

Work Related Musculoskeletal Disorders among Egyptian Otorhinolaryngologists: An Observational Cross Sectional Design

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Abstract: Otorhinolaryngologists are known to be prone to work related musculoskeletal disorders but its prevalence among otorhinolaryngologists in Egypt has not been reported. The purpose of the study was to investigate the prevalence of work related musculoskeletal disorders and to investigate relationship between risk factors and musculoskeletal disorders among Egyptian otorhinolaryngologists. Two hundred and twenty five otorhinolaryngologists were recruited from educational and Cairo university hospitals their ages ranged from 26:55 years, all were given dutch musculoskeletal questionnaire to answer the questions to assess the prevalence of musculoskeletal disorder, there was found that the higher prevalence of disorders were at the neck region (55.1%), shoulder (49.33), upper back (44.4%), wrist and hand (22.6%), lower back (35.1%), hip (22.6%), knee (37.78%), foot and ankle (19.11%), elbow (14.67). There was significant pain in different parts of the body.

Key words: Musculoskeletal Disorders • Work Related • Otorhinolaryngologists

INTRODUCTION

Musculoskeletal disorders (MSDs) are an important public health problem in both developed and developing countries, with substantial impact on the quality of life as well as a substantial economic burden in compensation costs, lost wages and productivity [1].

Wong *et al.* [2] surveying otolaryngology residents found that 6.4% residents missed work and 16.3% stooped during an operation at some point because of their symptoms.

Among surveyed members of the American Society of Pediatric Otolaryngology (ASPO), 62% experienced musculoskeletal pain, with female respondents more likely to report symptoms [3].

There is little studies about work related musculoskeletal disorders among Egyptian otorhinolaryngologists so the purpose of this study to investigate the prevalence of musculoskeletal disorders in Egypt. Therefore, the aim of this study was to identify the

musculoskeletal disorders in different body regions (Neck, back, upper limbs and lower limbs) among Egyptian otorhinolaryngologists.

To investigate the relationship between the risk factors (Personal and ergonomic factors) and the development of musculoskeletal disorders among Egyptian otorhinolaryngologists.

MATERIALS AND METHODS

The current study was conducted to identify the musculoskeletal disorders in different body regions (Neck, back, upper limbs and lower limbs) and to investigate the relationship between the risk factors (Personal and ergonomic factors) and the development of musculoskeletal disorders among Egyptian otorhinolaryngologists in Cairo educational hospitals, Cairo University hospitals, Cairo teaching hospitals in Egypt. The study was conducted in the period from September 2017 to April 2019.

Design of the Study: Cross-sectional observational study.

Participants: Two hundred and twenty-five (Male and female) otorhinolaryngologists participated in the study. participants included in this study were otorhinolaryngologist in Cairo educational hospitals Cairo University hospitals, Cairo teaching hospitals their age ranged from 26_33. Both genders were included in the study Otorhinolaryngologists who had any musculoskeletal abnormalities due to other causes related to work (i.e. congenital, traumatic), Otorhinolaryngologists with previous operation involving locomotors system and Pregnant women. Were all excluded.

Instrumentation

Dutch Musculoskeletal Questionnaire (DMQ): Netherlands Institute for Applied Scientific Research (TNO) developed a questionnaire called the 'Dutch Musculoskeletal Questionnaire' (DMQ); which is valid and reliable, to measure the self-reported musculoskeletal workload and other associated hazardous working conditions as well as related [4].

Description: A questionnaire ('Dutch Musculoskeletal Questionnaire', DMQ) for the analysis of musculoskeletal workload and associated potential hazardous working conditions as well as musculoskeletal symptoms in worker populations is described and its qualities, This questionnaire can be used as a simple and quick inventory for occupational health services to identify worker groups in which a more thorough ergonomic analysis is indicated [4].

Items: The following sections are distinguished in the questionnaire:

- Background variables (e.g. age, gender, education, duration of employment, work history, shift work).
- Tasks (Prevalence rates and perceived heaviness of task demands).
- Musculoskeletal workload (Postures, forces, movements).
- Health, in particular musculoskeletal symptoms; the phrasing of questions on prevalence is comparable with the 'Nordic Questionnaire on Musculoskeletal Disorders' [5].
- Musculoskeletal workload (Postures, forces, movements) is addressed in questions.

Validity of the Questionnaire: Self-reporting general questionnaire, Dutch Musculoskeletal Questionnaire, was used for this study. These questionnaire is valid and reliable that include various parameters related to MSD [6].

Procedure of Study: Two hundred and twenty five copies of the questionnaire were given to selected otorhinolaryngologiststs that work in educational and general and university hospitals in Egypt for self-administration.

Data Collection and Statistical Analysis: The data was collected from the questionnaires which were answered by 225 otorhinolaryngologiststs who work in educational and general hospitals in Egypt asked to complete a self-administered questionnaire.

- Descriptive statistics was used to estimate the prevalence of work related musculoskeletal disorders and demographic characteristics and physical risk factors.
- Frequencies and cross- tabulations were used to compare musculoskeletal disorders prevalence and demographics, work history and physical risk factors.
- The Cochran-Armitage test also was used to assist relationship between work related musculoskeletal disorders risk factors of work.
- Level of significance was set at < 0.05 .

RESULTS

In The current study two hundred and twenty five otorhinolaryngologists participated in the study and all participants were given the Dutch musculoskeletal questionnaire.

Table (1) shows the mean \pm SD, AGE, Weight, height, BMI And hours of work.

Table (2) shows the Prevalence of musculoskeletal disorders among Egyptian otorhinolaryngologists at different regions in the past 12 months.

In the current study, it was found that the higher prevalence of disorders were at neck, shoulder, upper back, wrist and hand, lower back, hip, knee and elbow.

Also This study revealed a number of risk factors that causes musculoskeletal disorders in different body regions as follow:

Table 1: Physical characteristics of otorhinolaryngologists in this study.

Items	N	Minimum	Maximum	Mean	Std. Deviation
Age	225	26	55	38.48	8.56
Height	225	150	190	171.23	8.81
Body mass index	225	45	140	79.39	14.28
BMI	225	19.59	40.76	26.56	3.55
Experience	225	1.00	30.00	13.449	8.54
Hours of work	225	24.00	76.00	48.66	11.45

Table 2: Prevalence of musculoskeletal disorders among Egyptian otorhinolaryngologists at different regions in the past 12 months:

Regions	Response by "yes"	Response by "No"
Neck	118 (52.4%)	107 (47.6%)
Upper Back	96 (42.7%)	129 (57.3%)
Lower back	71 (31.6%)	154 (68.4%)
Shoulders	106 (47.1%)	119 (52.9%)
Elbow	25 (11.1%)	200 (88.9%)
Wrist and hand	37 (16.4%)	188 (83.6%)
Hip and thigh	18 (8 %)	207 (92%)
Knee	34 (15.1%)	191 (84.9%)
Foot and ankle	22 (9.8%)	203 (90.5%)

Table 3: Shows The Cochran-Armitage test between proportion of subjects who worked in a twisted posture for long periods with trunk and pain in the right elbow, left wrist and right hip.

	Work in a twisted posture with trunk								
	Right elbow			Right hip/thigh			Left wrist/hand		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Sometimes Count	13	9	22	14	11	25	6	9	17
% within	59.1%	40.9%	100%	56%	44%	100%	66.7%	52.9%	100%
Regularly Count	0	0	0	1	0	1	2	1	1
% within				100%	0%	100%	100%	100%	100%
Chronically Count	4	0	4	2	0	2	2	0	4
% within	100%	0%	100%	100%	0%	100%	50%	0%	100%
Never Count	71	128	199	71	125	196	78	127	203
% within	35.7%	64.3%	100%	36.2%	63.8%	100%	37.1%	62.6%	100%
Total Count	88	137	225	88	136	224	88	137	225
% within	39.1%	60.9%	100%	39.3%	60.7%	100%	39.1%	60.9%	100%
Score	7.339			4.03			7.33		
p-value	0.007			0.045			0.007		

Table 4: Shows The Cochran-Armitage test between proportion of subjects who worked in a twisted posture for long periods with neck and pain in the right elbow, left elbow

	Work in a twisted posture with neck					
	Right elbow			Left elbow		
	Yes	No	Total	Yes	No	Total
Sometimes Count	22	0	22	17	0	17
% within	100%	0.90%	100%	100%	0%	100%
Regularly Count	0	0	0	1	0	1
% within				100%	0%	100%
Chronically Count	4	0	4	4	0	4
% within	100%	0%	100%	100%	0%	100%
Never Count	161	38	199	165	38	203
% within	80.9%	19.1%	100%	81.3%	18.7%	100%
Total Count	187	38	225	187	38	225
% within	83.1%	16.9%	100%	83.1%	16.9%	100%
Score	5.29			4.27		
p-value	0.021			0.039		

Table 5: Shows The Cochran-Armitage test between proportion of subjects who worked in a twisted posture for long periods with wrist and pain in the right elbow, left elbow

	Work in a twisted posture with neck					
	Right elbow			Left elbow		
	Yes	No	Total	Yes	No	Total
Sometimes Count	22	0	22	17	0	17
% within	100%	0.90%	100%	100%	0%	100%
Regularly Count	0	0	0	1	0	1
% within				100%	0%	100%
Chronically Count	4	0	4	2	2	4
% within	100%	0%	100%	50%	50%	100%
Never Count	154	45	199	160	43	203
% within	77.4%	22.6%	100%	78.8%	21.2%	100%
Total Count	180	45	225	180	45	225
% within	80%	20%	100%	80%	20%	100%
Score	5.54			3.51		
p-value	0.011			0.016		

The Cochran-Armitage test showed a statistically significant linear trend, $p = 0.007, 0.045, 0.007$ between pain in right elbow, right hip and left wrist and proportion of subjects who worked in a twisted posture with trunk for long periods.

The Cochran-Armitage test showed a statistically significant linear trend, $p = 0.021, 0.039$ between pain in right elbow and left elbow and proportion of subjects who worked in a twisted posture with neck for long periods.

The Cochran-Armitage test showed a statistically significant linear trend, $p = 0.011, 0.016$ between pain in right elbow and left elbow and proportion of subjects who worked in a twisted posture with wrist for long periods.

DISCUSSION

The present study was designed to investigate the prevalence of work related musculoskeletal disorders among otorhinolaryngologists and to investigate the relationship between the risk factors (Personal and ergonomic factors) and musculoskeletal disorders in different body regions.

There are increased reports of prevalence of work-related musculoskeletal disorders (WRMSDs) in surgeons performing minimal access surgeries. Due to the nature of the specialty, otorhinolaryngologists spend their work days in performing markedly precise procedures in small workspaces [7].

The otorhinolaryngologist's job profile encompasses key-hole surgeries, in the operation theatre and examining deep narrow cavities in the outpatient setup [8] the outpatient department examination and surgical procedures necessitate sitting posture for prolonged duration leading to a predominantly sedentary working lifestyle. Due to continuous use of devices like head-light,

otoscope, microscope, endoscope, they frequently adopt awkward neck, back and shoulder postures in the outpatient room [7].

Head and neck surgery, though being an open surgery is nevertheless associated with prolonged standing, awkward body positions and the occasional need to exert substantial forces on tissues, which are all associated with WRMSDs. Often head and neck surgery requires a team approach and this puts constraints on the optimal table height, the posture of the surgeon and assistants and their movements as they perform tasks in synchrony without obstructing each other's line of vision [9].

The finding of prevalence of the disorders of the current study agreed with Wytse J Fokkens *et al.* [10] found the most frequently affected body areas among otorhinolaryngologists were the neck (60.3%), back (59.8%) and shoulders (50.8%), although over 10% of surgeons also reported symptoms in the fingers (17.9%), wrists (11.7%), thumbs (10.6%) and knees (10.6%).

The finding of the current study agreed with those obtained by Valerie J Lund *et al.* [11] found that Sixty-three per cent among otorhinolaryngologists described symptoms in the shoulder, 54% in the hands and 46% in the neck; 23% had sought medical advice.

Also the result was in line with Vijendren *et al.* [12] who found that, Of those who reported work-related musculoskeletal disorders among otorhinolaryngologists, 24.1 per cent had pain in multiple parts of their body, whereas 16.7 per cent only had a single body part affected. The commonest areas affected were the neck (29.7 percent) and back (27.9 per cent), both individually and in combination.

Other factors like force application, limited workspace, temperature related and inadequate

illumination were reported less frequently as causal to development of WRMSDs [7].

An American study found that 73% of ENT surgeons feel that the ergonomics of Endoscopic sinus surgery (ESS) cause fatigue and 77% reported symptoms as a result of performing ESS. Sixty-three per cent described symptoms in the shoulder, 54% in the hands and 46% in the neck; 23% had sought medical advice [11].

This was confirmed by Twinkle Dabholkar *et al.* [7] who stated that The back and neck pain can be attributed to their prolonged stoop sitting or stoop standing postures adopted while doing repetitive, precision surgical tasks using microscope or nasal endoscope. Also an unorganized work set-up and inadequate assistance will cause the surgeon to repeatedly reach out for instruments.

Elbow, wrist and hand pain in the otolaryngologists may be due to uncomfortable instrument handles, repetitive upper limb movement, awkward wrist and forearm postures, cold temperatures in OR and vibrations associated with instruments like drills and suction handles. Epidemiological research associates the onset and severity of hand and wrist WRMSDs with repetitive cyclical loading of the upper extremity, performance of repetitive hand-intensive tasks, awkward or extreme wrist and forearm postures, cold temperatures and vibration [13, 14].

CONCLUSION

The prevalence of work related musculoskeletal disorders among otorhinolaryngologists in Egypt is near to the values reported for the counterparts around the world. Physical therapy can Prevent otorhinolaryngologists from risk factors that affect their health and work by educating them about the correct postures during their work and preventing work-related injuries. also help them for beter understanding about ergonomics in their work.

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