

Expert Consensus on Topics for Oral Cancer Educational Campaigns for Dentists and Population: a Delphi Study

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Consenso de Especialistas sobre Tópicos Relevantes para Campanhas Educacionais sobre Câncer Bucal: um Estudo Delphi
Consenso de Expertos sobre Temas Relevantes para las Campañas Educativas sobre Cáncer Bucal: un Estudio Delphi

Juliana Romanini¹; Natália Batista Daroit²; Karine Angar³; Karine Duarte da Silva⁴; Eduardo Dickie de Castilhos⁵; Isadora Peres Klein⁶; Bruna Jalfim Maraschin⁷; Marina Curra⁸; Andreas Rucks Varvaki Rados⁹; Paula Luce Bohrer¹⁰; Sabrina Pozatti Moure¹¹; Cristina da Silva Baumgart¹²; Cristiane Cadermatori Danesi¹³; Ingrid da Silva Santos¹⁴; José Ricardo Sousa Costa¹⁵; Léo Kraether Neto¹⁶; Tatiana Damiani Lafin¹⁷; Samara Andreolla Lazaro¹⁸; Pantelis Varvaki Rados¹⁹; Maria Antonia Zancanaro Figueiredo²⁰; Adriana Etges²¹; Camila de Barros Gallo²²; Marianne de Vasconcelos Carvalho²³; Vania Regina Camargo Fontanella²⁴; Vinicius Coelho Carrard²⁵

ABSTRACT

Introduction: Oral cancer is a significant public health problem whose impacts on affected individuals are aggravated by late diagnosis and high morbidity associated. **Objective:** Develop guidelines for educational campaigns about oral cancer. **Method:** The study sample consisted of a panel of 20 professors, covering the following specialties: stomatology, oral pathology, oral and maxillofacial surgery, radiology, epidemiology, and public oral health. Meetings were conducted using the Google Meet[®] platform. The guidelines' formulation involved two rounds when the questionnaires were administered. Two professors compiled the results that were discussed with the group after each round. **Results:** The outcomes demonstrated aspects of oral cancer educational campaigns grouped into six axes: epidemiology, prevention, risk factors, clinical characteristics, diagnosis, and treatment. Specific topics were evaluated for inclusion or exclusion in educational actions based on a 5-level Likert scale. The decision was guided by the existence of evidence supporting the information. Following the Delphi methodology, topics with over 80% favorable opinions were retained in the guidelines. In round 2, the panelists defined the target public for each subject (dentists or the general population) and provided additional considerations. A final list of recommended topics and justifications for exclusions was produced. **Conclusion:** This study successfully identified key issues related to oral cancer, facilitating the organization and standardization of content for educational campaigns targeting both dentists and the general public.

Key words: Mouth Neoplasms; Health Education; Early Detection of Cancer; Health Promotion; Delphi Technique.

RESUMO

Introdução: O câncer bucal é um importante problema de saúde pública, cujos impactos sobre os indivíduos acometidos são agravados pelo diagnóstico tardio e pela elevada morbidade associada. **Objetivo:** Estabelecer diretrizes para campanhas educativas sobre o câncer bucal. **Método:** A amostra do estudo foi composta por um painel de 20 professores, abrangendo as seguintes especialidades: estomatologia, patologia oral e maxilofacial, cirurgia e traumatologia bucomaxilofacial, radiologia odontológica e imagiologia, epidemiologia e saúde coletiva. O processo de formulação envolveu duas rodadas de questionários. Dois professores compilaram os resultados, que foram discutidos com o grande grupo após cada rodada, por meio de videoconferência (*Google Meet*). **Resultados:** As respostas foram agrupadas em seis eixos: epidemiologia, prevenção, fatores de risco, características clínicas, diagnóstico e tratamento. Dentro de cada eixo, foram pontuados temas específicos para inclusão (ou não) com base em perguntas objetivas. A decisão baseou-se na existência de evidências científicas que respaldassem as informações. Seguindo a metodologia Delphi, os temas com mais de 80% de opiniões favoráveis foram mantidos nas diretrizes. Na segunda etapa, os painelistas definiram o público-alvo de cada assunto (dentistas ou a população) e forneceram considerações sobre o tema. Ao final, foi produzida uma lista de temas recomendados e breves justificativas para os excluídos. **Conclusão:** O presente estudo identificou questões pertinentes ao câncer bucal, que poderiam, a partir de sua aplicação, facilitar a organização e a padronização dos conteúdos para campanhas educativas direcionadas a dentistas e à população em geral. **Palavras-chave:** Neoplasias Buciais; Educação em Saúde; Detecção Precoce de Câncer; Promoção da Saúde; Técnica Delphi.

RESUMEN

Introducción: El cáncer oral es un problema de salud pública importante, cuyos efectos en las personas afectadas se ven agravados por el diagnóstico tardío y la alta morbilidad asociada. **Objetivo:** Definir directrices para campañas educativas sobre cáncer bucal. **Método:** La muestra del estudio consistió en un panel de 20 profesores, que abarcaban las siguientes especialidades: estomatología, patología oral y maxilofacial, cirugía y traumatología bucomaxilofacial, radiología odontológica e imagiología, epidemiología y salud bucal pública. El proceso incluyó dos rondas de cuestionarios, cuyos resultados fueron analizados y resumidos por dos profesores para luego ser discutidos con el grupo grande después de cada ronda. Las reuniones se realizaron de forma virtual mediante Google Meet. **Resultados:** Los resultados fueron agrupados en seis ejes: epidemiología, prevención, factores de riesgo, características clínicas, diagnóstico y tratamiento. En cada eje, se dio puntaje a temas específicos para su inclusión (o no) basándose en preguntas objetivas. Dicha decisión se fundamentó en la existencia de evidencias científicas que respaldasen las informaciones. Siguiendo la metodología Delphi, se mantuvieron en las directrices los temas con más del 80% de aprobación. Además, en la segunda ronda, los panelistas definieron el público objetivo (odontólogos o población) para cada tema y aportaron comentarios adicionales. Al final se produjo una lista de temas recomendados y justificaciones breves para aquellos excluidos. **Conclusión:** Este estudio ayudó a identificar asuntos pertinentes al cáncer oral que podrían hacer más fácil, después de ser aplicado, organizar y estandarizar el contenido de las campañas educativas dirigidas a dentistas y a la población general.

Palabras clave: Neoplasias de la Boca; Educación en Salud; Detección Precoz del Cáncer; Promoción de la Salud; Técnica Delphi.

Full institutional affiliation of the authors see page 10.

Corresponding author: Vinicius Coelho Carrard. Rua Ramiro Barcelos, 2492/503 – Santana. Porto Alegre (RS), Brasil. CEP 90035-003. E-mail: vccarrard@gmail.com



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INTRODUCTION

Recent data from the National Cancer Institute (INCA) indicate an incidence of around 17,190 new cases of oral cancer annually in Brazil, of these, 12,260 cases were in men and 4,930 in women¹. Despite extensive research efforts to find diagnostic and treatment solutions, the mortality rate for this disease has remained stable around 50%. A possible explanation for this scenario is a late diagnosis at an advanced stage in two-thirds of the cases².

As the oral cavity is an easily accessible region for physical examination, diagnosis is not difficult. However, most dentists feel themselves ill-prepared to manage oral lesions³, often resulting in numerous referrals for specialized care in stomatology, which is typically available only in major urban centers. In the public health services, this overburdens tertiary care and, consequently, delays diagnosis^{4,5}.

Studies have demonstrated that dentists' knowledge on oral cancer is limited^{6,7}. This is concerning because these professionals play a central role in disease prevention and early diagnosis⁸. Most dentists attribute this issue to insufficient education during their training^{9,10}. Similarly, the general population exhibits a limited understanding of the disease, including its risk factors, signs, and symptoms¹¹. Continuing education activities are imperative to empower these professionals in epidemiology, risk factors, clinical characteristics, and diagnostic processes^{12,13}.

In response to these challenges, continuing education initiatives to enhance diagnostic capacity and self-efficacy have been proposed in various countries. In the United Kingdom, Silverman et al.¹⁴ demonstrated that such initiatives improved dentists' knowledge and ability to detect oral lesions early. A subsequent study showed that dentists in southern Brazil who regularly participate in continuing education programs identify lesions more frequently and detect more cancer cases than those who do not¹⁰. More recently, a systematic review indicated that educational efforts targeting the general population effectively increased their knowledge about the disease¹⁵.

Oral cancer awareness campaigns have been organized by educational institutions, dental professional organizations as associations, councils and unions, and public and private professional groups. For nearly 15 years, these activities were performed in the state of Rio Grande do Sul, including legislated actions that established a statewide period dedicated to this cause known as "*Maio Vermelho*". However, it has been observed that locally, these initiatives lacked standardization in terms of scientifically grounded content, resulting in

inconsistencies in both information dissemination and health education efforts. This gap underscored the need to develop standardized protocols to guide these activities and ensure accurate and effective health education^{16,17}. Given these challenges, the present study aimed to develop guidelines established through expert consensus to serve as a reference for organizing oral cancer educational activities for dentists and the population.

METHOD

The Delphi method^{18,19} was used to assess expert consensus on oral cancer topics to promote educational actions targeted at dentists and the general population. As this study represents a collaborative effort among colleagues and all the participants involved in the Delphi technique are co-authors of the study, the Ethics Committee of *Universidade Federal do Rio Grande do Sul* waived the ethical review in compliance with Directive 510/2016²⁰ of April 7, 2016 of the National Health Council.

STEP 1: ITEM GENERATION

The most relevant issues were identified through the following process:

a. An initial group of panelists was invited via email, with an explanation of the project objectives and methods. The selection of panelists required prior involvement in at least two different educational activities related to oral cancer and teaching experience in dental education of the following areas: stomatology, oral pathology, oral and maxillofacial surgery, radiology, epidemiology, and public oral health. Some of them also work in public health services, which helps to identify gaps and barriers in oral cancer detection and diagnosis. Individuals affiliated with industries and/or laboratories with potential conflicts of interest were excluded.

b. A Google Forms questionnaire was emailed to the participants containing a single open question: "What topics would you cover in an educational campaign about oral cancer?" The data collection period lasted seven days.

c. Two authors analyzed the answers and prepared a comprehensive feedback report which included the experts' aggregated assessments and comments, along with a summary of key themes identified through content analysis; this report was shared with panelists during a 60-minute Google Meet session, allowing diverse perspectives to be heard and considered. Anonymity was maintained to prevent bias and minimize the influence of dominant individuals.

STEP 2: CONSENSUS DEVELOPMENT

A consensus was reached after two Delphi rounds.

Round 1

Participants: The purposive sampling method was used to invite 18 oral diagnosis experts who worked at 15 teaching dentistry institutions in Rio Grande do Sul, the southernmost Brazilian state. In addition to their clinical and educational experience, the participants were knowledgeable in developing educational content for dental undergraduate courses and/or residency programs and were invited to join through a Google Meet session.

Questionnaire: A list of relevant items was compiled within each thematic axis that emerged from the responses to the Google Forms questionnaire (Step 1). These items were based on a literature review of PubMed-indexed articles published since 2000. The search query included the terms ‘oral cancer, knowledge, dentists’ in the title. Based on this strategy, a second 42-question questionnaire was developed and emailed. The invitees completed the questionnaire individually within 10 days.

A set of closed-ended questions was utilized to assess whether panelists agreed or disagreed with the pertinence of each topic for inclusion in educational actions on oral cancer. For every item, the participants responded “agree” or “disagree” and were free to provide additional comments or suggest complementary topics through an open-ended field. The frequency of agreement for each item was calculated to determine its level of acceptance among the experts. Consistent with recommendations for Delphi studies, the consensus threshold was defined as at least 80% of panelists agreeing on the inclusion of the item. All topics that reached this level of agreement were considered essential for incorporation into educational campaigns or activities.

Round 2

After collecting data from Round 1, the panelists held a session to present and discuss the results, when ambiguous interpretations were identified, requiring a second round to harmonize responses. The panelists determined which of the previously approved topics should be addressed to the general population and which should be restricted to dentists in this second round.

A new Google Forms questionnaire was then created. Frequencies for the obtained answers were calculated using SPSS version 21 (IBM, Armonk, NY, USA). Additionally, two panelists from institutions located in the state of São Paulo (*Universidade de São Paulo-SP*) and in the state

of Pernambuco (*Universidade Federal de Pernambuco – Pernambuco*) were included to ensure broader geographic representation within the expert group.

RESULTS

In Stage 1, 12 of 13 experts (92.3%) accepted the invitation, returned the questionnaire, and attended the online meeting. Two members of the research team held a 60-minute Google Meet session to review the responses and identify the topics suggested. The thematic axes proposed were epidemiology, risk factors, prevention, clinical characteristics/diagnosis, treatment/management, and conditions with potential malignancy.

In Stage 2, 20 of the 22 invited experts, mostly women ($n = 14$; 70.0%), agreed to participate, resulting in a 91% response rate, representing 17 institutions. The experts had a mean professional experience of 21.3 years (standard deviation (SD) = 10.4). The demographic and professional characteristics of the panel are presented in Table 1.

Of the 29 questions included in the questionnaire, 24 addressed topics to be assessed in regard to their relevance for oral cancer education campaigns, while the remaining five focused on conditions with uncertain or alleged malignant potential. Among the items proposed by the experts, 13 (44.8%) and 3 (10.3%) were deemed irrelevant or unnecessary for the general population and for dentists, respectively. This judgment was primarily attributed either to the context-specific nature of certain topics – limited to particular regions or countries – or to insufficient scientific evidence available to substantiate their inclusion. Detailed results are presented in Table 2.

All the suggested topics were approved as seen in Table 2. Two experts emphasized the significance of addressing the persistently high mortality rate linked to oral cancer over recent decades.

Table 1. Demographics of the Delphi experts (Step 2, $n=20$)

Sample characteristics	n, (%)
Sex	
Female	14 (70.0)
Male	6 (30.0)
Years of experience	
Mean (SD)	21.7 (10.4)
Min-Max	9-44
Institution	
Public	10 (50.0)
Private	10 (50.0)

Caption: SD = standard deviation.



Table 2. Evaluation of the suitability of key terms to be used in educational campaigns on mouth cancer

Items	Population			Dentists		
	Agree (%)	Disagree (%)	Verdict	Agree (%)	Disagree (%)	Verdict
Epidemiology						
Number of cases (World)	60.0	40.0	Rejected	95.0	5.0	Accepted
Number of cases (Brazil)	95.0	5.0	Accepted	95.0	5.0	Accepted
Number of cases (Rio Grande do Sul State)	85.0	15.0	Accepted	80.0	20.0	Accepted
Mortality rate	95.0	5.0	Accepted	100.0	0.0	Accepted
Mortality rate (compared to other cancer types)	70.0	30.0	Rejected	85.0	15.0	Accepted
Risk factors						
Tobacco	100.0	0.0	Accepted	95.0	5.0	Accepted
Electronic cigarette	95.0	5.0	Accepted	95.0	5.0	Accepted
Hookah	80.0	20.0	Accepted	85.0	15.0	Accepted
Alcohol	95.0	5.0	Accepted	90.0	10.0	Accepted
UV radiation	100.0	0.0	Accepted	95.0	5.0	Accepted
HPV (human papilloma virus)	100.0	0.0	Accepted	95.0	5.0	Accepted
Mate (<i>Chimarrão</i>)	80.0	20.0	Accepted	80.0	20.0	Accepted
Chronic trauma	75.0	25.0	Rejected	75.0	25.0	Rejected
Diet (protective effect)	80.0	20.0	Accepted	80.0	20.0	Accepted
Prevention						
Group for tobacco quitting	85.0	15.0	Accepted	85.0	15.0	Accepted
Dentist as a prescriber of pharmacological treatment for smoking cessation	45.0	55.0	Rejected	75.0	25.0	Rejected
Importance of the early diagnosis	100.0	0.0	Accepted	100.0	0.0	Accepted
Oral self-examination	60.0	40.0	Rejected	60.0	40.0	Rejected
Clinical characteristics and diagnosis						
Profile of higher risk group (men > 40 years old)	80.0	20.0	Accepted	100.0	0.0	Accepted
More frequent oral sites	80.0	20.0	Accepted	95.0	5.0	Accepted
Importance of full mouth examination as a routine by dentists	95.0	5.0	Accepted	100.0	0.0	Accepted
Training for oral mucosal lesion diagnosis	25.0	75.0	Rejected	95.0	5.0	Accepted
Biopsy – general guidelines	30.0	70.0	Rejected	95.0	5.0	Accepted
Management/Treatment						
Protocol for diagnosis communication	30.0	70.0	Rejected	100.0	0.0	Accepted
Patient referral to treatment	100.0	0.0	Accepted	100.0	0.0	Accepted
Role of dentist before, during and after diagnosis	100.0	0.0	Accepted	100.0	0.0	Accepted
Concepts regarding the mechanisms of chemotherapy and radiotherapy	25.0	75.0	Rejected	90.0	10.0	Accepted
Adverse effects of oncologic treatment	55.0	45.0	Rejected	95.0	5.0	Accepted
Association between disease staging and prognosis	70.0	30.0	Rejected	100.0	0.0	Accepted

The most well-known risk factors for the disease, as tobacco, alcoholic beverages, and ultraviolet radiation, received over 90% agreement. The same finding applies to electronic cigarettes and human papilloma virus expositions included as risk factors more recently. In contrast, chronic trauma was not approved for inclusion because it did not reach the minimum consensus threshold of 80% agreement. This finding is consistent with the current evidence, hardly robust still to substantiate this association.

The importance of early diagnosis yielded 100% agreement among the panelists. Self-examination was not considered a valuable strategy, but the panelists pointed out that self-care should be encouraged. In other words, it is considered valid for the population to be aware of their oral health issues and to seek dental consultation if they notice any changes, a position also supported by the World Health Organization (WHO) guidelines, which recommend self-care but not self-examination²¹.

Various topics have been approved, including conducting a routine comprehensive examination of the entire mouth and reviewing patients' demographic profiles and clinical features of the disease. Additionally, general guidelines covering biopsy types and indications as well as information about distinguishing oral mucosal lesions were included, but only for dentists (Table 2).

As seen in Table 2, all proposed topics were approved for educational interventions for dentists, encompassing their role in different dimensions of oral cancer management. This context comprises methods for delivering diagnoses and referrals for confirmed diagnoses and treatment-related information, despite not falling under the dentist's responsibility. Considering that the patient must be familiar with the stages that follow the diagnosis, the evaluators recommended the inclusion of topics related to the involvement of the dentist before, during and after diagnosis as well as their importance in the referral for treatment by the oncologic care team.

In what concerns the terminology of pathologic entities presenting a risk for malignant transformation,

58.3% of the panelists favored 'potentially malignant disorders'. In comparison, 33.3% suggested 'potentially malignant lesions', and 8.3% proposed 'oral potentially malignant lesions'. During the online meeting, one expert suggested that using 'lesion' might be more suitable within educational activities, as the discussion between 'disorder' and 'lesion' tends to be more academically inclined. Therefore, the final decision was to adopt the term 'potentially malignant lesions'.

All oral pathologic entities from the latest WHO Classification²², that were included in the present study questionnaire, met the agreement threshold to be retained in the recommendations for dentists. In contrast, only leukoplakia, erythroplakia, and actinic cheilitis were considered suitable for inclusion in educational interventions targeting dentists. These data are detailed in Table 3.

In stage two, comments with several important principles that could potentially guide campaigns addressing oral cancer as a public health issue have emerged from the questionnaire:

1. Target Public: Besides dentists, it is beneficial to involve other members of the oral health team and healthcare professionals from various fields.
2. Collaborative Activity Planning: Planning involving the public network requires discussions with municipal and state health departments to ensure all stakeholders' demands are recognized.
3. Commitment to Action: Organizing efforts to facilitate access to scientifically supported information and provide care for identified cases through campaigns offering examinations to the population and providing information about oral diseases.

During online discussions, experts reached a consensus on key messages to emphasize in actions. These messages included, specifically:

Table 3. Results of panelists' evaluation (%) of the inclusion of potentially malignant lesions in oral cancer educational campaigns

Potentially malignant lesions	Population			Dentists		
	Agree	Disagree	Verdict	Agree	Disagree	Verdict
Leukoplakia	85.0	15.0	Accepted	100.0	0.0	Accepted
Proliferative verrucous leukoplakia	40.0	60.0	Rejected	100.0	0.0	Accepted
Erythroplakia	80.0	20.0	Accepted	100.0	0.0	Accepted
Lichen planus	50.0	50.0	Rejected	90.0	10.0	Accepted
Actinic cheilitis	95.0	5.0	Accepted	100.0	0.0	Accepted



- Cancer is often preventable since its primary risk factors are avoidable.
- Early diagnosis is a primary goal of the healthcare system to reduce the rates of disease-related morbidity and mortality.
- Any persistent oral lesion lasting 14 days or more should be evaluated by a healthcare professional, whether a dentist or a doctor.
- The disease is treatable, particularly if diagnosed in its early stages.

DISCUSSION

The rapid expansion of digital communication platforms has enabled unprecedented access to information, shaping the contemporary landscape of knowledge dissemination. However, this accessibility has also led to a proliferation of misinformation on the internet and social media, particularly in critical public health areas like oral cancer awareness^{8,23}. To address this issue, this paper aimed to develop a set of comprehensive educational guidelines to combat misinformation and promote an accurate understanding of oral cancer among the general population and healthcare professionals¹¹. This timely initiative, the first of its kind, recognizes the urgent need for reliable frameworks amidst the widespread dissemination of unreliable information. By establishing evidence-based educational protocols, it seeks to empower individuals and healthcare professionals to navigate oral cancer information with confidence and accuracy and to standardize specific technical concepts for clinical practitioners and the public. Additionally, efforts should be made to increase dental students' knowledge about oral cancer for earlier diagnosis.

In today's digital age, there is an overwhelming abundance of health-related information online, particularly about oral cancer. However, the Delphi study identified a significant issue: the lack of quality control and verification of this information. Misinformation can lead to misconceptions and inappropriate health behaviors^{24,25}. Therefore, a critical component of educational campaigns should be the dissemination of accurate, evidence-based information to counteract unreliable sources²⁶.

Understanding the epidemiology of oral cancer is essential to grasp the magnitude of the disease and its impact on public health²⁷. Epidemiological data provide insights into the prevalence, incidence, and mortality rates associated with oral cancer, revealing the importance of targeted prevention and early detection strategies²⁸. This information is vital not only for dentists or other health professionals but also for policymakers to allocate resources²⁹. A study conducted in India highlights the importance of a multidisciplinary approach to control the epidemic of oral cancer in the

country. This includes the implementation of primary prevention programs, health education, early detection, and immediate treatment, in addition to policies that address common risk factors as tobacco and alcohol use³⁰. In this regard, a collaboratively developed plan involving public health professionals, managers, and educational institutions is both beneficial and essential.

Despite general awareness of traditional risk factors as tobacco use and excessive alcohol consumption, there is a concerning knowledge gap on the harmful effects of newer habits like electronic cigarettes (e-cigarettes) and hookah (water pipe) smoking^{31,32}. The present Delphi study underscored the need for educational campaigns to include updated information on these emerging risk factors. Educating the public about the potential dangers of these habits is crucial for prevention efforts, as their popularity, especially among younger populations, continues to rise^{28,33}. The literature has presented comprehensive evidence supporting the role of alcohol as a risk factor for mouth cancer for decades. However, it is essential to emphasize that this influence does not depend on the type of alcoholic drink, the substances it contains, or the quality of the drink, contrary to popular belief³⁴. Concerns were raised about potentially detrimental heat from *mate* consumption, however, current evidence only links it to esophageal cancer³⁵. The exclusion of chronic trauma was due to insufficient scientific support, and this topic remains arguable. However, the experts agree that eliminating irritative factors (e.g., ill-fitting dentures, fractured teeth) is advisable due to their association with other oral lesions^{36,37}.

Previous studies have revealed a significant knowledge deficit of both the general population and dentists on the clinical characteristics of oral cancer^{38,39}, which emphasizes the necessity of regular public educational campaigns and continuous professional development for dentists. Enhancing the understanding of the clinical signs and symptoms, as well as competencies related to oral cancer diagnosis⁴⁰ among these groups can lead to earlier detection and improved patient outcomes⁴¹. In this regard, oral self-examination was rejected by consensus. The effectiveness of oral self-examination for detecting oral cancer remains controversial. This may be due to methodological heterogeneity across studies, which hinders its implementation as a public health strategy^{42,43}. However, the panelists emphasized that self-care may be beneficial as a health education measure to increase awareness of potential clinical manifestations of the disease. Therefore, clinical examination for oral cancer detection must remain as a responsibility of healthcare professionals, especially dentists. Recently, the present group showed that continuing education actions can encourage dentists to look for oral lesions and increase their capacity to detect

malignant lesions¹⁰. Training programs for dentists have demonstrated positive outcomes in terms of increasing awareness and enhancing the ability to recognize suspicious lesions¹⁵. Furthermore, these programs have motivated dentists to adopt full oral examination routines, which are critical for early diagnosis⁴⁴. The present study suggests that these capacity-building initiatives should be sustained and regularly updated to maintain their effectiveness and adapt to new developments in the field.

The limitations of the study are the ungeneralizability of the results due to Brazil's continental dimensions and different health behavior patterns. However, the recommendations could be applied with minor adjustments to tailor this guide to the specific characteristics of each region. As a strength, the present group of panelists included experienced teaching professionals and other public health services. Further research is needed to adapt and validate these recommendations in diverse settings to ensure their global relevance, applicability, precision, and reliability⁴⁵⁻⁴⁸.

CONCLUSION

The Delphi study has provided a consensus from experts in pathology and stomatology working at educational institutions in different Brazilian regions, listing critical topics for educational campaigns on oral cancer. The need for accurate, reliable information, understanding the epidemiology of the disease, addressing emerging risk factors, and improving knowledge of clinical characteristics are essential components of effective public health strategies. Regular training for dental professionals has shown to be beneficial and should be continued. While the recommendations are culturally specific to Brazil, they offer a structure that can be adapted to other contexts, underscoring the importance of cultural considerations in public health interventions.

CONTRIBUTIONS

Juliana Romanini contributed to the conception of the study, acquisition, analysis, interpretation of the data, and critical review with intellectual contribution. Natália Batista Daroit, Karine Angar, Karine Duarte contributed to the acquisition, analysis, interpretation of the data and writing. Eduardo Dickie de Castilhos, Isadora Peres Klein, Bruna Jalfim Maraschin, Marina Curra, Andreas Rucks Varvaki Rados, Paula Luce Bohrer, Sabrina Pozatti Moure, Cristina da Silva Baumgart, Cristiane Danesi, Ingrid da Silva Santos, José Ricardo Sousa Costa, Léo Kraether Neto, Tatiana Lafin, Samara Andreolla Lazaro, Pantelis Varvaki Rados, Maria Antonia Zancanaro Figueiredo, Adriana Etges, Camila de Barros Gallo, Marianne de Vasconcelos Carvalho and Vania Regina Camargo

Fontanella contributed to the acquisition, analysis and critical review of the data with intellectual contribution. Vinicius Coelho Carrard contributed to the conception of the work, acquisition, analysis, interpretation of the data, writing, critical review with intellectual contribution. All the authors approved the final version for publication.

DECLARATION OF USE OF ARTIFICIAL INTELLIGENCE

This article benefited from language refinement provided by ChatGPT, a language model developed by OpenAI to improve clarity and fluency in English.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are not publicly available but access can be requested to the corresponding author (vccarrard@gmail.com).

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Institutional Affiliation

¹Prefeitura Municipal de Porto Alegre, Centro de Especialidades Odontológicas – Estomatologia. Porto Alegre (RS), Brasil. Hospital de Clínicas de Porto Alegre (HCPA). Porto Alegre (RS), Brasil. E-mail: julianaromanini@hcpa.edu.br. Orcid iD: <https://orcid.org/0000-0003-1214-3394>

²Atitus Educação, Curso de Odontologia. Porto Alegre (RS), Brasil. Universidade Federal do Rio Grande do Sul (UFRGS), Faculdade de Odontologia. Porto Alegre (RS), Brasil. E-mail: nataliadaroit@yahoo.com.br. Orcid iD: <https://orcid.org/0000-0002-0764-8999>

³Centro Universitário Uniftec, Curso de Odontologia. Bento Gonçalves (RS), Brasil. E-mail: karineangar@gmail.com. Orcid iD: <https://orcid.org/0009-0003-8930-0535>

⁴Centro Universitário Ritter dos Reis (UniRitter), Curso de Odontologia. Porto Alegre (RS), Brasil. Instituto do Câncer Infantil. Porto Alegre (RS), Brasil. E-mail: karineduardedasilva1@gmail.com. Orcid iD: <https://orcid.org/0000-0002-1451-7727>

⁵Universidade Federal de Pelotas (UFPel), Faculdade de Odontologia, Departamento de Odontologia Social e Preventiva. Pelotas (RS), Brasil. E-mail: eduardo.dickie@gmail.com. Orcid iD: <https://orcid.org/0000-0002-7072-6558>

⁶Complexo de Ensino Superior de Cachoeirinha (Cesuca), Curso de Odontologia. Cachoeirinha (RS), Brasil. E-mail: isadorapklein@gmail.com. Orcid iD: <https://orcid.org/0000-0003-1912-0654>

⁷Centro Universitário Franciscano, Faculdade de Odontologia. Santa Maria (RS), Brasil. E-mail: brunajalfim@gmail.com. Orcid iD: <https://orcid.org/0000-0002-8078-2940>

⁸Universidade de Caxias do Sul (UCS), Faculdade de Odontologia. Caxias do Sul (RS), Brasil. E-mail: marinacurra@gmail.com. Orcid iD: <https://orcid.org/0000-0001-8473-9424>

⁹Universidade do Vale do Taquari (Univates), Faculdade de Odontologia. Lajeado (RS), Brasil. E-mail: andreasrados@gmail.com. Orcid iD: <https://orcid.org/0000-0002-7962-1162>

¹⁰Universidade Feevale, Faculdade de Odontologia. Novo Hamburgo (RS), Brasil. E-mail: plbohrer@gmail.com. Orcid iD: <https://orcid.org/0009-0008-6232-8577>

¹¹Universidade Luterana do Brasil (Ulbra), Faculdade de Odontologia. Canoas (RS), Brasil. E-mail: sabrinamour@gmail.com. Orcid iD: <https://orcid.org/0000-0002-0299-7903>

¹²Associação Brasileira de Odontologia. Porto Alegre (RS), Brasil. E-mail: patologistabucal@gmail.com. Orcid iD: <https://orcid.org/0000-0002-1213-7683>

¹³Universidade Federal de Santa Maria (UFSM), Faculdade de Odontologia, Departamento de Patologia. Santa Maria (RS), Brasil. E-mail: cristianedanesi@gmail.com. Orcid iD: <https://orcid.org/0000-0001-9170-5791>

¹⁴UFRGS, Programa de Pós-Graduação em Epidemiologia (TelessaúdeRS). Porto Alegre (RS), Brasil. E-mail: iingridsantos@hotmail.com. Orcid iD: <https://orcid.org/0000-0001-6284-9868>

^{15,21}UFPel, Faculdade de Odontologia, Centro de Diagnóstico de Doenças Buciais (CDDB). Pelotas (RS), Brasil. E-mails: costajrs@hotmail.com; aetges@gmail.com. Orcid iD: <https://orcid.org/0000-0002-2542-2053>; Orcid iD: <https://orcid.org/0000-0002-6066-869X>

¹⁶Universidade de Santa Cruz do Sul (Unisc), Programa de Pós-Graduação em Promoção da Saúde. Santa Cruz do Sul (RS), Brasil. E-mail: leonet@unisc.br. Orcid iD: <https://orcid.org/0000-0002-0391-1833>

¹⁷Secretaria do Estado do Rio Grande do Sul. Porto Alegre (RS), Brasil. E-mail: tatiana-lafin@saude.rs.gov.br. Orcid iD: <https://orcid.org/0009-0005-1461-9829>

¹⁸Universidade Regional Integrada do Alto Uruguai e das Missões, Faculdade de Odontologia. Erechim (RS), Brasil. E-mail: sahandreolla@gmail.com. Orcid iD: <https://orcid.org/0000-0001-5878-3691>

¹⁹UFRGS, Faculdade de Odontologia. Porto Alegre (RS), Brasil. E-mail: pantelis@ufrgs.br. Orcid iD: <https://orcid.org/0000-0001-9307-1980>

²⁰Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Faculdade de Odontologia. Porto Alegre (RS), Brasil. PUCRS, Hospital São Lucas, Serviço de Estomatologia. Porto Alegre (RS), Brasil. E-mail: antonia.zfigueiredo@gmail.com. Orcid iD: <https://orcid.org/0000-0003-1104-5477>

²²Universidade de São Paulo (USP), Faculdade de Odontologia. São Paulo (SP), Brasil. E-mail: camilagallos@usp.br. Orcid iD: <https://orcid.org/0000-0002-8141-6029>

²³Universidade de Pernambuco (UPE), Faculdade de Odontologia de Pernambuco (FOP), Programa de Pós-Graduação em Odontologia, Grupo de Pesquisa em Histopatologia Oral. Recife (PE), Brasil. UPE, Hospital Universitário Oswaldo Cruz, Centro Integrado de Anatomia Patológica. Recife (PE), Brasil. E-mail: marianne.carvalho@upe.br. Orcid iD: <https://orcid.org/0000-0002-6815-5696>

²⁴UFRGS, Faculdade de Odontologia. Porto Alegre (RS), Brasil. Associação Brasileira de Ensino Odontológico. Brasil. E-mail: vaniafontanella@terra.com.br. Orcid iD: <https://orcid.org/0000-0001-9183-8447>

²⁵UFRGS, Faculdade de Odontologia. Porto Alegre (RS), Brasil. UFRGS, Programa de Pós-Graduação em Epidemiologia (TelessaúdeRS). Porto Alegre (RS), Brasil. HCPA, Serviço de Estomatologia. Porto Alegre (RS), Brasil. E-mail: vccarrard@gmail.com. Orcid iD: <https://orcid.org/0000-0002-1624-0178>