

QATAR UNIVERSITY

COLLEGE OF HEALTH SCIENCE

ORAL CANCER: KNOWLEDGE, ATTITUDE AND PRACTICE OF DENTISTS IN

THE STATE OF QATAR

BY

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ABSTRACT

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Title: Oral Cancer: Knowledge, Attitude and Practice of Dentists in The State of Qatar

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Background: Oral cancer is a silent invasive disease with poor prognosis in its late stage. In Qatar, head and neck cancers accounted for 4% of overall malignant cancers. More than 60% of these cases were diagnosed in late stages. It is mainly associated with behavioral risk factors, mainly tobacco and alcohol use. The oral cavity is an easily accessible site for examination. Dentists have a prime role in early detection and diagnosis of oral cancer. Number of oral cancer diagnosed annually is increasing in Qatar, due to the rapid increase in the population and adoption of different behavior risk factors. The aim of this study is to identify the level of knowledge among dentists regarding oral cancer clinical presentation and risk factors. To explore the impact of the dentists' demographic characteristics (scope of practice, years of experience and last time to attend a continuous professional development (CPD) course) on the level of knowledge. To explore dentists' attitude regarding oral cancer detection and prevention.

Method: This cross-sectional study used a self-administered questionnaire with 46-items. Thirty-items of the questionnaire were scored and categorized into three level of knowledge (high-Medium-low) for the risk factors and the clinical presentation of oral cancer. The study included a total of 271 dentists practicing in Primary Health Care Centers and Hamad Medical Corporation. One hundred and seventy-seven dentists responded to the survey.

Results: The mean score of the clinical presentation index is 7.59 (SD=2.40) out of total score of 14. The mean score of Risk factor index is 8.96 (SD=2.31) out of total score of 16. Younger ages are more likely to have high scores more than older age participants. Dentists with less than 10 years of experience are more likely to have satisfactory level of knowledge compared to dentists with more than 15 years of experience. Specialist dentists are more likely to have satisfactory clinical knowledge about oral cancer compared to general practice dentists. Attending a continuous professional development course about oral cancer would result in satisfactory level of clinical knowledge.

Conclusion: Dentists demonstrated unsatisfactory level of knowledge about the clinical feature and the risk factors about oral cancer. The patient's visit to the dentist is an opportunity for comprehensive oral examination. Dentists are therefore expected to be knowledgeable about the risk factors and the clinical presentation of oral cancer for preliminary diagnosis and instant referral. This study identified the gaps of oral cancer knowledge among dentists and identified the need for educational interventions about oral cancer. This is essential to improve the outcome of the health system and delivery of care.

درجة الماجستير في العلوم: يونيو 2018 ، الصحة العامة.

العنوان: سرطان الفم: معرفة واتجاهات وممارسة أطباء الأسنان في دولة قطر.

المشرف على الرسالة: د.علا محمد نور د.محمد سلطان الدرويش

خلفية البحث:

سرطان الفم هو مرض صامت يغزو الجسم، و يؤدي في مراحل المتأخرة الى مآلات شفائية ضعيفة جدا. في قطر، شكلت سرطانات الرأس والرقبة 4 ٪ من إجمالي حالات السرطان الخبيثة. تم تشخيص أكثر من 60 ٪ من هذه الحالات في مراحل متأخرة. يرتبط سرطان الفم بشكل رئيسي بعوامل الخطر السلوكية ، وخاصةً استهلاك التبغ والكحول. تجويف الفم هو موقع يسهل الوصول إليه للفحص.

أطباء الأسنان لديهم دور رئيسي في الكشف المبكر وتشخيص سرطان الفم. يتزايد عدد حالات سرطان الفم التي يتم تشخيصها سنوياً في قطر ، وذلك بسبب الزيادة السريعة في عدد السكان وتبني سلوكيات مختلفة تعتبر من عوامل الخطر السلوكية.

الهدف من هذه الدراسة هو تحديد مستوى المعرفة بين أطباء الأسنان فيما يتعلق بالاعراض السريرية وعوامل الخطر لسرطان الفم. لاستكشاف تأثير الخصائص الديموغرافية لأطباء الأسنان مثل نطاق الممارسة وسنوات الخبرة وآخر مشاركة في احدى دورات التطوير المهني المستمر على مستوى المعرفة. لاستكشاف موقف أطباء الأسنان فيما يتعلق بالكشف عن سرطان الفم والوقاية منه.

الطريقة:

استخدمت هذه الدراسة المستعرضة استبيانياً ذاتياً يحتوي على 46 عنصراً. تم تسجيل و تصنيف ثلاثين عنصراً من الاستبيان إلى ثلاثة مستويات من المعرفة بالاعراض السريرية وعوامل الخطر لسرطان الفم وهي (عالية - متوسطة - منخفضة).

النتائج:

متوسط درجة مؤشر الاعراض السريرية هو 7.59 (SD = 2.40) من مجموع النقاط 14. المتوسط الحسابي لمؤشر عوامل الخطر هو 8.96 (SD = 2.31) من مجموع النقاط 16.

من المرجح أن تحصل الفئات العمرية الأصغر على درجات أعلى من المشاركين الأكبر سنًا. أطباء الأسنان الذين لديهم خبرة أقل من 10 سنوات من المرجح أن يحصلوا على مستوى أكثر إرضاء من المعرفة مقارنة مع أطباء الأسنان الذين لديهم أكثر من 15 عامًا من الخبرة. من المرجح أن يكون لدى أطباء الأسنان المتخصصين معرفة سريرية أكثر إرضاء حول سرطان الفم مقارنة مع أطباء الأسنان الممارسين العاميين.

إن حضور دورات التطوير المهني المستمر حول سرطان الفم من شأنه أن يؤدي إلى مستوى مرضٍ من المعرفة السريرية.

الاستنتاج:

أظهرت الدراسة أن مستوى معرفة أطباء الأسنان حول الاعراض السريرية وعوامل الخطر المتعلقة بسرطان الفم غير مرضي. تعتبر زيارة المريض لطبيب الأسنان فرصة لإجراء فحص شامل للفم. لذلك من المتوقع أن يكون أطباء الأسنان على دراية بعوامل الخطر والاعراض السريرية لسرطان الفم من أجل التشخيص الأولي والإحالة الفورية. حددت هذه الدراسة الثغرات في معرفة سرطان الفم بين أطباء الأسنان وحددت الحاجة إلى التدخلات التعليمية حول سرطان الفم. وهذا أمر ضروري من أجل تحسين نتائج عمل النظام الصحي وتقديم الرعاية.

DEDICATION

*I dedicate my success to my parents who surrounded me with
their love and prayers all the time.*

*I specially dedicate my success to my husband Dr. Marzouq, without your
support and encouragement, this wouldn't have happened.*

My lovely boys Mohammad, Khalid and Omar, the three joys in my life.

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ABBREVIATIONS

ASR (W)	Age Standardized Rate to the world population
CITI	Collaborative Institutional Training Initiative program
CPD	Continuous professional development.
GLOBOCAN	Global Cancer Estimates
HNCs	Head and Neck cancers
HMC	Hamad Medical Corporation
HPV	Human Papilloma Virus
ICD	International Classification of Disease
IRB	Institution Review Board
LMICs	Low-to-middle income countries.
MENA	Middle East and North Africa region
OC	Lip & Oral Cavity Cancer
OC/OPC	Oral Cancer and Oropharyngeal Cancers
OPC	Oropharyngeal Cancer
PHCC	Primary Health Care centers
SCC	Squamous cell carcinoma
UV	Ultraviolet light
WHO	World Health organization

Chapter 1: INTRODUCTION

Oral cancer is a silent invasive disease, usually presented as a persistent painless ulcer on the side of the tongue, or an intraoral red lesion without any disturbing symptoms. These signs are usually neglected by the patient and sometimes unnoticed by the dentists. However, it needs an instant definite diagnosis. Different behavioral risk factors contribute to the development of oral cancer. Prognosis depend on several factors such as the age and general health of the patient, the type and location of the oral cancer, and the response of cancer to the treatment (1). However, one of the factors that a physician play an important role in, is the stage at which oral cancer is diagnosed for a patient. When oral cancer is diagnosed in its early stages at the time cancer is still localized, the patient will have higher survival rate after being treated and they will be under regular examination to ensure they are cancer free. Early treatment would have the best prognosis (2). On the other hand, patients diagnosed with oral cancer in its late stages will have lower survival rate. Furthermore, they will go through a difficult experience with radiotherapy and surgeries dissecting part of their oral cavity or face. Along with further surgeries of reconstruction and rehabilitation (3). This would eventually result in major impact on the patients' quality of live.

Oral cancer is rated as the fifteenth most commonly diagnosed cancer worldwide. It accounts for 2.1% of all cancers (4). The incidence rate oral cancer varies widely in different countries which is suggested by differences in the distribution of the etiological factors. Although, developed countries showed reduction in the incidence of lip and oral cancer, there is a high incidence of new cases in low-to-middle income countries, such as

Southeast Asia(5), which is linked to known life-style risk factors particularly the use of tobacco products.

In Qatar, cancer is the third leading cause of all-cause of death after cardio-vascular diseases, injuries (6). In 2015 head and neck cancers accounted for 4% of overall malignant cancers. More than 60% of these cases were diagnosed in late stages. The average ages diagnosed with oral cancer are between 45 and 49 years of age (7). The number of patients diagnosed with oral cancer in Qatar are increasing annually which is linked to the rapid increase in the population (8). The State of Qatar witnessed a rapid growth in its population within the last decade with 8.1% annual increase between 2009 and 2015. In 2016, the population reached over 2,500,000 compared to over 1,600,000 people in 2009. The unique structure of the population in Qatar is represented by high proportion of non-Qatari expatriates coming from different countries compared to Qataris. Moreover, Qatar has a marked imbalance in the population age distribution as working age group (15-64 years) reached 85% of the total population and imbalance in gender distribution with male to female ration of 3:1 (Figure 1) (8).

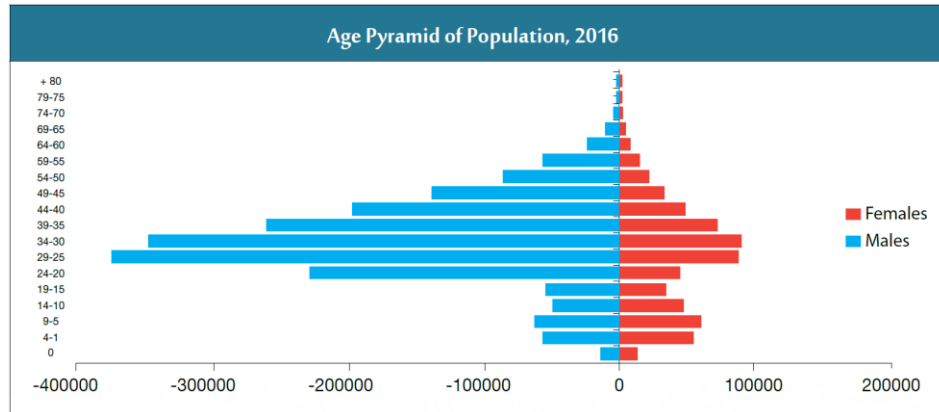


Figure 1. Age pyramid of the population in Qatar. (Source: Ministry of Development Planning and Statistics, December 2017)

The rich research about oral cancer and the available knowledge about the underlying risk factors, helped in the planning for controlling oral cancer. WHO Global Oral Health programs' approach for controlling oral cancer include two approaches. First approach is prevention through reduction of the exposure to risk factors. The second approach, is early detection of patients with suspicious oral lesions through screening programs (9).

The early detection of patients with oral cancer depends on the patients' awareness and perception about their health, and on the ability of healthcare providers to examine and screen their patients. Social Cognitive Theory describes the causative pathway of changing the individual behavior toward adopting a health-related practice. The theory describes important factors that impact the change in behavior; which include modeling through observing others, sense of self-efficacy through confidence in their ability to acquire the behavior, and outcome expectations by understanding the consequences of adopting the

behavior. Dental professions have a crucial role in the early detection of oral cancer via screening of high risk individuals. As any other health profession, dentists are healthcare providers who need further post-graduate training and continuous educational courses to be competent in diagnosing oral diseases, treating and preventing various oral health conditions.

Based on the social cognitive theoretical framework, this study will assess the dentists' knowledge regarding oral cancer risk factors and its clinical presentation. The study will also explore the dentists' attitude and practice toward oral cancer examination, in the governmental health sector in Qatar. This would help for future planning on oral cancer screening programs and improve the health system delivery of care. To date, no research has been done in Qatar to assess the dentists' awareness toward oral cancer. In addition, the dental sector in Qatar encounter dentists from different nationalities and different educational and learning backgrounds. Therefore, it would be valuable to determine the level of oral cancer awareness among practicing dentists in Qatar and assess their continuous educational needs.

Chapter 2: LITERATURE REVIEW

2.1 What is Head and Neck Cancer?

Cancer is one of the major threats to human worldwide. In 2012, an estimated number of 14 million new diagnosed cases of cancer and 8 million deaths was attributed to cancer, putting cancer as the second leading cause of death in the world (4). The World Cancer Report in 2014 stated that cancer rate may increase by 50% (15 million additional new cases) by the year 2020 (10, 11). High incidence rate of cancer is associated with high-income countries including France and Denmark, it also pointed out that cancer become a major health problem in the developing countries as it is disproportionately affected with increasing numbers of cancer in addition to lack of early detection and access to treatment which result in high proportion of world cancer death (10) .

Carcinogenesis or the formation of cancer starts when the cells of the human body begin to divide and multiply in an abnormal pattern and the old aging cells lives longer when they are supposed to die and be replaced with new normal cells. Cancerous cells can spread into surrounding tissues causing damage to other body organs. The cause of the abnormal behavior is related to the exposure of body tissues to a stimulus that cause damage to the cells' DNA, which result in genetic changes that affect the way the cells divide and multiply. These genetic changes can be inherited from one generation to another or it can develop through the lifetime of the human due to environmental exposures such as chemicals in tobacco, sun exposure, pollution or aging(12) .

Head and Neck cancers (HNCs) are one of the noncommunicable diseases that describe a collection of related group of cancers. According to the international classification of disease (ICD 10), it includes lips and oral cavity cancer (C00- C06),

pharyngeal cancer (C09- C10- C12-C13-C14), nasopharynx cancer (C11), salivary gland cancer(C07-C08) (13, 14). HNCs are the 9th most commonly diagnosed malignancies in the world (15). Squamous cell carcinoma (SCC) is considered the most common neoplasm of these cancers and It account for more than 90% of all oral malignancies. Add to that other types of less common cancers such as malignant melanomas, lymphomas and sarcomas (13). SCC exhibit abnormal squamous cells differentiation of the lining of the oral cavity and formation of keratinized layer over the poorly differentiated neoplastic epithelium resulting in white patch (leukoplakia) or a red patch (erythroplakia) on the lining of the oral cavity. Erythroplakia lesion show higher rate of neoplastic lesion compared to leukoplakia. SCC of the oral cancer and oropharyngeal cancers (OC/OPC) and SCC of other sites of Head and Neck cancer have different etiological factors, treatment and outcome. OC/OPCs are of importance in dentistry as these sites are easily accessible for a healthcare provider to directly examine and facilitate early diagnosis of malignant or premalignant lesions (16, 17) .

In 2012, head and neck cancer had an estimated global incidence of more than 550,000 new cases and approximately 300,000 deaths (4, 10, 18). This incidence is predicted to increase by 62% and reach an incidence with more than 850,000 cases (19). Oral cancer and oropharyngeal cancer are part of head and neck cancers. Anatomically, the oral cavity and the oropharynx are adjacent in site, but don't overlap. However, in surveillance data the reporting of cancer in these sites may overlap or may be reported with other head and neck tumors. The international classification of disease ICD-10, describe malignant neoplasm of the lip & oral cavity cancer (OC) and oropharyngeal cancer (OPC),

according to the anatomical site of the cancer. which involve the lips, tongue, gingiva, floor of the mouth, palate, cheek mucosa and tonsils (20).

2.2 Epidemiological Distribution of Oral Cancer and Oropharyngeal Cancer.

Oral cancer and oropharyngeal cancer (OC/OPC) are life-threatening diseases that are in need of attention. The sites of these cancers are easily accessible for direct examination. However, it is diagnosed in late stage and have poor prognosis (21). According to Global Cancer Estimates (GLOBOCAN,2012) related to worldwide cancer statistics, the incidence of oral cancer (OC) is rising with more than 300,000 new diagnosed cases, with 4/100,00 ASR(W) (age standardized rate to the world population) (4) . More than 140,000 new cases of oropharyngeal cancer (OPC) with 1.9/100,000 ASR(W). The overall incidence of OC/OPC combined is 5.9/100,000 ASR, with mortality rate 3.2/100,000 ASR (18). In different World Health organization (WHO) regions, there is a wide variation of the incidence rate of oral cancer (OC) in comparison to oropharyngeal cancer (OPC) (Figure 2).

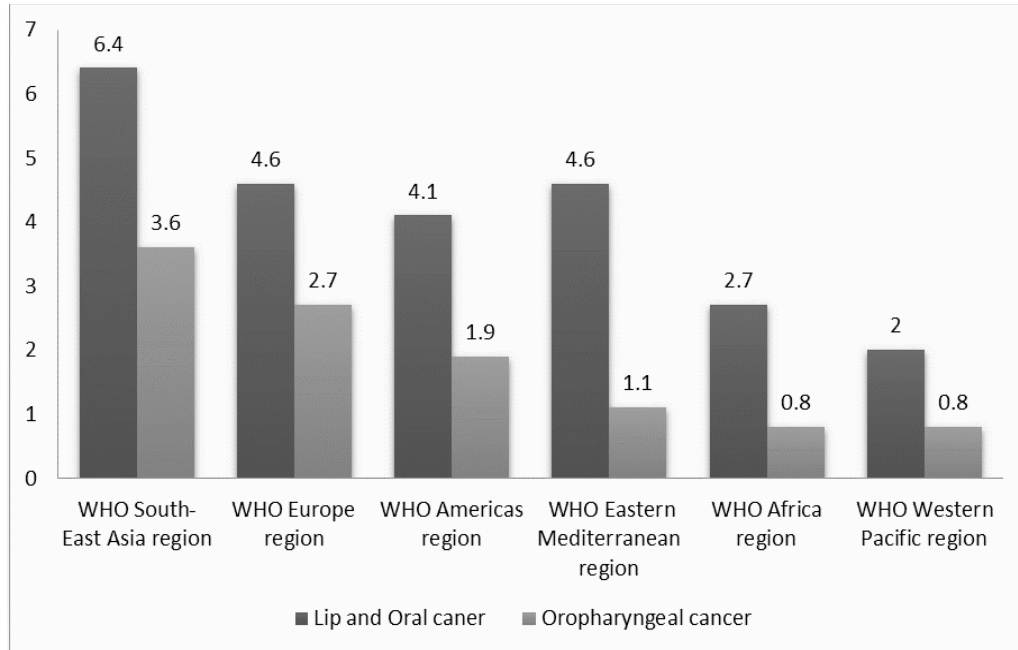


Figure 2. Age-Standardized incidence rate of the world population ASR(W) per 100,000 (GLOBOCAN,2012)

Bangladesh, Sri Lanka, Pakistan, and India in the South-East Asia region have the highest rate of OC/OPC with 18.3, 15.4, 12, 10.9/100,000 ASR respectively (4) . South East Asia showed an alarming increase in the incidence and mortality rate in the world, from oral and pharyngeal cancer. Specially in India, Bangladesh, Sri Lanka, Taiwan and China as it is consistent with the habit of chewing betel quid with or without added tobacco(22) .

In Europe; Hungary, Slovakia and France have the highest incidence rate of OC with 16.7, 11.6 and 10.7 per 100,000 ASR(W) respectively. France and Slovakia are showing significantly increase in rate of OPC than OC in men and women(23). The latest estimates in Europe by GLOBOCAN on oral cancer mortality rate was 2.7/100,000

ASR(W) and 2.2/100,000 estimated mortality rate for oropharyngeal cancer (4) . In Europe, a recently published study provides updated statistics of the incidence and mortality rate of oral and oropharyngeal cancer in different European regions. In Eastern Europe, Hungary (23.3) and Slovakia (16.4) show the highest incidence rate of Oral and pharyngeal cancer (OC/OPC) combined. The burden increases with mortality rate that reached 12.5 in Hungary and 10.2 in Slovakia. Hungary and Slovakia are burdened with Oral cancer as it is related to smoking and associated with the quantity, rate and type of the alcohol consumed that is mainly homemade and may have high level of acetaldehyde carcinogens (24) . Western and Southern Europe showed significant decrease in oral and pharyngeal cancer (OC/OPC) within the past two decades due to changes in the populational behavioral risk factors such as smoking. Except for France, despite the decrease in the Lip and Oral cancer in the past 15 years, they have the highest incidence of Pharyngeal cancer among men and women (24, 25) . In USA Oropharyngeal incidence rate (2009-2013) was 11.4 per 100,000 ASR(W) with average death rate 2.5 per 100,000 ASR(W) (26).

In the Middle East and North Africa region (MENA), GLOBOCAN (2012) estimates of the incidence rate of OC/OPC was 2.9/100,000 ASR, with mortality rate 1.4/100,000 ASR(18) . In Qatar, ASR was 2.5, with different burden among men compared to women, and Asian contributes to a higher proportion of diagnosed cases (Figure 3). The highest incidence rate was in Palestine (4.2) and Soudan (4.2) with high mortality rate of 2 ASR and 3.4 ASR respectively (Figure 4). In Palestine, 30 % of 20 years old college students were tobacco users. In addition to an increasing prevalence of waterpipe smoking among Palestinians with a misconception that waterpipe smoking is not harmful (27). Prevalence of oral cancer was higher in countries that exhibit tobacco-chewing habit like

Yemen and southwestern Saudi Arabia., where it is culturally acceptable to use Shamma and Qat in social occasions (28). Although, the incidence rate of oral cancer in the Arab countries is lower than that of world standardized rate, oral cancer is diagnosed mainly in its late stages (stage III & IV) with 5-years survival rate reaches 20-59.4% (28).

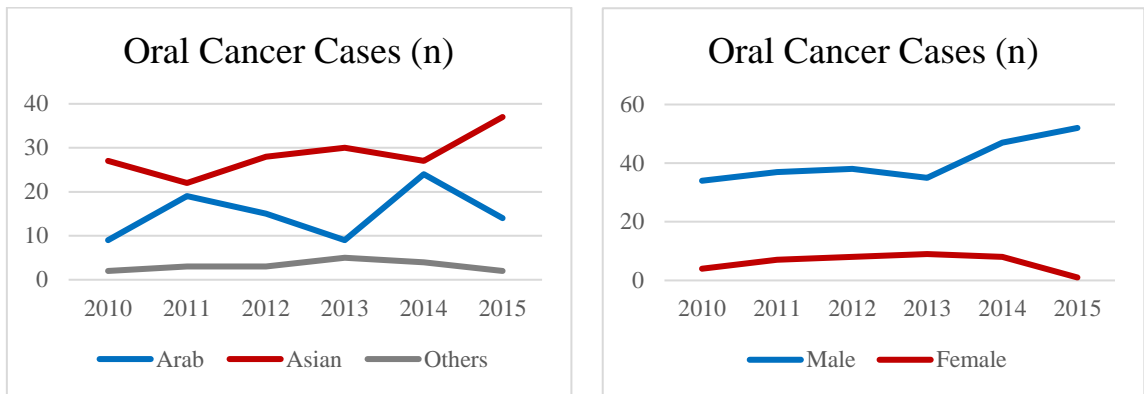


Figure 3 Number of diagnosed oral cancer cases by ethnicity (left), by gender (right), In Qatar

There is a wide geographical variation of the incidence rate, prevalence, mortality rate of oral cancer worldwide. This indicate a variety in the underling risk factors, access to health care facilities, variation in adoption of legislation or policies to restrict tobacco and alcohol use. An epidemiological study assessed the trend of oral cancer and oropharyngeal cancer between 2000-2010, in the United States. It revealed that the incidence of oral cancer declined in conjunction with an increase in the incidence of oropharyngeal cancer in the same period of time (29) . These results are consistent with the

decline of cigarettes smoking in these population. It is also reflects the variation in the trend of the risk factors, as oropharyngeal cancer is strongly associated with Human Papilloma Virus due to changes in these populations sexual behavior (30, 31) .

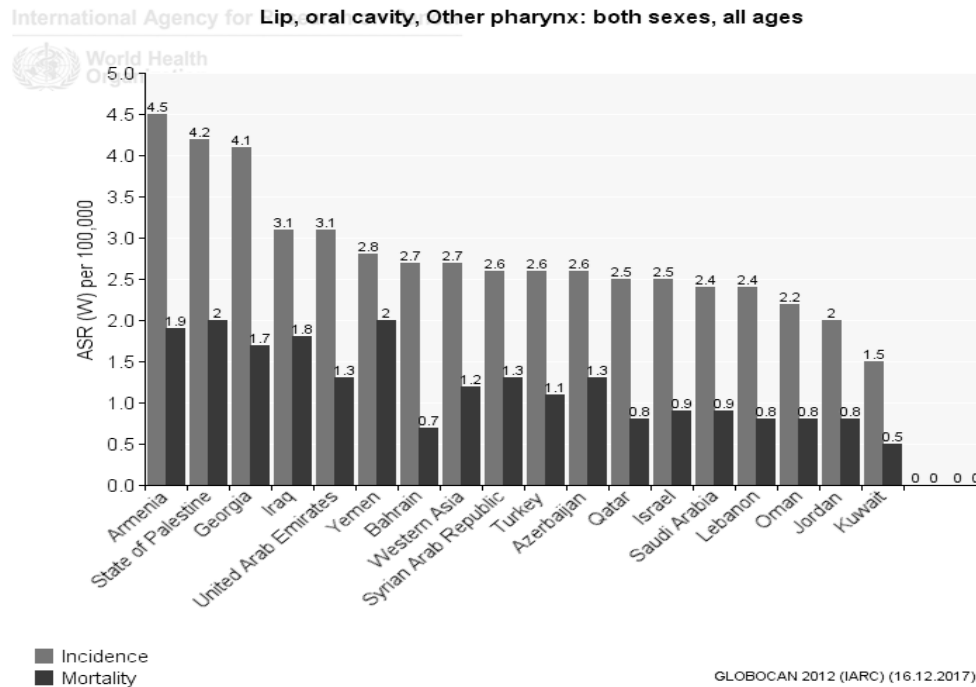


Figure 4. Age-standardized incidence and mortality rate per 100,000 in Western Asia region. (source: IARC, GLOBOCAN 2012)

2.3 Oral Cancer Risk Factors

Cancerous cells are a result of disturbance in their growth, due to damage or mutation of the cells' DNA. This disturbance can start spontaneously, or it may be stimulated by a range of factors. Oral cancer shares some of the main modifiable risk

factors with other cancer sites and other noncommunicable diseases. Epidemiological studies identified several factors contribute in causing oral cancer;

Tobacco: In diverse cultures and societies there are different methods of tobacco consumption. The relative risks of tobacco vary according to different method of use and type. The most common method is tobacco smoking as cigarettes and pipes. Other methods of smoking with bidis cigars and reverse smoking. A number of epidemiological studies identified smoked tobacco as being a cause for oral cancer. A meta-analysis of 15 case-control studies, was done to assess the magnitude of the association between tobacco smoking and developing oral cancer. The study revealed that there is sufficiently strong evidence that tobacco smokers are 5 times more likely to develop oral cancer in comparison to non-smokers (32). Another method of tobacco consumption is smokeless tobacco, which may be used as a powdered tobacco (snuff dipping) that is either inhaled dry or it is placed as a pinch of snuff between the gum and the cheek. In Sudan a more popular type of tobacco consumption is 'Toombak' dipping (type of snuff tobacco). Is highly prevalent among Sudanese men and it increases the risk for oral cancer (33). Betel quid (pan) chewing is another widely spread form of smokeless tobacco highly prevalent in South East Asia such as Bangladesh (20.3%) and India (20.6%) (34) . It is rarely used in Europe except for Sweden were 12.3% of their population use Swedish snus that is legally sold and socially accepted (35) . Chewing betel quid with the addition of tobacco or without tobacco is a causal factor of oral and oropharyngeal cancer with dose-response relationship (22). An increase in the daily amount of betel quid chewing for long years is related with higher risk of oral cancer. It mainly affects the buccal mucosa and the gums where the smokeless tobacco users usually keep it for long period of time(22) .

Alcohol: Alcohol drinking increases the relative risk of oral cancer by 5.13 times in comparison to nondrinkers or occasional drinkers, however this association might be confounded by smoking(36). The quality and the type of alcohol is a key factor as in some areas in the world, house-made alcohol contain higher level of carcinogenic by-products. Alcoholic drinks that contain higher levels of solvent would facilitate the penetration of carcinogens through the mucosal membrane of the oral cavity. A Meta-analysis study was done on case-control and cohort studies between 2009 and 2010, showed that alcohol is strongly associated as a risk factor for oral cancer and represent a dose response relationship between the amount of alcohol drinking and the increase in risk of pharyngeal cancer in comparison to non-drinkers (37, 38) .

Tobacco use and alcohol drinking, impose a synergistic effect and expose the person to be at higher risk of oral cancer in comparison to only tobacco users or only alcohol drinkers (39) .

Human Papilloma Virous (HPV): A sexually transmitted disease. It is causally associated with head and neck cancer (31). Developed countries went through a decrease in the incidence of oral cancer (OC), however; there is an evidence of increase in the incidence and prevalence of oropharyngeal cancer (OPC). This shift lead to a lot of molecular and epidemiological researches. Studies have proven that Human Papilloma virous (HPV) infection is an independent risk factor for OPC and it have been linked to the changes of the sexual behaviors of the affected population. OPC mainly affects the base of the tongue and tonsils, in people with younger ages than those affected with oral cancer (52-56 years) (30, 40).

Ultraviolet light exposure: The direct exposure to sunlight for long period of time or exposure to UV emitting devices (tanning machines) is associated with lip cancer. This is represented in people with outdoor occupation and people with continuous exposure to the sunlight(41, 42).

Poor Diet and Nutrition: Diet rich with fruits and vegetables can reduce the risk of oral cancer to 50% (43) . Iron, vitamin C, A, E and whole grain has protective effect and help to maintain healthy oral mucosal lining. Low intake of fruits and vegetables have been linked with increased risk of oral cancer. This is manifested more in LMICs (43, 44).

Other Risk Factor: Previous history of Head and Neck cancer(45), and older ages (more than 60 years) are at higher risk of oral cancer (5).

2.4 Prognosis of Oral Cancer

Robust observational studies identified prognostic factors that contribute in the survival rate of oral cancer patients. The stage of oral cancer (tumor size, metastasis to the regional lymph nodes) is the strongest predictor of prognosis and survival rate. Other behavioral practices such as: heavy smoking and alcohol drinking were identified as significant predictors for poor prognosis (1, 46). Localized oral cancer (stage I, II), in its early stages, it has high survival rate that can reach 83%. On the other hand, when the cancer spread to the lymph nodes (stage III, IV) the survival rate will drop to 38% (3, 47). The overall survival rate of SCC of the oral cavity is between 45% and 50 %(47). Two main factors contribute to the detection of oral cancer in its late stages. The first one is patient factor; due to the delay of patients in seeking health care

and consultation. The second factor is the health practitioner factor; the delay in the definite diagnosis and referral for treatment.

2.5 Prevention and the Role of Dentists in Early Detection

As the burden of oral cancer (OC) is increasing, several studies have identified the causes and the risk factors that contribute in the mortality and morbidity related to OC. The burden of OC is represented by high mortality rate as high proportion of oral cancer cases are diagnosed in advanced stages of cancer where the survival rate would be very low(28, 48). The treatment process that the oral cancer patient would go through involves radiotherapy, chemotherapy and surgery, the more advanced the stage of the tumor the more aggressive the treatment(49). Oral cancer survivors tend to lose part of their functional ability such as swallowing, ability to speak and this impacts the patients' quality of life (50). Oral cancer is a preventable disease if the exposure to the risk factors were reduced. The oral cancer patients would have a better prognosis and improve their quality of life if the disease is diagnosed in its early stages. Dentists have an important role in early detection of cancerous lesions, because the oral cavity is an easily accessible site for examination by visual inspection and tactile examination.

Two comprehensive approaches were recommended by the WHO to control oral cancer(9). The first approach is prevention; through implementing strategies and policies that reduce the exposure to evidence-based risk factors. The tobacco legislations in the developed countries, successfully reduced the consumption of tobacco products (51) and this was consistent with a reduction in the incidence of oral cancer cases(23). However, in the developed countries, there is an increasing incidence of oropharyngeal cancer at younger ages (less than 60 years) due to the potential role of Human Papilloma virus

infection (HPV) (23). As a result, this introduces HPV vaccination to reduce HPV infection in sexually active adolescent and looking for implication to reduce oropharyngeal cancer(52).

The second approach to control oral cancer is early identification and diagnosis of oral cancer patients through screening of high risk patients. This need easy access to health care and for the healthcare providers to be well trained and knowledgeable about the risk factors and the clinical presentation of the disease (9) . The available evidence in literature evaluating the effectiveness of population-based screening of oral cancer, showed that screening programs reduced the mortality rate of oral cancer and improved the survival rate as more individuals were diagnosed in early stages of oral cancer. However, more research in needed in this aspect due to the limitations of the available evidence (2). WHO Global Oral Health Program emphasizes on the integration of oral cancer prevention with the national cancer-control programs and the need for oral health care providers and the primary health care providers to be trained for the early detection, diagnosis and treatment (9).

Countries faced with increase in the number of diagnosed oral cancer cases in its late stages, conducted several studies to evaluate the healthcare providers knowledge and practice toward oral cancer examination. Moreover, some studies evaluated a variety of exposure variables in relation to the level of knowledge and practice. The results of these studies were used to improve the training courses directed to health care providers. Yellowitz *et al* conducted a series of studies science 1995 on physicians, dentists and oral hygienist to assess their knowledge, attitude and practice in different practice sittings in Maryland. These studies identified the educational and training deficiencies (53, 54). Also,

they highlighted the importance of interdisciplinary and inter-professional approach to reduce oral cancer mortality rate and improve the oral cancer survivors' quality of life, through early diagnosis (54). Where their results showed that Dentists who had never attend a CPD course on oral cancer or attended one within the past 5 years, were less likely to get high scores in the diagnostic and risk factors knowledge (53). In another study in USA, dentists achieved higher scores in their knowledge about the clinical presentation of oral cancer more than their scores in the knowledge about the behavior risk factors (55). Dentists with less than 20 years' experience were more likely to have high knowledge and were more likely to perform biopsies or referrals(55) . In another study, Physicians were more likely to correctly identify the risk factors for oral cancer more than the dentists. Also, the dentists were less proficient in reporting the risk factors when taking the patients' history (56). Another study in Iran where they had consistent results that younger dentists with experience less than 5 years showed higher level of knowledge (57). . A study conducted in Jordan where they evaluate the association between early detection practice, level of knowledge and diagnostic ability with several participants variables. Found that practitioners with less than 10 years of experience had significantly higher knowledge scores. Attending CPD course on OC was significantly associated with higher early detection practice and higher level of knowledge. Furthermore, the study showed significant association between the level of knowledge and the early detection practice. Significant association between the level of knowledge and the diagnostic ability of the health care professionals (58).

Each KAP (Knowledge-Attitude-Practice) study is customized to the target population and unique with its results, because it explores issues with local relevance.

Chapter 3: OBJECTIVES AND RESEARCH QUESTION

3.1 Aim of the Study

To explore the dentists' awareness toward oral cancer examination and prevention in the governmental health sector in Qatar.

3.2 Research questions

- What is the level of knowledge about OC among dentists in governmental health sector?
- What is the proportion of dentists who demonstrate good practice and good attitude toward the oral examination of high-risk patients?
- What is the impact of factors such as gender, age, years of experience, the scope of practice and attending CPD course about OC on the level of dentists' knowledge?

3.3 The Study Objectives

1. To assess the level of knowledge about oral cancer clinical presentation and the risk factors among dentists' in the governmental health sector.
2. To explore the dentists' current practice in the examination of high-risk patients.
3. To explore dentists' attitude regarding their role in the detection and prevention of oral cancer.
4. To assess the impact of gender, age, years of experience, the scope of practice and attending CPD about OC on the level of dentists' knowledge

Hypothesis:

1. Attending CPD course on oral cancer is associated with high level of knowledge, better practice decisions and positive attitude.
2. Practical experience with less than 5 years is associated with higher level of knowledge about oral cancer.

Chapter 4: METHODOLOGY

4.1 Study design

This study is a cross-sectional survey. A questionnaire was distributed to all practicing dentists in Primary Health Care centers (PHCC) and Hamad Medical Corporation (HMC), as they represent the two main providers in the governmental health sector in Qatar.

4.2 Study Population

The target population is dentists practicing in the governmental health sector. The sampling frame is represented by dentists in Primary Health Care centers (PHCC) and Hamad Medical Corporation (HMC) dental clinics. Dentists practicing in PHCCs are the front-line dentists who provide primary and secondary oral health care services to patients. There are 23 Primary Healthcare Centers distributed in three different geographical areas, which are the Northern region, Central region and Western region. In which all have dental clinics. Dentists practicing in HMC participated in the survey from Hamad Dental Centre and Al Wakra hospital dental clinics, which are providing a wide range of specialized treatment measures. Both institutions are providing health care services to high number of residents and nationals annually. Also, they provide dental and oral health services with very low costs which make it a desirable destination for most of the population who seek health care. The three geographic areas of PHCC, along with Hamad Dental Center and AL Wakra hospital were considered as five cluster areas to be considered in the analysis. The clustering effect on the level of knowledge was assumed because the participants were recruited from different institutions and the wide distribution of primary health care centers

in Qatar would expose the dentists to different level of experiences with patients. Other governmental institutions were not included in this study as they have smaller number of dentists and due to feasibility issues. The private sector is another destination that provide dental and oral care services which include 1168 dentists were also excluded due to difficult access and feasibility issues. The private sector is very expensive choice compared to the governmental sector.

No determined exclusion or inclusion criteria is used in this study, because all the participants determined in the sample frame were included in the survey.

4.3 The Sample Frame

This study collected information from all participants in the study sample frame. The total number of registered dentist in PHCC is 171 dentists. The total number of dentists in HMC dental clinics are 100 dentists. The total number of the participants is 271 dentists. No further follow up was required from the participants after completion of the questionnaire.

4.4 Data Collection

In this study, the dentists' level of knowledge about oral cancer, attitude and practice toward oral cancer examination, was assessed with KAP (Knowledge-Attitude-Practice) study as a research method. The quantitative method in this study used paper-based self-administered questionnaire. It is structured questionnaire written in English language. The questionnaire items had been tested for validity and reliability and were used in previous studies (55, 57, 59). Additional items in the demographic part were designed and used specially for this study context. Face and content validity of the questionnaire were assessed by specialist dentist and experts in the field. The questionnaire consists of four

parts: demographic questions, knowledge questions regarding the clinical presentation of oral cancer and risk factors, questions related to the dentists clinical practice with their patients and the fourth part consist of attitude questions about their role in examination and prevention.

The demographic part of the questionnaire includes six items about the participants' age, gender, years of experience, year of graduation from dental college, scope of dental practice, last time for a dentist to attend a continuing education program on oral cancer.

The knowledge questions are divided into two parts. Fourteen knowledge questions about the clinical presentation of oral cancer such as; the most common site, type of oral cancer, signs and symptoms and most common age of diagnosis. Participant got 1 score for each correct response selected. The scoring was divided into three levels of knowledge using previously developed scale (55, 59). Dentists who score between zero to 9 correct responses represent low level of knowledge. 10 or 11 correct responses indicate medium level of knowledge. 12 to 14 correct responses indicate high level of knowledge. The second part of knowledge questions included 16 items assessing the dentists' knowledge about evidence-based risk factors that contribute in increasing the risk or oral cancer, such as; smoking, alcohol, sun exposure and viral infections. Eight items are real risk factors for oral cancer and the other items are not risk factors. A score of 1 was issued for each correct response. Scoring was divided into three levels of knowledge using previously developed scale (55, 59). Zero to 8 correct responses scored as low score. 9 - 10 correct responses scored as medium score and 11 to 16 correct responses scored as high score and represent a high level of knowledge.

The third part of the questionnaire is asking about the dentists' attitude toward oral cancer examination of high-risk patients and opinion about their role in prevention of patients from oral cancer. Also, it explored their perception to provide tobacco cessation education to smoker patients. It includes 11 items and the responses are based on 5-point Likert scale (1=Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree, 5=Don't know). The fourth part of the questionnaire explored the dentists' practice regarding oral cancer examination techniques, the appropriate steps to examine the oral cavity and the tongue. number of referrals for patients with suspicious lesions, number of biopsies taken from patients for further laboratory investigations and what factors they assess and probe when taking the patients' medical history. The responses of the participants in the attitude and practice parts of the questionnaire are measured as proportions.

The questionnaires were coded with serial numbers that identify the setting and the location of study site. The consent forms were attached for the participants to read about the purpose of the research and they were be asked to sign upon agreeing to participate in the research. The questionnaire forms were distributed to all the determined number of dentists. The filled in questionnaires were collected after three to five days. The strategy used in this survey to motivate the participants to fill the questionnaires included prenotification emails sent through their institutions, explaining about the research and asking the dentist to respond. Also, it was followed by multiple contact attempts with members from the determined sample. Confidentiality of the collected data and the obtained results were insured as the questionnaires were stored in a locked cabinet. Data were saved in the investigator's laptop with password protected files and are accessible only to the authorized investigators

4.5 Statistical Analysis

Descriptive and inferential statistics are used to examine the research questions. Frequencies of the collected data and responses to questions in the survey were reported. The mean and standard deviation for the scores in clinical presentation knowledge index and risk factors knowledge index. Both knowledge indexes were categorized into low, medium and high level of knowledge based on previously validated scale. Furthermore, the three level of knowledge were combined to satisfactory and unsatisfactory level of knowledge. This study assessed the impact of a number of factors in relation to the level of knowledge (gender, years of experience, scope of practice and last time to attend oral cancer CPD course). Intraclass Correlation Coefficient test was reported. Cluster Adjusted Chi-square test to evaluate associations between both knowledge indexes and number of covariates. Univariate logistic regression adjusted for clustering effect, was used to identify potential predictors for satisfactory level of knowledge about oral cancer versus unsatisfactory level of knowledge. Alpha level of 0.05 is the significance level to evaluate the statistically significant results. Data entry and analysis were done using STATA 14 software.

4.6 Ethical Approval

Eethical approval was obtained from the Institution Review Board (IRB) of Qatar University (Reference number: QU-IRB 818-E/17). PHCC Institution Review Board approved on the research with reference number PHCC/IEC/17/12/043. HMC approval was obtained from Hamad Dental Centre. Informed consent was developed to inform the potential participants about the aim of this study. The consent form was obtained from all the participants agreed to participate and they were informed that their participation in this

study is voluntary. The participants' confidentiality was ensured by secure storage of data and limiting access only to authorized personnel.

4.7 Timeline and Resources

The activities conducted in this project are indicated in Table 1, with the corresponding months.

Table 1 Timeline.

Task	Month							
	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	March 2018	April 2018
Literature review	X	X	X	X				
CITI certificate	X							
Qatar University IRB		X						
PHCC IRB					X			
HMC approval							X	
Data collection in PHCC						X		X
Data collection in HMC							X	
Data analysis							X	X
Writing up							X	X
Final thesis submission								X

Budget

This research was supported with a student grant QUST-1-CHS-2018-13 from Qatar University Office of Research Support to cover the needed expenses.

Chapter 5: RESULTS

5.1 Demographic Characteristics of the Participants

This chapter presents a description of the study participants and descriptive about the participants' responses to the survey questions. In addition to inferential statistical analysis to address the proposed research questions. A total of 177 out of 271 dentists responded with complete questionnaires. Two questionnaires were sent back incomplete and were excluded from entry. Eighteen questionnaires were sent back empty two of them declare refusal to participate. The response rate was 65.31%. The level of missing responses is very low, less than 2% in the demographic questions. The other questions had a variety in missingness level, but it didn't exceed 4.5 % in any question. Mainly the missingness was observed in the opinion questions.

Among the respondents, there were 92 (51.9%) male dentists and 85 (48.1%) female dentists. Nearly half of the dentists (51.4%) were young age dentists less than 39 years of age. High percentage of the respondents were practicing in PHCC (74.6%) and 25.4% were practicing in HMC. Ninety-One dentists have a practical experience of more than 15 years, which contributes to almost half of the participants (52.3%). Just over half of the dentists (58.6%) are general practice dentists. Among the respondents, 62 dentists (35%) had attended a continuous educational course about OC within the past 2 years. (Table 2)

Table 2 Demographic Characteristics of the Participants

Characteristics (n=177)	Frequency (n)	(%)
Practice setting		
HMC	45	25.4%
PHCC	132	74.6%
Gender		
Male	92	51.9%
Female	85	48.1%
Age		
23-29 years	7	4.00%
30-39 years	83	47.4%
40-49 years	57	32.6%
50-59 years	22	12.6%
More than 60 years	6	3.40%
Years of practical Experience		
Less than 5 years	4	2.30%
5-10 years	31	17.8%
11-15 years	48	27.6%
More than 15 years	91	52.3%
Scope of practice		
General Practice	102	58.6%
Speciality practice	72	41.4%
Last time to attend CPD course about OC		
Less than 2 years	62	35.0%
2-5 years ago	39	22.0%
More than 5 years ago	50	28.3%
Never	26	14.7%

5.2 Knowledge about OC Clinical Presentation

Fourteen questions were used to assess the dentists' level of knowledge regarding the clinical presentation of oral cancer. Table 3 displays the prevalence of dentists correctly identified the clinical features of oral cancer. Majority of dentists were familiar about the

proper physical oral examination steps (72.3%) and tongue examination steps (83.1%). Also, high proportion of the dentists (84.2%) correctly identified that squamous cell carcinoma is the most common form of oral cancer. Considering the most common site of OC, 138 dentists (77.9%) correctly identified the tongue as the first most common site of OC and 96 dentists (54.2%) correctly identified the floor of the mouth as the second most common site of OC. Only 42.9% were able to correctly identify both sites. Fifty-Eight dentists (32.8%) correctly identified that familial clustering is less likely to be associated with OC in comparison to tobacco, alcohol use and increasing age. Only 38 dentists (21.5%) correctly identified that oral cancer in its early stage is asymptomatic. Moreover, 56 dentists (31.6%) correctly identified that majority of OCs are diagnosed in people 60 years or older. When examining the lymph nodes, 75.7% correctly identified an important characteristic of the lymph nodes of oral cancer metastasis. The part of the tongue that most likely to develop OC is the ventral and lateral part, and it was correctly identified by 82 dentists (46.3%). Oral cancer is diagnosed mainly in advanced stage, but only 69 dentists (39%) were familiar with this. Lip cancers in relation to sun exposure was correctly identified by 112 dentists (63.3%). Correctly, 66.7% of dentists reported that oral cancer most probably will be painless and appear as small red lesion. Leukoplakia and Erythroplakia are conditions associated with oral cancer, 95 dentists (53.7%) correctly identified these conditions, but only 44 dentists (24.9%) were able to distinguish the importance of Erythroplakia as a more serious premalignant condition compared to Leukoplakia.

Table 3 Prevalence of dentists correctly identify the clinical presentation of oral cancer

Clinical presentation questions (n= 177)	Frequency	(%)
Correctly identify oral examination.	128	72.3%
Correctly identify tongue examination.	147	83.1%
Squamous cell carcinoma is the most common form of oral cancer.	149	84.2%
Tongue is the first most common site of oral cancer.	138	77.9%
Floor of the mouth is the second most common sites of oral cancer.	96	54.2%
Familial clustering is Least likely associated with oral cancer	58	32.8%
Oral cancer early sign is asymptomatic	38	21.5%
Majority of oral cancer cases are diagnosed in people 60 years or older	56	31.6%
Lymph nodes Hard, painless, mobile or fixed.	134	75.7%
Ventral-lateral border of the tongue is site most likely develop oral cancer.	82	46.3%
Oral cancer most often diagnosed in advanced stage.	69	39.0%
Lip cancers are related to sun exposure.	112	63.3%
Early oral cancer lesions appear small, painless, red area.	118	66.7%
Erythroplakia and Leukoplakia are associated with oral cancer.	95	53.7%

The scores for the clinical presentation questions were summed for each dentist. On average the dentists had 7.59 (SD= 2.40) score of the clinical presentation knowledge index with a range of scores between 0 and 14, out of total score of 14.

5.3 Knowledge about OC Risk Factors

Regarding the knowledge about the risk factors, sixteen items were used for assessment. Eight items were considered as real risk factors and the other items are not

considered risk factors for OC. Figure 5 and 6 represent the prevalence of dentists correctly identified the risk and non-risk factors of oral cancer. High percentage of dentists correctly identified older age (72.9%), alcohol use, (93.2%), tobacco use (97.7%), viral infection (85.3%) and prior oral cancer (94.4%) as risk factors for oral cancer. Low consumption of fruits and vegetables as a risk for OC was correctly identified by 50 dentists (28.3%) and 42 dentists (23.7%) didn't know if it is a risk for OC. Although 132 dentists (74.6%) correctly identified chewing beetle quid as a risk for OC, 41 dentists (23.2%) doesn't know its effect. Accordingly, this was seen with the knowledge about Gutka use, 87 dentists (49.2%) correctly identify it as a risk factor and 84 dentists (47.5%) didn't know its effect (Figure 5).

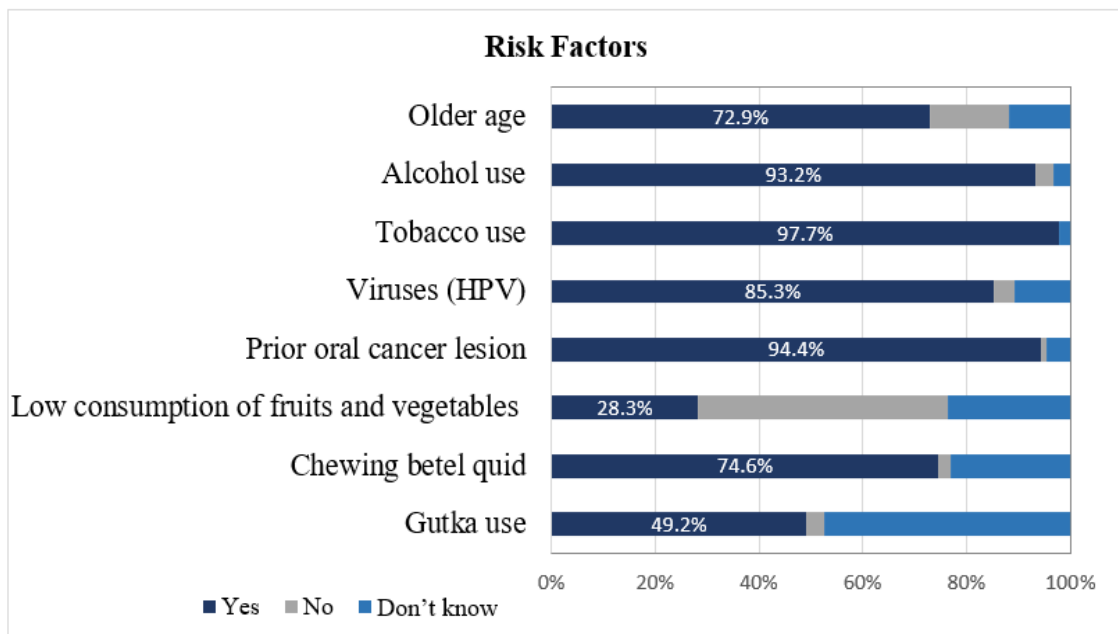


Figure 5. Percentage of dentists correctly identified Oral Cancer risk factors by answering “YES”.

Regarding the non-risk factors for OC shown in Figure 6, it showed that 137 dentists (77.4%) correctly identified mouth rinse use as non-risk to develop OC. Obesity was correctly identified as non-risk by 112 dentists (30.5%), but 48 dentists (27.1%) didn't know if obesity is considered as risk or non-risk factor. Low percentage of dentists correctly identified that marijuana use (11.9%), spicy food (29.9%) and poor oral hygiene (31.6%) are non-risk factors for OC. Eating hot food and drinking hot beverages was correctly identified as non-risk for oral cancer by 96 dentists (54.24%). Family history of cancer was correctly identified as non-risk for OC by only three dentists (1.69%) and 163 dentists (92.09%) wrongly identified it as risk for OC. Only 54 dentists (30.51%) correctly identified that poor fitting denture is not an independent risk for oral cancer.

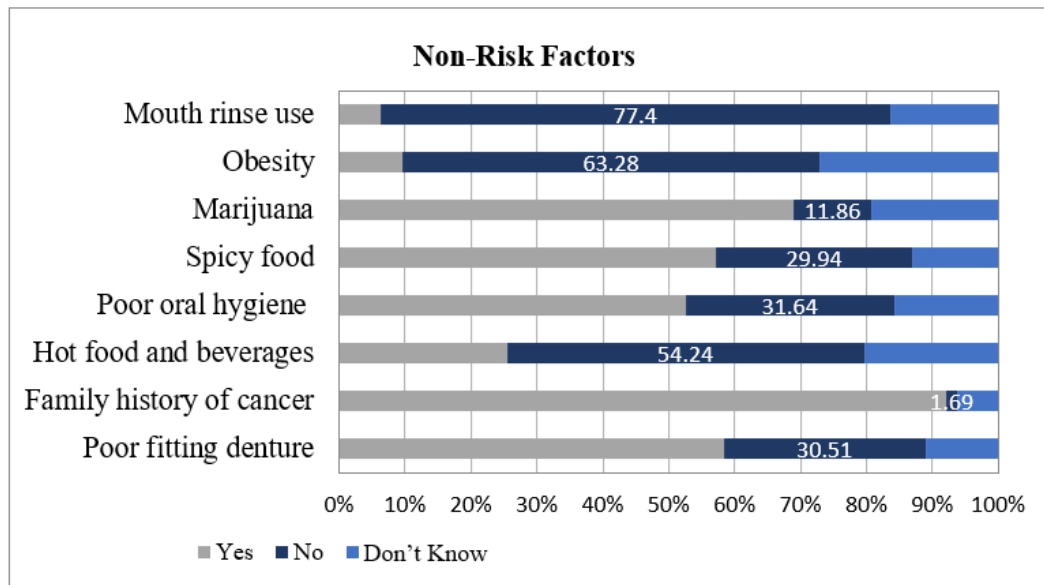


Figure 6. Percentage of dentists correctly identified the non-risk factors of Oral Cancer by answering “NO”.

The scores for the risk factors questions were summed for each dentist. On average the dentists had 8.96 (SD=2.31) score of Risk Factors knowledge index, with a range of scores between 2 and 14, out of total score of 16.

Pearson correlation test for both knowledge index scores showed low correlation (Pearson's $r=0.21$). This explain that both knowledge indexes are not related indexes and are evaluating different areas of knowledge. The knowledge scores for the clinical presentation of OC and the risk factors scores, were categorised into three levels of low, medium and high knowledge. For more exploration of the pattern distribution of knowledge among dentists, both knowledge indexes were cross-classified (Table 4). Only 15.8% had medium-to-high level of knowledge in both indexes and 30.5% had Low score of knowledge in both indexes. One hundred and thirty-eight dentists (78%) had low scores in the clinical presentation knowledge index (Figure 7).

Table 4 Distribution of dentists by the pattern of knowledge

Knowledge of OC risk factors	Knowledge of OC clinical presentation		
	Low score (0-9)	Medium score (10 or 11)	High score (12-14)
Low score (0-8)	54 (30.5%)	9 (5.1%)	2 (1.1%)
Medium score (9 or 10)	50 (28.2%)	9 (5.1%)	5 (2.8%)
High score (11-16)	34 (19.2%)	10 (5.6%)	4 (2.3%)

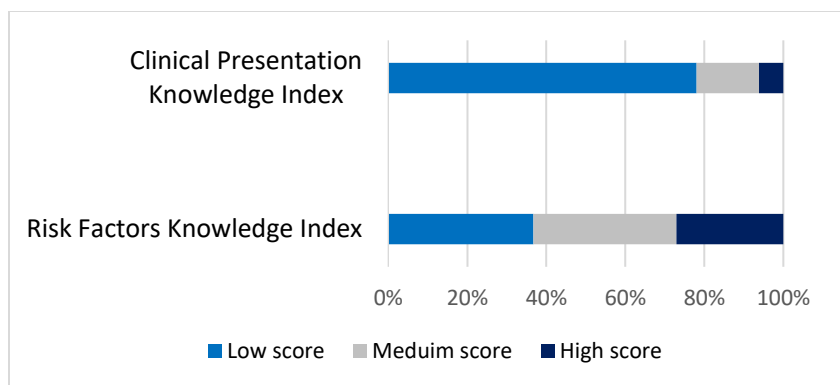


Figure 7. Percentage distribution of the knowledge score

5.4 Attitudes and Opinions

The participants were asked to rate their opinion about their training, confidence and knowledge to examine patients for oral cancer (Figure 8). Among the respondents, 116 dentists (66.7%) agree that their knowledge about OC is current. Also, 86 dentists (48.6%) agree and 52 dentists (29.4%) disagree about being adequately trained to examine patients for oral cancer. High percentage of dentists (90%) agreed that they should be trained to provide tobacco cessation education. High proportion of dentists (92%) are certain that early detection improves the 5-year survival rate. Palpating the lymph nodes in the patients' neck during the extra-oral examination, 153 dentists (87.9%) were comfortable in palpating the lymph nodes. Forty-five dentists (26.6%) disagree that OC examination should be a separate reimbursable procedure. In evaluating the dentists' confidence in their ability to perform oral cancer examination, 69 dentists (39.4%) are between agree and strongly agree about being not confident in their training. Almost half of the dentists (49.3%) disagree with the statement about OC exams that it should be discontinued after three negative exams. Moreover, 65.5% of the dentists strongly agree about being comfortable referring

patients with suspicious oral lesion to specialists. Only fifty dentists (28.3%) disagree with the statement that OC examination for adults 18 to 39 years of age should be provided annually and 90 dentists (50.9%) agree with this statement. More than half of dentists (63.3%) agree that OC examination for people 40 years of age and older should be provided annually.

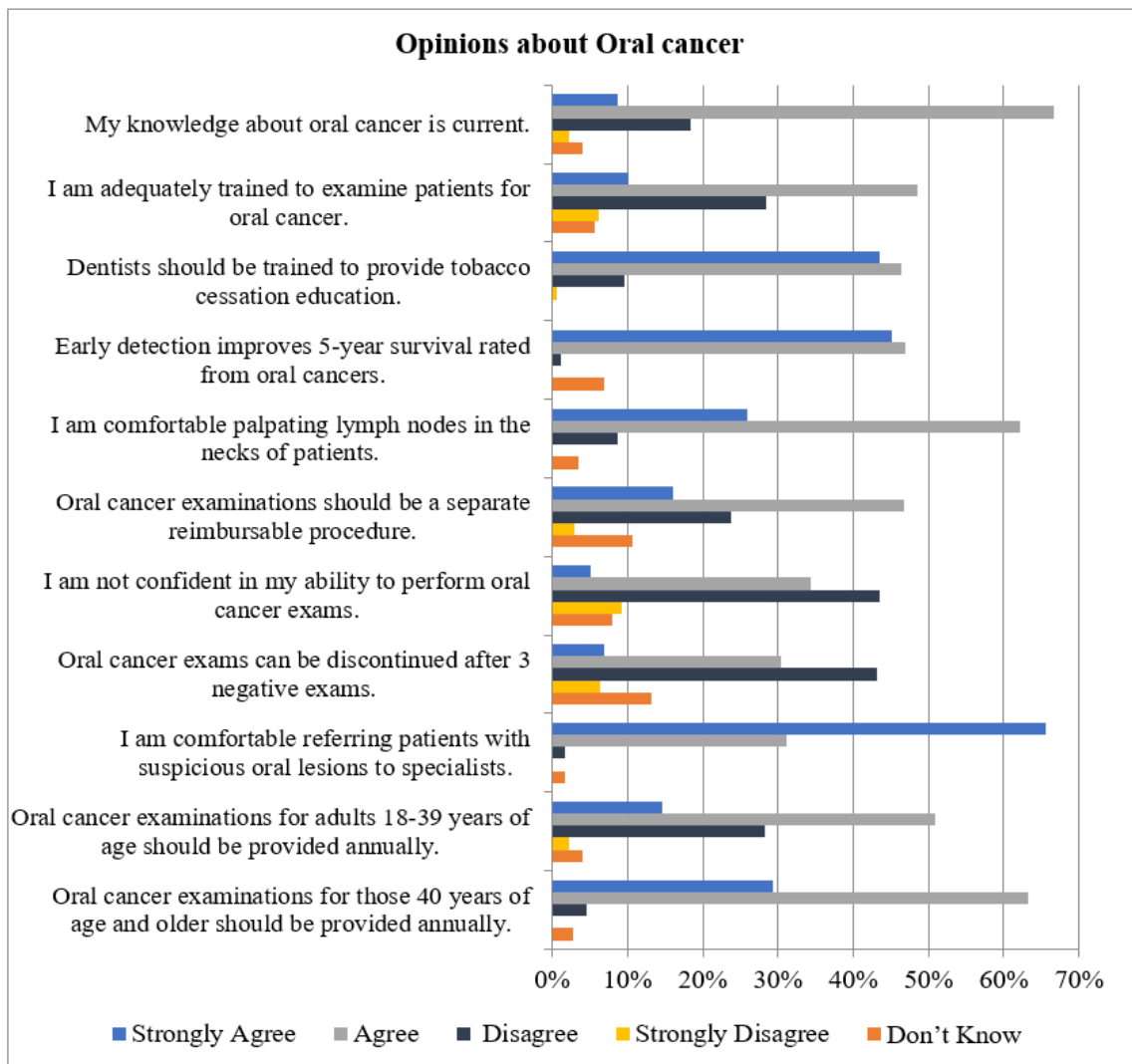


Figure 8. Opinions of the dentists.

When the participants were asked about their opinion of who have the primary role in detecting early signs and symptoms of OC, 80.39% of general practice dentists acknowledge that they have the primary role in early detection and 70.83% of specialist dentists believe that it is general practice dentists primary role.

To evaluate the dentists' current practice, they were asked about the factors they assess and probe when taking the patients' medical history (Table 5). It revealed that the percentage of dentists asking their patients about current tobacco use (96%) was higher than those asking patients about previous tobacco use (89.2%) or asking about the type and amount of used tobacco (80%). To lower extent, the dentists ask patients about the current alcohol use (68%), past alcohol use (64.7%) and type and amount of alcohol used (46.8%). Also the dentists reported asking about their patient's history of cancer (86.8%) and family history of cancer (80.6%).

Table 5 Factors assessed by the dentists when taking the patients' medical history.

	Yes	No
Patient's present tobacco use	168 (96.0%)	7 (4.0%)
Patient's previous tobacco use	157 (89.2%)	19 (10.8%)
Type and amount of tobacco	140 (80.0%)	35 (20.0%)
Patient's present alcohol use	177 (68.0%)	55 (31.9%)
Patient's past alcohol use	112 (64.7%)	59 (34.1%)
Type and amount of alcohol use	80 (46.8%)	91 (53.2%)
Patient's history of cancer	152 (86.8%)	23 (13.1%)
Family history of cancer	141 (80.6%)	34 (19.4%)

Dentists were asked about oral cancer education materials available in their practice. High proportion of dentists (77.6%) reported that there is no available OC education material for their patients. Thirty-two dentists (18.4%) reported the availability of brochures or pamphlets about OC. Only three dentists (1.7%) reported that they provide verbal education and instructions to their patients about OC.

Another question was assessing their practice decision when they detect a lesion. Most of the dentists (89.3%) they do refer to the specialist. Nine dentists (5.1%) reported performing Toluidine Blue Staining. Eight dentists (4.52%) report performing Brush Biopsy. Only one dentist report using ViziLite.

5.5 Assessments of Dentists Characteristics and The Level of OC Knowledge

Cluster adjusted analysis was done to adjust for the difference in the knowledge scores in different areas. According to the assumption of clustering effect on the level of knowledge. The performed analysis was adjusted for clustering in 5 areas (Figure.9). Intraclass correlation Coefficient (ICC) was measured to evaluate difference in the knowledge score in different areas. For the clinical presentation knowledge score, $ICC = 0.028$ and for the risk factors knowledge scores $ICC = 0.084$, which is interpreted as 2.8% and 8.4% of the knowledge score variance is due to difference in the practice setting area and more than 90% is attributed to individual difference.

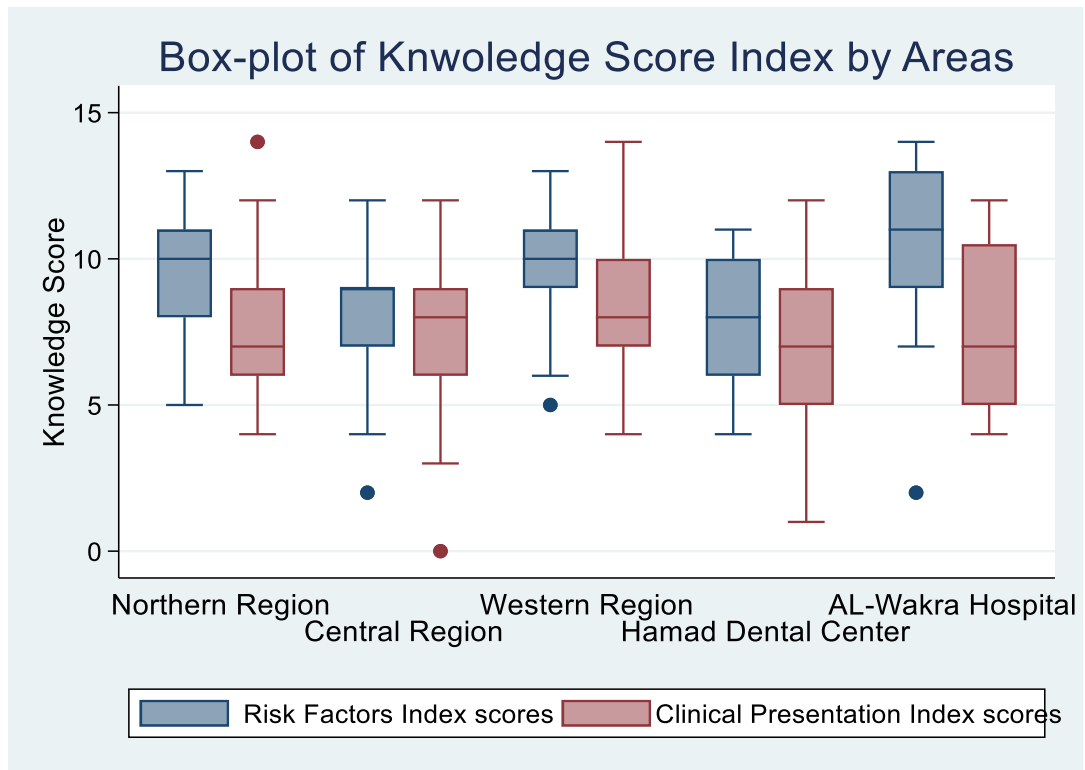


Figure 9. Knowledge Score Indexes in five cluster areas

The Inferential statistics were used to explore the association between six dentists' characteristics in relation to three levels of knowledge. Table 6 demonstrate the distribution of the level of knowledge in both knowledge indexes in relation to gender, age, years of practical experience, scope of practice and last time since attending CPD course about OC. The association was assessed with cluster adjusted Chi square for different areas. Younger dentists less than 39 years of age are more likely to have high scores in the clinical presentation index, more than older age participants (Adjusted Chi²=3.96, df=4, *P value*=0.411). Also, there is significant association between the years of experience and the level of knowledge about OC risk factors (Adjusted Chi²=11.38, df=4, *P value*=0.023).

Dentists with years of experience less than 10 years, tend to have higher scores in the risk factors knowledge index compared to dentists with more than 10 years of experience. Furthermore, general practice dentists are more likely to have medium-to-higher scores in the risk factor index compared to specialist dentists. However, it is not significant association after applying cluster adjusted analysis (Adjusted Chi²=0.716, df=2, P value=0.698) (Table 6).

Table 6. Association between dentists' characteristics and the knowledge indexes of the risk factors and the clinical presentation of oral cancer.

	Clinical Presentation Knowledge Index				Risk Factors Knowledge Index			
	Low score (n)	Medium score (n)	High Score (n)	<i>P</i> value	Low score (n)	Medium score (n)	High score (n)	<i>P</i> value
Gender								
Male	73	12	7	0.671 [†]	32	35	25	0.908 [†]
Female	65	16	4		33	29	23	
Age								
Less than 39 years	71	11	9	0.411 [†]	32	33	26	0.603 [†]
40-49 years	45	11	0		24	19	13	
≥ 50 years	20	6	2		7	12	9	
Years of practical Experience								
≤10 years	25	7	4	0.575 [†]	9	11	16	0.023 [†]
11-15 years	39	6	3		21	13	14	
> 15 years	71	15	4		33	40	17	
Scope of practice								
General Practice	84	14	4	0.825 [†]	31	46	25	0.698 [†]
Speciality practice	51	14	7		32	18	22	
Last time to attend CPD course about OC								
Less than 2 years	48	10	4	0.912 [†]	20	26	16	0.736 [†]
2-5 years ago	26	10	3		14	12	13	
More than 5 years	41	5	4		23	12	15	
Never	23	3	0		8	14	4	

[†] Cluster Adjusted Chi2 test

The relationship between dentists' characteristics and their level of knowledge was further assessed using cluster adjusted univariate logistic analysis to assess the impact of potential predictors; gender, years of experience, scope of practice and last time to attend CPD course on OC (Table 7). The range of scores in the medium category level of knowledge is small range (9 or 10 in the clinical index and 10 or 11 in the risk factors index) for this reason the outcome variables were recategorized in to binary outcome. The clinical presentation knowledge score was categorized into satisfactory level of knowledge (by combining medium and high scores) and unsatisfactory level of knowledge (participants with low scores). The same was done for the risk factor index, by recategorizing it into satisfactory and unsatisfactory level of knowledge.

Dentists with less than 10 years of experience are 1.64 times more likely to have satisfactory level of clinical presentation knowledge compared to dentists with more than 15 years of experience (Table 7). Also, dentists with less than 10 years of experience are 1.73 time more likely to have satisfactory level of knowledge about OC risk factors compared to dentists with more than 15 years of experience, after adjusting for clustering effect. The odds of specialist dentists to have satisfactory level of knowledge about clinical feature of OC is 1.92 times higher compared to general practice dentists. The opposite is observed with knowledge about risk factors, as specialist dentists are 46% less likely to have satisfactory level of knowledge about OC risk factors. Dentists who attended a CPD course about OC within the past 2 years are 2.23 times more likely to have satisfactory level of knowledge about the clinical feature of oral cancer. No significant association was identified between attending CPD courses and the level of knowledge in the risk factors knowledge index.

Table 7.Univariate logistic analysis

knowledge *	Clinical presentation			Risk factors knowledge *		
	OR ‡	95% CI	P value	OR ‡	95% CI	P value
Characteristics						
Gender						
Male	1.00	-		1.00	-	
Female	1.18	0.73-1.89	0.485	0.84	0.57 - 1.23	0.375
Practical Experience						
> 15 years	1.00	-		1.00	-	
11-15 years	0.86	0.19-3.78	0.017	0.744	0.41- 1.33	0.355
≤10 years	1.64	1.32-2.04		1.73	0.72- 4.13	
Scope of practice						
General Practice	1.00	-		1.00	-	
Speciality practice	1.92	0.91-4.03	0.084	0.54	0.22 - 1.33	0.184
Last time to attend a CPD course						
Never	1.00	-		1.00	-	
> 5 years ago	1.68	0.50-5.57		0.52	0.24 - 1.11	
2-5 years ago	3.83	0.82-17.8	0.321	0.79	0.30 - 2.06	0.329
Less than 2 years	2.23	0.40-12.3		0.93	0.57 - 1.51	

*Binary outcome (Satisfactory vs. Unsatisfactory level of knowledge).

‡ Adjusted odds of Satisfactory level of knowledge, accounting for clustering.

Due to small sample size we were not able to identify enough number of significant covariates to be introduced as potential predictors in multivariate logistic regression model building

Chapter 6: DISCUSSION

Patient's visit to the dentist is an opportunity for comprehensive oral examination and a chance for one-to-one oral health education for the patients. The number of oral cancer patients in Qatar has been increasing (between 2010 and 2015), with a corresponding increase in the population (7, 8). Qatar has a unique population structure with a diversity in the population's ethnic origin. Due to large number of ethnic groups living in Qatar, the population is adopting different behavioral risk factors and different health behaviors. Qatar achieved the universal coverage through the established governmental healthcare system as all residence are covered with the governmental health insurance in HMC and PHCC. The governmental healthcare system provides highly subsidized services to all the population. Dental and oral health services in PHCC and HMC are subsidized, which make the cost of treatment is very low compared to the services provided in the private sector. Healthcare providers and dentists in particular, play an important role in early detection of high risk patients for screening and patient awareness. This require great knowledge about the crucial risk factors that contribute in increasing the risk of oral cancer. Moreover, dentists' need to be knowledgeable about the clinical presentation of oral cancer for preliminary diagnosis and instant referral for further investigation. The early detection of asymptomatic oral cancer in the early stages is reflected to satisfactory clinical outcome and cure for most oral cancer patients. This will have a role in improving the outcome of the health care system and delivery of care. Assessing the level of knowledge is one way to measure the dentists' performance.

In dental practice, extraoral and intraoral examination is an essential step of new patient exam (60). Extraoral examination includes the examination of the patient's cervical

and submandibular lymph nodes. Therefore, dentists need to be knowledgeable about the characteristics of relatively normal lymph nodes compared to abnormal lymph nodes. In our study, high percentage correctly identified the characteristic of Lymph nodes with metastatic cancer, this is higher than what was observed in other studies(57, 59). Accordingly, this is reflected in their attitude as most of them agree about being comfortable in palpating the patients' neck for lymph nodes examination. Intraoral examination includes the comprehensive examination of the oral cavity and the tongue. In our study, large percent of dentists demonstrate the knowledge about the tongue exam steps and had the knowledge about the oral exam steps. However, low percent of the dentists are confident to perform oral cancer examination for the patients, and one third of them are not confident in their ability to perform OC examination. In evaluating their training to examine patients for OC, only 48.6% agree about being adequately trained and 29.4% disagree about being adequately trained to examine patients for OC. Therefore, it is important to refresh their basic knowledge and improv their skills through training about the oral and tongue examination steps. This will increase their confidence and show positive attitude toward comprehensive oral examination for their patients.

The findings of our study identified that high percentage of dentists correctly identified squamous cell carcinoma as the most common form of OC, which is similar to the percentage observed among dentists in Yemen, Kuwait and North Carolina (55, 61, 62). However, some important gaps in knowledge about OC clinical features were identified. Less than one quarter (21.5%) of dentists correctly identified that oral cancer is asymptomatic in its early stage, which is lower than in Iran were 45% and in British Columbia and Nova Scotia were 78.4% correctly identified this characteristic (57, 59). Accordingly, low proportion of

dentists (39%) identified that OC is mainly diagnosed in advanced stage which is lower than what was observed in Kuwait (75%) and in Yemen (66%) were more than half of the dentists were more knowledgeable (61, 62). Almost half of the dentists (53.7%) were familiar with Erythroplakia and Leukoplakia as important signs of premalignant lesion, among them only forty-four dentists (24%) correctly identified Erythroplakia as lesion with higher dysplastic changes to cancer. Similarly observed in Iran were 50% correctly identified these signs. On the other hand, higher percentage of dentists in Turkey (64.1%) and Kuwait (93%) correctly identified Erythroplakia and Leukoplakia as premalignant signs (62, 63). These are important signs of premalignancy that the dentists need to be familiar with. The differences in the level of knowledge in different countries might be related to different educational backgrounds, different training opportunities and different shared educational environment. As for the most common site of OC, less than half of the dentists correctly identified the tongue and floor of the mouth as the most common site to develop OC. These identified gaps in clinical and diagnostic knowledge about OC need to be addressed in the CPD courses concerned with OC. Because the dentists need to have the knowledge of what to look for and where to look when doing OC examination for the patients.

High percentage of dentists correctly identified tobacco (97.7%), alcohol (93.2%) and prior oral cancer (94.4%) as risks for oral cancer, consistently with other studies (57, 61, 64) . This is reflected in their practice when taking the patients' medical history, as majority of dentists reported assessing the patients' present tobacco use (96%), patients' history of cancer (86.8%) and to a lower extent the patients' present alcohol use (68%). However, 23,2% of the dentists didn't know the effect of chewing betel quid and nearly

half of the dentists didn't know Gutka use, as risk factors for oral cancer. More emphasis is needed to increase their knowledge about different types of tobacco use that include smokeless tobacco such as betel quid and Gutka (smokeless tobacco in the form of powder) which is widespread among the Asian culture. Also, chewing Qat that is common in some areas in the Arab region. Dentists were asked about their opinion if they should be trained to provide tobacco cessation education, 43.5% strongly agree and 46.3% Agree. Their knowledge about squamous cell carcinoma to be directly linked to tobacco use, showed a positive attitude toward the willingness to be actively involved in smoking cessation intervention.

Poor diet represented by inadequate consumption of fruits and vegetables is associated with increasing the risk of oral cancer (65). Almost half of the dentists in the study sample, wrongly identify it as non-risk for OC and almost quarter of them (23.73%) doesn't know the effect of low consumption of fruits and vegetables. Poor imbalance diet can increase the risk of chronic health problems and is associated with cancer (66). Health care providers play an important role in educating and motivating their patients about healthy diet. Knowledge of the dentists about the importance of fruits and vegetables can be spread to the patients by increasing their awareness for healthy diet.

Dentists showed some misunderstanding about the risk and non-risk factors of OC. Almost half of the dentists wrongly identified spicy food, poor oral hygiene and poor fitting denture as risk factors, where there is not enough evidence in literature to identify them as risk factors for OC. High percentage of dentists wrongly identified family history of cancer as a risk for OC. These identified factors are important knowledge tips, where patients can ask their dentists about them in an educational session. Raising the population awareness

about oral cancer risk factors plays an important role in the prevention. For this reason, awareness among dentists is important for correct patient health education.

The results of this study identified that nearly one-third of the dentists are showing low level of knowledge in both knowledge indexes. Moreover, slightly more than three-quarter of dentists (78%) have low level of knowledge about the clinical feature of OC. This is surprisingly, more than what was observed in Clovis *et al* were 35%, in Patton *et al* were 59% and in Maryland study were 35.5% had low level of knowledge about the clinical presentation of OC (57, 60, 63). Although 66.7% of our study participants reported that their knowledge about OC is current, it is not reflected in their level of clinical knowledge about OC. Moreover, 28.3% disagree about being adequately trained to examine patients for OC. This indicates that there is a need for educational intervention for our study participants.

Different characteristics were assessed in relation to the level of knowledge. This study showed that dentists who attend a CPD course about OC within the past 2 years are 2 times more likely to have satisfactory level of clinical knowledge compared to those who never attend. However, this association didn't reach the significance level in our study. Furthermore, no association was observed between attending CPD course and the level of risk factors knowledge. Suggesting that OC risk factors are not well addressed in the delivered courses and the focus is directed toward the clinical knowledge. Yellowitz and Horowitz *et al* conducted a mailed survey on large sample size of dentists in USA, were they showed that attending a CPD course about OC is significantly reflected as better practice toward OC examination and propping OC risk factors among their patients (67). Moreover, Yellowitz *et al* results showed that attending a CPD course about OC is not

significantly associated with knowledge about the risk factors. However, attending CPD course is significantly associated with higher level of clinical knowledge, which is consistent with the results of our study (53). This demonstrate the need for CPD course about OC and more emphasis is needed on the techniques used to deliver CPD courses and the importance to deliver blended techniques of learning and education. In Qatar continuous professional development (CPD) for health care providers is compulsory, as it is regulated by Qatar Council for Health Care Practitioners (QCHP). Practicing dentists need to do 40 hours of continuous professional development every two years as a requirement for practicing licensing renewal. Age of the dentists is another characteristic that was assessed with the level of knowledge. Although the present study didn't show significant association between age and the level of knowledge, more number of younger dentists (less than 39 years of age), had high level of knowledge about the clinical presentation of OC and the risk factors, which is consistent with other studies that identified young age to be significantly associated with higher knowledge (57, 61, 62). Although in other study in Iran they reported that age is not associated with the level of knowledge, but the association was assessed with Spearman rho correlation between age and the knowledge score (68). Difference in results is suggested by different test of analysis. Young age dentists are recently graduated so they demonstrate better knowledge. On the other hand, practical experience was significantly associated with knowledge about the risk factors. Dentists with less than 10 years of practical experience, are more likely to have higher knowledge about OC risk factors and they are 1.64 times more likely to have satisfactory level of clinical knowledge about OC, compared to dentists with more than 15 years of experience, and it is consistent with the results in other studies (55, 64).

Undergraduate studies have a positive impact on the level of knowledge, but this impact will diminish with time. This reiterates the importance of continuous professional development (CPD) for updating the information. Scope of practice is another characteristic that was assessed. Specialist dentists are almost twice more likely to have higher clinical knowledge than general practice dentists. Specialist dentists are more likely to do invasive surgical procedures and take incisions, so they may be knowledgeable about the clinical feature of OC. On the other hand, specialists were 54% less likely to have satisfactory level of knowledge about OC risk factors. This can be explained as general practice dentists treat patients from different age groups with different demographic characteristics and treat more number of patients every day than specialist dentist. So, general practice dentists can observe different behavioral risk factors among different groups of people. The effect of dental specialty on the level of knowledge was not addressed in other studies so we were not able to compare our findings.

The strength of this study is represented by the used methods of paper-based self-administered questionnaire to make it easy for the participants to complete. Although the used method has a logistic burden of more cost and time consuming, we believe that the used method overcame the accessibility barriers to the target population and the low response that might be observed in web-based survey. Moreover, self-administered survey is less prone to biased responses due to social desirability compared to interviewer-administered survey.

The other strength point of this study is represented by the acceptable response rate of 65.31%. This is explained by the determined strategy that was used to minimize refusal rate to this survey, which included prenotification emails, followed by multiple contact attempts, had improved the response rate by motivating more dentists to respond.

Non-response bias is one of the limitations of this study. The non-respondents to this survey might have different level of knowledge compared to the respondents. Which consequently might bias the study results. It was difficult to gather information about the non-responders or about the dentists in the determined sample frame. However, there were a high proportion of responders among dentists in PHCC and we believe there is no difference between the responders and non-responders in PHCC. In HMC, the response among the dentists was poor and we suggest that the responders might be different than the non-responders. This study didn't collect information about the country where the dentists had their education or were trained, which is one of the limitations. The information gathered in this survey are self-reported rather than observed data. So, response bias of the participants bias is another limitation. Dentists practicing in the private sector were not included in this survey. Therefore, these results can't be generalized to the private sector.

Chapter 7: CONCLUSION AND RECOMMENDATIONS

This study was able to identify gaps in the knowledge of the practicing dentists in Qatar about oral cancer and to compare these gaps with other results observed in other countries. The unsatisfactory level of knowledge that was observed in this study, strongly suggest providing educational intervention to dentists about the main clinical features of OC that can be observed in their practice and integrate this educational intervention with education about the evidence-based risk factors. In addition to identify myth concepts about OC, by update them with the recent evidence-based science. Young dentists are more likely to have higher scores in the level of knowledge. Dentists graduated less than 10 years, demonstrate satisfactory level of knowledge about OC compared with dentists with more than 15 years of experience. We recommend that young dentists less than 39 and less than 10 years of experience to be involved in providing lectures or educational courses to their colleagues in their practice settings. Recently graduated dentists can participate by sharing their knowledge which they most probably obtained from undergraduate studies.

High percentage of dentists have positive attitude toward providing tobacco cessation intervention for their patients. This is consistent with their high knowledge about tobacco smoking as a risk for oral cancer. Dental practice is a unique setting to provide cost effective tobacco cessation intervention. However, we recommend further research to be done regarding the applicability of this type of intervention and the readiness of dentists to provide tobacco cessation intervention for their patients. The results of this study can be used as base-line data for future educational intervention courses for dentists about oral cancer. To evaluate the effectiveness of courses about oral cancer in raising the dentists' knowledge and awareness.

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**ORAL CANCER: KNOWLEDGE, ATTITUDE
AND PRACTICE OF DENTISTS IN THE
STATE OF QATAR**

DENTISTS' SURVEY



كلية العلوم الصحية
College of Health Sciences
جامعة قطر
QATAR UNIVERSITY

Informed consent

This research is carried out to assess Oral Cancer knowledge, attitude and practice among dentists in the state of Qatar. Oral cancer is an important oral health issue that needs to call attention to. This survey will help to assess your level of knowledge about oral cancer. Explore your opinions and attitude toward oral cancer prevention and examination. Identify your current clinical practice toward oral cancer examination. This would help for future planning on oral cancer screening programs and improve the health system delivery of care

You are invited to participate in this self-administered survey. The questionnaire takes approximately 10 minutes to be completed. Your anonymity is assured as you will not be asked for you name or identifying information. All information will be treated with utmost confidentiality. Data will be stored in the researcher's laptop with password protected files and will be accessible only to the authorized investigators. Your participation is voluntary, and you may refuse to participate. You will receive no direct benefit nor risks from participating in this research.

If you have any question about the survey or the study, you can contact:

Dr. Diana Jboor
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Please select your choice:

- I have read the above information and I voluntarily agree to participate in the study.
- I have read the above information and I refuse/ disagree to participate in the study.

**Oral Cancer: Knowledge, Attitude and Practice of Dentists in the State of Qatar
DENTISTS' SURVEY**

Please read each question carefully and provide your most appropriate response.

Dental Practice

1. Which of the following best describes your **PRACTICE** setting?
 - 1. HMC Hospital
 - 2. Primary Health Care Center

2. When doing an oral examination, the clinician should: (CHECK ONLY ONE)
 - 1. Palpate the thyroid gland
 - 2. Palpate the lymph nodes of the head and neck
 - 3. Palpate all salivary glands
 - 4. Radiograph suspected lesions
 - 5. All of the above

3. When examining the tongue for oral cancer, the clinician should: (CHECK ONLY ONE)
 - 1. Have patient stick out tongue as far as possible for inspection
 - 2. Examine posterior dorsum of the tongue with a tongue blade or mirror
 - 3. Pull the patient's tongue out and inspect both sides of it
 - 4. Inspect the underside of the tongue by having the patient raise tongue
 - 5. All of the above
 - 6. Don't know

4. When you detect a lesion, do you: (CHECK ONE OR MORE)
 - 1. Perform Toluidine Blue Staining
 - 2. Perform Brush Biopsy
 - 3. Perform Incisional Biopsy
 - 4. Use ViziLite
 - 5. Refer
 - 6. Other (Specify) _____

5. In the past 12 months, about how many patients did you biopsy for suspicious oral lesions?
 _____Write in number; if none, write "0."

6. In the past 12 months, about how many patients did you refer for diagnosis of suspicious oral lesions?
 _____Write in number; if none, write "0."

7. In your opinion, who should have the primary role in detecting early signs and symptoms of oral cancer?
 - 1. General Dentist
 - 2. Oral and maxillofacial surgeon
 - 3. Dermatologist
 - 4. Ear, nose and throat specialist
 - 5. Other (Specify) _____

8. What kind of oral cancer patient education materials are available in your practice?
 - 1. None
 - 2. Brochures / Pamphlets
 - 3. Video
 - 4. Other (Explain) _____

9. When taking a medical history, which of the following do you assess?
 (CIRCLE ONE ON EACH LINE)

	<u>Yes</u>	<u>No</u>
Patient's past alcohol use?	<input type="checkbox"/>	<input type="checkbox"/>
Patient's present alcohol use?	<input type="checkbox"/>	<input type="checkbox"/>
Type & amount of alcohol used?	<input type="checkbox"/>	<input type="checkbox"/>
Patient's previous tobacco use?	<input type="checkbox"/>	<input type="checkbox"/>
Patient's present tobacco use?	<input type="checkbox"/>	<input type="checkbox"/>
Type & amount of tobacco?	<input type="checkbox"/>	<input type="checkbox"/>
Patient's history of cancer?	<input type="checkbox"/>	<input type="checkbox"/>
Family history of cancer?	<input type="checkbox"/>	<input type="checkbox"/>

**ANSWER THE FOLLOWING BASED
ON YOUR KNOWLEDGE ABOUT
ORAL CANCER**

10. Excluding the lip, which of the following are the **TWO** most common sites of oral cancer? (CHECK TWO)
- 1. Soft palate
 - 2. Tongue
 - 3. Gingiva
 - 4. Buccal mucosa
 - 5. Floor of mouth
 - 6. Don't know
11. The **most common** form of oral cancer is: (CHECK ONLY ONE)
- 1. Lymphoma
 - 2. Squamous cell carcinoma
 - 3. Basal cell carcinoma
 - 4. Adenocarcinoma
 - 5. Kaposi's sarcoma
 - 6. Don't know
12. Which **ONE** of the following factors is **LEAST** likely to be associated with oral cancer: (CHECK ONLY ONE)
- 1. Increasing age
 - 2. Familial clustering
 - 3. Alcohol consumption
 - 4. Tobacco use
 - 5. Don't know
13. The symptom most commonly expressed by a patient with an **EARLY** sign of oral cancer is: (CHECK ONLY ONE)
- 1. Pain
 - 2. Ulceration
 - 3. Swelling
 - 4. None; patient is asymptomatic
 - 5. Don't know
14. The **majority** of oral cancers are diagnosed in people who are: (CHECK ONLY ONE)
- 1. Less than 18 years of age
 - 2. 18 - 39 years of age
 - 3. 40 - 59 years of age
 - 4. 60 years of age or older
 - 5. Don't know
15. A lymph node most characteristic of oral cancer metastasis, **when palpated**, is: (CHECK ONLY ONE)
- 1. Hard, painful, mobile
 - 2. Hard, painless, mobile or fixed
 - 3. Soft, painful, mobile
 - 4. Soft, painless, fixed or mobile
 - 5. Don't know
16. Which area of the tongue is **most likely** to develop oral cancer? (CHECK ONLY ONE)
- 1. All the tongue
 - 2. Dorsal surface
 - 3. Ventral - lateral border
 - 4. Anterior - lateral border
 - 5. Base of tongue
 - 6. None of the above
 - 7. Don't know
17. Oral cancer lesions are **most often** diagnosed in which stage: (CHECK ONLY ONE)
- 1. Premalignant
 - 2. Early
 - 3. Advanced
 - 4. Don't know
18. Lip cancers: (CHECK ONLY ONE)
- 1. Are related to sun exposure
 - 2. Are increasing each year
 - 3. Have a worse prognosis than most oral cancers
 - 4. Affect the upper lip more frequently than the lower lip
 - 5. Have not been related to any form of tobacco use
 - 6. Don't know

19. Early oral cancer lesions usually appear as a:
(CHECK ONLY ONE)

- 1. Small, painless, red area
- 2. Small, painful, red area
- 3. Small, painful, white area
- 4. Small, bleeding area
- 5. Don't know

20. Of the following conditions, which TWO are most likely to be associated with oral cancer?
(RANK IN ORDER OF IMPORTANCE)

- 1. Leukoplakia
- 2. Erythroplakia
- 3. Pemphigus vulgaris
- 4. Migratory glossitis
- 5. Denture stomatitis
- 6. Don't know

RANK IMPORTANCE
First _____
Second _____
(Write in numbers)

21. Which of the following factors place an individual at high risk for oral cancers?

(CIRCLE YOUR RESPONSE ON EACH LINE)

	Yes	No	Don't Know
Older age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor fitting dentures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor oral hygiene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of tobacco products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of spicy foods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Family history of cancer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hot beverages and food	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low consumption of fruits and vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of marijuana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Certain viruses (i.e. HPV)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obesity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of 'Gutka'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chewing 'Beetle Quid'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prior oral cancer lesion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of mouth rinses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OPINIONS

22. Please indicate the extent to which you agree or disagree with each of the following statements:

(CIRCLE ONE RESPONSE ON EACH LINE)

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
a) My knowledge about oral cancer is current.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Oral cancer examinations for those 40 years of age and older should be provided annually.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Oral cancer examinations for adults 18-39 years of age should be provided annually.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) I am comfortable referring patients with suspicious oral lesions to specialists.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Oral cancer exams can be discontinued after 3 negative exams.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) I am not confident in my ability to perform oral cancer exams.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Oral cancer examinations should be a separate reimbursable procedure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) I am comfortable palpating lymph nodes in the necks of patients.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Early detection improves 5-year survival rates from oral cancers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Dentists should be trained to provide tobacco cessation education.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) I am adequately trained to examine patients for oral cancer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Personal Data

23. Your Gender: 1. Male
 2. Female
24. Your age: (CHECK ONE)
 1. 23 - 29 years
 2. 30 - 39 years
 3. 40 - 49 years
 4. 50 - 59 years
 5. 60 years and older
25. Year of graduation
from dental school (e.g. 2007): _____.
26. Years of practical experience: (CHECK ONE)
 1. less than 5 years
 2. 5 -10 years
 3. 11-15 years
 4. More than 15 years
27. Which of the following best describe your
scope of practice?
 1. General dental practice
 2. Speciality dental practice
28. When was the last time you attended a
continuing education course on oral cancer?
(CHECK ONLY ONE)
 1. Within the past 2 years
 2. During the past 2 - 5 years
 3. More than 5 years ago
 4. Never

Thank you
*We appreciate your cooperation and support for this
project
Please Return Promptly*