



# Dental patient awareness of smoking effects on oral health: Comparison of smokers and non-smokers

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## KEYWORDS

Smoking;  
Oral health;  
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Patient knowledge

**Summary Objectives:** The negative effects of cigarette smoking on oral health are well established, yet few studies assessed patient awareness of such effects. The aim of this study was to examine differences in dental patient knowledge and awareness of the effects of smoking on oral health between smokers and non-smokers.

**Methods:** Adult patients from 12 dental centers in Kuwait were asked to complete a 14-point self-administered structured questionnaire on the effects of smoking on oral health in this cross-sectional survey. Significant associations between oral health knowledge, smoking status, and sociodemographic variables were examined with univariate analysis and logistic regression.

**Results:** A total of 1012 subjects participated (response rate=84.3%). The prevalence of smoking was 29.3%. Fewer smokers than non-smokers thought that oral health and smoking are related (92.2% vs. 95.8%;  $P=0.020$ ), and that smoking affected oral cancer (52.4% vs. 66.8%;  $P<0.001$ ), periodontal health (72% vs. 78%;  $P=0.040$ ), or tooth staining (86.1% vs. 90.9%;  $P=0.018$ ). Logistic regression analysis showed smokers to be significantly less aware of the oral health effects of smoking than non-smoking patients (OR=1.51; 95% CI: 1.05-2.16;  $P=0.025$ ).

**Conclusion:** Smoking dental patients are significantly less aware of the oral health effects of smoking than non-smokers. Comparative studies in other populations may be warranted to ascertain the validity of these results.

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## Introduction

The negative effects of smoking on the general health of tobacco users are well documented. Smoking has been established as a risk factor for death from several systemic diseases, including

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lung cancer, respiratory diseases, and cardiovascular disease.<sup>1-3</sup> Smoking has also been demonstrated to affect the oral health of smokers in a variety of ways ranging from cosmetic effects, such as tooth staining, to potentially life-threatening conditions such as oral cancer.<sup>4,5</sup> Some of the reported effects of smoking on oral health include increased susceptibility to periodontal diseases,<sup>6-8</sup> reduced response to both surgical and non-surgical periodontal therapies,<sup>9,10</sup> an increased risk of dental implant failure,<sup>11</sup> and a higher risk for oral cancer and pre-cancerous lesions.<sup>12-14</sup>

Despite these established negative effects of smoking on oral health, few studies examining dental patient knowledge and awareness of such effects are available.<sup>15-20</sup> Moreover, most of the available studies have focused on oral cancer, and none has examined other oral health aspects. The aim of this study was, therefore, to assess dental patient knowledge and awareness of the oral health effects of smoking, and to investigate the role of smoking status and sociodemographic characteristics on such knowledge.

## Methods

A cross-sectional survey was carried out during June 2003. Twelve primary dental care centers were randomly selected, two from each of the six health districts in Kuwait. Data were collected through a self-administered questionnaire. The inclusion criteria comprised Kuwaiti nationals 18 years of age or older. The study protocol was approved by the Ministry of Health Review Board, and informed consent was obtained from all study participants.

A total of 1200 patients were approached while awaiting access to the dentist (100 in each of the 12 centers) and asked to complete the questionnaire by each dental center's reception personnel. Out of the 1200 questionnaires distributed, 1012 were returned, for a response rate of 84.3%. No other data was available from the 188 patients who did not return the study forms.

The questionnaire consisted of 14 questions and was divided into three sections: sociodemographic characteristics, knowledge about the effects of smoking on oral health, and willingness of the patient to quit smoking if he/she knew about the hazards of smoking on oral health. The questionnaire was tested on 15 patients prior to the start of the survey, and unclear items were modified accordingly.

Sociodemographic variables included age, gender, marital status, education, and self-reported smoking

status (number of cigarettes smoked per day, duration of smoking). Both smokers and non-smokers were asked whether smoking had an effect on oral health in general or not. This was followed by specific questions in which respondents were asked to select what oral and dental conditions they thought smoking had an influence on. These conditions included four established oral health effects of smoking (oral cancer, periodontal disease, delayed wound healing, and tooth staining), and a control question of an effect with no proven association with cigarette smoking (caries).

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 12.0 (Chicago, IL, 2003) statistical software. Differences in age between smokers and non-smokers were compared using the student *t*-test. Association between smoking status and sociodemographic characteristics (age range, gender, education level, and marital status) with knowledge of each of the oral health effects and differences in knowledge between smokers and non-smokers were assessed using the chi-square test. Differences in knowledge of the specific oral health effects in all patients were assessed with chi-square test for linear trends.

Binary logistic regression was utilized to examine which factors were significant in multivariate analysis after adjusting for confounding between effects. The regression model used the dependent variable 'knowledge score' calculated in the following manner: a score of 1 was given if the patient correctly responded to all four established effects (oral cancer, periodontal disease, wound healing, and tooth staining) as being influenced by smoking; a score of 0 was given if any of these variables was not selected. Independent variables entered in the model were age range, sex, marital status, level of education, and smoking status.

## Results

The mean age and standard deviation of all study subjects were 33.92 and 8.67 years, respectively, and the number of self-reported smokers was 297 (29.3%). Table 1 presents the sociodemographic characteristics of respondents according to smoking status. Smokers were mainly males (93.3%), married (75.1%), and with high school education or less (52.2%). There was a significant difference between smokers and non-smokers according to gender ( $P < 0.001$ ) and education level ( $P = 0.017$ ), but not in age or marital status.

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