalent WRMSD was lower back pain (N = 56, 13.3%) followed by neck pain (N = 46, 11.0%), wrist pain (N = 43, 10.2%), hip pain (N = 6, 1.4%) and pain in heel of foot (N = 17, 4%). The variables such as age ( $\chi^2 = 24.99$ ; P = 0.003); gender ( $\chi^2 = 0.544$ ; P = 0.028); employment status ( $\chi^2 = 9.837$ ; P = 0.007); duration of pain ( $\chi^2 = 1.551$  P = 0.001) and duration of treatment ( $\chi^2 = 1.006$ ; P=0.001) were significantly related to WRMSD.

**Conclusions:** Since the WRMSD are prevalent among office workers of SBUMS, designing proper interventional studies are recommended. However, doing more researches to confirm the results of this study is guaranteed.

**Keywords:** Work-Related Musculoskeletal Disorders, Health Centers, Office workers, Prevalence

### Introduction

Work-Related Musculoskeletal Disorders (WRMSD) is one of the most important reason for job disability that in turn leading to job impairment and also economical cost for individuals, organizations and communities worldwide. These worksite health problem such as low back pain, shoulder pain and pain in other musculoskeletal system usually are seen after a long time sedentary position in working sites (Biswas et al., 2017). Assessing the prevalence of WRMSD among office workers is

recommended due to two main reasons including. detection of musculoskeletal disorders and find out their relevant factors that cause these disorders (Biswas et al., 2017).

Furthermore, finding out the factors influencing WRMSD, would be resulted in designing and implementing proper intervention which is so important for preventing the problem (Comper et al., 2017).

A sedentary lifestyle could be led to WRMSD<sup>2</sup> in the workplaces. For instance, office workers who work with computer in a sitting position for a long-term in their worksites may more likely to suffer from WRMSD (Madadzadeh et al., 2017). Although there are limited research studies in order to estimate the WRMSD and relevant factors in different working sites (Ehsani et al., 2017, Mirzaei and Ansari, 2017, Noormohammadpour et al., 2017, Yousefi et al., 2017), doing more studies

Corresponding author: Health Education Department, Faculty of Medical Sciences, Tarbiat Modares University, Tehran. P. O. Box: 14115-331, Tel: 0098 21 82884547; Fax: 00982182884555; e-mail: tavafian@modares.ac.ir

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<sup>2</sup>. WRMSD

in this regard to clear the real prevalence of WRMSD among office workers who work with computers are guaranteed. This study aimed to assess Work-Relevant Musculoskeletal Disturbances among Office workers working in Shahid Beheshti University of Medical Sciences in Tehran, Iran.

## Methods

This cross-sectional study was done among office workers who were working in health centers affiliated to SBMU. From all health centers (N = about 140) three health centers located in different geographically areas of Tehran city, were selected randomly. Of all these centers, 420 office workers were recruited to enter into the study. Inclusion criteria for entering the office workers into the study were as being aged 18 years and above and also working with the computer in the health centers at least for 6 months. However, every office workers who suffering from any disability or illness which were barriers for doing tension exercises and also the individuals who were not satisfied to enter into the study were excluded from the study.

The data were collected by a questionnaire regarding demographic characteristics of the office workers as well as a standard Nordic questionnaire (Parry et al., 2017). This questionnaire has 19 questions about demographic information (15 questions), musculoskeletal problems (5 questions) and VAS<sup>3</sup> (1 question). Validity and reliability of the Persian version of this questionnaire were approved in previous study (Khosroabadi et al., 2010, Rahimabadi et al., 2012, SAMAEI et al., 2015). In this study, the validity and reliability of the questionnaire were demonstrated through Intra Class (ICC<sup>4</sup>) and Cronbach's alpha that were obtained as 0.631 and 0.781 respectively. The data analyzing was done using SPSS 16 (Chicago, IL, USA). The T-test, Chi-square test and univariate/multivariate binary logistic regression were used to examine odds ratios and confidence intervals regarding relationships between planned variables. All comparison tests were considered at a significant level of < 0.05.

In this study all ethical principals were considered. All the participants were provided with the full explanation about the procedures and targets of the study and written consent form was

completed by them. Ethics committee of tarbiat Modares University approved the study.

## Results

In all, 420 office workers from 424 ones (99.2% response rate) with mean age of 37.1 (SD = 8.03) years were examined in present study. The majority of participants aged between 30-35 years (N = 106, 25.2%) The highest percentage of participants were graduated with undergraduate college degree (N = 258, 61.4%). The rest of demographic characteristics of studied office workers and the rate of WRMSD in different subgroups are shown in Table 1.

Table 2 shows the frequency and percent of different WRMSD in studied participants.

As it is shown in Table 2, lower back pain is the most prevalent disorder (N = 56; 13.3%) followed by neck pain (N = 46; 11.0%) and wrist pain (N = 43; 10.2%).

The unilabiate and multivariate logistic regression was done to determine the risk factors for WRMSD among office workers. This information is shown in Table 3. As this Table shows, the chance of WRMSD in office workers who were not treated was several times more than who were treated (O. R = 3.871; CI: 1.832-10.175; P = 0.005).

## Discussion

The present study showed the high prevalence of WRMSD among office workers who worked with computer in their worksites. This results are supported by the findings of previous evidences in different societies (Ehsani et al (year of the study) Jakobsen et al., 2017, Adeleke et al., 2017, Malmberg-Ceder et al., 2017). According to these studies, it could be discussed that the WRMSD is a worldwide health problem in both developed and undeveloped countries. Therefore, paying more attention to it and finding the best problem solving approaches by the governments as well as private section is strongly recommended. In present study, it was cleared that the WRMSD were less prevalent among women compared to men. This result is in contrast with results by the previous evidence that reported workers and women were more likely to suffer from WRMSD (Steenstra et al., 2017; Malmberg-Ceder et al., 2017) Although the results of this study showed that back pain was the most prevalent problem among studied office workers and it is in consistent with other existed evidences (van der Zee-Neuen et al., 2017), there

<sup>3</sup>. Visual Analogue Scale

<sup>4</sup>. Intra Class

are some differences between results of the present study and the other studies regarding the rates of WRMSD in differen subgroups (De Almeida et al., 2017) so that in present study the rates of these disorders were reported less that the other studies. These differences may be due to different resaons such ad different demographic, social and cultural charististics of the studied samples in different studies. However, this is an important point of the current study and it should be considered in future

studies and so more researches should be done in this regard. The previous evidence has focused on this point and recommended more researches (De Almeida et al., 2017). In accordance with this argument, differences in target group diversity and also activity levels in different workers, for example, who working in construction, industry, or who are municipal workers or Office workers and who work in traditional agriculture or mechanized agriculture should also be considered.

**Table 1. Demographic characteristics of studied office workers.**

Characteristics	Levels	Frequency (n = 420)	Frequency and Percent of WMSD N (%)		P-value
		N (%)	Yes	No	
Age group (yr)	<= 25	26 (6.2)	(0) 0	(26) 6.2	0.003
	26-30	45 (10.7)	(21) 5	(24) 10.2	
	31-35	106 (25.2)	(24) 5.7	(82) 19.5	
	36-40	78 (18.6)	(11) 2.4	(67) 16.2	
	41.00 +	165 (39.3)	(48) 11.2	(117) 28.1	
Gender	Male	113 (26.9)	(58) 13.8	(55) 59.3	0.028
	Female	307 (73.1)	(25) 6	(282) 21	
Marriage status	Single	132 (31.2)	(16) 3.8	(116) 27.4	0.037
	Married	289 (68.8)	(67) 15.9	(221) 52.9	
Education level	≤ 12 years	0 (0)	0 (0)	0 (0)	0.683
	14-year college degree (16-year)	0 (0)	0 (0)	0 (0)	
	college degree (20-years)	45 (10.7)	(9) 2.1	(36) 8.6	
	Master	258 (61.4)	(47) 11.2	(211) 50.2	
	PhD and above (26-years)	60 (14.3)	(14) 3.3	(46) 11	
Type of Health center *	North (3, 4, 6-8)	150 (35.7)	(18) 4.3	(132) 24.8	0.717
	East (11-15)	150 (35.7)	(19) 4.5	(131) 31.4	
	Shemiranat (1)	120 (28.6)	(46) 11	(74) 24	
Employment status	Official	125 (29.8)	(13) 3.1	(112) 26.7	0.007
	Others	295 (70.2)	(70) 16.7	(225) 53.6	
Being treated	Yes	83 (19.8)	(34) 8.1	(49) 72.1	0.001
	No	337 (80.2)	(49) 11.7	(288) 68.5	
Duration of pain	< 1	61 (14.5)	(5) 1.2	(56) 13.3	0.001
	1-2	31 (7.4)	(27) 6.4	(4) 1	
	2-3	18 (4.3)	(16) 4	(2) 0.3	
	3-5	13 (3.1)	(8) 1.9	(5) 1.2	
	5 +	31 (7.4)	(11) 2.6	(20) 4.8	
	Non pain	266 (63.3)	0 (0)	266 (63.3)	
Duration of Treatment	< 1	111 (26.3)	(58) 13.8	(53) 12.5	0.001
	1-2	30 (3.8)	(18) 2.3	(12) 1.5	
	2-3	5 (1.2)	(4) 1	(1) 0.2	
	3-5	3 (0.7)	(2) 0.5	(1) 0.2	
	5 +	15 (3.6)	(10) 2.4	(5) 1.2	
	Non pain	266 (63.3)	0 (0)	266 (63.3)	
BMI (kg/m2)	Underweight (< 20)	50 (11.9)	(4) 1	(46) 10.9	0.015
	Normal weight (20-24.9)	192 (45.7)	(2) 0.5	(190) 5.2	
	Overweight (25-29.9)	147 (35)	(54) 12.9	(93) 22.1	
	Obesity (> 30)	31 (7.3)	(25) 5.9	(6) 1.4	

\*In terms of municipalities.

In this study, there was significant relationship between musculoskeletal disorders and employment status which is consistent with the findings of other studies (Jakobsen et al., 2017; Adeleke et al., 2017; van der Zee-Neuen et al., 2017).

Although in some previous studies, it was revealed that the prevalence of musculoskeletal disorders among educated people was less than those with

lower level of education due to this fact the higher educated individuals are more awarded regarding the important role of doing exercises and daily activities, for WRMSD prevention (Kwon et al., 2006, Ramezani et al., 2015), our study did not show the relationship between education and WRMSD rate. Thus, to confirm this result, doing more researches with larger samples is strongly recommended.

**Table 2. Frequency and percent of WRMSD in studied participants.**

MSD N (%)	Low back	Knees	shoulder	Heel	Neck	Wrist	Elbow	Pelvic	Finger joint
	56 (13.3)	24 (5.7)	29 (6.9)	17 (4)	46 (11)	43 (10.2)	36 (8.6)	6 (1.4)	34 (8.1)
*P-value	0.000	0.005	0.152	0.647	0.035	0.235	0.701	0.893	0.772

WRMSD: Work-Related Musculoskeletal Disorders.

\*Chi square test P-value.

in the present study, there was significant relationship between musculoskeletal disorders and BMI that is in the line of results reported by previous evidences (Ehsani et al., 2017 & Kwon et al., 2006). Moreover, existed study showed that high body mass index could increase chance of suffering from musculoskeletal disorders up to 1.2 times (De

Almeida et al., 2017). In present study, the significant relationship between musculoskeletal disorders and age was also revealed which is supported by the existed evidences (De Almeida et al., 2017 & Chou et al., 2017). Although, there were some strong points for this study, some limitations might encounter with the results of it.

**Table 3. Factors associated with WRMSD in office workers.**

Factor	Levels	Frequency	Percent (%)	Crude OR (%95CI)	P	Adjusted OR (%95CI)	P
BMI (kg/m <sup>2</sup> )	Underweight (< 20)	6	0.32	0.43 (0.21-1.08)	0.26	0.42 (0.11-1.07)	0.16
	Normal weight (20-24.9)	47	0.34	1 [Reference]	...	1 [Reference]	...
	Overweight (25-29.9)	50	0.38	2.43 (1.12-3.44)	0.01	2.48 (1.02-3.04)	0.01 <sup>c</sup>
	Obesity (> 30)	10	0.40	1.49 (1.31-2.45)	0.33	1.09 (1.01-2.29)	0.43
Gender	Female	307	0.74	1 [Reference]	...	1 [Reference]	...
	Male	113	0.48	0.499 (0.249-1)	0.050	0.506 (0.252-1.017)	0.056
Duration of pain (yr.)	< 1	61	0.43	1 [Reference]	...	1 [Reference]	...
	1-2	31	0.42	0.401 (0.304-11.193)	0.001	0.406 (0.304-10.184)	0.000 <sup>d</sup>
	2-3	18	0.40	0.398 (0.254-8.201)	0.001	0.368 (0.144-8.107)	0.000 <sup>d</sup>
	3-5	13	0.38	0.322 (0.212-8.187)	0.001	0.312 (0.710-7.087)	0.000 <sup>d</sup>
	5 +	31	0.42	0.398 (0.254-8.201)	0.001	0.320 (0.184-7198)	0.000 <sup>d</sup>
Being treated	Yes	83	0.50	1 [Reference]	...	1 [Reference]	...
	No	337	0.87	4.153 (1.541-11.193)	0.005	3.871 (1.832-10.175)	0.005

WRMSD: Work-Related Musculoskeletal Disorders.

a No/very low WRMSD low/moderate/high/very high WRMSD.

b No/very low/low WRMSD moderate/high/very high WRMSD.

c P < .05.

d P < .01.

The first limitation is that during cross-sectional studies, the researchers could not find the causes of the studied variables, so doing more causative studies are strongly recommended to find the influencing factors for WRMSD. Secondly, the data in this study were collected through self-reporting that might be not true exactly. In spite this limitation, the results of this study were supported by previous studies that meant the gathered data were valid. Although the studied office workers were randomly selected, they all came from one university that might encounter with the generalization of the results to all total population who living in Tehran. Thus, doing multi central researches is strongly suggested in future.

### Conclusions

Given the outbreak and prevalence of WRMSD, particularly among office workers as well as significant relationship between age, BMI, treatment and WRMSD, designing proper interventional programs for high risk groups are recommended. However, confirming these results in future studies is suggested

### Conflict of Interest

There were no conflict of interest regarding the material and results of this study.

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