

## RESEARCH ARTICLE

# Oral Cancer Awareness of the General Public in Saudi Arabia

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### Abstract

**Background:** The aim of this study was to assess the level of awareness and knowledge about signs and risk factors of oral cancer in the general population in Saudi Arabia. **Materials and Methods:** A self-administered questionnaire was used to collect information from Saudi adults aged 15 years and older. A total of 679 persons participated in the survey. Descriptive statistics were calculated and chi-square tests, t-tests, and one-way analysis of variance (ANOVA) were used to examine differences between groups. The significance level was set at  $p < 0.05$ . **Results:** Only 53.6% of the participants had heard of oral cancer. Smoking and alcohol consumption were identified as the major risk factors by 81.7% and 56.3% of the participants, respectively. Only 22.2% and 18.2%, respectively, were able to correctly identify red and white lesions as early signs of oral cancer. Participants with less than high school education were significantly less aware, and had much less knowledge, of the signs and risk factors of oral cancer ( $p < 0.05$ ). **Conclusions:** This survey demonstrates a general lack of awareness among the public about oral cancer and a lack of knowledge about its signs and risk factors. There is a clear need to inform and educate the public in matters relating to the known risk factors associated with oral cancer. A media campaign informing the public about oral cancer is clearly required.

**Keywords:** Oral cancer - knowledge - public - Saudi Arabia

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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). Incidence rates are much higher in developing regions like Southeast Asia, where they account for up to 50% of all malignant tumors (Argawal et al., 2012; Siegel et al., 2012; Ghani et al., 2013; Krishna Rao et al., 2013).

Oral cancer includes a large group of malignant neoplasms, of which squamous cell carcinoma is the most common form accounting for 95% of oral cancers. Risk factors for oral cancer include smoking, smokeless tobacco use, alcohol drinking and HPV (human papilloma virus) infections (Lohavanichbut et al., 2009; Warnakulasuriya, 2009; Lin et al., 2011; Halawany et al., 2013; Tadbir et al., 2013; Al-Aizari and Al-Maweri, 2014; Al-Attas et al., 2014). The cancer has a strong association with smoking and alcohol use (Franceschi et al., 1992; Mashberg et al., 1993). The relative risk of oral cancer increases between 10- and 15-fold in smokers (Franceschi et al., 1992). Moreover, the synergistic effects of cigarettes and alcohol use on development of oral cancer are well documented (Bross and Coombs, 1976; Park et al., 2011).

The previously mentioned risk habits are very common in Saudi Arabia. For instance, the prevalence of smoking is approximately 21% among the general adult population and 25% among university students (Al-Haqwi et al., 2010). This rate is considered one of the highest in the world (Al-Haqwi et al., 2010; Kujan et al., 2014). Additionally, Saudi Arabia has a large expatriate community particularly people of Southeast Asian origin, in which social habits such as areca nut chewing are common. Subsequently, these factors will contribute to an increased incidence of oral cancer in Saudi Arabia in future years (Al-Haqwi et al., 2010; Kujan et al., 2014).

The prognosis for oral cancer is poor, with an overall five year survival rate of 59% (Jemal et al., 2005). Mortality rates depend on cancer stage, varying between 30% and 18% (Jemal et al., 2005). 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

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(Agrawal et al., 2012; Saleh et al., 2012). This highlights the need for an extensive awareness campaigns on the issues related to oral cancer.

Several studies have shown that public is not well aware of risk factors associated with oral cancer and that the level of knowledge is influenced by sociodemographic factors (Warnakulasuriya et al., 1999; Park et al., 2011; Agrawal et al., 2012; Tadbir et al., 2013; Al-Maweri et al., 2014; Quadri et al., 2014; Hassona et al., 2015). 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; Al-Maweri et al., 2014; Quadri et al., 2014; Hassona et al., 2015). 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. Despite the high prevalence of tobacco use and the increasing in incidence and high mortality rates of oral cancer, there is a dearth of literature regarding knowledge of the cancer in the Saudi community. Hence this study was planned and conducted to assess the level of awareness and knowledge about oral cancer among a selected population of Saudis, and also to determine factors associated with the level of knowledge.

## Materials and Methods

This cross-sectional study was conducted on the general population in Riyadh, the capital city of Saudi Arabia. The Faculty of Dentistry Research Ethics Committee reviewed and approved the study. The research was conducted in full accordance with the declared ethical principles of the World Medical Association Declaration of Helsinki (2002).

Four main shopping malls located at various parts of the city were strategically chosen to recruit the population from all the economic and social backgrounds. A convenient sample (non-probability sampling technique) was employed. All Saudi public aged 15 years old and over were eligible to participate. Participation in the study was completely voluntary, and participants were informed that their responses would be anonymous and treated confidentially. The purpose of the study was explained and verbal consent was obtained from all participants. Permission was obtained from the shopping malls' management before commencing the study

The self-administered questionnaire was adapted from previously validated items that have been applied in similar studies (Elango et al., 2009; Agrawal et al., 2012; Al-Maweri et al., 2014). Before submitting the questionnaire, a pilot study was conducted on a random sample of patients to ensure clarity and practicability of the questions. No major amendments were required following feedback from the pilot.

The self-administered questionnaire comprised 13 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 assessed 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 smoking habits was also reported. Education level was grouped (according to Saudi schooling system) as illiterate (no school education), primary (maximum up to grade 6), intermediate (up to grade 9), secondary (up to grade 12) and college/university. Data were collected in December 2014.

SPSS (IBMR Statistical Package for Social Studies) version 20.0 was used for data entry and analyses. Descriptive statistics were generated. Qualitative data were presented as frequencies and percentages and quantitative data were presented as means and standard deviations. The chi-square test, Student's t-test, and one-way analysis of variance (ANOVA) were used to examine differences between groups. Results were considered significant at  $p < 0.05$ .

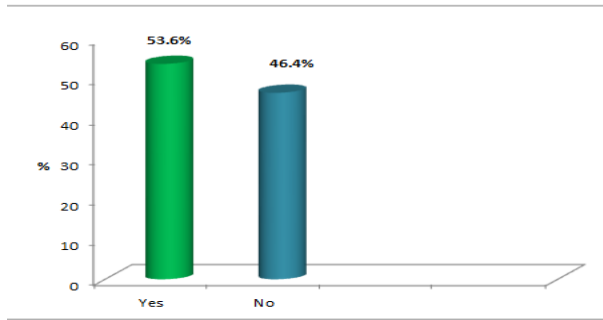
## Results

The response rate was 97% (679 out of 700). The sample comprised 436 (64.2%) female subjects and 243 (35.8%) male subjects. The mean age of the participants was  $28.65 \pm 10.97$  years (range: 15-70), with 60.7% in the 15 to 29-year-old age group. In terms of education, 64.9% had university education, 24.2% had high school education, 7.5% had intermediate education, 2.2% had primary education, and 1.2% of the participants were illiterate. Out of total, around 14% were smokers.

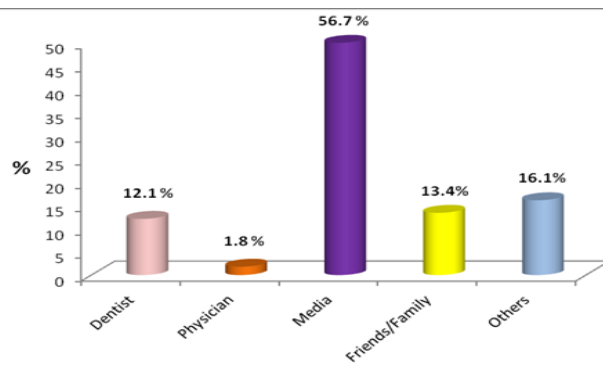
Figure 1 shows proportion of oral cancer awareness among the participants. Only 53.6% had heard of oral cancer, with no significant difference across gender (Figure 1). It was evident that the general awareness was significantly greater among those with the highest level of education. Among the participants who have heard of oral cancer, the public media (TV, newspapers, and the Internet) were the main sources of information (59.8%). Only 12.1% had heard about oral cancer from their dentists (Figure 2).

Around two thirds of the participants believed that oral cancer is preventable, and 54% believed that it is treatable. There was, however, certain misconception about oral cancer, as 17% believed that oral cancer is a contagious disease. When asked about the risk factors of oral cancer, 81.7%, 61.9% and 56.3%, respectively, identified smoking, smokeless tobacco usage and alcohol consumption as risk factors. However, only one third of the subjects (32.4%) identified older age as a risk factor of oral cancer, and only 16.8% identified sun exposure as a risk factor in case of lip cancer (Table1).

The participants showed poor knowledge regarding the early signs and symptoms of oral cancer. Of total, only 22.2% and 18.2% were able to correctly identify red and white patches, respectively, as possible signs of oral cancer (Table1).



**Figure 1. Proportion of Subjects who were Aware of Oral Cancer**



**Figure 2. Source of Information Regarding Oral Cancer**

**Table 1. Proportion of Knowledge about Oral Cancer**

Variable	Yes N (%)	No N (%)	Don't Know N (%)
<b>General knowledge</b>			
Heard of OC	364 (53.6)	315 (46.4)	-
OC is preventable	445 (65.9)	16 (2.4)	214 (31.7)
OC can be treated	361 (54.0)	33 (4.9)	274 (41.0)
OC is contagious	112 (17.0)	286 (43.3)	262 (39.7)
<b>Risk factors for OC</b>			
Old age	215 (32.4)	116 (17.5)	333 (50.2)
Smoking	539 (81.7)	21 (3.2)	100 (15.2)
Smokeless tobacco use	414 (61.9)	33 (4.9)	222 (33.2)
Alcohol drinking	378 (56.3)	73 (10.9)	221 (32.9)
Sun exposure	112 (16.8)	225 (33.7)	330 (49.5)
<b>Signs of OC</b>			
Non-healing ulcer	201 (30.0)	53 (7.9)	415 (62.0)
Red patch	149 (22.2)	66 (9.9)	455 (67.9)
White patch	121 (18.2)	77 (11.6)	468 (70.3)
Lump	276 (41.1)	37 (5.5)	359 (53.4)

\*OC = Oral cancer

**Table 2. Factors Associated with Knowledge about Oral Cancer**

Variable	Mean	SD	P-Value
Gender	Male	5.67	3.09
	Female	5.68	
Age groups (years)	15-29	5.51	2.94
	30-39	5.82	
	> 40	6.15	
Education level	< 12 years	5.03	2.85
	≥ 12 years	5.76	
Smoking	Yes	5.32	3.12
	No	5.74	

\*t- test; NS = Non-significant; \*\*ANOVA

The total mean score of oral cancer knowledge was  $5.68 \pm 2.91$  (Range=0-12) with no significant differences between males and females ( $p > 0.05$ ). Knowledge of oral cancer was significantly associated with education ( $p < 0.05$ ); participants with less than high school education were significantly less aware, and had much less knowledge, of the signs and risk factors of oral cancer. Moreover, although not statistically significant ( $p > 0.05$ ), non-smokers showed better knowledge than smokers (Table 2).

## Discussion

Unfortunately, most oral cancers, even in developed countries, are detected in late stages (La Vecchia et al., 2004). A commonly cited reason for late disease presentation is the inability to recognize the early signs of cancer (Macleod et al., 2009). Thus, raising awareness and educating the public on the early signs of cancer should enable patients to present at an early stage resulting in improved survival. Data on the level of oral cancer awareness in Saudi Arabia is scarce, making the planning of public health policies to improve survival of patients with the disease very challenging. Hence, this study was carried out to determine the level of oral cancer awareness and knowledge among Saudi general population.

The present study showed that the level of participant's awareness about oral cancer was alarmingly low, with only 53.6% were aware of oral cancer. This figure is similar to that reported in previous studies in Jordan (45.6) and the UK (56%) (Warnakulasuriya et al., 1999; Hassona et al., 2015). However, this rate of awareness is much lower than that reported in Australia (79%) India (91.2%), Malaysia (84.2%, 92%), Sri Lanka (95%), USA (84.5%) and Yemen (71.5%) (Ariyawardana and Vithanaarachchi, 2005; Tomar et al., 2005; Park et al., 2011; Agrawal et al., 2012; Al Dubai et al., 2012; Ghani et al. 2013; Al-Maweri et al., 2014). 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 awareness (Ariyawardana and Vithanaarachchi, 2005; Agrawal et al., 2012; Ghani et al., 2013). The low level of awareness observed in our study could be attributed to the relatively uncommon nature of oral cancer in Saudi Arabia and to the current lack of public health education programs focusing on this type of cancer.

In our study, more than half of the participants knew about oral cancer through public media. Such findings emphasize the importance of mass media in education the public about important health issues, including oral cancer. Our results support previous findings, which reported 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; AL-Maweri et al., 2014; Hassona et al., 2015). Disappointingly, only 12.1% had heard about oral cancer from their dentists. Therefore, dentists are required to practice their pivotal role in informing the public about oral cancer.

Our study population also showed an insufficient knowledge regarding risk factors. Although over 80% of the participants identified tobacco use as a risk factor,

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. These findings corroborate most of the previous studies, which have reported greater public knowledge of tobacco as a risk factor compared with other potential risk factors (Horowitz et al., 1995; Warnakulasuriya et al., 1999; Park et al., 2011; Agrawal et al., 2012; Ghani et al., 2013; Tadbir et al., 2013; Al-Maweri et al., 2014; Hassona et al., 2015). The greater awareness of tobacco as a risk factor could be attributed to anti-tobacco media campaigns explaining the adverse effects of smoking. Hence, educating the public about other potential risk factors such as alcohol consumption and sun exposure is of paramount importance.

In a similar fashion to risk factors, the results of the present study showed very low knowledge regarding clinical presentations of oral cancer. Only 30% identified non-healing ulcer and only less than quarter of the participants correctly identified red/white patches as early signs of oral cancer. These results, however, are not peculiar to our population, as most of the published studies have 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; Al-Maweri 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). 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 public awareness and knowledge about risk factors and early signs of oral cancer. In the present study we found a significant correlation between the level of knowledge and education ( $P < 0.01$ ). Participants with high school or university education had the highest knowledge scores while those who were illiterates or had only primary or intermediate education had the lowest knowledge scores. This finding is consistent with the results of other studies (Ariyawardana and Vithanaarachchi, 2005; Elango et al., 2009; Agrawal et al., 2012; Ghani et al., 2013; Hassona et al., 2015).

Several studies have reported that gender and age were significant factors associated with the level of knowledge about oral cancer (Ghani et al., 2013; Al-Maweri et al., 2014; Hassona et al., 2015). In the present study, however, we did not observe any significant differences in the level of knowledge between genders and age groups. This suggests that the education level is the most important variable influencing level of knowledge. Therefore, improving knowledge of people especially those with low education is particularly important.

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.

Despite the high response rate in the present study, there were some potential limitations that should be taken in consideration. One limitation of this study was the fact that the sample was restricted to those coming into the shopping malls, and that's why we cannot generalize the results. Therefore, population-based studies are needed to assess, in greater detail, public knowledge about oral cancer. Additionally, 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 Saudi public.

In conclusion, we investigated awareness and knowledge of oral cancer among a selected population in Saudi Arabia and found deficits in their knowledge of signs, symptoms and risk factors for the cancer. Both professional efforts and public education in improving awareness and knowledge of OPC risk factors, signs and symptoms are clearly needed.

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