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Dentists and occupational diseases: A descriptive study in Tunisian population

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Abstract
Introduction: Occupational diseases are health problems that occur to individuals as a result of exposure to factors arising from work activity. Dentists are exposed to many factors which could affect General health. The objective of the study was to determine the occupational diseases among Tunisian dentists through a survey and calculate their prevalence while comparing with other countries in the world.
Material and method: Through "Google forms', a web questionnaire was sent to dentists who participated anonymously and voluntary. A total of 331 dentists, from all regions of Tunisia, participated in the survey.
Results: 71.6% female and 28.4% male participated in the study. Among them, 42% belonged to the state sector and 58% to the private sector. Dentists in Tunisia suffer mainly from Stress 80.2% and Back pain 87%, followed by musculoskeletal disorders 61.6% and visual disorders 60%. As well as psychological problems 38. 4%, hearing troubles 33.3% and Allergies 34.3%. Statistically significant differences between males and females concerning back pain, musculoskeletal disorders, Hearing disorders, allergies and psychological disorders. Statistically not significant differences among age ranges for all health problems, except musculoskeletal disorders which seems to be proportional to age.
Conclusion: The profession of the dental doctor is undoubtedly a highly risked job, altering over time the general health particularly locomotor functions. This investigation showed that 87% of Tunisian dentists suffer from back pains and 80% suffer from stress. Futures dentists have to aware of these health hazards and have to learn ergonomics ways of working in order to maintain good health.

Keywords: dentist, occupational diseases, Tunisia, musculoskeletal disorders, pain back

Introduction

Occupational diseases are health problems that occur to individuals resulting of exposure to factors arising from work activity. Dentistry is known as an exhaustive occupation. Recently, it has been classified as the most vulnerable profession concerningCoV-19 transmission regarding others occupations [1] and could be considered as a transmission source [1]. Thus, Variable others factors could be in correlation with occupational diseases for dentists either contamination [2]. According to Ayatollahi [1], being dentist is extremely hazardous. These hazards are mainly biological, biomechanical, physical, chemical, and psychological [1, 2]. In this regard, few updated data are available in the literature and no previous study was performed in Tunisia. The current study aimed to determine the occupational diseases among Tunisian dentists through a survey, calculate their prevalence in comparison with other countries in the world, as well as determine correlations with possible risk factors to ensure a more global preventive approach.

Material and Method

The questionnaire was posted on social networks, sent by email and distributed to dentists randomly. It was done through "Google forms" which is a survey administration application included in the office suite Google Drive with Google Docs, Google Sheets and Google Slides. A total of 331 dentists, from all regions of Tunisia, participated anonymously and voluntary via a web questionnaire. The questionnaire included items describing the sociodemographic characteristics of the participants, lifestyle habits, professional features and workplace technical characterization along with a self-reported disease status. Statistical analysis was performed using SPSS 23software. Descriptive statistics including the percentage and prevalence were calculated.Chi-squared tests otherwise with the corresponding non-parametric test were used to compare percentages. The significance level was set at 95% and P-values<0.05 were considered significant.

Results

331 dentists participated in the study: 71.6% female and 28.4% male. Their age distribution is illustrated in Figure 1. Among them, 42% belonged to the state sector and 58% to the private sector. 50.2% of them were working more than 6 hours per day while 49.8% of them were working less than 6 hours per day. Besides, 41.7% were helped by dental assistant during the dental intervention while 58.3% were working without the dental assistant help. Most of them (77%) were working sitting down. Others were working in a standing and a lean-forward positions with respectively 39%and 26%.

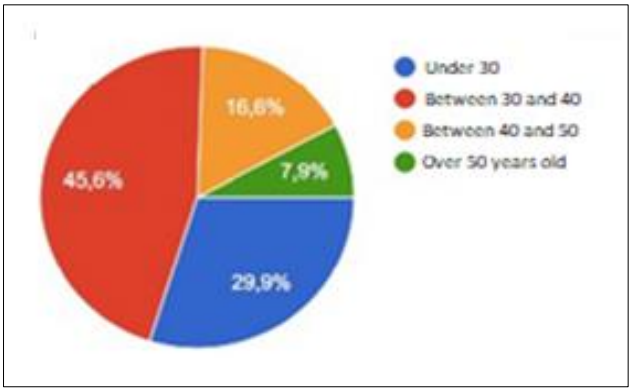

Fig 1: Sample distribution according to age range

In this sample, after data collection, dentists in Tunisia suffer mainly from Stress 80.2% and Back pain 87%, followed by musculoskeletal disorders 61.6% and visual disorders 60%. As well as psychological problems 38. 4%, hearing troubles 33.3% and Allergies 34.3%. Among those who reported having an allergy related to the profession, 71.6% of them were allergic to latex and 20.6% to monomeric resins. A low prevalence of allergy to sodium chloride, amalgam and disinfectants were noted. Only 4.8% among participants were contaminated and most of them was Cov19+ (80%). was the cause. Back pain affected particularly the cervical area 65.2%, followed by the lumbar area 57.9% and the dorsal area 38.3%. The distribution of all reported health problems according to the gender, age, time, sector and working position are illustrated by tables 1to 5.

Table 1: Genderwise distribution of Health problems among dentists

Health Problem	Gender	Number N	% in the category	p-value
Back pain	Female	216	91.1	0.001
	Male	72	76.6	
Musculoskeletal disorders	Female	161	67.9	≤0.001
	Male	43	45.7	
Hearing troubles	Female	82	37.4	0.030
	Male	21	23.3	
Visual troubles	Female	149	93.9	0.067
	Male	46	50	
Allergy	Female	90	38.3	0.031
	Male	22	23.9	
Contamination	Female	11	4.6	0.8
	Male	5	5.3	
Stress	Female	191	80.9	0.29
	Male	72	78.3	
Psychological Troubles	Female	101	43	0.026
	Male	25	38.4	

Table 2: Distribution of health disorders over age

Health Problem	Age range								p
	Under 30 years		Between 30 and 40 years		Between 40 and 50 years		More than 50 years		
	N	% in the category	N	% in the category	N	% in the category	N	% in the category	
Back pain	80	80.8	136	90.1	49	89.1	23	88.5	0.181
musculoskeletal disorders	45	45.5	98	64.9	40	72.7	21	80.8	≤0.001
Hearing troubles	28	30.1	41	29.5	20	38.5	14	56	0.183
Visual troubles	49	50.5	90	60.4	35	66	21	80.8	0.091
Allergy	29	30.2	53	35.1	21	38.9	9	34.6	0.387
Contamination	3	3	5	3.3	5	9.1	3	11.5	0.104
Stress	80	81.6	120	80	44	80	19	76	0.742
Psychological Troubles	40	40.4	62	41.3	62	41.3	7	28	0.328

Table 3: Distribution of health disorders according to sector

Health Problem	Secteur				p
	State		Privat		
	N	% in the category	N	% in the category	
Back pain	122	87.7	166	86.5	0.726
musculoskeletal disorders	84	60.4	120	62.5	0.703
Hearing troubles	50	37.6	53	30.1	0.134
Visual troubles	80	58.4	115	61.2	0.801
Allergy	8	5.8	8	4.2	0.723
Contamination	8	5,8	8	4.2	0.506
Stress	99	72,3	164	85.9	0.007
Psychological Troubles	50	76	76	40	0.751

Table 4: Distribution of health disorders over time

Health Problem	Number of working years							Number of working hours per day				
	Under 10 years		Between 10 and 20 years		More than 20 years		p-value	Under 6 hours		More than 6 hours		p-value
	N	% in the category	N	% in the category	N	% in the category		N	% in the category	N	% in the category	
Back pain	172	85.1	86	91.5	30	85.7	0.31	151	91.8	137	82.5	**0.01**
musculoskeletal disorders	114	56.4	63	67	27	77.1	0.03	104	63	100	60.2	0.60
Hearing troubles	56	29.6	29	33.3	18	54.5	0.09	58	37.9	45	28.8	0.22
Visual troubles	109	54.8	58	63	28	82.4	0.04	105	65.2	90	54.9	0.12
Allergy	59	29.6	38	40.4	15	44.1	0.14	59	36.2	53	32.3	0.76
Contamination	5	2.5	6	6.4	5	14.3	≤0.001	11	6.7	5	3	0.12
Stress	164	81.6	74	79.6	25	73.5	0.54	127	77.9	136	82.4	0.45
Psychological Troubles	86	42.6	30	32.6	10	29.4	0.06	60	36.8	66	40	0.71

Table 5: Distribution of health disorders according to the working position

Health Problem	Working position														p-value
	1		2		3		4		5		6		7		
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Back pain	138	85.2	46	88.5	27	87.1	15	78.9	19	95	4	80	39	92.9	0.638
Musculoskeletal disorders	92	56.8	32	61.5	18	58.1	11	57.9	19	95	4	80	28	66.7	0.050
Hearing troubles	43	28.3	23	46.9	8	28.6	6	31.6	8	47.1	3	60	12	30.8	0.309
Visual troubles	93	58.9	34	66.7	18	58.1	11	57.9	16	80	3	60	20	48.8	0.745
Contamination	9	5.6	3	5.8	0	0	1	5.3	1	5	0	0	2	4.8	0.908
Stress	125	77.6	35	68.6	26	86.7	18	94.7	19	95	4	80	36	85.7	0.229
Psychological Troubles	54	34	25	48	12	38.7	8	42.1	9	45	2	40	16	38.1	0.855

1: Sitted; 2: standing; 3:Sitted standing; 4:leaning forward;5: Sitted, leaning forward; 6: standing, leaning forward;7: standing, Sitted, leaning forward; N:Number; %:% in the category.

Discussion

The present study showed that Back pain is the most frequent problem among Tunisian dentists. This founding is consistent with previous study which that it seems to be the major problem for dentists [3]. It presented 87%. Such a high percentage was reported by a study carried out in Saudi Arabia (90.2%) [4].Others reported lower percentages 49% in Greece [5]. These differences in percentages could be due to the similarity of the working conditions or also to the ethnic origin of the populations of Saudi Arabia compared to Greece. Back pain affected particularly the cervical zone, the lumbar zone and dorsal zone with respectively percentages of 65.2%, 57.9% and 38.3%. Samoladas [5] and Al-Shehri [6] reported that this problem is more localized in the cervical, dorsal and lumbar zones with percentages 14.5% and 60%, 17.4% and 64% and 20% and 68.1% respectively.

In the other hand, 61.6% of the participants suffered from musculoskeletal disorders. Close percentages were reported by similar studies done in Brazil [7] (81.4%), Australia (87.2%) [8].Neurological disorders were observed with a percentage of 33.2%. However, only 15.76% was reported by Vodanović in Croatia [9]. Besides, 33.3% of participants, suffered from hearing problems. Lower Percentages found in Croatia [9] and Saudi Arabia [10] which were respectively 19.03% and 15.8%. In addition, visual problems, classified as the fourth problem, were also common among dentists in Tunisia with a percentage of 60%. Studies have reported lower percentages in Libya (22%) [11] and Croatia (46.87%) [9]. Discrepancies could be correlated with the better conditions in relationship with innovative technologies which facilitate dental intervention. In the other hand, Allergic reactions were reported also among occupational diseases for dentists with a prevalence of 34.3%. Percentages were higher in Romania 76.1% [12], but lower in both Belgium 22.5% [13] and Libya 11% [11]. In this term, many studies confirmed this founding [3, 12, 14, 15].

The present study pointed out that female dentists were more exposed to occupational diseases than men [14-17]. Statistically significant differences were noted between the two genders for back pain, Musculoskeletal disorders, Hearing disorders, Allergies and psychological disorders (Table 1). Several studies have proven this founding particularly for musculoskeletal problems [13]. However, Vodanović [9] reported statistically not significant differences between the two genders, except shoulder pain from which female dentists suffer significantly more than males. The vulnerability of female dentists could be linked to hormonal factors. For stress, the Tunisian female dentist is not more risky compared to men unlike Puriene [14] has confirmed this association.

The distribution of health problems according to age is presented in Table 2.

Indeed, not statistically significant differences among age ranges for all health problems (Table 2), except musculoskeletal disorders which seems to be proportional to age (p≤0.001). 80.8% of dentists over 50 years suffer from this pathology, while 72.7% of those aged between 40 and 50 years are affected. Therefore, age increases the risk of musculoskeletal disorders. The Literature review of Puriene [14] highlighted the impact of time on the dentist especially men. Several previous studies have affirmed, yet, that young dentists are more likely to have these health problems compared to adult dentists [13]. Regarding the work sector, the prevalence of occupational diseases seems to be

higher in the private sector. The difference was statistically significant (Table 3). It can be concluded, therefore, that the private sector is actually more stressful than the state sector. Results seem to be logical because of the huge responsibility in the private sector regarding patient care, administrative responsibilities. Moreover, table 4 showed statistically significant differences were observed among practitioners for both musculoskeletal disorders and visual troubles. The risk of these pathologies is proportional to age. Regarding the risk of contamination, obtained results are logical since it increases proportionally through time ($p \leq 0.001$). According to table 4 only pain back is correlated to the number of working hours per day as differences were statistically significant ($p=0.01$).Thus, the duration of work per day seems to increase the risk of Spinal Pain ($p = 0.015$).

According to Table 5, the working position constitutes a risk factor for musculoskeletal disorders ($p = 0.05$). Standing and standing, bending forward are the risky positions with percentages of 56.8 and 80%, respectively.

However, according Ratzon [19], the fact of altering between sitting and standing working positions, reduces the risk of back pains comparing to sitting position.

Conclusion

The profession of the dental doctor is undoubtedly a highly risked job, altering over time the general health particularly locomotor functions. This investigation showed that 87% of Tunisian dentists suffer from back pains and 80% suffer from stress. Musculoskeletal disorders and visuals troubles were also frequent and were reported respectively among 61.6% and 60%of the participants. Following health problems were less frequent: psychological disorders (38.4%), allergies and hypersensitivities (34.3%), hearing disorders (33.3%) and neurological disorders (33.2%). women dentists was more vulnerable to occupational diseases and older dentists are more exposed to musculoskeletal disorders. Futures dentists have to aware of these health hazards and have to learn ergonomics ways of working in order to maintain good health.

Moreover, promoting preventive attitudes such as the working position have to be ensured since the first years of dental practice. As well as maintaining the mental health through sport activities and enjoying live are necessary [14].

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