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Research Article

### ADDICTION OF CHEWING TOBACCO, SHAMMA AND KHAT: PERVASIVENESS OF ORAL CANCER IN SAUDI ARABIA

Shalini Saggu<sup>1\*</sup>, Atif Abdulwahab A. Oyouni<sup>1</sup>, Hasibur Rehman<sup>2</sup>, Abdullah Farasani<sup>3</sup>

<sup>1</sup>Department of Biology, Faculty of Sciences, University of Tabuk, Tabuk 71491, Saudi Arabia

<sup>2</sup>Department of Urology, School of Medicine University of Alabama, Birmingham, Al,35294,  
USA

<sup>3</sup>Department of Medical Laboratory, Faculty of Applied Medical Sciences, Jazan University,  
Jazan, Saudi Arabia

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**Abstract:**

**Objective:** The purpose of our study was to conduct a review and analyze the pattern of oral cancer (OC) in Saudi Arabia.

**Methods:** We conducted a retrospective descriptive epidemiological review of oral cancer of all Saudi oral cancer cases diagnosed. The keywords used in this study were permutations of the following: "Squamous Cell Carcinoma", "oral cancer", Nasopharynx, Hypopharynx. "awareness", "knowledge", "epidemiology", "prevalence", "incidence" and "Saudi Arabia".

**Results and Conclusions:** SCR reported a total 158 cases of male patients in 1994 and after the five-year interval, the number of cases was 161, 182, 186 and 251 (in 1999, 2004, 2009 and 2013) when compared to females. The number of cases was relatively higher in the year 2013 in both male and females as compared to the other years. The median age group was found to be 45-47 years. The highest rate of current smoking (15.6%) in Saudis among aged 55 to 64 years. The rate was higher for males (24.7%) when compared to females (4.2%). Among Saudi patients, there is a significant increase in the number of male cases of OC cancer when compared with the female. Persistent observance, screening, and patient education are needed to establish early diagnosis and perform the optimal treatment.

**Keywords:** Oral Cancer, Shamma, Khat, Epidemiology, Nasopharynx

**#Corresponding Author:****Dr. Shalini Saggu,**

Assistant Professor, Department of Biology, Faculty of Sciences,  
University of Tabuk, Tabuk 71491,  
Kingdom of Saudi Arabia.

E-mail: [shalinisaggu05@gmail.com](mailto:shalinisaggu05@gmail.com)

QR code



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**INTRODUCTION:****Background**

Oral cancer (OC) has a major health problem in many parts of the world. OC is defined as a neoplasm linking the oral cavity, which begins at the lips and ends at the anterior pillars of the fauces [1]. It includes cancers of the lips, tongue, cheeks, the floor of mouth, hard and soft palate, sinuses, and pharynx (throat), can be life-threatening if not diagnosed and treated early. While its incidence is relatively low in western countries but on Indian subcontinent and other parts of Asia it remains one of the most common forms of cancer. Incidence and mortality are higher in developing countries when compared with the developed countries[2,3]. Squamous cell carcinoma (SCC) comprises 90-95% of all OC malignancies. Regional metastasis is prevalent in oral squamous cell carcinoma (OSCC), in at least 30% of cases[4]. It develops mostly between the sixth and the seventh decades of life and incidence in younger people (<40 years old) is very rare[5,6].

Risk factors for oral cancer include smoking, smokeless tobacco use, alcohol drinking and HPV (human papillomavirus) infections [7,8]. OC has a strong association with smoking and alcohol use. The relative risk of oral cancer increases between 10 and 15 fold in smokers [9]. Moreover, the synergistic effects of cigarettes and alcohol use on the development of oral cancer are well documented [10-11]. In the Arab world, tobacco was introduced more than 500 years ago, and in the last 50 years its consumption has increased rapidly with the expediency and affordability of manufactured cigarettes. Male smoking rates in the Arab world are amongst the highest in the world, with a prevalence of up to 77% [12]. In women, smoking is still uncommon [13]. In some Arab countries, other forms of tobacco consumption are also common, mainly the smoking of shisha which has augmented drastically over the last 30 years [14].

The previously mentioned risk habits are very common in Saudi Arabia. For instance, the prevalence of smoking is approximately 21 % of the general adult population and 25 % of university students<sup>15</sup>. This rate is considered one of the highest in the world [15, 16]. 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 [15,16].

Studies have shown that the people are not aware of the risk factors associated with OC. Moreover, the majority of populations failed to recognize the early signs and symptoms of the OC. In spite of the high rate of tobacco use and the increasing incidence and high mortality rates of oral cancer, there is a dearth of literature regarding the knowledge of cancer in the Saudi community.

**Risk factors (Table 1)*****Khat Chewing***

Khat also pronounced as “cot” is a stimulant drug derived from a shrub (*Catha edulis*) that is inhabitant to East Africa and southern Arabia. It grows wild in countries bordering the Red Sea and along the east coast of Africa. The public of these countries has chewed the khat for centuries. There is numerous name for the plant, depending on its origin: chat, qat, qaad, jaad, miraa, mairungi, cat and catha. In the Western literature, it is referred to as khat.

Khat chewing is the foremost kind of ingestion by the majority of the people. Only a tiny number ingest it by making a drink from dried leaves, or, rarely by smoking dried leaves. Approximately, 90% of the alkaloid content of Qat is extracted into saliva during chewing, and most of it is absorbed through the oral mucosa [17]. Therefore, oral tissues might be exposed to high doses of Qat constituents during Qat chewing rendering them susceptible to its potential toxic effects (Table 1).

***Smokeless tobacco/Shamma consumption***

In consumption, it most commonly appears in the forms of smoking, chewing, snuffing, or dipping tobacco (Table 1). Its use kills 6 million people every year with a prospect increase to 8 million per year by 2030 [12]. It is the foremost risk factor for most chronic diseases including cardiovascular disease, stroke, chronic respiratory diseases and a significant number of cancers [18,19].

***Alcohol consumption***

Use of alcohol is strictly banned in Saudi Arabia. WHO (2015) reports show that the consumption rate is 0.2 (liters/capita). It is a restricted factor due to religious and cultural reasons [20, 21].

***Human papillomavirus (HPV)***

Evidence supports the view that HPV is a major reason for the increased incidence of a subset of head and neck squamous cell carcinoma in several geographic areas around the world [22, 23]. HPV can cause cancers at the pharynxes, base of the tongue, and tonsils, in an area known as the “oropharynx”. Kreimer

et al. found that HPV is prevalent in 35.6% of oropharyngeal, 23.5% in oral and 24% of laryngeal cancers, respectively [24]. HPV-16 was the most common subtype found in all HPV-positive cancers [24]. In Saudi Arabia, religion and cultural boundaries may hinder the investigation of the real impact of HPV infection as a risk factor for cancer in general, and HNC in particular.

In our study, an integrative literature scrutiny was undertaken to do a retrospective epidemiological study from all the OC cancer reports available till date in Saudi Arabia

### MATERIALS AND METHODS:

We conducted a retrospective descriptive epidemiological review of oral cancer from 1976 onwards of all Saudi oral cancer cases diagnosed. The keywords used in this study were permutations of the following: “Squamous Cell Carcinoma”, “oral cancer”, Nasopharynx, Hypopharynx. “awareness”, “knowledge”, “epidemiology”, “prevalence”, “incidence” and “ Saudi Arabia”. Case reports and clinical trials regarding treatment options were excluded. In this study, some part contains information from the Saudi Cancer Registry ([www.chs.gov.sa](http://www.chs.gov.sa)) and from ([www.kfshrc.edu.sa](http://www.kfshrc.edu.sa)) last accessed on February 2017. The data regarding cancer in Saudi Arabia are publicly available and easily accessible. Also, we tried to scrutinize the literature (PubMed, Google, Mendeley) and reports (cancer registries) available in Saudi Arabia.

Here, we critically gathered all the information from reliable sources with the aim of presenting the prevalence of oral cancer in Saudi Arabia.

We think that Ethical Approval is not necessary for our manuscript because the study includes the review and our Institute has no objection for conducting this study.

### Statistical analysis

The descriptive analysis of the epidemiological data was performed by calculating the overall percentage by using SigmaPlot, Systat Software program version 11 (SPSS Inc., Chicago, IL, USA).

### RESULTS AND DISCUSSION:

The estimated population of Saudi Arabia for the year 2017 is 32,540,57. Out of these, the migrants are 70,000. In our study, we have found that in the year 1976 the total number of cases of oral cancer was 5 and after five-year interval raises to 24. In 1986 number of registered cases was 33 when compared to 1991 which was 65 (Figure 1). The median age group

was found to be 45-47 years. The total number of habit-proximity oral cancer sites were found to be mucosa of the lower lip, lower gum, tongue, the floor of mouth, cheek mucosa, the vestibule of mouth, retromolar area. A total of 428 male cases of OC were diagnosed as compared to female (366 cases) between 1976 to 1995. In 1999-2000, among the Saudis, 5,713 (50.4%) were male cancer cases and 5,617 (49.6%) were female. The male to female ratio was 102:100. The overall age-standardized incidence rate (ASIR) for all Saudis with a world standard population reference was 62.6/100,000 (61.6/100,000 in males and 63.5/100,000 in females).

According to SCR, the number of lip, tonsil, hypopharynx cancer cases appears to be static from 1994 to 2013 in both male and females (Figure 2A, 2B, 3C, and 3D). However, tongue, mouth, and nasopharynx cancer cases appear to be higher in both male and female cases. In 2013, Nasopharynx cases were elevated in both male and female cases (136 and 47). (Figure 2A, 2B, 3C and 3D). It can be seen from the figure 3 that the OC cancer cases were high in male as compared to female. SCR reported a total 158 cases of male patients in 1994, and after the 5-year interval, the number of cases was 161, 182, 186 and 251(1999, 2004, 2009 and 2013) when compared to females which were relatively low (Figure 3).

Among the distribution of 20 most common malignancies (1975–2012) (total cases=75,233) at King Faisal Specialist Hospital and Research Center Oral Cavity was the 7th most frequent showing 3,458 cases, which represents 4.6%. KFSH&RC reported 520 cases of oral cavity tumors cases during 2002-2006 from a total of 13,720 cases, representing 3.8%. While During 2007-2011, 502 Oral cavity tumors cases from a total of 12,723 tumor cases, which represent 3.9%. The Saudi Health Interview Survey (SHIS) is an extensive national survey aimed at assessing chronic diseases, health behaviour's, and risk factors among adults aged 15 or older in the Kingdom of Saudi Arabia. According to SHIS in the year 2013 on average, at the age 18.7 Saudis start smoking (males at 19.0 and females at 21.6). Overall, 29.7% began smoking before the age of 15, and 60.9% began smoking before the age of 18 (Table 2).

The main risk factors for OC and HNC are tobacco smoking, chewing, and alcohol consumption and these have been estimated to account for the vast majority of the disease burden worldwide [25, 26]. Rates of male tobacco use in the Arab world are amongst the highest in the world, with a prevalence of up to 77% [12]. Smoking is still uncommon in women in the Arab

world [13]. Over the last 30 years, the smoking of shisha (water-pipe) has increased significantly in the Arab [14].

A study reports that about 50% of khat chewers develop oral mucosal keratosis (OMK) [27]. This pathological change is considered as a pre-cancerous lesion that may develop into oral cancer [28]. Usage of khat, its duration and frequency increase the severity and prevalence of this lesion. The importance of khat after finding that most of the oral squamous cell

carcinomas in study patients were located in the buccal mucosa and lateral sides of the tongue, which come into direct contact with khat during chewing [29]. In a survey, about 50% of the patients with head and neck cancer presented with a history of khat chewing and all of them had used khat over a period of 25 years or more in Saudi Arabia [30]. In some cases, the malignant lesion occurred at the same site as where the khat bolus was held.

Table 1. Different forms of Tobacco used in Saudi Arabia

Types of Tobacco
Jirak (Hookah, Shisha or water pipe)
Shamma
Cigarettes
Shag
Khat (Algat) Chewing
Pipe tobacco

Table 2. Percentage of smoking by age group in male and female for the year 2013.

Age group	Male	Female
<25	16.1	0.8
<35	30.5	1.2
<45	30.6	1.3
<55	26.5	2.9
<65	24.7	4.2
65+	9.7	1.8

Figure 1. Total number of oral cancer cases from the year 1976-1995 (Median age was 45-47).

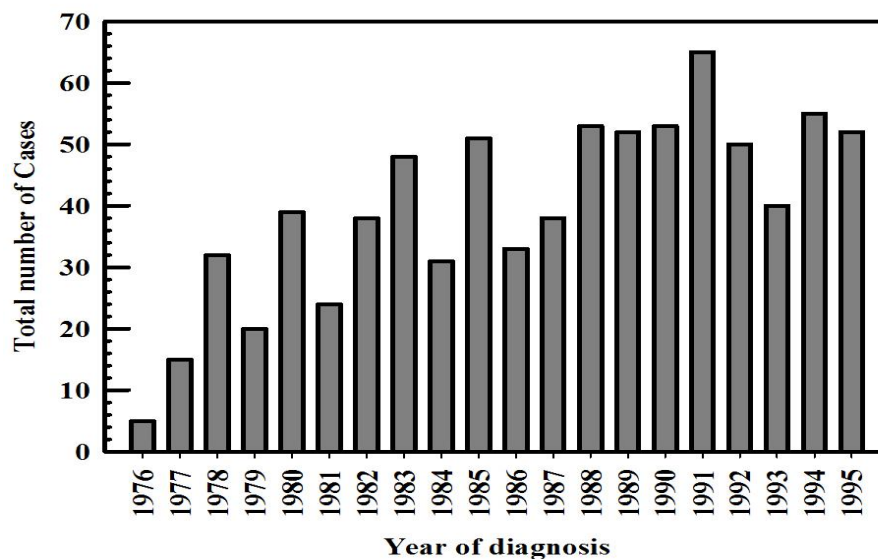


Figure 2. Number of cases by site for oral cancer among Saudi males and females from the year 1994-2013.

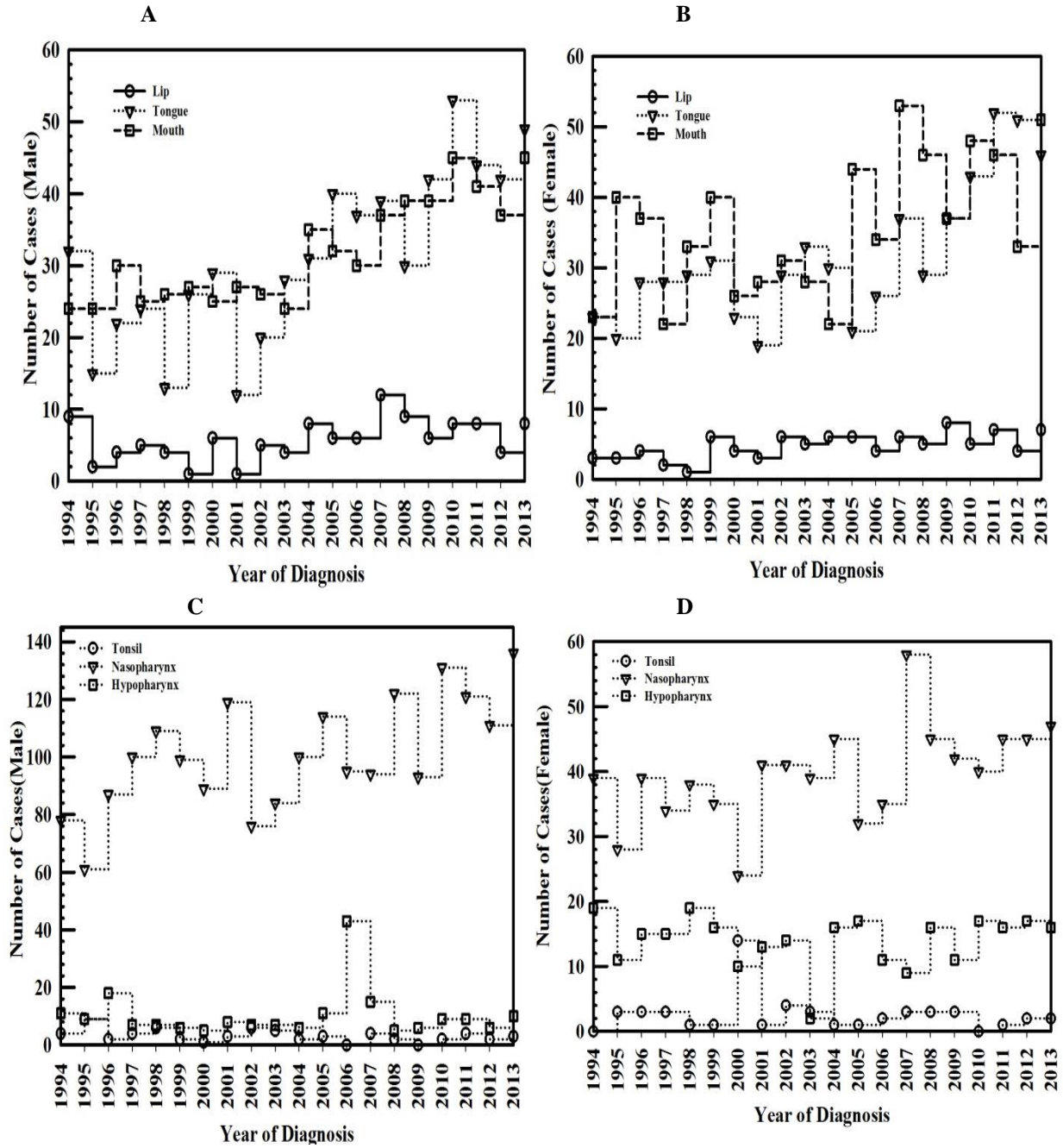
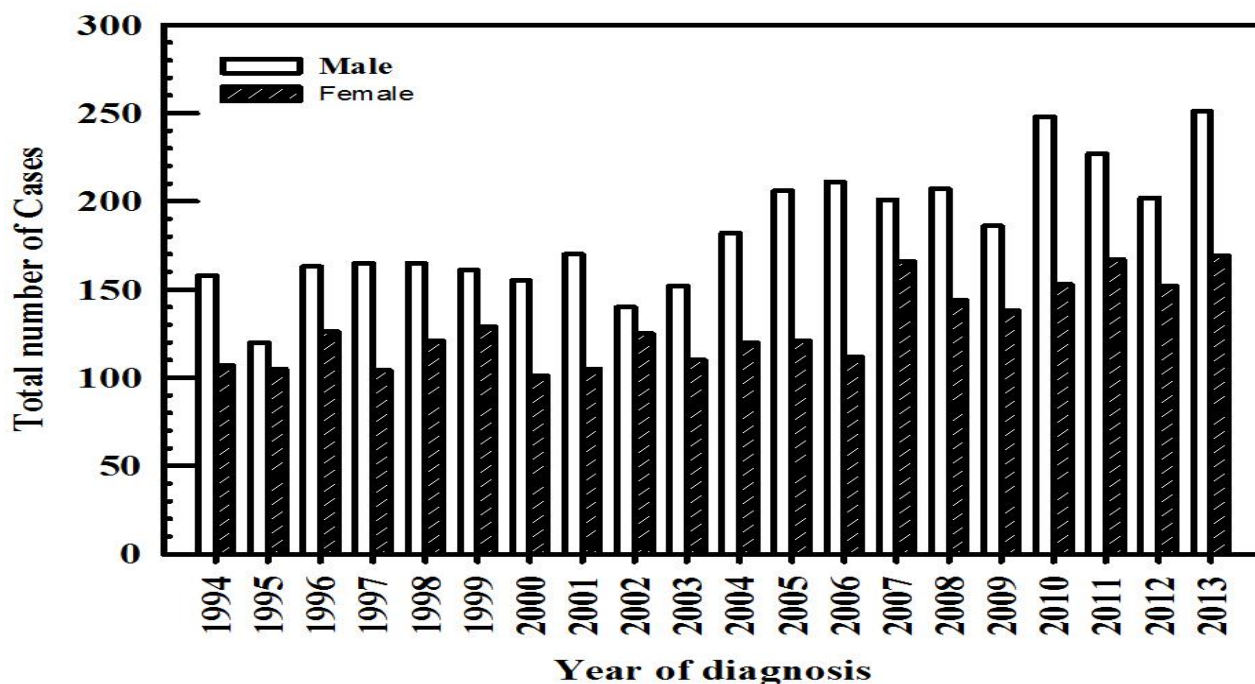


Figure 3. Total number of proximity site OC cases from the year 1994-2013 in male and female cases.



Khat was found to be among the most commonly used types of tobacco use among undergraduate students of the Jazan region. The highest number of oral cancer cases were diagnosed each year in the Jazan region of Saudi Arabia [31]. A previous retrospective longitudinal study conducted from 1976 till 1995 revealed that 35.4% of all the oral cancer cases from the nation was just from one province namely, Jazan [32].

The smoking rate is increasing for both the cigarettes and shisha use [33]. Therefore, most of the studies concluded that a high correlation existing between khat chewing, addiction of shamma and oral cancer. Shamma increases the incidence of oral cancer 29 fold followed by cigarette used [32].

Furthermore, at the King Faisal Specialist Hospital & Research Center Tumor Registry in Riyadh (KFSH&RC), oral cancer accounts for 4.2% of all cancer types (total reported cases = 2,292). In their data, oral cancer ranked the 12th most common cancer among males and 6th among females [34].

### CONCLUSION:

Although the incidence of cancer in Saudi Arabia is lower than that of many other countries, as well as the overall global population, it has risen significantly over the last two decades.

In conclusion, the study reveals that Shamma addiction, any form of tobacco use increases the likelihoods of oral cancer. The community health practitioners in the should be actively involved in conducting and implementing various prevention strategy in the cancer-prone region.

Despite the conspicuous increase in community awareness among Saudis, Saudi Arabia is still ranked as the fourth largest tobacco importer in the world. The prevalence of current smokers varies from 22-28%. It has become a significant problem among high school, college and medical students.

Initiatives to educate people on the risks, as well as the provision of support for making the necessary lifestyle changes, could have a significant impact on cancer incidence.

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### Conflict of interest

The authors declare that there are no conflicts of interest.

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