

## An Assessment of Occupational Stress, Job Satisfaction and Coping Strategies among Dentists in Damascus, Syria

Research Article

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### Abstract

**Background:** Dentistry is understood to be a stressful profession.

**Aims:** (1) To distinguish grounds of stress can help preventing associated adverse effects. (2) To assess the association of various personal and work related factors with general stress. (3) To evaluate the level of job satisfaction among dentists. (4) To explore how job satisfaction among dentists is associated with various personal and work related factors. (5) To determine coping strategies among Syrian dentists.

**Methods:** Non-randomized and cross-sectional survey had been accomplished between October 2018 to March 2019. The questionnaire included modified version of the Occupational Stress, developed version of the dentist satisfaction survey. Besides, the coping strategies were administered for 409 dentists.

**Results:** With response rate (82.8 %), 61.86% was reported being stressed. The most common cause of stress has maintained high levels of concentration. Least frequent stressor was Treatment of patient with maladaptive response to nervous functions. The mean score of total careers of the respondents was 122.3. There is a medium-strong inverse correlation between scales of Job stressors and Job satisfaction. Most common coping strategy was referred to the interactions with people.

**Conclusions:** Dentists are encouraged to implement extensively active coping strategies and participate in stress management courses helping them in job satisfaction improvement.

**Keywords:** Occupational Stress; Job Satisfaction; Coping Strategy; Dentist; Syria.

### Introduction

Stress nowadays is a natural and unavoidable part of everyday life and all people need a certain amount of stress, otherwise their lives would be dull. Stress is responsible each year for the loss of some 100 million working days; perhaps this is why the topic of stressful work has attracted the attentions of many researchers [1]. Seley [2] characterized stress as "the spice of life", although too much stress may be damaging to body, some stress may be a source of motivation if put under proper control. The long-term exposure to stress can be a trigger for many psychosomatic disorders [3], poor job performance, poor job satisfaction, poor family, peer and coworker relations, as well as decreased life satisfaction and general well-being [4].

In recent years, Occupational stress has become an increasingly serious problem around the world [5]. It is common within health care professionals in the developed countries, although less is

known about its prevalence in Middle Eastern countries [6]. Over the years, studies have shown that experiencing stress in the work setting leads to undesirable consequences on the well-being and safety of an individual and invariably for the organization [7].

Although dentists occupy an important position in the society, dentistry has been considered one of the most stressful of all healthcare professions [3]. The image of dentistry as being stressful is part of the dental culture and tends to override the personal experience due to the nature and working conditions as in the dental surgery [8]. Job-related factors are almost explaining half of the overall stress in a dentist's life [9]. Levels of burnout (exhaustion) are increasing [7], which appears to be related to deficits in executive functioning or cognitive control [10]. Cross-sectional studies had indicated that 10% of dentists experience high levels of burnout [11].

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found high levels of stress and burnout amongst a survey of more than 2,000 UK dentists where 17.6% admitted that they had seriously thought about committing suicide [8].

Career satisfaction is a one central indicator of subjective career success [12]. An American study used the dentist satisfaction survey (DSS) [13], has investigated external or environmental factors contributing to a job satisfaction, nonetheless, research involving individual-level factors is relatively scarce. By focusing on intrapersonal factors, we can be able to better explain why individuals in similar work environments experience differing levels of satisfaction.

Cope is the constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person [14]. Coping strategies come under two broad classifications: 1- Adaptive: problem-focused coping, long-term, as past experience - talking it out with others, are seen as constructive ways of dealing with stress, and 2- Maladaptive: emotion-focused coping and short-term as eating, sleeping, smoking, are reducing tension temporarily, but do not deal directly with the stressful situation [15]. Coping has been acknowledged as a mediator between encountered stress and life adjustment outcomes [16].

Only meager number of surveys has been undertaken to assess stress, satisfaction and cope behaviors of dentists. Thereon, the current subject aimed to investigate sources of occupational-stress, job satisfaction and coping strategies among them and then tracking their relationship with the demographic characteristics of dentists.

## Methods and Materials

### Survey Instrument

For this purpose, the following test tools were considered with their reliability, validity and objectivity mentioned in their respective manuals. The first section of the questionnaire collated-demographic information, including gender, age, and social status, specialty, years of experience, working hours per week, income and number of patients treated per day. The second section consisted of the modified version of the Occupational StressIndicator (OSI) questionnaire devised by Cooper et al., [17] was used to obtain information about job stressors. It consisted of 33 items within the following seven scales: time pressures, financial stress-

ors, patient-related stressors, staff problems, profession-related stressors, and the nature of work and Fears from future. The response options were as follows: ‘never’, ‘seldom’, ‘sometimes’, ‘often’ and ‘all the time’. Similar versions of this questionnaire have been used widely in dental research [18]. The third section comprised the DSS [19] instrument with minor modifications made to reflect cultural uniqueness (i.e. spacing medical insurance regimens, tradition, convention, education, illiteracy prevalence), more appropriate for Syrian dentists. It consisted of 37 items: Seven items to measure the factor of overall professional satisfaction (OPS) and 30 items related to 10 work environment factors. The supplementary material (SM) reproduces the DSS. Note that negatively phrased items were incorporated into the survey and are underlined in the SM. The work environment factors included: Perception of staff, Income, Professional relations, Time management, Stress, Patient relations, Personal time, Prudent strategies, Respect, and Delivery of care. All items were measured by a 5-point Likert scale: 1=Strongly Disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4=Agree, and 5=Strongly Agree. The last section consisted 10 strategies, was used for coping with stress; Fig.S1

### Subjects and study design

The paper has not investigated the correlations between the naturally-occurring biological diseases (incl. oral) and the occupational stress.

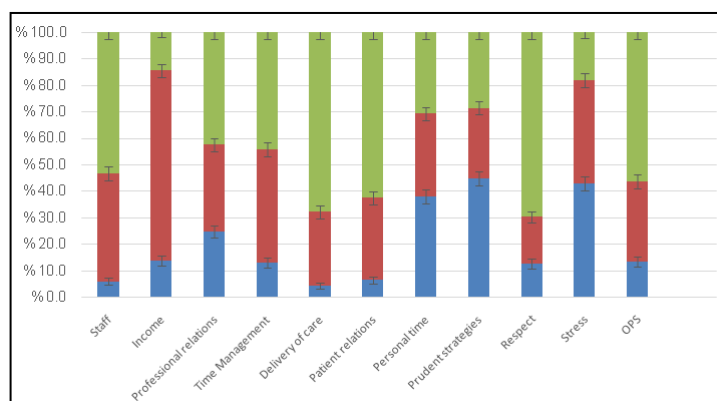
**Inclusion criteria:** This cross-sectional study took place between October 2018 and March 2019 among dentists working in Damascus, Syria, who had more than two years of work experience.

**Exclusion criteria:** A participant, who did not graduate from Syrian university or complete the questionnaire.

**Sample size:** The sample was non-randomly selected (not randomized), the questionnaire was posted with a covering letter explaining the study’s purpose. 409 of dentists were invited to participate in the study.

The sample size was estimated using G \* Power (ver. 3.1.9.2, Universität Kiel, Kiel, Germany), and the minimum sample size was calculated for analysis using a chi-squared test. To obtain a 95% confidence, and at least 5 percent-plus or minus-precision, this gave Z values of 1.96, per the normal tables. Considering the internal consistencies, the minimum required sample size for the

Figure 1. Rank order of job satisfaction variables based on mean score.



objective of the study was calculated using the Cochran's formula for cross-sectional surveys, as follows:

$$n = \frac{z^2 P(1-P)}{d^2} = \frac{(1.96)^2 \times 0.70 \times 0.30}{(0.05)^2} = 322$$

d: is the desired level of precision (i.e. the margin of error),  
 P: is the (estimated) proportion of the population which has the attribute in question, and  
 t: is the effect size that is given in the normal distribution table (z-table).

Therefore, the minimum sample size of surveys was 322 and the final sample was 339, which fulfilled this statistical requirement.

### Statistical analyses

The survey responses were entered into an electronic database then the entry errors and outlier values were reviewed. Descriptive statistics were expressed as mean ( $\mu$ ), Standard deviation (SD) and frequency ( $v$ ). Further data screening was made to check all variables for missing data, skewness and kurtosis. A student's t-test was used to compare the effects of variables. Associations between categorical variables were tested for statistical significance using the Chi-square test ( $\chi^2$ ) [20]. P values were determined for the continuous and categorical variables using the Mann-Whitney U test and  $\chi^2$  test, respectively. Cronbach Alpha coefficients of the factors extracted in the analysis were identified to test the reliability of the dimensions. The score of items for each factor were

averaged to determine the degree of satisfaction. The average scores of each factor were classified into three categories based on the mean score in line with previous research [22]: dissatisfied (1.0–2.5), neutral (>2.5–<3.5), and satisfied (3.5–5.0). (Table S1)

Total career score (TCS) was defined as a total score of all items. All statistical analyses conducted using SPSS version 24 Independent t-tests and analysis of variance (ANOVA), were implemented to compare variables of demographic and practice characteristics. Stepwise multiple regression analysis was used to identify predictors of TCS and its related personal and professional characteristics, p-values <0.05 were considered as having statistically significant differences. The fallouts from the logistic regression were expressed as 95% confidence intervals (CIs).

### Results

Of the 409 dentists invited to participate in the study, 371 responded (Males are the majority; Age distribution bands in decrement sequence:  $\leq 29$ , 30-39, 40-49,  $\geq 50$ ; Unmarried dentists and General dentists were 124.4% that of Married and Specialists, respectively; Years of expertise distribution bands in decrement sequence: <10, 2–5, 6–10; Working (hr./wk.) bands in decrement sequence: 21–40, <20, >40; Silent majority of Syrian dentists monthly-pensions is ranged between \$100-400; Preponderance of treated patients:  $v$  (<12); Total response rate (TRR): 82.8%; Table 1) while 32 participants were excluded.

Table 1. Key descriptive data of survey respondents and results of total career score<sup>a</sup>.

Characteristics	N (%)	$\mu \pm SD$	95%CI for $\mu$		Skewness	Max.	Min.	Range	df	T/V	P	
			Lower bound	Upper bound								
Gender	M	194 (57.2)	122.8 $\pm$ 12.6	121	124.6	0.473	160	97	63		0.795	0.427
	F	145 (42.8)	121.6 $\pm$ 13.7	119.4	123.9	-0.23	153	78	75			
Age (yr.)	>29	127 (37.5)	123.1 $\pm$ 13.9	120.7	125.6	-0.23	160	78	82	335	0.453	0.715
	30-39	98 (28.9)	121.1 $\pm$ 12.3	118.6	123.6	-0.107	150	85	65			
	40-49	81 (32.9)	122.3 $\pm$ 12.5	119.5	125	-0.088	160	89	71			
	>50	33 (9.7)	122.6 $\pm$ 13.8	117.7	127.5	0.504	151	102	49			
Marital status	Married	146 (43.1)	122.2 $\pm$ 11.4	120.4	124.1	-0.098	151	89	62		-0.069	0.944
	Unmarried	193 (56.9)	122.3 $\pm$ 14.3	120.3	124.4	-0.065	160	78	82			
Specialty	General	193 (56.9)	120.4 $\pm$ 13.4	118.5	122.3	-0.333	153	78	75		-3.085	0.002b
	Specialist	146 (43.1)	124.8 $\pm$ 12.3	122.8	126.8	0.481	160	101	59			
Years of expertise	5-Feb	117 (34.5)	119.9 $\pm$ 13.4	117.5	122.4	-0.197	153	75	78	336	5.034	0.007b
	10-May	138 (40.7)	124.9 $\pm$ 12	122.9	126.9	-0.051	160	85	75			
	>11	84 (24.8)	121.2 $\pm$ 13.7	118.3	124.2	0.245	160	89	71			
Working (hr./wk.)	>20	1441 (32.5)	22.3 $\pm$ 12.2	120.3	124.3	0.438	160	97	63	336	1.508	0.225
	21-40	157 (46.3)	21.7 $\pm$ 14.6	119.4	124	-0.225	153	78	75			
	>40	38 (11.2)	124.8 $\pm$ 9.1	121.8	127.8	-0.835	140	102	38			
Monthly-pensions	<100	20 (5.9)	117.6 $\pm$ 10	112.9	122.3	-0.233	137	97	40	334	2.072	0.084
	100-200	127 (37.5)	1200.6 $\pm$ 11.9	118.6	122.7	-0.609	142	78	64			
	200-400	112 (33)	123.8 $\pm$ 13.8	121.2	126.4	0.336	160	95	65			
	400-600	44 (13)	122.7 $\pm$ 15.1	118.1	127.3	-0.708	144	83	61			
	> 600	36 (10.6)	125.4 $\pm$ 12.6	121.1	129.7	0.532	153	102	51			
Treated patients	< 12	226 (66.7)	122.1 $\pm$ 13.2	120.3	123.8	-0.071	160	78	82		-0.407	0.684
	> 12	113 (33.3)	122.7 $\pm$ 12.9	120.3	125.1	-0.071	153	85	68			

Respondents, N(%); Mean total career score,  $\mu$ ; Standard deviation, SD; Confidence interval, CI; Degrees of freedom, df; t-Student, T; V-value, V; P-value, P; Male, M; Female, F

<sup>a</sup> The mean difference is significant at 0.05 level

There was a considerable variation in the number of stressors that dentists experienced frequently or all the time, with the number per dentistranging from 1 to 28. The frequency with which the various stressors were reported as occurring ‘very often’ or all the time (Table S2).

An Exploratory Factor Analysis method was used to determine the degree of correlation of the stressors in each section, 33 Stressors are summarized into seven sections using the Principal Component method, and variables branched were redistributed to the sections using the method of varimax, and these sections together contributed to explaining 61.05% of the total variance. (Table S3)

The quality of the factor analysis was significant .Also, using Bartlett's Test, this test is significant ( $\chi^2 = 5974.2, p.value = 0.000 < 0.05$ ) (Table S4). The most commonly reported stressors under the control management standard were Maintaining high levels of concentration, Time pressure (considering work schedule, time of work, and breaking time) and Repetitive nature of work. Work stress caused general stress response syndrome.

The least frequent stressors were Treatment of patient with maladaptive response to nervous functions, Feeling of devaluation from patient, and Packet of staff-based problems. 61.86% reported often being stressed (Table 2 and Table S5).

Cronbach Alpha of Vocational stressor, Pressure stressor, Nature of work stressor, Financial stressor, OSI,Future stressor, Patient-related stressor, Staff stressor are 0.935, 0.887, 0.858, 0.849, 0.712, 0.699, 0.673, 0.649, respectively and internal consistency reliability of OSI (P-value: 0.000; All values were significant for  $\alpha=0.05$ ). (table S6)

The demographic characteristics of the participants and relationships with general stress are presented in Table 3. There was no significant relationship between general stress scores and gender (men have presented slightly higher job stress which was not significant with females), age, social status, years of experience, working hours per week, income, and number of patients treated per day. However, general stress showed a significant correlation with Specialty (P = 0.000). T-test showed that general dentists exhibited higher stress than specialist dentists, the mean difference was statistically significant (P = 0.00)

**Table 2. Frequency of stressors reported very often or all the time among general dental practitioners (n=339).**

Stressor	N (%)	$\chi^2$	P
Maintaining high levels of concentration	276 (81.4)	133.83	0
Time pressure	225 (66.4)	36.34	0
Repetitive nature of work	222 (65.5)	32.52	0
Empathizing with children	221 (65.2)	31.29	0
The urgent needs for enduring vocational development	204 (60.2)	14.04	0
Unsatisfactory laboratory service from technicians	195 (57.5)	7.67	0.006
Long working hours	194 (57.2)	7.08	0.008
Time scheduling	192 (56.6)	5.97	0.015
Feeling exile, isolated, and ignorance	192 (56.6)	5.97	0.015
Equipment breakdown/defective materials	188 (55.5)	4.03	0.044
Possible viral infection contraction	187 (55.2)	3.61	0.057
Incompetency in dealing with abrupt interventions through surgical operation	177 (52.2)	0.66	0.415
Causing pain	172 (50.7)	0.07	0.786
Conflict between profit and professional ethics	168 (49.6)	0.02	0.871
Possibility of making mistakes	157 (46.3)	1.84	0.175
Flooding of dentists in marketplace	154 (45.4)	2.83	0.092
Feeling with colleagueship marginalization	153 (45.1)	3.21	0.073
Quoting fees/collecting payments	151 (44.5)	4.03	0.044
Actual making mistakes	148 (43.7)	5.45	0.02
Clinic overcapacity of patients	144 (42.5)	7.67	0.006
Capability to overcome bureaucratic regulations	121 (35.7)	27.75	0
Rising costs	116 (34.2)	33.77	0
Ability to achieve a profitable leverage	109 (32.2)	43.48	0
Cancellations/no show	99 (29.2)	58.64	0
Patient's derogation of dentist's efforts	82 (24.2)	90.33	0
Treatment of patient with troubles in comprehensive response	73 (21.5)	109.87	0
Treating Non-Responsive children	72 (21.2)	112.16	0
Unsatisfactory auxiliary help	69 (20.4)	119.17	0
Ability to sell practice in future	56 (16.5)	152	0
Inability to reach the high-standard of services	53 (15.6)	160.14	0
Packet of staff-based problems	50 (14.7)	168.49	0
Feeling of devaluation from patient	44 (13.0)	185.84	0
Treatment of patient with maladaptive response to nervous functions	39 (11.5)	200.94	0
Chi-Square value, $\chi^2$ ; P-value, P			

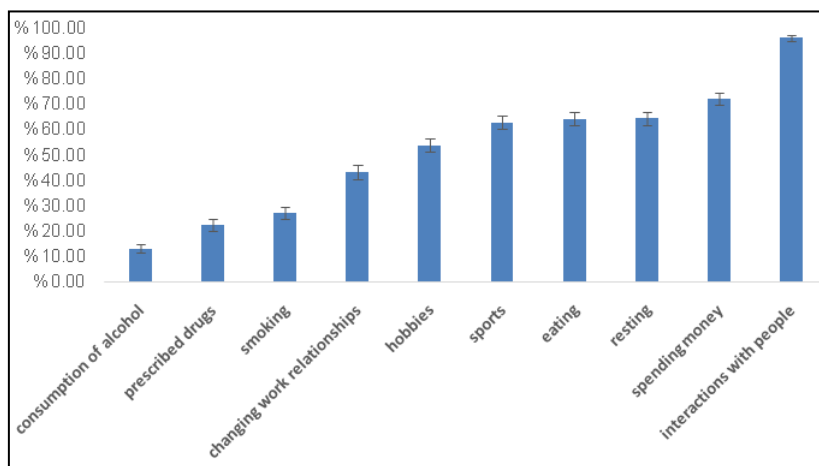
Chi-Square value,  $\chi^2$ ; P-value, P

Table 3. Demographic characteristics and general stress among dentists in Damascus, Syria.

Characteristics		N	μ± SD	95%CI		Skewness	RMSE	P
				Lower bound	Upper bound			
Gender	M	194	3.1±0.4	3	3.1	-0.277		0.196
	F	145	3.1±0.4	3.1	3.2	0.525		
Age (yr.)	>29	127	3.1±0.4	3.1	3.2	0.748	0.16	0.334
	30-39	98	3.1±0.4	3	3.2	-0.66		
	40-49	81	3.1±0.4	3	3.2	-0.197		
	>50	33	3±0.4	2.8	3.1	-0.442		
Marital status	Married	146	3.1±0.5	3	3.2	-0.182		0.957
	Unmarried	193	3.1±0.3	3	3.1	0.312		
Specialty	General	193	3.2±0.4	3.1	3.2	0.339		0.000b
	Specialist	146	3±0.4	2.9	3	-0.568		
Years of expertise	5-Feb	117	3.1±0.4	3	3.2	0.495	0.168	0.655
	10-May	138	3.1±0.4	3	3.1	-0.166		
	>11	84	3.1±0.4	3	3.2	-0.171		
Working (hr./wk.)	<20	144	3.1±0.4	3	3.1	-0.705	0.168	0.475
	21-40	157	3.1±0.4	3	3.2	0.398		
	>40	38	3.1±0.3	3.1	3.3	1.296		
Monthly-pensions	<100	20	3.1±0.5	2.9	3.3	-0.732	0.169	0.971
	100-200	127	3.1±0.3	3	3.1	0.198		
	200-400	112	3.1±0.4	3	3.2	-0.472		
	400-600	44	3.1±0.5	3	3.3	0.841		
	>600	36	3.1±0.4	3	3.2	-0.748		
Treated patients	<12	226	3.1±0.4	3	3.1	0.055		0.624
	>12	113	3.1±0.4	3	3.2	-0.111		

Respondents, N(%); Mean, μ; Standard deviation, SD; Confidence interval, CI; Root Mean Square Error, RMSE; P-value, P; Male, M; Female, F  
 b The mean difference is significant at 0.05 level

Figure 2. Strategies for coping with stress among dentists in Damascus, Syria (N = 339).



Cronbach’s alpha reliability coefficients for DSS is 0.805 and Internal consistency reliability for OPS is 0.8. (Table S7)

Table S8 depicts the average TCS. The top three highest mean score factors were Delivery of care, Respect, and Patient relations while the three lowest factors were Stress, Prudent strategies, and Personal time. Nearly half of the dentists were generally satisfied. The majority of dentists and staff were satisfied mainly with professional relations but with fair contentment about the income and time assigned for clinic management. The positive engage-

ment in work was accompanied with the improvement in Clinical productivity (No significant association was detected between productivity (Job performance) and job burnout) and so on the dentist’s expenditure. (Table S8, Fig.1)

The effect of demographic and practice characteristics on TCS was evaluated by a stepwise-regression analysis (Table 4). Results showed that Specialty and Years of experience were significant predictors of TCS.

As revealed in Table 5, the ANOVA table shows that the F-sta-



tistic was 21.5 and a significance level (Sig.) of 0.000. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, proving that there is an impact of job stressors on overall Job satisfaction. In addition, there is a weak inverse correlation between scales of Job stressors and Job satisfaction (Table 5), representing the relative contribution of scales of job stressors (nature of work, patient-related stressors, time pressures, Fears from future, and profession-related stressor) in explaining the variance in the Job satisfaction. (Table S9 shows model summary – testing of hypothesis research).

Most common coping strategies used were interactions with people and spending money. The least common strategies were prescribed drugs and consumption of alcohol (Figure 2).

A higher proportion of males and specialists respondents reported using prescribed drugs, playing sports, engaging in hobbies, and smoking to deal with stress. Dentists who had recent graduated were more likely than other age groups to report playing sports and spending money, while older dentists were less likely than other age groups to report eating. Changing the work environment was a strategy used more by married dentists (73, 50%) than unmarried (74, 38.3%). Spending money and eating used as stress-coping strategies by fewer of more experienced dentists. Whereas, engaging in hobbies and resting used by fewer of less experienced dentists to manage stress. More dentists who work > 20 (hr./wk.) reported using drugs, eating, and changing the work environment as strategies for coping with job-related stress, and fewer dentists who have the best Monthly-pensions reported eat-

ing, drinking alcohol, and interacting with people as strategies for coping with stress. Whereas dentists who have the highest Monthly-pensions and work >40 (hr. /wk.) reported resting as a strategy to deal with stress. Fewer busier dentists (those who treated, on average, at least 12 patients per day) identified resting, eating, and playing sports as strategies for coping with work stress (Table 6).

Coping (incl.sports, spending money, resting, prescribed drugs, changing work relationships, and hobbies, respectively) served as a mediator between stress and experienced job satisfaction. With emotion focused coping, feeling loneliness and derogative were significantly correlated with job satisfaction which gave rise to advanced levels of psychological disturbance (Table 7).

Variables perceived stress and non-adaptive strategies to cope in addition to adaptive strategies and mindfulness were positively correlated with each other.

### Discussion

Stress has widely documented physical and psychological consequences, such as anxiety, burnout and the development of cardiovascular diseases [18]. Although there is a number of more recent stress measures used in the literature, we chose a modified version of that used by Cooper et al., [17] to allow comparison with previous work involving dentists. The current study found that there was a considerable variation in the number of stressors that dentists experienced frequently or all the time, with the

**Table 4. Demographic characteristics and Mean total career score among dentists in Damascus, Syria.**

Characteristics		N (%)	μ (SD)	Max.	Min.	Range	T	P
Specialty	General	193 (56.9)	20.4 (13.4)	153	78	75	-3.085	0.002d
	Specialist	146 (43.1)	24.8 (12.3)	160	101	59		
Years of expertise	5-Feb	117 (34.5)	119.9 (13.4)	153	75	78	5.034	0.007d
	10-May	138 (40.7)	124.9 (12)	160	85	75		
	>11	84 (24.8)	121.2 (13.7)	160	89	71		

Independent t-test and ANOVA were performed for comparisons with two variables and with three variables, respectively Respondents, N (%); Mean, μ; Standard deviation, SD; t-Student, T; P-value, P  
dThe mean difference is significant at 0.05 level

**Table 5. The effect of job stressors on Job satisfaction based on stepwise regression.**

Scales of job stressors	Job satisfaction				
R	-0.491				
R2	0.241				
df	333				
F	21.5				
Sig.	0				
DW	0.746				
Scales of job stressors	Nature of work	Patient-related stressor	Time pressure	Fears from future	Profession-related stressor
B	-0.075	-0.133	-0.112	-0.045	-0.048
T	-2.711	-4.602	-5.107	-2.465	-1.977
Sig.	0.007	0	0	0.014	0.049
VIF	1.724	1.069	1.04	1.083	1.757

Bivariate correlation, r; Coefficient of determination, R2; Root Mean Square Error, RMSE; Degrees of freedom, df; Significance, Sig.; Durbin-Watson statistic, DW; Unstandardized coefficient, B; Student's t-test; T; Variance inflation factor, VIF

Table 6. Strategies most commonly used for coping with stress by demographic and practicing characteristics (brackets contain percentages).

Characteristics(N)	interaction with people	sports	resting	alcohol	eating	spending money	hobbies	changing work relationship	prescribed drugs	smoking
Gender										
M(194)	191(98.5)*	139(71.6)***	132(68)	29(14.9)	128(66)	143(73.7)	120(61.9)**	81(41.8)	53(27.3)**	74(38.1)***
F(145)	135(93.1)	74(51)	87(60)	16(11)	90(62.1)	102(70.3)	63(43.4)	66(45.5)	23(15.9)	18(12.4)
Age (yr.)										
>29(127)	124(97.6)	94(74)**	80(63)	19(15)	86(67.7)*	100(78.7)**	66(52)	48(37.8)	22(17.3)	37(29.1)
30-39(98)	94(95.9)	52(53.1)	58(59.2)	15(15.3)	70(71.4)	75(76.5)	54(55.1)	46(46.9)	25(25.5)	25(25.5)
40-49(81)	79(97.5)	46(56.8)	59(72.8)	7(8.6)	48(59.3)	53(65.4)	43(53.1)	39(48.1)	22(27.2)	23(28.4)
>50(33)	29(87.9)	21(63.6)	22(66.7)	4(12.1)	14(42.4)	17(51.5)	20(60.6)	14(42.4)	7(21.2)	7(21.1)
Marital status										
Married(146)	142(97.3)	95(65.1)	94(64.4)	18(12.3)	101(69.2)	100(68.5)	86(58.5)	73(50)*	38(26)	38(26)
Single(193)	184(95.3)	118(61.1)	125(64.8)	27(14)	117(60.6)	145(75.1)	97(50.3)	74(38.3)	38(19.7)	54(28)
Specialty										
General(193)	184(95.3)	110(57)**	108(56)***	30(15.5)	120(62.2)	142(73.6)	88(45.6)***	87(45.1)	27(14)***	38(19.7)***
Specialist(146)	142(97.3)	103(70.5)	111(76)	15(10.3)	98(67.1)	103(70.3)	95(65.1)	60(41.1)	49(33.6)	54(37)
Years of expertise										
2-5(117)	112(95.7)	69(59)	63(53.8)**	19(16.2)	71(60.7)*	88(75.2)***	46(39.3)***	51(43.6)	21(17.9)	36(30.8)
5-10(138)	134(97.1)	96(69.6)	100(72.5)	15(10.9)	100(72.5)	112(81.2)	89(64.5)	56(40.6)	30(21.7)	41(29.7)
>11(84)	80(95.2)	48(57.1)	56(66.7)	11(13.1)	47(56)	45(53.6)	48(57.1)	40(47.6)	25(29.8)	15(17.9)
Working (hr./wk.)										
>20(144)	138(95.8)	100(69.4)	96(66.7)*	21(14.6)	104(72.2)*	108(75)	87(60.4)	79(54.9)***	53(36.8)***	42(29.2)
21-40(157)	151(96.2)	93(59.2)	92(58.6)	23(14.6)	92(58.6)	11(70.7)	79(50.3)	51(32.5)	18(11.5)	42(26.8)
>40(38)	37(97.4)	20(52.6)	31(81.6)	1(2.6)	22(57.9)	26(68.4)	17(44.7)	17(44.7)	5(13.2)	8(21.1)
Monthly-pensions										
<100(20)	19(95)	15(75)	16(80)*	2(10)*	13(65)*	14(70)	12(60)	15(75)**	7(35)	8(40)
100-200(127)	119(93.7)	85(66.9)	73(57.5)	16(12.6)	75(59.1)	93(73.2)	61(48)	59(46.5)	32(25.2)	40(31.5)
200-400(112)	111(99.1)	69(61.6)	70(62.5)	22(19.6)	85(75.9)	85(75.9)	68(60.7)	50(44.6)	27(24.1)	26(23.2)
400-600(44)	42(95.9)	23(52.3)	29(65.9)	5(11.4)	26(59.1)	24(54.5)	23(52.3)	13(29.5)	5(11.4)	8(18.2)
>600(36)	35(97.2)	21(58.3)	31(86.1)	0(0)	19(52.8)	29(80.6)	19(52.8)	10(27.8)	5(13.9)	10(27.8)
Treated patients										
<12(226)	215(95.1)	157(69.5)***	151(66.8)	31(13.7)	153(67.7)*	168(74.3)	129(57.1)	104(46)	55(24.3)	60(26.5)
>12(113)	111(98.2)	56(49.6)	68(60.2)	14(12.4)	65(57.5)	77(68.1)	54(47.8)	43(38.1)	21(18.6)	32(28.3)

\*P < 0.05, \*\*P < 0.01, \*\*\*P < 0.001

Table 7. Hayes analysis to assess moderator strategies between Job satisfaction and Stress.

Moderator Mediator	Coeff.	Std. Error	T	P	α=0.05
Consumption of alcohol	-0.053	0.124	-0.428	0.669	Non Sig.
Interaction with people	3.931	2.088	1.882	0.061	Non Sig.
Prescribed drugs	0.256	0.089	2.873	0.004	Sig.
Smoking	0.131	0.084	1.564	0.119	Non Sig.
Changing work relationships	0.247	0.083	2.960	0.005	Sig.
Hobbies	0.227	0.081	2.823	0.003	Sig.
Sports	0.514	0.079	6.531	0	Sig.
Eating	0.116	0.085	1.368	0.172	Non Sig.
Resting	0.290	0.085	3.416	0.001	Sig.
Spending money	0.350	0.079	4.426	0	Sig.

number per dentist ranging from 1 to 28, This result is consistent with those reported by dentists in New Zealand, the variation is ranging from 0 to 31 [9].

61.86% of the dentists surveyed suffered from stress. Similar results have been reported in studies of general dentists in the UK (68.4%) [18], dentists in Denmark (59.7%) [21].

MTCS and mean overall professional satisfaction subscale score were 122.3 out of 185 and 3.46 out of 5, respectively. These find-

ings are parallel to other observations conducted in china, which were 123.12 out of 190 and 3.28 out of 5 [19], respectively. Also, in Australia, and Sweden studies [22, 23].

The most common stressors among dentists were related to the nature of work (e.g., maintaining concentration, repetitive nature of work, and the need to empathizing with children) that caused their dissatisfaction with their success in their work under pressure. Many of the frustrations associated with time pressures were also evident, possibly due to pressure on dentists to schedule as

many appointments as possible with limited time, long working hours, and satisfaction with time was generally average (neutral) that included professional interrelationship, overseas relations, official obligations, transportation, In addition to private interrelations (time allocated for personal relations and community meetings, time assigned for research, and other interests not related to work).

These frustrations may be partly the result of external pressures to meet certain responsibilities (e.g., pressures by family and friends, colleagues, and the medical community); but may also in part be the result of the dentists' own personal set of values and sense of responsibilities, and urgent needs for enduring vocational development, as there is a great emphasis these days on conducting and publishing research, such circumstances undoubtedly lead to increased tension, creating difficulties in integrating work responsibilities with social life. These results are similar to those in previously reported study [24]. Ayers et al. reported that the second and third most common sources of stress among general dentists in New Zealand were time-related pressure (48%) and the need to maintain high levels of concentration at work (43%) [9]. In a study of dentists in Islamabad, Pakistan, finding enough time for family and friends was reported as the most common source of stress [24]. Cooper et al. indicated that time management problems were a common source of stress among dentists [17]. Other study indicated that respondents were dissatisfied with stress and time management [19].

Dentists in this study also pointed out many aspects of the practice related to the conditions of the profession in general and reported that it was stressful and negative for them (e.g., feeling with collegiality marginalization, flooding of dentists in marketplace, the urgent needs for enduring vocational development, fear of making mistakes or actually committing them, incompetency in dealing with abrupt interventions through surgical operation, equipment breakdown/defective materials, and unsatisfactory laboratory service from technicians).

52.2% of respondents experiencing of medical emergency in the dental surgery [9], although it has been found to be one of the most highly ranking stressors in the UK [17], only 15% of dentists reported that this was a stressor very often or all the time [9]. This may reflect a difference in the wording of the questionnaires used; Cooper et al. [17] used a five point Likert-type scale ranging from 'no stress' to 'a great deal of stress', whereas we used a similar scale labeled 'never' to 'all the time'. Although a medical emergency would be one of the greatest potential sources of stress, it does not occur commonly, and many dentists may not have experienced such an event. Dentists also reported low satisfaction with professional relationships, such as their relationships with specialists in the medical arena and their contact with global expertise.

Pressure related to income is clearly visible in dentists' self-reports at work. Dentists have struggled with a conflict between profit and professional ethics due to the increase in the general costs of running a dental clinic and the necessity to pay specific fees, so they need to work harder and see more patients and working long hours to generate sufficient income. Income-related stressors are reported to be high for dentists working in the National Health Service [25], where there is a perceived need to work quickly in order to generate sufficient income.

Job satisfaction with financial condition was low which included pension, overall expenditures, conciliating paid-salaries and allowances, billings, and premium-insurance payment. It seems that negative attitudes about the health care system were predicted by dissatisfactions and frustrations with procedures, limitations, and bureaucratic regulations imposed on the profession by the government, these pressures were less than previously reported [26].

The least frequent stressors were patient-related stressors (e.g., treatment of patient with troubles in comprehensive response, treating non-responsive children, and feeling of devaluation from patient). Ayers et al. [9] reported the most common source of stress was treating uncooperative children (52%), and Kay et al. reported that the most common stress is the patient's demands (75%), in the UK involved treating difficult or uncooperative patients (64.8%) [27]. Dentists were satisfied with their patient relations, as many dentists enter into medical school with noble ideas of helping those who are suffering and in pain, and that helping patients and being able to treat illness during patients' adherence to medication regimen were aspects of medical practice that dentists valued and found meaningful. It is possible that the gratification of knowing that someone in need has been helped is one factor that makes the long hours and heavy workloads of the dentist's job more manageable.

Dentists appeared that the least sources of stress are the problems of staff, majority of dentists were highly satisfied with performance of the medical assistants, teamwork in healthcare, team involvement in troubleshooting, this is due that staff was hired and managed by the dentist or the organization affiliated with it. Kay et al. reported that problems associated with staff are the most common (56%) [27]. It is evident that the work of a dentist still provides a great deal of general satisfaction as a career choice. Respondents were neutral in their satisfaction with the practice of the profession (dentistry fulfills current career aspirations, satisfaction in work, ability dealing with disabilities, continuous desire to gain knowledge, unwillingness to change career, and urging high-school students to study dentistry), possibly it relates to wanting to move away from any health-related job, having been dissatisfied with one health-related career, it may also be that these alternatives are more financially rewarding with less stress.

A number of stressors contributed significantly to dissatisfaction with work as a dentist, the same stressors that contributed to overall stress also contributed to dissatisfaction with practice.

It is difficult to speculate on the causal relationship between the concepts of satisfaction and stress, the results show a negative significant correlation between stress and job satisfaction.

Therefore, improving work condition is essential in order to increase the level of satisfaction and thus to lower the level of stress. Similar results were obtained in other professions [19].

No significant differences in occupational stress were observed between males and females, this finding mirrored two studies in Yemen and Iran which reported nonstatistical differences in stress among men and women. However, Rogers et al. reported that female Irish dentists were more stressed than males [20]. It was found that males suffer from pressures related to the nature of work more than females, one study showed males suffer from



maintaining high levels of concentration and causing pain more than females [9], perhaps because of childrearing and family responsibilities greatly impact females' working life and that female dentists are more likely to take a career break by more personal time and relatively long maternity leave. While, female dentists have suffered from financial and patient-related pressures more than male, due to mismatch between the number of patients treated and personal obligations.

The results reveal no gender differences in satisfaction levels, this result is consistent with previous observation [15], and contrast with two studies from Australia which referred to that female dentists had higher job satisfaction than male dentists [22, 25]. Other study conducted in Turkey reported that male dentists had higher mean career satisfaction scores than female dentists [28].

Additionally, there were no significant differences in general stress according to age, and this is consistent with a study reporting no relationship between stress and age [24]. Older dentists were less concerned about patient pressures, this is due to they are often more experienced, which increases the ability to treat patients with weak response, in addition to our society's traditions of respecting and appreciating older dentists. Contrary to our findings, there is no statistically significant difference in satisfaction according to age; several previous studies indicated that older dentists were more satisfied or less depressed with dentistry [15, 25].

There were no statistically significant differences in general stress according to the working hours per week. More working hours caused time pressures and more patients to secure sufficient income, and increased fears of future. Ayers et al., reported that time pressures and long work hours had a significant impact on the stress of the dentist, and stated that weekly workload increased fears related to future [9]. General satisfaction was not associated with hours worked per week, but Chinese study, dentists who work less than 40 hours per week were generally more satisfied with dentistry [19].

According to years of experience, there were no statistically significant differences in general stress, compared to study in Iran that found dentists with fewer than 10 yrs. of experience exhibited higher stress than dentists with over 20 yrs. of experience. Similarly indicated in previous studies reported that experience is a factor in controlling and managing stress [17, 24].

More satisfaction with dentists had 5-10 yrs. (vs. 2-5 yrs.); this can be attributed to the decrease in practical and clinical experience, and the increased fear of making mistakes in the younger dentists. Overall occupational satisfaction in a study was significantly different based on years of practice, it was reported that dentists practicing > 5 yrs. were the most satisfied overall [19], with the lowest satisfied for dentists with 6-10 yrs., this decrease may result from increased professional responsibilities in both management and research and patient care.

There were no statistically significant differences in general stress and job satisfaction according to the number of patients who were treated per day. In another study, it was found that longer working hours also means less personal time and less freedom of a working schedule, contributing to lower job satisfaction [27]. There was an increase in profession-related stressors (e.g., fear of committing mistakes or actually committing), in contrast, an increase in fear

of the future with more patients, was attributed to more consumption of equipment and the possibility of increasing defects. Specialist dentists were generally more satisfied with dentistry and less stress than general dentists. They had significantly lower degrees of time pressure, work pressures, financial pressures, patient pressures, and fears of future than general dentists. This would strongly suggest that, in order to improve job satisfaction, practitioners should define their preferred fields of dentistry, and strive to gain more experience and training, while avoiding areas where they have less interest or ability.

There were no significant differences in overall stress and satisfaction according to income. While there is an increase in profession-related stressors, the lower the monthly income, the reason may be that dentists resort to using less quality materials or because of their inability to equip their patients with modern equipment that helps them in continuing professional development because of the high prices that contradict their low income.

The most common techniques for managing stress identified in the current study were interactions with people (92.2%); this strategy did not modify the relationship between satisfaction and stress, it is likely that dentists interact with people more, without identifying this as a technique to manage stress, spending money (72.3%) and resting (64.6%). The least commonly used were smoking (27.1%), prescribed drugs (22.4%) and alcohol consumption (13.3%). In New Zealand, the most common reference strategy was interactions with people (77.3%), while the least strategies were smoking (4%) and prescribed drugs (3%) [9].

Tobacco use as a coping mechanism is similarly low in the UK 8.6% and in Iran 4.3% of dentists reporting that they smoke to manage stress [17, 27]. Similarly, smoking and drug use were not frequently reported as strategies used by Dutch dentists to manage stress [29].

13.3% of the respondents used alcohol to relieve stress, other authors have reported worrying use of alcohol by dentists [29]. Conversely, Myers and Myers [18] reported that, although 90% of dentists in their sample consumed alcohol regularly, the mean weekly consumption was low.

Consistent with reports from previous study [30], dentists tended not to apply active coping strategies for stress management. The gender differences were not unexpected with males more likely to report using sports, interacting with people, practicing hobbies, using drugs and smoking, have been reported as strategies to relieve stress. There were no statistically significant differences between males and females regarding the use of the strategy to change the work environment, and it contradicts a study that found that more males (26%) use it compared to females (16%).

The strategies used by dentists were similar regardless of their monthly income, except that a smaller percentage of dentists with higher income ate and changed the work environment, and none of them recorded drinking alcohol.

## Conclusion

A major cause of stress among dentists is a lack of knowledge about managing stress [27], the most common type of stress in

dentists in Syria has been maintaining high levels of concentration, time pressure, repetitive nature of work, and empathizing with children, there are differences in the strategies used by male and female practitioners to manage stress.

For Syrian dentists, total career satisfaction was judged to be good overall. Delivery of care, patient and staff relations, and respect were most satisfied factors, while lack of personal time, lower income, and stress were the least satisfied factors. A clear increase in job satisfaction scores was predicted on the basis of specialty (more specialist) and years of practice 5-10 (vs. 2-5).

Therefore, Policies defining the standard of dental care need to be made, stress management and coping strategies should therefore be included in the dental curriculum in order to avoid physical and psychological problems that may occur later as a result of occupational stress, and workshops, seminars and education programs on occupational stress and practice management for dental students and dentists should be organized periodically.

Stress literature is curious, particularly given its importance in the depression literature.

Further exploration of the importance of this variable may therefore remain a good avenue for further research.

Future studies exploring the job satisfaction of Syrian dentists can build upon this study by other regions with different demographics and investigating how leadership roles impact job satisfaction, to identify interventions that can be used to reduce stress between dentists and improve their working conditions.

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