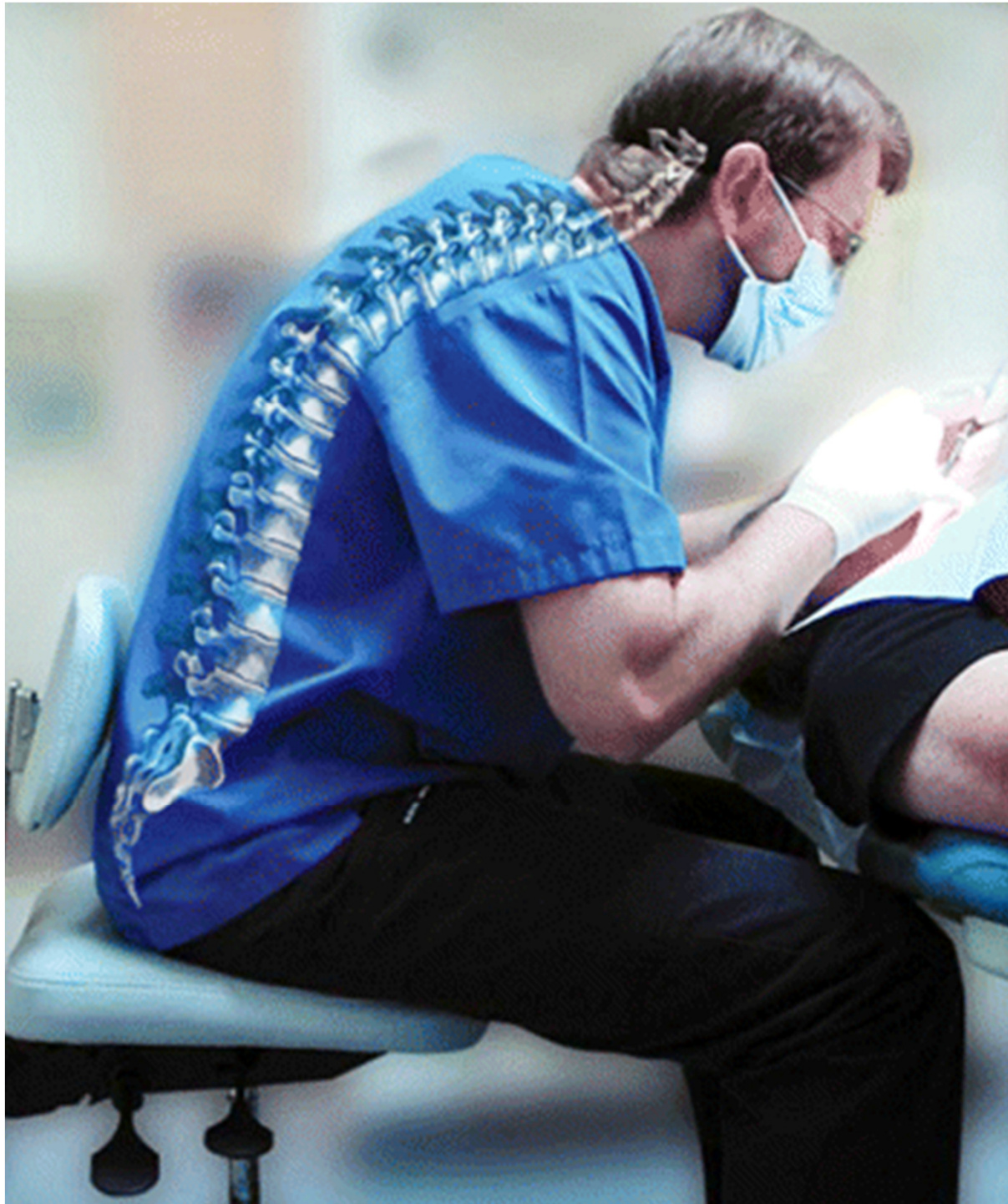


# Musculoskeletal Disorders among Dentists in Alexandria



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# Musculoskeletal disorders (MSD)

- **Musculoskeletal disorders (MSD), is a term used to describe injuries of tendons, ligaments, nerves and supporting structures. MSD have become increasingly common worldwide among the healthcare professional, where, dentists are at high risk for developing profession-related disorders such as MSD. (Puriene etal; 2008)**

- **Markin and Cherney (2005)** stated “Dentists assume static postures on a daily basis, these postures require more than 50% of the muscles of the body to contract to hold the body motionless while resisting gravity ,it has been shown that both dentists and dental hygienists spend 86% of their work time with a neck and trunk flexion of at least 30 degrees”.

- **Many dentists had reported work stress caused by MSD that disrupt their practice. Some think of leaving the profession because of MSD pain.**



# Materials & Methods

# Materials & Methods

- **Survey cross sectional study with a random sample of 210 dentists from different public dental clinics to study MSD prevalence among dentists in Alexandria.**

# Questionnaire

- **Specially designed questionnaire was used for collection of data that serve the purposes of the study.**
- **Percentage of the questions in the survey were:**
  - 30% related to demographic data.
  - 50% focus on different types of MSD.
  - 20% analysis of epidemiological risk factors associated with the occurrence of MSD.



# Demographic data

- **The first part included basic demographic data as:**
  - Age
  - Gender
  - Department of dentistry practice
  - Years of practice
  - Training on occupational health & safety.

# Different types of MSD

- **Information about MSD as:**
  - location of pain
  - Period of experience pain
  - Seeking for medical care and non steroid medication.

# Risk factors related to MSD

- **Risk factors which may be related to MSD such as:**
  - Number of patients per week
  - Bending of back and neck frequency
  - Repetitive movement of hands, as a result of using vibrating tools



# Statistical analysis

# Statistical analysis

- It was performed using the SPSS program version 20.
- Chi-square test was used to test the statistical association between sample characteristics and MSD.
- Fisher exact tests were used when the sample distribution was small.
- To identify the associated most important risk factors, multiple stepwise logistic regressions were used.



## Comparison of MSD region with gender

- **Table 1** Low back related symptoms were slightly higher in males (57.4%) than in females (52.6%).
- However, females were more significant than males in wrist region ( $p < 0.043$ ).

## Table I Comparison of MSD region with gender

Region	Female (135)		Male (54)		Total (189)		P
	No	%	No	%	No	%	
Low back	71	52.60	31	57.40	102	53.40	0.710
Neck	66	48.88	24	44.44	90	47.60	0.919
Shoulder	47	34.81	17	31.48	64	33.80	0.815
Wrist	36	26.66	8	14.81	44	23.30	0.043*
<b>Region</b>	<b>Female (135)</b>		<b>Male (54)</b>		<b>Total (189)</b>		<b>P</b>

## Prevalence of MSDs according to age groups of dentists.

- **Table II:** showed that lower back & neck related symptoms were higher with increased age ( $p < 0.048$  &  $p < 0.014$ ) respectively.
- Lower back related symptoms were the most prevalent in all age groups except in the age group (41-50 y) where the neck and shoulder symptoms had the highest percentages in this age.
- Wrist related symptoms were the least in the older age groups.

**Table II.** Prevalence of MSDs according to age groups of dentists.

Age (years)	Lower back		Neck		Shoulder		Wrist	
	No	%	No	%	No	%	No	No
23-30	13	52.0	5	20.0	2	8.0	9	36.0
31-40	39	47.6	31	37.8	20	24.4	28	34.1
41-50	27	57.4	32	68.1	29	61.7	4	8.5
51-60	23	65.7	22	62.9	13	37.1	3	8.6
<i>MCP</i>	0.048*		0.014*		0.085		0.119	

MCP: P value based on Mont Carlo exact probability

\* P < 0.05 (significant)

## Prevalence of MSDs according to age groups of dentists.

- **Table III:** Mild pain was documented in young age while sever pain was seen in old age with significant difference ( $p < 0.028$ )



**Table III** Relation between age and the degree of pain among dentists with MSD

Age (years)	Degree of pain						MCP
	Mild		Moderate		Severe		
	No	%	No	%	No	%	
23-30	22	88.0	3	12.0	-	-	0.028*
31-40	61	74.4	21	25.6	-	-	
41-50	6	12.8	36	76.6	5	10.6	
51-60	2	5.7	30	85.7	3	8.6	
<b>Total</b>	91	48.1	90	47.6	8	4.2	

MCP: P value based on Mont Carlo exact probability

\* P < 0.05 (significant)

**Table IV a** The relation of **MSD** and the characteristics of the dentists (gender).

Characteristics	Total	Presence of MSD				MCP
		Yes		No		
		No	%	No	%	
<b>Gender</b>						
▪ Male	63	54	85.7	9	14.3	0.838*!
▪ Female	147	135	91.8	12	8.2	

MCP: P value based on Mont Carlo exact probability  
 !: P value based on Fisher exact probability

\* P< 0.05 (significant)

**Table IV b** The relation of **MSD** and the characteristics of the dentists  
(Department of dentistry practice).

Characteristics	Total	Presence of MSD				MCP
		Yes		No		
		No	%	No	%	
Department of dentistry practice						0.761
▪ Surgery	90	78	86.7	12	13.3	
▪ Operative	42	39	92.9	3	7.1	
▪ Oral medicine	30	27	90.0	3	10.0	
▪ Orthodontic	12	12	100.0	0	0.0	
▪ Prosthesis	12	9	75.0	3	25.0	
▪ Endodontic	24	24	100.0	0	0.0	

MCP: P value based on Mont Carlo exact probability  
!: P value based on Fisher exact probability

\* P< 0.05 (significant)

**Table IV C** The relation of **MSD** and the characteristics of the dentists (Years of practice).

Characteristics	Total	Presence of MSD				MCP
		Yes		No		
		No	%	No	%	
<b>Years of practice</b>						0.270
▪ 1-10	54	51	94.4	3	5.6	
▪ 11-20	78	72	92.3	6	7.7	
▪ 21-30	57	45	78.9	12	21.1	
▪ 31-40	21	21	100.0	0	0.0	

MCP: P value based on Mont Carlo exact probability  
 !: P value based on Fisher exact probability

\* P < 0.05 (significant)

**Table IV D** The relation of **MSD** and the characteristics of the dentists  
(**Training on occupational health safety**).

Characteristics	Total	Presence of MSD				MCP
		Yes		No		
		No	%	No	%	
<b>Training on occupational health safety</b>						0.001*!
▪ Yes	21	0	0.0	21	100.0	
▪ No	189	189	100.0	0	0.0	

MCP: P value based on Mont Carlo exact probability  
!: P value based on Fisher exact probability

\* P < 0.05 (significant)



**Table V a** The relation of MSD and some risk factors related to the dentists  
(No. of patients / week)

Work Environment	Total	Presence of MSD				FEP
		Yes		No		
		No	%	No	%	
No. of patients / week						
▪ 10-20	27	18	66.7	9	33.3	0.074
▪ 21-30	6	6	100.0	0	0.0	
▪ 31-40	27	27	100.0	0	0.0	
▪ 41-50	24	18	75.0	6	25.0	
▪ 51-60	63	60	95.2	3	4.8	
▪ 61-70	63	60	95.2	3	4.8	

FEP: P value based on Fisher exact probability

\* P< 0.05 (significant)

**Table V b** The relation of MSD and some risk factors related to the dentists  
(Using vibrating tool)

Work Environment	Total	Presence of MSD				FEP
		Yes		No		
		No	%	No	%	
<b>Using vibrating tool</b>						0.337!
▪ Yes	63	60	95.2	3	4.8	
▪ No	147	129	87.8	18	12.2	

FEP: P value based on Fisher exact probability

\* P < 0.05 (significant)

**Table V b** The relation of MSD and some risk factors related to the dentists  
(**Breaks between patients**)

Work Environment	Total	Presence of MSD				FEP
		Yes		No		
		No	%	No	%	
<b>Breaks between patients</b>						
▪ Yes	42	21	50.0	21	50.0	0.001*
▪ No	168	168	100.0	0	0.0	

FEP: P value based on Fisher exact probability

\* P< 0.05 (significant)

**Table V c** The relation of MSD and some risk factors related to the dentists  
(**Bending of neck & back**)

Work Environment	Total	Presence of MSD				FEP
		Yes		No		
		No	%	No	%	
<b>Bending of neck &amp; back</b>						0.001*
▪ Yes	180	177	98.3	3	1.7	
▪ No	30	12	40.0	18	60.0	

FEP: P value based on Fisher exact probability

\* P< 0.05 (significant)

## Table V d The relation of MSD and some risk factors related to the dentists (Repetitive movement of hand)

Work Environment	Total	Presence of MSD				FEP
		Yes		No		
		No	%	No	%	
Repetitive movement of hand						0.001*
▪ Yes	168	168	100.0	0	0.0	
▪ No	42	21	50.0	21	50.0	

FEP: P value based on Fisher exact probability

\* P< 0.05 (significant)



## Table V e The relation of MSD and some risk (Simple office exercise)

Work Environment	Total	Presence of MSD				FEP
		Yes		No		
		No	%	No	%	
Simple office exercise						0.001*
▪ Yes	33	15	45.5	18	54.5	
▪ No	177	174	98.3	3	1.7	

FEP: P value based on Fisher exact probability

\* P< 0.05 (significant)

- **The logistic regression analysis for the risk factors revealed that repetitive movements of hands was by far the most leading factor to MSDs followed by bending of bending of back & neck .**

**Table V1** Results of multiple exact logistic regression analysis for risk factors of having MSD among dentists.

Factor	B	S.E.	P	OR	95.0% C.I for OR	
					Lower	Upper
Bending of neck & back	0.33	0.630	0.047*	1.40	1.02	6.70
Repetitive movement of hand	2.70	0.280	0.039*	14.93	0.70	318.04
Simple office exercise	-0.80	0.570	0.042*	0.45	0.03	0.98
Constant	0.22	2.607	0.934	1.24		
Model significance	X <sup>2</sup> =10.6; P=0.040*					
Pseudo R <sup>2</sup>	36.0%					
Classification accuracy	58.1%					

# The relation of **MSD** and the characteristics of the dentists

- Departments of orthodontic & endodontic had the highest prevalence of MSD (100%) while the least percentage (75%) was shown in the department of prosthesis.
- It was revealed that all dentists who had no training on occupational health & safety were complaining from MSDs (100%) compared to dentists who had training on occupational health with significant difference ( $p < 0.001$ ).

- **The majority of dentists in this study were complaining from either mild pain (48.1%) or moderate pain (47.6%) while small percentage of dentists (4.2%) were suffering from sever pain, this was in agreement with the study in Pakistan <sup>(21)</sup> ,that revealed the majority of dentists suffered from mild or moderate pain and only small percentage had sever pain.**

- In this study MSD involved 3 anatomical regions in (15.8%) of dentists, this finding nearly corresponds to the study in Greece<sup>(22)</sup> which reported that (15%) had at least 3 MSD complaints.
- 55.5% of those having MSDs were seeking for medical care, out of them 33.33% were seen by physical therapy, while the rest (22.22%) asked for neurology.

- **Logistic regression analysis for the risk factors revealed that repetitive movement of hands was by far the most leading factor to MSDs followed by bending of back & neck.**

- **This was in consistency with the study of Karwaski et al;<sup>(27)</sup> & Ratzen<sup>(28)</sup> who reported that MSDs are a product of many risk factors including repetitive movements and poor prolonged static postures.**
- **The static forces resulting from bending back & neck are considered to be more burden than dynamic forces.**





# **Preventive Measures**

# Preventive measures

- **The other preventive measures to prevent the risk of MSDs are: education and training on occupational health & safety.**
- **Focus should be placed on warning against repetitive movements of hands and bending of back & neck.**
- **There is a big need to take break between each patient with making simple office exercises.**



# Conclusion

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- **Dentist are subjected to MSD due to repetitive stress on muscles and ligaments, mal posture during work, the frequent use of vibrating tools and no breaks between patients. Prevention and maintenance programs recommended by physical therapists must be practiced on daily bases to avoid MSD.**

