

Mouth cancer awareness and beliefs among dental patients

Yazan Hassona¹, Crispian Scully², Mais Abu Ghosh¹, Zaid Khoury³, Shadi Jarrar⁴ and Faleh Sawair¹

¹Department of Oral Surgery, Oral Medicine, and Periodontology, Faculty of Dentistry, The University of Jordan, Amman, Jordan; ²University College London, London, UK; ³Department of Dentistry, The University of Jordan Hospital, Amman, Jordan; ⁴Ministry of Health, Amman, Jordan.

Objectives: The aim of the present study was to assess the levels of awareness, knowledge about signs and risk factors of mouth (oral) cancer, and attitudes towards early diagnosis and treatment among dental outpatients. **Material and methods:** A total of 1,200 adult outpatients attending dental clinics at the University of Jordan Hospital for dental examination and treatment were randomly selected to participate in the study. An 18-item pretested close-ended questionnaire was used for the study. Descriptive statistics were generated and chi-square tests, *t*-tests, one-way analysis of variance (ANOVA), and Spearman's rho test were used to examine differences between groups. **Results:** Only 45.6% of the subjects had heard about oral cancer. Some 66.9% and 33.8%, respectively, were able to correctly identify tobacco and alcohol as risk factors. Some 24.1% had no knowledge about any signs of oral cancer. Male subjects, smokers, alcohol drinkers, older participants (>40 years), and participants with less than a university education were significantly less aware, and had much less knowledge, of the signs and risk factors of oral cancer ($P < 0.05$). **Conclusion:** Awareness about oral cancer among Jordanian dental outpatients is low. These dental patients, especially those in high-risk groups for mouth cancer and those of lower socio-economic status (SES), are less well informed about the signs and risk factors of oral cancer. Interventions to improve public knowledge about oral cancer and attitudes towards early diagnosis and treatment are urgently indicated.

Key words: Oral, cancer, public, awareness, Jordan

INTRODUCTION

Oral cancer is a significant world health problem: it is the sixth most common cause of cancer-related death worldwide^{1,2}. The aetiology of oral cancer is primarily linked to tobacco use, alcohol consumption^{3–8} and betel use^{9,10}, and combinations of these habits¹¹. Human papillomavirus (HPV) infection is implicated in oropharyngeal cancer, and ultraviolet light is implicated in lip cancer^{12,13}. Socio-economic status (SES) is influential^{14–16}. Other factors possibly implicated in mouth and oropharyngeal cancers include immunosuppression^{17,18}, familial and genetic factors^{19–23}, diet^{24–26}, marijuana²⁷, and exercise²⁸.

There is a 5-year survival rate of approximately 50% overall^{29–31}, the poor prognosis being largely attributed to delays in diagnosis and treatment^{32,33}. Previous research has indicated that lack of public awareness about signs and risk factors of oral cancer can contribute to the late diagnosis and poor prognosis³⁴.

Jordan is a Middle Eastern country with a relatively small population of about 7 million. Almost half of this population comprises adolescents and youths (<40 years)³⁵. About 30% of the Jordanian population smoke tobacco in the form of cigarettes or narghile – a tobacco pipe that draws the smoke through water; a hookah, arghila, qalyān, or shisha³⁵.

There are limited data on the prevalence and risk factors of oral cancer in Jordan; however, the data that are available indicate that the impact of oral cancer in Jordan is probably underestimated³⁶. In addition, little is known about public awareness and beliefs regarding oral cancer.

Therefore, the purpose of the present study was to determine the levels of public awareness, knowledge about the signs and risk factors of oral cancer, and attitudes towards treatment and early diagnosis. It was planned to use the results obtained from this study to assist in the implementation of a health-

education programme to enhance public knowledge about oral cancer and attitudes towards early diagnosis and treatment.

MATERIALS AND METHODS

The study was conducted in the Department of Dentistry at The University of Jordan Hospital during the period August 2013 to January 2014. The Faculty of Dentistry Research Ethics Committee reviewed and approved the study. The research was conducted in full accordance with the World Medical Association Declaration of Helsinki.

All study patients were dental patients older than 16 years of age attending dental clinics for examination and dental treatment. Patients who were diagnosed with oral cancer or referred for assessment of a suspicious oral mucosal lesion were excluded from the study.

An 18-item pretested close-ended questionnaire that requires 3–6 minutes to complete was employed. The purpose of the study was explained and verbal consent was obtained from all participants. The questionnaire elicited information about patients' demographics and tobacco and alcohol habits (six items), knowledge about oral cancer (eight items), and attitude towards early diagnosis and treatment (four items). Illiterate individuals were directly interviewed and their responses were recorded by the authors. Responses to questions about risk factors and signs of oral cancer were assessed as correct or incorrect and knowledge scores were calculated for each respondent.

Statistical analysis was performed using SPSS for Windows release 16.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were generated. The chi-square test, Student's *t*-test, one-way analysis of variance (ANOVA), and Spearman's rho test were used to examine differences between groups. Results were considered significant at $P < 0.05$.

RESULTS

Demographic characteristics and tobacco and alcohol habits

The sample of 1,200 Jordanian subjects comprised 685 (57.1%) female subjects and 515 (42.9%) male subjects. The mean age of study patients was 35.7 ± 16 (range: 16–86) years. In terms of education, 61.3% had a university education, 30.3% had high school education only, 5.6% had elementary school education, and 2.8% were illiterate. Out of the total group investigated, 33.2% were smokers (14.9% cigarettes, 12% narghile, 6.3% both) and 8.1% reported alcohol drinking.

Oral cancer awareness

Only 45.6% of participants had heard about oral cancer. In patients who were aware of oral cancer, the public media (TV, newspapers, and the Internet) were the main sources of information (59.8%). Only 15% had heard about oral cancer from their dentists, 12.1% had heard about it from their physicians, and 12.7% from friends and relatives.

Older patients (>40 years of age) and alcohol drinkers had the lowest level of awareness ($P < 0.05$). No significant association was found between oral cancer awareness and the level of education, smoking habits, gender, and regular dental visits ($P > 0.05$) (Table 1).

Knowledge about oral cancer

When asked about the cause of oral cancer, 66.9% and 33.8%, respectively, identified tobacco and alcohol as risk factors. About one-third (27.8%) believed that oral cancer can be inherited, and 20.2% believed that the occurrence of oral cancer is just a matter of luck. About one-quarter (25.4%) attributed oral cancer to inadequate toothbrushing, and 24.3% thought that infectious agents are behind the development of oral cancer.

Knowledge scores for the main risk factors (tobacco and alcohol) ranged from 0 to 2, with 28.1% obtaining a score of 0, 43.8% a score of 1, and 28.1% a score of 2 (Figure 1). Male subjects, smokers, and alcohol drinkers had significantly less knowledge of the risk factors for oral cancer ($P < 0.05$), whilst participants with a university education had significantly more knowledge ($P < 0.05$). There was no significant association between participants' age and regular dental visits and their knowledge of the risk factors for oral cancer ($P > 0.05$) (Table 2).

Table 1 Factors associated with awareness about oral cancer

Variable	Awareness		P value
	Yes (%)	No (%)	
Age			
>40 years	37.3	63.7	0.000*
<40 years	50.1	49.9	
Gender			
Male	45.6	54.4	0.98
Female	45.5	54.5	
Education			
Less than university	49.3	50.7	0.13
University	43.2	56.8	
Smoking			
Yes	42.6	57.4	0.15
No	47.1	52.9	
Alcohol use			
Yes	35.1	64.9	0.03*
No	46.5	53.5	

*Indicates statistical significance at $P < 0.05$.

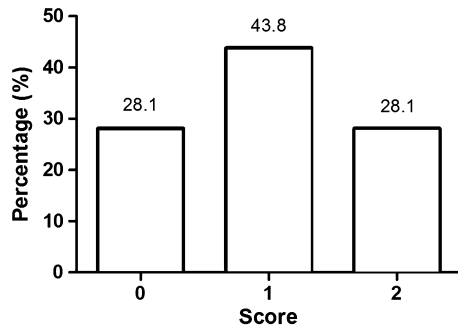


Figure 1. Knowledge about the main risk factors for oral cancer. Participants' responses regarding knowledge about oral cancer were assessed as correct or incorrect. Score 0 indicates that the participant does not know the two main risk factors for oral cancer (tobacco and alcohol), score 1 indicates that the participant knows only one risk factor, and score 2 indicates that the participants know the two main risk factors.

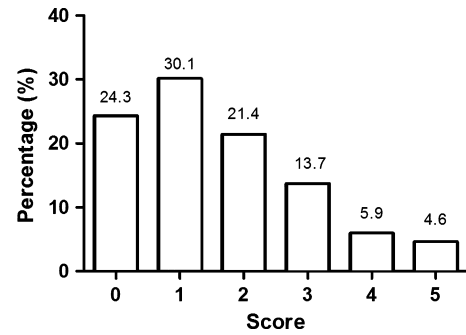


Figure 2. Knowledge about the signs of oral cancer. Responses regarding knowledge about the signs of oral cancer were assessed as correct or incorrect. Score 0 indicates that the participant does not know any sign of oral cancer, score 1 indicates that the participant knows only one sign, score 2 indicates that the participant knows two signs, score 3 indicates that the participant knows three signs, score 4 indicates that the participant knows four signs, and score 5 indicates that the participant knows all five possible signs of oral cancer (swelling, red/white patch, ulcer, pain, difficulty in tongue movement/swallowing).

Table 2 Factors associated with knowledge about risk factors for oral cancer

Variable	Knowledge about risk factors			P value
	Don't know the two main risk factors (%)	Know one of the two main risk factors (%)	Know the two main risk factors (%)	
Age				
>40 years	29.2	39.1	31.5	0.85
<40 years	28.7	40.3	31.0	
Gender				
Male	33.2	43.9	22.9	0.000*
Female	24.2	43.8	32.0	
Education				
Less than university	31.4	44.4	24.2	0.002*
University	26.0	43.4	30.6	
Smoking				
Yes	34.4	43.6	21.9	0.000*
No	24.9	43.9	31.2	
Alcohol use				
Yes	27.8	61.9	10.3	0.000*
No	28.1	42.2	29.6	

*Indicates statistical significance at $P < 0.05$.

When asked about signs of oral cancer, 24.1% knew no signs of oral cancer. However, 43.8%, 41.4%, and 32.9% were able to correctly identify white/red patches, a long-standing swelling, and a non-healing ulcer, respectively, as possible signs of oral cancer. Pain and difficulty in swallowing were identified by 20.3% and 23.7%, respectively, as possible signs. Knowledge scores for signs of oral cancer ranged from 0 to 5 with 24.3% obtaining a score of 0, 21.4% a score of 2, and only 4.6% scoring a maximum of 5 (Figure 2).

Male subjects, smokers, and participants with less than a university education had significantly less knowledge about signs of oral cancer ($P < 0.05$). No

significant association was found between knowledge about signs of oral cancer and participants' gender, age, alcohol drinking habits, and regular dental visits (Table 3).

Only 22.2% and 15.3%, respectively, were able to correctly identify the tongue and lips as the most common sites of oral cancer. A minority (5.6%) believed that erupted teeth can develop oral cancer, and 36.4% believed that people younger than 40 years of age are most likely to be affected by oral cancer. About one-third (26.2%) believed that oral cancer is untreatable and 15.9% thought that oral cancer is contagious and therefore that they should avoid contact with affected patients. Some 6.8% believed that the use of certain herbs can cure oral cancer.

Attitude towards early diagnosis and treatment

Only 35.5% of the participants reported that they visited a dentist regularly for oral examination. However, 86.1% believed that regular dental visits can help in the early detection of oral cancer and 67.5% thought that dentists are qualified to diagnose oral cancer. No significant association was found between regular dental visits and participants' age, gender, level of education, smoking, and alcohol consumption habits.

When asked about actions that they would take if they noticed an oral lesion, 39.9% stated that they would consult a dentist, 26.8% that they would consult a physician, 17.9% that they would apply home remedies (olive oil, sesame paste, water and salt, mouth wash, or iodine), and 7.3% would take no action ('wait and see'). Participants with a university education were more likely to consult a doctor (dentist/physician) regarding a noticeable oral lesion

Table 3 Factors associated with knowledge about signs of oral cancer

Variable	Mean score (SD)	P value
Age		
>40 years	1.8 (1.3)	0.71
<40 years	1.9 (1.2)	
Gender		
Male	1.44 (1.3)	0.000*
Female	1.72 (1.4)	
Education		
Less than university	1.43(1.4)	0.000*
University	1.71 (1.35)	
Smoking		
Yes	1.4 (1.26)	0.000*
No	1.71 (1.42)	
Alcohol use		
Yes	1.53 (1.34)	0.56
No	1.61 (1.38)	

*Indicates statistical significance at $P < 0.05$.

($P < 0.05$). Male subjects were more likely to take no action ($P < 0.05$), whilst female subjects were more likely to apply home remedies ($P < 0.05$). No significant association was found between the chosen action and participants' attitude towards regular dental visits, age, smoking, and alcohol consumption habits ($P > 0.05$).

DISCUSSION

The overall prognosis of oral cancer is not good, with a 5-year survival rate generally of approximately 50%²⁹⁻³¹, the prognosis being influenced by several factors – especially the stage at the time of diagnosis and treatment^{37,38}. Unfortunately, most oral cancers, even in developed countries, are detected in late stages³⁹, and delay in diagnosis and treatment has been attributed, at least in part, to the lack of public knowledge and awareness about signs and risk factors of oral cancer^{34,40-44}.

The present study examined the level of awareness and knowledge about oral cancer in Jordanian dental patients. The level of participants' awareness about oral cancer was alarmingly low, with only 45.6% knowing that cancer can occur in the mouth. Similar studies conducted in other countries have revealed variable results, with values ranging from 32.3% to 95% (Table 4)^{34,45-65}. Interestingly, studies conducted in countries with a particularly high prevalence of oral cancer, such as India, Sri Lanka, and Malaysia, reported higher levels of public awareness⁴⁵⁻⁴⁷. The low level of awareness observed in our study could be attributed to the relatively uncommon nature of oral cancer in Jordan⁶⁶ and to the current lack of public health education programmes focusing on this type of cancer.

Tobacco smoking and alcohol consumption are the two main risk factors for oral cancer⁶⁷. The results of

Table 4 Public and dental patients' awareness about oral cancer in different countries

Reference	Country	Level of public awareness (%)
57	Australia	79
59	Germany	66
58	India	86
45	India (Gorakhpur)	91.2
49	India (South)	60.2
52	Iran (Babol)	24
46	Malaysia	89.9
53	Malaysia	92
54	Malaysia	84.2
56	Nigeria	72
65	Portugal	68.6
55	Sri Lanka	84
47	Sri Lanka	95
51	Turkey	39.3
63	UK	95.6
34	UK	56
48	UK	80
60	USA (Florida)	84.5
62	USA (Maryland)	85
61	USA (North Carolina)	86

the present study showed that around one-third of Jordanian subjects smoke tobacco in the form of cigarettes or narghile and 8.1% drink alcohol. Although more than two-thirds were aware of the association between tobacco use and oral cancer, only 33.8% were aware that alcohol is a risk factor. Similarly to our findings, most studies have reported greater public awareness of tobacco as a risk factor (47–95%) compared with alcohol consumption (6.6–64%)^{34,58-63,68}. The greater awareness of tobacco as a risk factor could be attributed to exposure to anti-tobacco messages in various aspects of daily life. Targeting information about the association between alcohol consumption and oral cancer is desirable as the synergistic effect of tobacco and alcohol seems to be little known to the public.

Some 55.4% of the participants obtained scores of 0 and 1 (of a maximal score of 5) when asked about signs of oral cancer, indicating a significant lack of knowledge in this aspect. Similarly to other studies, ulcer, mass, and white/red patches were the most commonly identified signs of oral cancer^{59,60,64}. We have suggested a 'RULE' for cancer diagnosis – an acronym based on Red or white lesion, Ulcer, Lump, Exceeding 3 weeks' duration⁶⁹.

The results of the present study showed that general awareness about oral cancer was higher in younger subjects (those <40 years of age). This can be attributed to the greater exposure of young individuals to public media, including the Internet. Although level of education was not associated with general awareness about oral cancer, participants with a university education had significantly more knowledge about signs and risk factors of oral cancer, a finding consistent

with the results of other studies^{58,61}. Interestingly, high-risk groups, such as male subjects, smokers, alcohol drinkers, and participants >40 years of age, had much less knowledge about the risk factors and signs of oral cancer. Improving knowledge of these high-risk groups about oral cancer is therefore particularly important.

More than half (59.8%) of the participants knew about oral cancer through public media (TV, newspaper, and the Internet), which emphasises the importance of using public media to inform society about important health issues, including oral cancer. Only 15% had heard about oral cancer from their dentist. Dentists are therefore encouraged to practice their pivotal role in informing the public about risk factors and signs of oral cancer. In addition, continuous education programmes should focus on updating dentists' knowledge about oral cancer and improving their clinical skills in oral cancer screening.

Attitudes towards early diagnosis and treatment were generally positive. Most of the participants (86.1%) believed that regular dental visits can help in early detection of oral cancer, and 67.5% believed that dentists are qualified in the diagnosis of oral cancer. However, only 35.5% regularly visit dentists for oral examination. The importance of regular dental visits for oral examination and for consultation regarding an abnormal oral lesion should therefore be emphasised to the public. Practices such as applying home remedies for persistent oral lesions were relatively common among participants (17.9%). This could be attributed to cultural factors and to inherited beliefs about the curative effect of some indigenous herbs and plants; this is particularly common among less-educated and older people in Jordan⁷⁰.

The present study was primarily a hospital-based survey; however, it revealed some important aspects about public knowledge and awareness regarding oral cancer. Well-designed population-based studies are therefore needed to assess, in greater detail, public knowledge about oral cancer. Nevertheless, the findings of our study suggest that suitable health education materials depicting risk factors and clinical features of oral cancer should be provided to the public, especially high-risk groups⁷¹.

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Conflict of interest

None declared.

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Correspondence to:
Dr Yazan Hassona,
Department of Oral Surgery, Oral Medicine,
Pathology and Periodontics,
Faculty of Dentistry,
The University of Jordan,
PO Box: 11942 Amman, Jordan.
Email: yazan@ju.edu.jo