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Epidemiological Insights and Policy Interventions for Tobacco Associated Oral Cancer in the United Arab Emirates: A Narrative Review

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Abstract

Oral cancer (OC) is a significant public health concern in the United Arab Emirates (UAE), primarily linked to tobacco use, including cigarettes, shisha, dokha, and smokeless tobacco products. Globally, OC ranks as the 13th most common cancer, with a burden in developing regions. In the UAE, modernization and lifestyle shifts have contributed to rising OC prevalence, accounting for 3.2% of all cancer cases. This is a review examining the determinants, risk factors and current preventive measures targeting tobacco-related OC in the UAE. Key determinants include the duration and intensity of tobacco use, early initiation and genetic susceptibility. Major gaps persist in healthcare provider awareness, public participation in screening programs and the absence of a comprehensive national cancer control plan. Recommended strategies include strengthening multisectoral collaboration, enhancing early detection, improving workforce training and reinforcing stricter tobacco regulations.

Keywords: Oral cancer, Tobacco, United Arab Emirates, Oral Cancer prevention.

1. Introduction

Oral cancer (OC) is defined as a neoplasm involving the oral cavity, which begins at the lips and ends at anterior pillars of the throat (Al-Jaber et al., 2016). It is a non-communicable chronic disease caused mainly by tobacco smoking or chewing and alcohol consumption. The primary focus of this article is tobacco use as a causative agent of OC.

It is the 13th most commonly occurring cancers globally with 377713 new cases and 177757 deaths in 2020 (WHO

Comprehensive Assessment of Evidence on Oral Cancer Prevention Released, 2023). The occurrence and death rate of OC are higher in underdeveloped nations in comparison to developed nations (Al-Jaber et al., 2016).

The increasing prevalence of OC in the UAE as a result of modernization and changes in lifestyle indicates that the disease is largely preventable (Al-Rawi et al., 2012). The UAE National Cancer Registry, 2019 reports OC to constitute 3.2% of all cancer cases. Tobacco smoking causes 22% deaths due to cancer worldwide (Berezhnova & Moonesar, 2022). The increasing prevalence of tobacco smoking, including the use of waterpipes, among UAE citizens has contributed to the emergence of OC (Nasser et al., 2020). As per the data from WHO, 18% UAE adults are smokers. (Rahman et al., 2016).

AlNeyadi et al. conclude that OC has a male predilection due to the higher prevalence of tobacco use among males, since smoking is not considered culturally acceptable among females (AlNeyadi et al., 2024). OC occurs among 60-70 years of age and is rare below 40 years (Al-Jaber et al., 2016). The most common sites for OC are tongue, labial or buccal mucosa, gingiva, palate and alveolar mucosa (Dhanuthai et al., 2017).

Determinants

The primary factors influencing the development of OC caused by tobacco use in the UAE are the duration and intensity of tobacco consumption. Early initiation of tobacco use increases the risk of developing OC, as the harmful effects of carcinogens have more time to take effect (Nasser et al., 2020). Some people may have a genetic predisposition to OC, making them more susceptible to the harmful effects of tobacco carcinogens (Al-Jaber et al., 2016).

Risk Factors

Controlling tobacco use will enable effective disease prevention. Studies have shown that tobacco, including smokeless forms, plays a significant role in the development of OC (Yi et al., 2013). The International Agency for Research on Cancer has identified over 60 direct carcinogens in cigarette smoke such as nitrosamines, polycyclic aromatic hydrocarbons and tobacco-specific nitrosamines (Dhanuthai et al., 2017).

Cigarette smoking is the predominant method of tobacco consumption associated with OC. Smoke inhalation directly exposes the oral cavity to carcinogens. Shisha and Dokha are frequently used in the United Arab Emirates (Bangera et al., 2022). Smokeless tobacco products, such as khaini, mishrak and betel quid, pose significant health risks. These products are inserted between the cheek and gum, which facilitates the absorption of nicotine and carcinogens into the bloodstream.

2. Methods

This study is a narrative review of published literature examining tobacco-associated OC in the UAE. Although a structured search strategy was employed, this review is presented as a narrative synthesis rather than a formal scoping review, as no quality appraisal or PRISMA-ScR reporting was undertaken.

2.1 Eligibility criteria

The Population, Concept, Context (PCC) framework for determining the eligibility of the studies as per the research objective is presented in Table 1.

Table 1. PCC FRAMEWORK

Population	Adolescents and adults exposed to tobacco
Concept	Tobacco-associated OC
Context	United Arab Emirates

An extensive search was conducted to answer the main aim of this review with the following inclusion criteria:

1) Addressed OC epidemiology, risk factors, prevention, or policy interventions

2) Examined tobacco use (smoked or smokeless) as a primary risk factor

3) Focused on the UAE or provided relevant evidence from GCC or comparable settings

4) Included original research, systematic reviews, narrative reviews, policy papers, or authoritative reports.

Meanwhile, the exclusion criteria were:

1) Unrelated to OC or tobacco exposure

2) Focused exclusively on non-tobacco-related oral malignancies

3) Opinion articles without supporting evidence

4) Published in languages other than English

2.3 Information sources

The following electronic literature databases were searched from September 2024 to October 2024: PubMed and Google Scholar to identify relevant articles published until June 2025. Relevant government reports and publications from the World Health Organization (WHO) and UAE Ministry of Health and Prevention (MOHAP) were also reviewed.

2.4 Search strategy

The search terms were derived from MeSH (Medical Subject Heading) terms in PubMed using the following keywords: oral cancer, tobacco, smoking, water pipe, shisha, dokha and UAE. Additional terms were handpicked during literature search. The keywords were searched within All fields. The keywords were separated using appropriate Boolean operators (AND and OR).

3.1 Study selection

The initial search yielded 126 records. After removal of duplicates and screening of titles and abstracts, 52 articles were assessed for full-text eligibility. Of these, 22 articles met the inclusion criteria and were included in the final synthesis.

3.2 Characteristics of included studies

Majority of included studies were observational epidemiological studies (n = 14), followed by systematic reviews (n = 1), policy analyses and governmental reports (n = 3) and cross-sectional surveys assessing knowledge, attitudes and practices related to OC and tobacco use (n = 4). Tobacco exposure examined included cigarette smoking, shisha (water pipe), dokha and smokeless tobacco products. Key outcomes assessed were OC incidence, mortality, stage at diagnosis, screening practices, public awareness, healthcare provider knowledge and policy effectiveness. The major forms of tobacco used in the UAE and their associated oral cancer risk are summarized in Table 1.

3. Results

Table 2. Forms of Tobacco Used in the UAE and Associated OC Risk

Tobacco product	Common use in UAE	Mode of exposure	OC risk
Cigarettes	Widely used	Smoke inhalation	High
Shisha (Waterpipe)	Social and recreational use	Prolonged smoke exposure	High
Dokha	Popular among young adults	High nicotine smoke inhalation	High
Smokeless tobacco (khaini, mishrak, betel quid)	Limited but present	Direct mucosal contact	Very high
Emerging products (e-cigarettes, heated tobacco)	Increasing	Aerosol exposure	Uncertain / Emerging evidence

(Adapted from Dhanuthai et al., 2017; Bangera et al., 2022; AlNeyadi et al., 2024)

4. Discussion

Although the UAE government has made ongoing attempts to address OC, it remains a significant economic and health burden for the nation.

4.1 Measures for intervention

The UAE has implemented several measures to reduce the number of OC cases linked to tobacco. A number of laws and regulations have been implemented in the UAE to reduce tobacco use. The World Health Organization Framework Convention on Tobacco Control (WHO FCTC) was signed by UAE in 2006 and Bill No. 15 was approved in 2009 that included strong policy

measures such as higher tobacco taxes, prohibitions and fines on smoking in public areas and limitations on tobacco advertising and promotion (Berezhnova & Moonesar, 2022).

Public awareness campaigns have been launched by the UAE government and health organizations to educate the population about the dangers of tobacco use leading to OC. These campaigns use various media channels, such as television, radio, print media and social media, to reach a wide audience. Several programmes in UAE incorporate counselling, medication and support groups along with free smoking cessation support and national toll-free quit lines to assist smokers willing to quit (Fadhil, 2022). UAE National Cancer Registry is the population-based cancer registry established under the jurisdiction of the Ministry of Health and Prevention (MOHAP) in 2013 and by 2025, the UAE aims to have reduced cancer mortality by nearly 18% (Al-Shamsi, 2022).

Dental examinations which may encompass an OC screening for indications of malignancy like lumps, sores, or white patches are essential for the effective management of OC. Oral visual screening for OC has the potential to prevent at least 37,000 deaths worldwide and can reduce mortality in high-risk individuals (Hashim et al., 2018). MOHAP launched the National Periodic Health Screening Programme and Cancer Screening Initiative, 2015 with the objective of enhancing public consciousness regarding early cancer detection via routine medical examinations, which enable more efficacious treatment modalities (Ahmed et al., 2020).

Tranby et al reported that around 70% of cases are detected at advanced stages, resulting in a decrease in the 5-year survival rate. The UAE has been actively engaged in the development of national cancer control plans to improve cancer care services in accordance with internationally recognized standards (Al-Shamsi et al., 2022).

4.2 Gap Analysis

Major gaps exist in cancer quality control in the UAE, even with the advent of medical technology. Furthermore, cancer treatment varies greatly from one facility to another. Due to the differences in the quality of cancer care, the UAE needs a comprehensive national cancer control plan as currently it does not have one. Information about the state of cancer care in the UAE is scarce at present. These data are essential for bridging gaps and enhancing cancer treatment (Al-Shamsi et al; 2022).

Healthcare professionals, including general practitioners and dentists, have gaps in their knowledge regarding OC risk factors and preventive measures (Gómez et al., 2010). It is important that continuing education courses address these knowledge gaps in order to advance efforts towards early detection and prevention which is a real challenge (Muthanandam et al., 2021). Arab populations' acceptance of screening programmes is less than expected; this could be due to lack of health awareness and false public perceptions of the programmes' advantages (Al-Othman et al., 2015).

The WHO Report on the Global Tobacco Epidemics, 2021, states that although the UAE has tobacco control laws in place, the country's compliance rate is relatively low (roughly 10%), necessitating attention and stringent policy measures (Berezhnova & Moonesar, 2022). Comparatively, other GCC countries such as Saudi Arabia and Qatar have demonstrated improved tobacco taxation compliance and centralized cancer care frameworks, highlighting opportunities for policy learning and regional collaboration (Alotaibi et al., 2022; Al-Thani et al., 2025). The incidence of cancer is anticipated to increase 1.8 times by 2030 (Arafa et al., 2020). With the current rate of tobacco smoking, the incidence of OC is also expected to rise in the UAE. Key gaps in tobacco-associated oral cancer control in the UAE and the corresponding recommended actions are outlined in Table 3.

4.3 Implications for inaction

Not taking action towards OC control in the UAE has numerous adverse consequences. The absence of effective preventive measures and awareness campaigns is likely to result in an increase in the incidence of OC resulting in higher mortality rates and greater strain on the healthcare system. The incidence of cancer is anticipated to increase 1.8 times by 2030 (Arafa et al., 2020).

Research indicates that there is a lack of knowledge regarding the symptoms of OC among the population of the UAE (Al-Othman et al., 2015). Treatment and prognosis become more complicated and less effective when diagnosed in later stages. OC can significantly impair an individual's quality of life, resulting in difficulties with swallowing, eating, and speaking.

OC in advanced stages frequently necessitate more extensive and costly treatment in comparison to those in the early stages. The use of biosimilars has become increasingly prevalent in UAE as a means of coping with the rising global costs of cancer drugs (Al-Shamsi et al., 2022). The financial burden of healthcare expenses related to tobacco-related diseases is exorbitant as 1.8% of the global GDP is attributed to health expenditures and productivity losses caused by smoking (Berezhnova & Moonesar, 2022).

4.4 Recommendations

OC control should be a multisectoral approach. Primary healthcare, secondary care hospitals, tertiary care, and private cancer care centers must be linked and integrated for efficient diagnosis and treatment. In order to address the issue of cost-effectiveness, it is imperative to involve all stakeholders and enhance cancer care initiatives, thereby, ensuring equitable and affordable cancer services. It is necessary to monitor the performance of a qualified workforce whose expertise and skills have been enhanced through training and continuing education. Gaining international accreditations from reputable global organizations is crucial for maintaining consistent progress.

The primary emphasis should be placed on promoting preventive measures such as enhancing education, implementing screening programmes and early detection. The patient's journey from experiencing symptoms to receiving treatment must be carefully planned in accordance with local cultures and international guidelines. It is necessary to enforce stricter prohibitions on tobacco use and levy hefty fines for offending while also restricting tobacco access.

Table 3. Key Gaps in Tobacco-Associated OC Control in the UAE and Recommended Actions

Identified Gap	Impact	Recommended intervention
Limited public awareness	Delayed diagnosis	National OC awareness campaigns
Low screening participation	Advanced-stage detection	Community-based screening programs
Knowledge gaps among healthcare providers	Missed early signs	Mandatory continuing professional education
Weak tobacco law enforcement	Continued high exposure	Stronger compliance monitoring and penalties
Absence of comprehensive national cancer control plan	Fragmented care	Implementation of a unified national cancer control framework

4.5 Strengths and Limitations

This review synthesizes epidemiological, clinical, and policy evidence on tobacco-associated OC in the UAE using a transparent PCC framework and multiple authoritative data sources, enhancing its public health relevance. However, as a narrative review, it is subject to selection bias, heterogeneity across included studies and lack of formal quality appraisal. Limited availability of UAE-specific longitudinal data and restriction to English-language publications may also affect generalizability.

5. Conclusion

The UAE is an emerging economy with a significant OC incidence rate, which is predicted to rise along with the country's morbidity and death rate. While oral screening and early detection efforts exist, they fall short of the intended population's target coverage. To effectively combat OC, a comprehensive and efficient national cancer control plan and stricter tobacco control policies are required.

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The research is exclusively based on published literature; hence, ethical approval is not required.

Disclosure Statement:

The authors declare no Conflict of Interest.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used ChatGPT 7 in order to assist with readability, phrasing and structure. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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