Health hazards of tobacco smoking : An alarming lack of public awareness

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أجريت هذه الدراسة لأول مرة في الأردن لمعرفة مدى إدراك المرضى للآثار السلبية الناتجة عن التدخين على الصحة العامة وصحة الفم. تم مقابلة عينة عشوائية مكونة من 524 مريضاً من مراجعي المراكز الصحية الأربعة الأساسية في مدينة عمان العاصمة وتم سؤالهم عن الآثار السلبية للتدخين. دلت النتائج على أن الغالبية العظمى (97.9%) من المرضى يدركون أن للتدخين آثار سلبية على الصحة العامة وأن 87.4% يدركون العلاقة ما بين التدخين وسرطان الرئة، الغير مدخنين يعتقدون ذلك أكثر من المدخنين. تقريباً ثلث المرضى أخفقوا في معرفة العلاقة ما بين التدخين و أمراض القلب والجهاز التنفسي وما يقارب الثلثين أخفقوا في معرفة العلاقة ما بين التدخين وارتفاع ضغط الدم والجلطة الدماغية وسرطانات المريء و البنكرياس والمثانة. أما فيما يخص آثار التدخين السلبية على صحة الفم فإن غالبية المرضى (83.2%) ربطوا ما بين التدخين وتلون الأسنان ولكن كان هنالك قلة إدراك للعلاقة ما بين التدخين وأمراض اللثة والتسوس والتهابات الفم الفطرية وفقدان الأسنان المبكر. لسوء الحظ، دلت الدراسة على أن ما يقرب من ثلث المرضى لا يدركون أن التدخين أهم مسببات سرطان الفم. هنالك حاجة ماسة لتثقيف المجتمع الأردني بالآثار السلبية للتدخين لعل ذلك يساعد للحد من هذه العادة السيئة وأطباء ألأسنان هم جزء مهم من الكادر الصحي الذي قد يساهم بفاعلية في عملية شرح الآثار السلبية للتدخين وطرق التوقف عنه.

This paper assesses public awareness and knowledge of smoking-associated oral and general health hazards. A face-to-face interview with a randomly selected sample of 524 patients of those attending the four main health care centers in Amman, Jordan was used to collect the data. Virtually all respondents (97.9%) were aware that smoking has negative effects on general health and the majority (87.4%) related lung cancer to smoking. It was found that non-smokers were significantly more likely to believe in this than current smokers. About one third of respondents to this survey were unaware of the link between smoking, heart and chronic pulmonary diseases and around two thirds were unaware of the link with hypertension, stroke and other cancers. There was an 83.2% awareness of the link between smoking and staining of teeth but there were serious deficits in awareness of the role of smoking in gingival disease, calculus formation, caries, oral infections and loss of teeth. Almost one third of the patients did not know that smoking is the most important aetiological factor of oral cancer. There is a clear need to inform and educate the Jordanian public on matters related to the known health hazards of tobacco consumption and dentists should be involved in smoking cessation strategies.

INTRODUCTION

Currently, some four million deaths per year are attributable to tobacco use, and this figure is expected to rise to 8.4 million by 2020.[1] About 700 million men and 100 million women in the developing countries are smokers[2] and in contrast to developed countries, there has been recently a substantial rise in the number of smokers.[3] Tobacco use can seriously affect general as well as oral health.[4] Worldwide tobacco use is a major cause of lung cancer, chronic lung diseases, ischaemic heart disease, myocardial infarction, peripheral vascular disease, stroke, peptic ulcer and premature death.[4,5]

Tobacco consumption is associated with numerous oral lesions and conditions.[6,7] Nearly 85% of cases of oropharyngeal cancer are related to tobacco use.[6] In addition, a relationship between tobacco use and the development of premalignant lesions has been reported.[8] Smokers with these potentially malignant lesions have an annual cancer transformation rate of about 5%.[9] Studies have shown that smoking accounts for nearly half of all periodontal diseases and that periodontal therapy in smokers is less effective.[7,10] Smokers tend to have greater gingival inflammation and harbour more supragingival plaque and calculus than non-smokers.[4,11] Since the chemicals within tobacco ensure that the gingiva does not bleed as readily as in

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non-smokers, smokers with periodontal disease may be unaware that their condition could progress rapidly.[11] Due to the increased prevalence and severity of periodontitis in smokers resulting in greater bone loss and deeper periodontal pockets, studies have shown that tobacco users have 67% greater tooth loss than non-smokers.[12]

Previous studies have found significantly higher caries rates in smokers compared with non-smokers.[13] In addition to a greater degree of oral neglect among smokers, the saliva of smokers was found to have a reduced protective buffer capacity and contain significantly higher numbers of bacteria specifically associated with dental caries.[14] Although the actual pathogenic role is unknown, smoking was also found to be a predisposing factor in oral candidosis.[15]

Tobacco stains and discolours teeth, dentures and restorations.[16] In addition, tobacco can cause halitosis, hairy tongue, smoker's melanosis and nicotinic stomatitis.[4] Tobacco is a peripheral vasoconstrictor that can reduce the capillary blood flow within the mouth. Consequently, healing is much slower and not as successful following oral surgery in smokers.[11] In addition, dry sockets occur 4-times more frequently in smokers than in non-smokers.[8] Tobacco is damaging the success of dental implants; implant failure-rates were 4.8% in non-smokers compared to 11.3% in smokers.[17]

National surveys conducted in Jordan have shown that 26.8% of the adult population were smokers and that the majority began smoking early in life.[18,19] Attitudes to smoking and awareness of the specific health risks of tobacco use have been identified as important influences on smoking habits.[5-6] Therefore, this study was conducted to assess whether lack of awareness of health risks associated with smoking is responsible for this high number of smokers in Jordan.

SUBJECTS AND METHODS

This study was conducted in the main four primary health care centers in Amman, Jordan. These centers serve citizens living in the middle areas of Jordan who constitute more than half of the total population. The objective was to select an unbiased sample of out patients from these four primary health care centers. A letter explaining details of the research was first sent to each health care center with the approval of the appropriate ethics committees in these centers. Only subjects who were aged 18-years and above were included in the study. The purpose of the study was explained to the subjects and their informed consent to participate in the study was obtained. Demographic data, smoking habits, oral hygiene methods, and subject knowledge about smoking-associated general and oral health hazards were collected. Smoking behaviour was classified as current smokers, ex-smokers or non-smokers. Subjects' responses regarding health hazards of tobacco use were measured using a binary scale of either yes or no. Data collection was completed between January and March 2003. A total of 524 patients were interviewed.

The responses were coded and analysed using a Statistical Package for Social Science (SPSS version 10.0) database. Chi-square tests was used to compare the number of patients in different subgroups and the associations between different factors. Differences at the 5% significant level were accepted as significant.

RESULTS

Subjects

Data from 524 patients were available for analyses. The patients' age ranged from 18 to 68 years with a mean of 31.9

years (median = 30; standard deviation = 10.48). Of the study sample, 225 (42.9%) were males and 299 (57.1%) were females. With regard to tobacco smoking, 60.1% of patients were non-smokers, 9.2% were ex-smokers, and 30.7% were current smokers. A significant association was found between tobacco smoking habit and gender; 52.9% of males were current smokers and 14.2% were ex-smokers, while 14% of females were current smokers and 5.4% were ex-smokers ($c^{\chi}2 = 122.7$; 2 df; $P < 0.05$) as shown in Table 1.

Table 1. Smoking habits of 524 patients surveyed

	Non-smokers		Ex-smokers		Current smokers		Total	
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)
Males	74	(32.9)	32	(14.2)	119	(52.9)	225	(42.9)
Females	241	(80.6)	16	(5.4)	42	(14.0)	299	(57.1)
Total	315	(60.1)	48	(9.2)	161	(30.7)	524	(100.0)

In respect of oral hygiene methods used by the patients, 14.5% either had never used or irregularly used tooth brush and 88.9% had either never flossed or irregularly used dental floss. No correlation was found between tobacco smoking and brushing or flossing habits.

Patients' awareness on smoking and general health

Responses to questions about the hazards of smoking on general health and its association with lung cancer, other cancers (cancer of oesophagus, pancreas or urinary bladder), chronic respiratory tract infections, heart disease, hypertension, stroke and premature death, are shown in Fig. 1. Among the surveyed, 458 (87.4%) were aware that smoking is an important aetiological factor of lung cancer. A greater proportion of those who were non-smokers (90.5%) or ex-smokers (87.5%) were in agreement with this compared with current smokers (80.7%) ($^{c}\chi 2 = 9.05$; 2 *df*; $P = 0.01$). Although non-smokers (75.2%) were more likely to be aware of the link between smoking and premature death than ex-smokers (66.7%) and current smokers (65.8%), this difference was not statistically significant. Awareness of the importance of smoking as a factor in the aetiology of the other diseases was similar among current smokers, ex-smokers, and

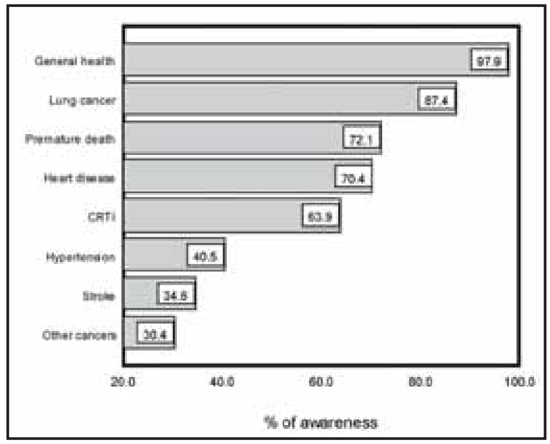

Fig. 1. Awareness of 524 patients on general health hazards of tobacco consumption.

Table 2. Relationship between the gender of the patients and their awareness of the general health hazards of tobacco consumption

Health Hazard	Male		Female		Significance
	*n**	(%)	*n**	(%)	
General health	219	(97.3)	294	(98.3)	NS
Hypertension	95	(42.2)	117	(39.1)	NS
Heart disease	161	(71.6)	208	(69.6)	NS
Stroke	77	(34.2)	104	(34.8)	NS
CRTI	142	(63.1)	193	(64.5)	NS
Lung cancer	197	(87.6)	261	(87.3)	NS
Other cancers	71	(31.7)	88	(29.4)	NS
Premature death	157	(69.8)	221	(73.9)	NS

*Number of those who were aware of the health hazard of tobacco consumption.
NS not significant

non-smokers. No significant difference was found between the gender of the patients and their awareness of the general health hazards of smoking (Table 2). Eleven patients (2.1%), of whom 5 were current smokers, reported that smoking did not affect the general health.

Patients' awareness on smoking and oral health

Figure 2 shows the responses of the patients regarding the negative effects of smoking on general oral health and its implication in the aetiology of oral cancer, oral infections, caries, loss of teeth, staining of teeth, calculus formation and gingival disease. Among individuals surveyed, 512 (97.7%) believed that the use of tobacco was damaging to oral health. Smoking was considered an important factor in the aetiology of oral cancer by 363 (69.3%) patients. More patients who were non-smokers (72.4%) or ex-smokers (72.9%) were in agreement with this compared with current smokers (62.1%) ($c\chi 2 = 5.60$; 1 d*f;* $P = 0.02$). Although non-smokers (57.1%) and ex-smokers (56.3%) were more aware of the link between smoking and gingival health than smokers (49.7%), this difference was not statistically significant. More females

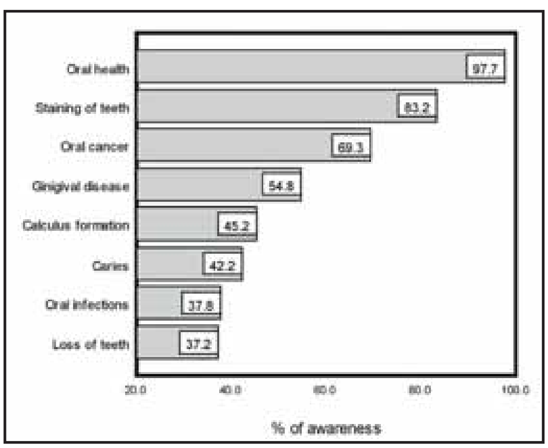

Fig. 2. Awareness of 524 patients on oral health hazards of tobacco consumption.

significantly reported that smoking is an important causative factor of staining of teeth ($c\chi 2 = 5.82$; 1 *df*; $P = 0.02$) and oral infection[s] ($c\chi 2 = 4.03$; 1 *df*; $P = 0.04$) compared with males (Table 3).

Table 3. Relationship between the gender of the patients and their awareness of the oral health hazards of tobacco consumption

Health Hazard	Male		Female		*Significance*
	*n**	(%)	*n**	(%)	
General oral health	217	(96.4)	295	(98.7)	NS
Staining of teeth	177	(78.7)	259	(86.6)	0.02
Calculus formation	100	(44.4)	137	(45.8)	NS
Gingival disease	114	(50.7)	173	(57.9)	NS
Oral infections	74	(32.9)	124	(41.5)	0.04
Caries	95	(42.2)	126	(42.1)	NS
Loss of teeth	86	(38.2)	109	(36.5)	NS
Oral cancer	149	(66.2)	214	(71.6)	NS

*Number of those who were aware of the health hazard of tobacco consumption
** *P* value of Chi-square test
NS not significant

DISCUSSION

In comparison with previous national studies[18,19] smoking is becoming more prevalent in Jordan, particularly among men, where more than half of the male patients surveyed were smokers. A national response to the public health problem of tobacco, therefore, needs to be intensified. The strategy should be directed toward increasing the public awareness of the health hazards of tobacco consumption. Although a large majority of people surveyed acknowledged the damage done by smoking on general health and made the link with cancer, particularly lung cancer, the role of tobacco in the development of other illnesses was apparently overlooked by a high percentage of the people surveyed. About one third of our respondents were unaware of the link between smoking and heart and chronic pulmonary diseases and around two thirds were unaware of the link with hypertension, stroke and other cancers. Smoking by females is still socially unacceptable in the Jordanian community. This could explain the low proportion of females who smoke although their awareness of the general health hazards of tobacco use is not better than that of males. However, the public awareness of tobacco hazards in Jordan is almost similar to data in a study conducted in 21 European countries by Steptoe *et al.*[20] who found that 97.4% of a 16,483 respondents were aware of the association between smoking and lung cancer. However, only 64.4% of men and 62.9% of women were aware of the role of smoking in heart disease. In the study of Burns *et al.*[21], 45% of the US military members surveyed were not well informed about the systemic or oral hazards of tobacco usage. Interestingly, Melani *et al.*[22] have found that 8% of medical students and 10% of nursing students in Tuscany had considered tobacco not dangerous to health and that 11% of the nursing students were unaware of the link between smoking and ischaemic heart disease.

The awareness of the people surveyed on the association between smoking and oral health is more disappointing. While a majority of the individuals knew that smoking stains teeth, there was serious deficiency in the awareness of the role of smoking in gingival disease, calculus formation, caries, oral infections and loss of teeth. Disappointingly, almost one third of the patients did not know that smoking is the most important aetiological factor of oral cancer. Similarly, in other countries, the level of public awareness is not much higher; 24% of the British people were unaware of the link between smoking and oral cancer.[23]

These data point to major limitations in knowledge about basic health risks associated with tobacco use. In this study, knowledge of the role of smoking in relation to lung cancer as well as oral cancer was associated negatively with smoking; that is, smokers were less likely than non-smokers or ex-smokers to be aware of this link. In contrast, Steptoe *et al.*[20] have found that an awareness of the association between smoking and heart disease was higher among smokers rather than non- and ex-smokers in 20 European countries. This may suggest that in developing countries, such as Jordan, the increasing prevalence of smoking is the result of lack of awareness of associated hazards and that there is a clear need to inform and educate the public about the negative effects of smoking on oral as well as general health.

Smoking is an issue for dentists as it is for other health care professionals. Since many of the effects of tobacco on soft and hard tissues in and around the oral cavity are clinically observable, dentists are well placed to become involved in smoking cessation strategies. All dentists should be given smoking cessation training and be encouraged to actively promote smoking cessation by patients who smoke, in their dental practice. However, Burgan[24] found that 13.9% of Jordanian dentists were ex-smokers and 35% were current smokers. Therefore, efforts need to be directed to include more content in dental curricula on tobacco related diseases and smoking cessation techniques.

In summary, there is an alarming lack of public awareness in Jordan of the health hazards of tobacco consumption. Due to the serious effect of smoking on oral and general health and the lack of public awareness, advice to patients to quit smoking is a dental professional responsibility. Undergraduate dental students should learn more about smoking cessation techniques since many of the adverse health effects of smoking are reversible and smoking cessation treatments represent some of the most cost effective health care interventions.

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