Original Article

Does Smoking Hamper Oral Self-Care Among Dental Professionals?

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Abstract

Objectives: Smoking may impact oral self-care (OSC). This study aimed to analyze the role of smoking in OSC among Iranian dental health professionals.

Materials and Methods: The cross-sectional data were collected at two annual dental meetings and seven randomly selected dental schools in Iran. A total of 1,459 respondents composed of 967 general dental practitioners (GDPs), 229 dental educators (DE), and 263 senior dental students (DS) anonymously completed a self-administered questionnaire inquiring about smoking status and OSC.

Results: Thirty percent of the male and 12% of the female dental health professionals reported smoking tobacco. There was no difference between their professional status. Women reported better OSC than did men, but only 26% of the women and 17% of the men followed the three most important recommendations for OSC. Smoking was associated with infrequent tooth brushing and flossing, irregular use of fluoride containing toothpaste, consumption of sugary snacks and weak adherence to the recommended OSC guidelines.

Conclusion: Dental health education should place more emphasis on smoking counseling and cessation among dental health professionals.

Key words: Smoking; Dental Professionals; Oral Hygiene

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INTRODUCTION

Tobacco use continues to be among the leading global causes of preventable death [1]. To control this huge global public health burden, all stakeholders must take appropriate actions. Healthcare professionals including physicians, dentists, and nurses have key opportunities to provide tobacco cessation education. Unfortunately, some health care professionals are smokers, with an incidence of 2% to 45% worldwide [2]. Generally, healthcare professionals with presumably better-than-average health-related behavior serve as role models for lay people, and in particular, for

their patients. Due to their comprehensive knowledge of measures to control oral diseases, dental health professionals are expected to maintain optimal OSC at higher rates compared to lay people, as well as other highly-educated people. The few published reports about OSC among dentists confirm that nearly 90% brush their teeth twice daily [3-5]. However, reports from developing countries show that dentists seem to adhere to all three of the prerequisites for optimal OSC (tooth brushing twice daily, using fluoride containing toothpaste and avoiding daily sugary snacks) infrequently. This rate was reported to be 20% among Indian dentists [3] and 24% in their Mongolian counter parts [4].

Among lay people, smoking seems to occur in conjunction with other behaviors that are damaging to oral health, while not smoking, in contrast, tends to occur with behaviors that promote oral health in adolescents, adults, and the elderly [6-8]. Because of their professional education, this trend is expected to be even more pronounced among dental health professionals. The present study analyzed the role of smoking in OSC of dental health professionals in Iran. We hypothesized that smoking is negatively associated with the maintenance of optimal OSC, and that this relationship varies by professional status and educational level.

MATERIALS AND METHODS

The present study was carried out among Iranian dental health professionals including GDPs, university DEs, and senior DSs, by means of a self-administered questionnaire inquiring about respondents' smoking status and OSC practices.

The GDPs who participated in this study consisted of participants at two major national dental meetings ─ one in December 2004, and the other in July 2005 ─ in Tehran, Iran. During the meeting days, the dentists completed the questionnaire (included in the meeting documents) and returned it anonymously [9].

The DEs and DSs who participated in this study were recruited from seven dental schools randomly selected from the 15 state dental schools in Iran. In spring of 2005, one of the authors (MK) presented to each of the schools during two workdays and delivered the questionnaires to the DEs in their department, and to DSs in their classrooms, to be completed anonymously and returned immediately [10,11].

Questions about smoking

Three similar questions inquired separately about smoking cigarettes, pipes, and water-pipes as follows: Do you smoke cigarettes/pipe/water-pipe? For each category of smoking respondents were dichotomized to non-smokers (never smoked or had quit) or smokers (any frequency of smoking). In the final analysis, those classified as non-smokers in all three categories of smoking were considered non-smokers.

Questions about OSC

Four questions inquired about the respondents' OSC practices: (a) How often do you usually brush your teeth? Five answer choices were offered, which were later dichotomized to "at least twice daily" and "less than twice daily", (b) How often do you usually consume sugar-containing snacks or drinks in between main meals? Again five answer choices were offered, which were later dichotomized to "less than daily" and "daily", (c) Do you usually use fluoride toothpaste when brushing? Four answer choices were offered, out of which "always or almost always" constituted regular use of fluoride toothpaste, and (d) How often do you usually floss your teeth? Again five answer choices were offered, which were later dichotomized to daily and less than daily.

Derived from the evidence-based recommendations for OSC [12-15], answers to three of the OSC questions (a-c) were combined to indicate recommended oral self-care (ROSC).

Fulfilling three of these prerequisites was considered optimal ROSC: brushing teeth twice daily, regularly using fluoride containing toothpaste, and consuming sugary snacks less than daily. Finally, the respondents provided their year of birth and sex as background information.

Subjects

A total of 1,723 dental professionals returned the questionnaire. The final sample was decreased to 1,459 responses due to missing answers to questions regarding smoking, OSC, or gender, in 264 (15%) questionnaires.

Statistical evaluation

Statistical evaluation included the Chi-square test for differences in frequencies. Logistic regression modeling served to explain strength of the factors related to adherence to ROSC. We subsequently calculated the corresponding odds ratios (OR) and 95% confidence intervals (95% CI).

RESULTS

Of the 1,459 respondents, 967 were GDPs (64% men), 229 DEs (61% men), and 263 DSs (43% men); 35% of the GDPs, 54% of the DEs, and 2% of the DSs were 40 years of age or older; whereas 19%, 6% and 87%, respectively, were 30 years of age or younger.

Overall, 78% of the respondents were non-smokers. More women (88%) were nonsmokers compared to men (70%) (P<0.001). The majority of the respondents reported following the recommendations for OSC: eating sugary snacks less than daily (53%), brushing their teeth at least twice daily (60%), and using fluoride toothpaste regularly (73%). Twenty-four percent of the respondents adhered to ROSC. Table 1 shows how OSC and non-smoking state varied among the respondents by professional status and sex. General dental practitioners used the least amount of sugar-containing snacks (P<0.001), while DEs had the highest adherence to twice-daily tooth brushing (P=0.05).

Table 1. Oral health-related behaviors among dental professionals (n=1459) in Iran, by gender (M=Men, W=Women)

Oral health-related behaviors R = Included in recommended oral self-care	All respondents			DS		GDP		DE		Difference by professional status
	All	M	W	M	W	M	W	M	W	
Number	1459	871	588	113	150	619	348	139	90	
Sugary snacks, less than daily (R)	53%	57%	48%	45%	36%	61%	56%	50%	33%	p < 0.001
Gender difference		p < 0.001		p = 0.16		p = 0.15		p =0.01		
Tooth brushing, at least 2×/day (R)	60%	53%	70%	43%	68%	54%	68%	58%	80%	p = 0.05
Gender difference		p < 0.001		p < 0.001		p < 0.001		p = 0.001		
Fluoride toothpaste, regularly (R)	73%	68%	82%	65%	83%	71%	82%	61%	80%	p = 0.12
Gender difference		p < 0.001		p = 0.001		p <0.001		p = 0.002		
Dental flossing, at least 1×/day	54%	49%	62%	35%	65%	52%	60%	46%	64%	p = 0.76
Gender difference		p < 0.001		p <0.001		p =0.02		p = 0.007		
Recommended oral self-care: 3×R	24%	22%	27%	12%	21%	25%	31%	20%	21%	p = 0.001
Gender difference		p = 0.05		p = 0.09		p =0.03		p =0.86		
Not smoking	78%	70%	88%	67%	85%	70%	87%	72%	100%	p = 0.07
Gender difference		p < 0.001		p = 0.001		p < 0.001		p < 0.001		

DS = Dental student, GDP = General dental practitioner, DE = Dental educator
Statistical evaluation by means of Chi-square test

Table 2. Oral health-related behaviors among dental professionals (n=1,459) in Iran, by smoking status (S=Smoker, NS=Non-smoker).

Oral health-related behaviors R = Included in recommended oral self-care	All respondents			DS		GDP		DE	
	All	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
Number	1459	331	1128	59	204	233	734	39	190
Sugary snacks, less than daily (R)	53%	49%	54%	30%	42%	54%	61%	49%	42%
		p = 0.009		p = 0.10		p = 0.08		p = 0.48	
Tooth brushing, at least 2×/day (R)	60%	50%	63%	43%	61%	53%	61%	43%	72%
		p < 0.001		p = 0.02		p = 0.04		p = 0.002	
Fluoride toothpaste, regularly (R)	73%	66%	75%	67%	77%	73%	77%	45%	73%
		p = 0.001		p = 0.003		p = 0.61		p = 0.001	
Dental flossing, at least 1×/day	54%	46%	56%	49%	56%	38%	56%	36%	57%
		p = 0.001		p = 0.07		p = 0.02		p = 0.02	
Recommended oral self-care: 3×R	24%	17%	26%	20%	30%	5%	21%	13%	22%
		p < 0.001		p = 0.007		p = 0.005		p = 0.27	

DS = Dental student, GDP = General dental practitioner, DE = Dental educator
Statistical evaluation of differences by chi-square test.

Table 3. Smoking and professional status as determinants of recommended oral self-care[1] among dental professionals (n=1459) in Iran, assessed by means of logistic regression modeling

	E.S. **(Estimate of Strength)**	**S.E.**	**OR**	**95% CI**	**P-value**
Professional status					
General practitioner (reference)			1.0		
Dental educator	0.62	0.20	1.9	1.3-2.8	0.002
Dental student	0.17	0.26	1.2	0.7-2.0	0.52
Smoking (0=Smoker, 1=Non-smoker)	0.56	0.17	1.8	1.3-2.4	0.001
Gender (1=Male, 2=Female)	0.24	0.13	1.3	1.0-1.7	0.07
Age (years)	0.004	0.009	1.0	1.0-1.0	0.68
Constant and goodness of fit[2] (*p*)	-2.27	0.33			0.16

[1]Following all these: eating sugary snacks less often than daily, brushing teeth at least twice daily, and using fluoride toothpaste regularly.
[2]Hosmer-Lemeshow test

Except for avoiding sugary snacks, women reported adhering to recommended level of OSC more often than did men. Adhering to ROSC was most common among GDPs (P=0.001), regardless of sex (25% of men and 31% of women).

Overall, 22% of the respondents reported smoking: 16% smoked cigarettes, 11% used water-pipes, and 3% used pipe. General dental practitioners reported smoking cigarettes most frequently (18%; P=0.02), while DSs most commonly smoked water-pipe (16%; P<0.001). Regardless of the respondents' professional status, smoking seemed to have a deteriorating impact on OSC except for the consumption of sugary snacks (Table 2). Fewer smokers than non-smokers reported using fluoride toothpaste regularly, brushing their teeth twice daily, flossing their teeth daily, or adhering to ROSC. Table 3 shows the results of a logistic regression model that analyzed the strength of various factors related to ROSC. The model, which controls for sex and age, showed that DEs (OR=1.9; 95%CI 1.3-2.8; P=0.002) and non-smokers (OR=1.8; 95%CI 1.3-2.4; P=0.001) were most likely to report adhering to ROSC.

DISCUSSION

Smoking was more prevalent among oral health professionals in this study compared to the WHO statistics for the general Iranian adult population [1]; the difference for men was 30% vs. 26%, and for women, 12% vs. 2%. Smoking had a negative impact on oral health behavior as fewer smokers compared to non-smokers reported optimal levels of adherence to each of the OSC measures and the ROSC. This was shown by both bivariate and multivariate analyses (Tables 2 and 3).

The benefits of not smoking were clear: non-smokers were more likely to adhere to ROSC (OR=1.8). However, in accordance with previous studies from India [3] and Mongolia [4], only a minority of the respondents reported adhering to the ROSC. Among dental health professionals, the DEs were most likely to report adhering to ROSC (OR=1.9). This could be considered as a positive finding because of the DEs' role in training current and future dentists.

Our results indicate that the majority of dental health professionals overlooked the simple OSC measures to maintain their own oral health. Such behavior may also influence dentists' ability to promote preventative practices for their own patients and undermine the quality of dental care provided by them. Reports from physicians and medical students strongly indicate that those with healthy behaviors are more likely to familiarize their patients with preventative measures [16,17], which is certainly true for the dental health professional as well. Moreover, among healthcare professionals, smoking cessation counseling has been reported to be less likely to occur by smokers than non-smokers [18,19].

Despite expectations that dental health professionals would know more about smoking-related health hazards, smoking rates among dental health professionals in this study exceeded those among lay-people. The six-fold rate of smoking among female dental professionals compared to lay-people being especially alarming. However, our results are generally in line with the smoking rates of the other health care professionals [2].

With the exception of the low rates of smoking among health care professionals in the United States, Australia, the United Kingdom, and Finland [18], smoking is highly prevalent among medical professionals in the rest of the world, including Western European countries [2]. A recent report from Italy confirms the rates being exceedingly high [20]. Similarly, a very recent national data on Iranian dental students reported high rates for smoking [21]. Our findings call for a greater emphasis on tobacco counseling and smoking cessation for dental health professionals, who are supposed

to serve as role models for their patients and the broader community. Among all dental health professionals studied, women reported better OSC than did men. This difference was obvious for nearly every single OSC category measured. These results are in accord with sex differences reported in recent population-based studies of adults in Finland [22] and in the UK [23]. Our study has some limitations. The tendency to provide favorable responses, also known as social desirability [24], may have influenced the participants' responses in this study. Nevertheless, smoking rates in our participants exceeded those of the general Iranian population [1], which suggests that our respondents reported honestly, since smoking in Iran, especially among women, is considered socially unattractive and unacceptable. Due to incomplete answers we had to exclude 15% of the surveys, which can be considered a weakness of this study. The numbers of respondents in the various subgroups, however, were large enough to yield reliable estimates of the relationship between smoking and OSC.

Our results came from a self-administered questionnaire, and we relied on self-reporting to measure OSC. More accurate conclusions, however, could have been derived if the information had been based on clinical examination of the respondents.

Smoking negatively affects optimal oral self-care among dental professionals. This finding calls for greater emphasis on both tobacco cessation counseling and oral health education in the dental health education system.

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