

RESEARCH ARTICLE

Public Awareness and Knowledge of Oral Cancer in Yemen

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Abstract

Background: Oral cancer is increasing in incidence in Yemen and indeed worldwide. Knowledge regarding risk factors and early signs in the general population can help in prevention and early detection of the disease. **Purpose:** The aim of this study was to assess the level of awareness and knowledge of oral cancer in the general population in Yemen. **Materials and Methods:** A cross-sectional survey using a self-administered questionnaire was conducted on Yemeni adults aged ≥ 15 years old. A total of 543 persons participated, the collected data being analyzed using SPSS software. The significance level was set at $p < 0.05$. **Results:** Two thirds (71.5%) of the participants had heard about oral cancer. Smoking and smokeless tobacco usage were identified as the major risk factors by 71.5% and 73.7% of the participants, respectively. Only 24.1% and 21.4%, respectively, were able to correctly identify red and white lesions as early signs of oral cancer. Knowledge of oral cancer was significantly associated with age ($p < 0.01$), gender ($p < 0.05$) and education level ($p < 0.001$). **Conclusions:** The findings suggest that the knowledge regarding oral cancer in this population is low. Therefore, educational programs are highly needed to improve such knowledge.

Keywords: Oral cancer - knowledge - public awareness - Yemen

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Introduction

Oral cancer is a significant disease worldwide with up to 400,000 new cases every year and almost 130,000 deaths annually (Ferlay et al., 2010). Notably, the incidence and mortality rates as a result of oral cancer are higher in developing countries as compared to the developed world. Most of oral cancer cases have been reported from countries like India, Bangladesh, Europe, South America and Oceania (Warnakulasuriya, 2009; Ghani et al., 2013). In Yemen, there has been no well-documented national population-based cancer registry. Yet, some hospital based studies have revealed a quite high relative frequency of oral cancer among Yemenis, 3.7%, when compared to the neighboring countries; furthermore, most of the cases were presented at advanced stages (Halboub et al., 2011; Alaizari and Al-Maweri, 2014).

Squamous cell carcinoma accounts for 95% of oral cancers. The etiology of oral cancer is multi-factorial, but the most important risk factors are: tobacco smoking and chewing, excess alcohol consumption, betel quid chewing, sun exposure in the case of lip cancer, human papilloma virus (HPV) infection, immunodeficiencies, diet and nutrition and socio-economic status (Warnakulasuriya, 2009; Lohavanichbutr et al., 2009; Lin et al., 2011; Al-

attas et al., 2014). Unconfirmed risk factors are ethnicity and race, poor oral hygiene, dental conditions, chronic candidiasis and chronic trauma of the oral mucosa (Warnakulasuriya, 2009). The previously mentioned risk habits are very common in Yemen except HIV infection, betel quid chewing, and alcohol consumption. Moreover, khat chewing and smokeless tobacco use (locally known as shammah) are highly prevalent. Such habits have been linked with occurrence of oral cancer in Yemen (Scheifele et al., 2007) and Saudi Arabia (Brown et al., 2006).

Most of the consequences of cancers occurring in the oral cavity can be prevented by abstaining from the known risk factors and also by early detection (Llewellyn et al., 2004; Amarasinghe et al., 2010). Delayed presentation of oral cancer results in increased treatment morbidity and reduced survival rates. It has been reported that lack of public knowledge and awareness is the most significant factor in delaying diagnosis and treatment of oral cancer (Warnakulasuriya et al., 1999; Agrawal et al., 2012). This underscores the need for an extensive awareness campaigns on the issues related to oral cancer. It has been reported that public awareness of oral cancer is low (Park et al., 2011; Agrawal et al., 2012; Ghani et al., 2013; Tadbir et al., 2013; Quadri et al., 2014); and several studies have shown that oral cancer awareness is lesser when compared

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with other types of cancer (Pakfetrat et al., 2010; Park et al., 2011; Rogers et al., 2011). Moreover, it has been reported that the majority of certain populations failed to recognize the early signs and symptoms of oral cancer (Ghani et al., 2013; Tadbir et al., 2013; Quadri et al., 2014).

Any increase in the understanding about signs, symptoms and early detection of oral cancer among the general population can thus help in prevention, better cure and prognosis of the disease. Efforts are required for the early detection and primary prevention of oral cancer among the community by the means of a variety of outreach programs related to education and awareness of oral cancer. Dental students may be particularly important in this context (Halawany et al., 2013). In Yemen, data regarding knowledge of oral cancer among the public is lacking. Hence this study was planned and conducted to assess the level of awareness and knowledge about oral cancer among a selected population of Yemenis, and also to determine factors associated with the level of knowledge.

Materials and Methods

This cross-sectional survey was performed on the general population of Sana'a, the capital city of Yemen. The sample size was calculated using a single proportion formula based on the proportion of awareness among the adults in Malaysia of 84.2% at the precision of 5%, giving minimum sample size of 228.

Ten main shopping malls located at various parts of the city were chosen to recruit the population from all the economic and social backgrounds. A convenient sample (non-probability sampling technique) was employed. Participants were limited to those 15 years of age or over, who understood the purpose of the study and were able to give written consent after reading the information sheet and being informed verbally about the study. This involved 700 Yemeni adults, who were present in the shopping malls at the time of the study.

A structured questionnaire was developed from previously validated items (Elango et al., 2009; Park et al., 2011; Agrawal et al., 2012; Ghani et al., 2013; Tadbir et al., 2013) with modifications to suit the local population, especially in the area of risk factors associated with the disease. Before submitting the questionnaire, a pilot study was performed on a random sample of the population (n=35), and the questionnaire was modified according the feedback obtained.

The self-administered questionnaire comprised 14 closed-ended questions that assessed the subjects' awareness of oral cancer, source of information, knowledge of signs/symptoms and risk factors for oral cancer. Oral cancer awareness was ascertained by asking the following question: 'Have you ever heard of mouth cancer?'. Responses to knowledge questions were assessed as correct or incorrect, and scores of knowledge items were summed for each respondent to obtain the mean total knowledge score on oral cancer. Socio-demographic data such as age, gender, education level, and dental visits was also reported. Education level was grouped as illiterate (no school education), elementary (maximum

up to grade 9), high school (up to grade 12) and college/university.

Questionnaires were self-administered; the interviewer was readily available when respondents required assistance. Illiterate participants were interviewed face to face by one of the investigators.

The study was approved by the Research and Ethics Committee, Faculty of Medicine and Health Sciences, Sana'a University, Yemen. Permission was obtained from the shopping malls' management before commencing the study. All participants were informed about the study methods and purposes and consents were obtained. Data were collected in July 2014.

SPSS (IBMR Statistical Package for Social Studies) version 20.0 was used for data entry and analyses. A knowledge score was calculated for each participant based on the answers to the 13 knowledge items. A correct response was given the score of 1 whilst an incorrect response or a "don't know" response was given the score of 0. A total knowledge score out of 13 was computed for each participant with possible scores ranging from 0-13. Qualitative data were presented as frequencies and percentages, and the outcomes were analyzed by Chi-square test. The quantitative data were presented as means and standard deviations, and the outcomes were analyzed by non-parametric tests (Mann-Whitney and, Kruskal-Wallis) as the data were not normally distributed. The significance level was set at $p < 0.05$.

Results

Out of the 700 invited people for the study, 543 returned questionnaires, giving a response rate of 77.6 percent. One hundred and fifty seven dropped out of the study because they did not answer the questionnaire.

Table 1 presents the demographic characteristics of the study participants. The sample comprised an almost equal distribution of male and female (52.9% vs 47.1%). The age of the participants ranged from 15-83 years (mean=27.37±11.26), with 63.5% in the 20 to 39-year-old age group. Around half of the participants had college/university education.

Nearly, 71.5% of the participants reported having heard of oral cancer, with no significant difference across gender ($p > 0.05$) (Figure 1). Young participants showed higher rates of oral cancer awareness as compared to the old age group. It was also evident that the general awareness was significantly greater among those with the highest level of education.

Among the participants who were aware of oral cancer, 36.3% gained the information from the public media, 22.5% from the dentist and 8.2% from the physicians. (Figure 2).

Around two thirds (69.8%) of the participants believe that oral cancer is preventable, and half of them (49.4%) believe that it is treatable. There was some misconception about oral cancer as 19.5% of the participants believe that oral cancer is contagious. Among the various risk factors for causing oral cancer, smoking and smokeless tobacco usage were identified as the major risk factors by 71.5% and 73.7% of the participants, respectively. However, only

Table 1. Demographic Data of the Subjects (n =543)

Variable		N	%
Gender	Male	287	52.9%
	Female	256	47.1%
Age groups (years)	≤ 19	118	21.7%
	20-39	345	63.5%
	>40	80	14.7%
Education level	Illiterate	58	10.7%
	Elementary	51	9.4%
	Secondary	160	29.5%
	University	274	50.5%

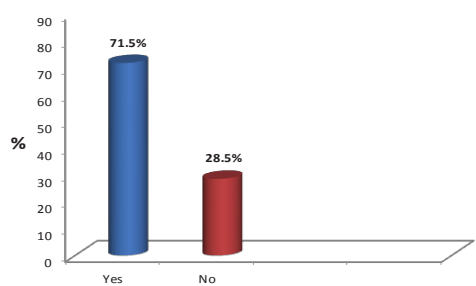


Figure 1. Percentage of the Participants Who have Heard of Oral Cancer

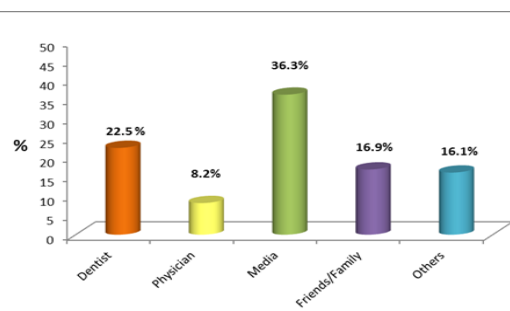


Figure 2. Source of Information about Oral Cancer

Table 2. Proportion of Knowledge about Oral Cancer

Variable	Yes N (%)	No N (%)	Don't know N (%)
General knowledge			
Heard of OC	388 (71.5)	155 (28.5)	--
OC is preventable	379 (69.8)	30 (5.5)	132 (24.3)
OC can be treated	268 (49.4)	51 (9.4)	222 (40.9)
OC is contagious	106 (19.5)	205 (37.8)	222 (40.9)
Risk factors for OC			
Old age	231 (42.5)	77 (14.2)	219 (40.3)
Smoking	388 (71.5)	40 (7.4)	100 (18.4)
Smokeless tobacco use	400 (73.7)	34 (6.3)	102 (18.8)
Alcohol drinking	320 (58.9)	70 (12.9)	149 (27.4)
Sun exposure	154 (28.4)	148 (27.3)	234 (43.1)
Signs of OC			
Non-healing ulcer	197 (36.3)	64 (11.8)	279 (51.4)
Red patch	131 (24.1)	82 (15.1)	325 (59.9)
White patch	116 (21.4)	83 (15.3)	335 (61.7)
Lump	279 (51.4)	26 (4.8)	234 (43.1)

OC: oral cancer

47.9% of the participants identified older age as a risk factor. Of total, only 28.4% could correctly identify sun exposure as a risk factor for lip cancer. (Table 2).

Generally, the participants showed poor Knowledge regarding the early signs and symptoms of oral cancer.

Table 3. Association between Level of Knowledge of Oral Cancer and Demographic Factors

Variable		Mean	SD	P-value
Gender	Male	6.06	3.26	0.03*
	Female	6.65	3.08	
Age groups	< 19	6.58	2.95	0.017**
	20-39	6.47	3.02	
	>40	5.4	4.01	
Education level	Illiterate	3.69	3.46	0.001**
	Elementary	6.33	3.39	
	Secondary	6.5	2.84	
	University	6.8	3.02	

*Mann-Whitney test; **Kruskal-Wallis test

Of total, only 24.1% and 21.4%, respectively, were able to correctly identify red and white patches as early signs of oral cancer. (Table 2).

The total mean knowledge score was 6.34 ± 3.19 (range: 0-13), with significant association with gender ($p=0.03$), age ($p<0.05$) and level of education ($p<0.001$). Young participants, females and those with high education had the highest knowledge scores. (Table3).

Discussion

Public awareness about oral cancer, its risk factors and their signs and symptoms can lead to early clinical presentation. Thus, raising awareness and educating the public on the early signs of cancers will enable patients to present at an early stage resulting in improved survival. Data on the level of oral cancer knowledge in Yemen is lacking, making the planning of public health policies to improve survival of patients with the disease very challenging. Therefore, this study was conducted to evaluate public awareness and knowledge about oral cancer in Yemen.

The results of this study demonstrated the general lack of knowledge about oral cancer in our population; only 71.5% of participants were aware of oral cancer, a finding similar to that reported in previous studies elsewhere (Horowitz and Nourjah, 1996; Tomar et al., 2005; West et al., 2006; Devadiga and Prasad 2010; Peker and Al-Kurt, 2010; Park et al., 2011; Agrawal et al., 2012; Tadbir et al., 2013). This emphasizes the importance of initiating intensive public education programs targeting the public to increase such knowledge.

In our study, a considerable proportion (36.3%) of the participants had heard of oral cancer via public media, indicating the importance of mass media in educating the public about oral cancer. These results support previous findings, which report that mass media is a common source of information regarding oral cancer (Peker and Al-Kurt 2010; Park et al., 2011; Ghani et al., 2013; Tadbir et al., 2013). A recent Malaysian study has assessed the impact of promoting oral cancer awareness of the public using a mass media campaign; the results showed a significant increase in the public awareness regarding general knowledge and etiology factors of the disease (Saleh et al., 2012). Furthermore, another study has reported that television advertising offered the largest coverage in an oral cancer awareness campaign in comparison to other

methods (Eadie et al., 2009).

Our study population also showed an inadequate knowledge regarding risk factors. Although more than two thirds of the participants identified tobacco use (smoking and smokeless tobacco use) as the main risk factors, similar to earlier studies conducted in Australia, England, India, Iran, Malaysia and the USA (Horowitz et al., 1995; Warnakulasuriya et al., 1999; Tadbir et al., 2013; Park et al., 2011; Agrawal et al., 2012; Ghani et al., 2013), only small proportion of participants were aware that old age, alcohol consumption, and sun exposure in the case of lip cancer are also potential risk factors. The greater awareness of tobacco as a risk factor could be attributed to anti-tobacco media campaigns explaining the adverse effects of smoking. A study conducted by Pierce and his colleagues (1990) showed that this media campaign against smoking had a positive impact on cessation of smoking. Sadly, in our country there is a high rate of tobacco usage in its different forms, so educating people about smoking adverse effects could make them quit these deleterious habits.

Unfortunately, the knowledge pertaining clinical presentation of oral cancer was remarkably unsatisfactory. Only less than quarter of the participants knew that presence of red and or white patches was early signs of oral cancer. These findings are consistent with most of the published studies that reported lack of public knowledge regarding early signs of oral cancer (Tomar et al., 2005; Devadiga and Prasad 2010; Pakfetrat et al., 2010; Park et al., 2011; Agrawal et al., 2012; Saleh et al., 2012; Tadbir et al., 2013; Quadri et al., 2014). Such findings indicate that there is not enough attempt on giving information about first signs of oral cancer, and that is why most of people have not enough information about that (Tadbir et al., 2013). It has been reported that the lack of public knowledge on early signs of oral cancer leads to late clinical presentation and consequently decreasing the survival rates (Hollows et al., 2000; Al Dubai et al., 2012). This is well reflected by the fact that most of oral cancer cases in Yemen are presented in advanced stages. Hence raising awareness and educating the public on the early signs of cancers is mandatory for early diagnosis and treatment of the disease.

Several socioeconomic factors may affect the public oral cancer knowledge and awareness. In the present study we found a significant association between level of knowledge and gender, age and education level. In this study, female participants had better knowledge than males, which might be attributed to their more usage of educational programs of the media. Another explanation is the fact that women are generally more concerned about their health than men, making them more curious to get information. This finding is in line with other studies which reported an association between gender and knowledge (Srikanth Reddy et al., 2011; Agrawal et al., 2012; Tadbir et al., 2013; Ghani et al., 2013).

In our study we observed a significant relationship between the level of knowledge and level of education. Participants of high education background had the highest knowledge scores while those who were illiterates or

had only primary education had the lowest knowledge scores. This finding is supported by previous studies, which have documented that knowledge is proportional to the education level of respondents (Ariyawardana and Vithanaarachchi 2005; Elango et al., 2009; Agrawal et al., 2012; Ghani et al., 2013).

The level of knowledge was observed to be higher in the younger age groups ($p < 0.01$), which could be attributed to their higher education level, as noted above. Moreover, higher knowledge among the young can be ascribed to their wider exposures to mass media such as internet, TV and social networks.

It has been reported that all observational studies such as cross-sectional surveys are prone to limitations and bias (Lu, 2009). This study has some limitations that should be taken in consideration. One limitation of this survey was restricting participants to those coming into the shopping complexes which might have introduced selection bias of the participants of a certain generation or demographic profile. However, in order to minimize such bias we strategically selected several shopping malls, located in different regions of the city, to make sure that the participants from different socioeconomic background were involved. Another limitation may be the format of the questions as different wording can give different results. Nevertheless, despite these limitations, this study provides valuable baseline information on the level of oral cancer awareness and knowledge among Yemeni public.

Generally, a lack awareness of oral cancer with regards to its risk habits, signs and symptoms was evident in this population, necessitating implementing and initiating intensive educational programs for the recognition of risk habits, signs and symptoms and early detection of oral cancer. Such education programs could be carried out targeting the public utilizing the mass media means. Most of the participants declared that they received their information about oral cancer via TV, Radio, magazines and newspapers. This demonstrates the important role of mass media in educating people. Moreover, dental professionals, especially those who serve at peripheral centers, have a vital role to play in educating their patients about oral cancer.

In conclusion, similar to studies in other countries, the findings of this survey suggest that the public awareness and knowledge of oral cancer is insufficient in Yemen. The level of knowledge was influenced by socio-demographic factors; Knowledge level was higher among females, younger age groups and highly educated participants. The study suggests that both professional efforts and public education in improving awareness and knowledge of oral cancer are urgently needed. It appears that the study is the first of its kind in Yemen to evaluate the public oral cancer knowledge. Further studies with larger sample sizes covering the entire population in Yemen are highly recommended.

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