Smoking as a risk factor for Oral Cancer and 30 years of prevention campaigns in the state of Paraná, Brazil

O tabagismo como fator de risco para o Câncer Bucal e 30 anos de campanhas de prevenção no estado do Paraná, Brasil

El tabaquismo como factor de riesgo de Cáncer Oral y 30 años de campañas de prevención en el estado de Paraná, Brasil

DOI:10.34119/bjhrv7n4-091

Submitted: Jun 12th, 2024
Approved: Jul 02nd, 2024

Laurindo Moacir Sassi
PhD in Health Sciences by Universidade Federal de São Paulo
Institution: Hospital Erasto Gaertner
Address: Curitiba, Paraná, Brasil
E-mail: sassilaurindo@gmail.com

Maria Isabela Guebur
PhD in Sciences by Universidade Federal de São Paulo
Institution: Hospital Erasto Gaertner
Address: Curitiba, Paraná, Brasil
E-mail: isabelaguebur@hotmail.com

Rafaela Savio Melzer
Master in Stomatology by Pontifícia Universidade Católica do Paraná (PUC - PR)
Institution: Hospital Erasto Gaertner
Address: Curitiba, Paraná, Brasil
E-mail: rafamelzer@hotmail.com

José Luis Dissenha
Specialist in Oral and Maxillofacial Surgery and Traumatology by Faculdade Ingá
Institution: Hospital Erasto Gaertner
Address: Curitiba, Paraná, Brasil
E-mail: jldissenha@ig.com.br

Juliana Lucena Schussel
PhD in Oral Pathology by Universidade de São Paulo (USP)
Institution: Hospital Erasto Gaertner
Address: Curitiba, Paraná, Brasil
E-mail: juliana.schussel24@gmail.com

Fernando Zanferrari
PhD in Stomatology by Pontifícia Universidade Católica do Paraná (PUC - PR)
Institution: Hospital Erasto Gaertner
Address: Curitiba, Paraná, Brasil
E-mail: flzodonto@gmail.com
ABSTRACT
Smoking continues to occupy a significant space in global and Brazilian charts as the main risk factor for mouth cancer. Objective: To bring to literature the experience of 30 years of health actions to prevent oral cancer in the state of Paraná. Method: From 1989 to 2018, health actions aimed at preventing oral cancer were carried out in the State of Paraná - Brazil. A systematic anamnesis together with the intra-oral clinical examination was carried out on individuals participating in the campaigns over 30 years of age. Everyone responded to a questionnaire with personal data and reports of risky habits, such as smoking and alcohol consumption. Results: 29,682 people were examined and 6,358 mouth lesions were detected in the evaluated population. Between 1989 and 2008, 21.3% of patients were smokers. In the following years, from 2009 to 2013, there was a slight increase in tobacco consumption, reaching 21.6%. From then on, there was an increase to 27.2% between 2014 and 2018. Conclusion: Oral cancer prevention campaigns are extremely important, as they help in the early diagnosis of malignant and potentially malignant lesions.

Keywords: tobacco, mouth neoplasms, cigarette smoking.

RESUMO
O tabagismo continua a ocupar um espaço significativo nos gráficos mundiais e brasileiros como o principal fator de risco para o câncer de boca. Objetivo: Trazer para a literatura a experiência de 30 anos de ações de saúde para a prevenção do câncer bucal no Estado do Paraná. Método: De 1989 a 2018, foram realizadas ações de saúde voltadas para a prevenção do câncer bucal no Estado do Paraná - Brasil. Uma anamnese sistemática, juntamente com o exame clínico intraoral, foi realizada em indivíduos participantes das campanhas com mais de 30 anos de idade. Todos responderam a um questionário com dados pessoais e relatos de hábitos de risco, como tabagismo e consumo de álcool. Resultados: 29.682 pessoas foram examinadas e 6.358 lesões bucais foram detectadas na população avaliada. Entre 1989 e 2008, 21,3% dos pacientes eram fumantes. Nos anos seguintes, de 2009 a 2013, houve um leve aumento no consumo de tabaco, chegando a 21,6%. A partir de então, houve um aumento para 27,2% entre 2014 e 2018. Conclusões: As campanhas de prevenção do câncer bucal são de extrema importância, pois auxiliam no diagnóstico precoce de lesões malignas e potencialmente malignas.

Palavras-chave: tabaco, neoplasias bucais, tabagismo.
RESUMEN
El tabaquismo continúa ocupando un espacio significativo en las tablas mundiales y brasileñas como principal factor de riesgo de cáncer de boca. Objetivo: Traer a la literatura la experiencia de 30 años de acciones de salud para prevenir el cáncer bucal en el estado de Paraná. Método: De 1989 a 2018 se realizaron acciones de salud dirigidas a la prevención del cáncer bucal en el Estado de Paraná - Brasil. Se realizó una anamnesis sistemática junto con el examen clínico intraoral de los individuos participantes en las campañas mayores de 30 años. Todos respondieron a un cuestionario con datos personales e informes de hábitos de riesgo, como el tabaquismo y el consumo de alcohol. Resultados: Se examinaron 29.682 personas y se detectaron 6.358 lesiones bucales en la población evaluada. Entre 1989 y 2008, el 21,3% de los pacientes eran fumadores. En los años siguientes, de 2009 a 2013, se produjo un ligero aumento del consumo de tabaco, alcanzando el 21,6%. A partir de entonces, se produjo un aumento hasta el 27,2% entre 2014 y 2018. Conclusiones: Las campañas de prevención del cáncer oral son sumamente importantes, ya que ayudan al diagnóstico precoz de lesiones malignas y potencialmente malignas.

Palabras clave: tabaco, neoplasias bucales, fumar.

1 INTRODUCTION

Presenting a mortality rate of 50% in the first five years after diagnosis and having its etiology associated with tobacco use, alcohol consumption and infection with the Human Papilloma Virus (HPV), squamous cell carcinoma affects more than half a million people per year. year 1.

Smoking, in its various forms, continues to be a significant factor in head and neck cancer 2. Krishnan's study et al., from 2017, highlighted that almost 70% of patients with this type of cancer had a history of smoking 1. Furthermore, the National Cancer Institute (INCA) warns about the increased use of different forms of tobacco, including cigars, hookahs, straw cigarettes, electronic cigarettes and the traditional industrialized cigarette 3. Specifically regarding hookah smoking, one session can expose the user to a significant amount of toxins, equivalent to 100 cigarettes 3.

Studies have demonstrated the association between tobacco and genetic changes that may predispose to head and neck cancer, including abnormal expression of the p53 gene. This plays a crucial role in tumor suppression, regulating the cell cycle and inducing apoptosis. Changes or mutations in the p53 gene can compromise its protective function, allowing damaged cells to proliferate. The relationship between tobacco and head and neck cancer involves complex molecular mechanisms that affect the integrity of DNA and the genetic regulation of cells 4.
According to the study mentioned by Jehtwa et al., in 2017, it was shown that smokers are approximately twice as likely to develop cancer compared to non-smokers. They also observed that, after 20 years without smoking, the risk for ex-smokers was equivalent to that of people who had never smoked.

The present study aims to elucidate the 30th anniversary of the Oral Cancer Prevention Campaign in the State of Paraná, demonstrating the importance of health actions such as oral cancer prevention and anti-smoking actions.

2 METHOD

Aiming to reach the target audience of the population over 30 years of age, the prevention campaigns are part of a project accepted by the Erasto Gaertner Hospital Ethics and Research Committee, aiming to find early injuries and inform the population about risk factors for head and neck malignancy.

In the period from 1989 to 2018 (divided into periods of 5 years) health actions were carried out aimed at preventing oral cancer in the State of Paraná - Brazil. A systematized anamnesis together with the intra-oral clinical examination was carried out on individuals over 30 years of age, who were voluntary participants in the campaigns. Everyone responded to a questionnaire with personal data and reports of risky habits, such as smoking and alcohol consumption. In addition, other information such as age, color, sex, education and socioeconomic level, frequency of visits to the dentist and level of knowledge about oral cancer were part of the questionnaire.

After completing the questionnaire, the patients were examined by qualified professionals, who, using artificial lighting, helped to detect oral lesions.

3 RESULTS

29,682 people were examined and 6,358 mouth lesions were detected in the evaluated population. The most frequently encountered injuries were: traumatic of prosthetic etiology (generally with a higher percentage); inflammatory; leukoplastic, with characteristics of malignancy; papillomas and erythroplasia. Patients who, at the time of evaluation, presented some type of injury were duly referred to Erasto Gaertner Hospital. The public who attended received guidance on prevention and self-examination.
Through data relating to smoking, it was observed that, between 1989 and 2008, the average number of smoking patients was 21.4%. In the following years, from 2009 to 2013, there was a slight decrease in tobacco consumption, now representing 21%. From then on, there was an increase to 28.3% between 2014 and 2018. The table below shows the evolution of data regarding smoking.

<table>
<thead>
<tr>
<th>PERIOD OF YEARS</th>
<th>PERCENTAGES RELATED TO SMOKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989 TO 1993</td>
<td>25.7%</td>
</tr>
<tr>
<td>1994 TO 1998</td>
<td>24.4%</td>
</tr>
<tr>
<td>1999 TO 2003</td>
<td>18.7%</td>
</tr>
<tr>
<td>2004 TO 2008</td>
<td>18.2%</td>
</tr>
<tr>
<td>2009 TO 2013</td>
<td>21.0%</td>
</tr>
<tr>
<td>2014 TO 2018</td>
<td>28.3%</td>
</tr>
</tbody>
</table>

Source: Erasto Gaertner Hospital Statistics Service

Regarding smoking, 30 years of prevention campaigns showed that, on average, 22.7% had this harmful habit. The most significant age group showed a slight prevalence between 41 and 50 years old, with 68.1% of respondents being white. 22.5% earned more than two minimum wages and 55.8% had only a first degree of education. Of those interviewed, 73.8% never participated in any prevention campaign and 28.6% sought dental care only when they felt pain.

<table>
<thead>
<tr>
<th>AGE GROUP OF HIGHEST CONSUMPTION</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 – 40</td>
<td>18%</td>
</tr>
<tr>
<td>41 – 50</td>
<td>22.3%</td>
</tr>
<tr>
<td>51 – 60</td>
<td>22%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOCIOECONOMIC LEVEL</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>No income</td>
<td>2.7%</td>
</tr>
<tr>
<td>&lt; 2 minimum wages</td>
<td>68.6%</td>
</tr>
<tr>
<td>2 – 5 minimum wages</td>
<td>22.5%</td>
</tr>
<tr>
<td>5 – 10 minimum wages</td>
<td>4.6%</td>
</tr>
<tr>
<td>&gt; 10 minimum wages</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SKIN COLOR</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>68.1%</td>
</tr>
<tr>
<td>Black</td>
<td>4.6%</td>
</tr>
<tr>
<td>Brown</td>
<td>24.8%</td>
</tr>
<tr>
<td>Yellow</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EDUCATION</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>First degree</td>
<td>55.8%</td>
</tr>
<tr>
<td>High school</td>
<td>18.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EDUCATION</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third degree</td>
<td>6.8%</td>
</tr>
<tr>
<td>Others</td>
<td>2.2%</td>
</tr>
<tr>
<td>Illiterate</td>
<td>16.8%</td>
</tr>
</tbody>
</table>

Table 1: Percentages related to smoking divided according to each period of year

Table 2: Percentage of smoking relationship according to age group, socioeconomic level, skin color, education, dental care and participation in a prevention campaign
## 4 DISCUSSION

Studies demonstrate the significant contribution of alcohol and tobacco consumption to the development of head and neck cancers \(^4,^6\). According to estimates, these two substances are responsible for approximately 72% of cases in this category of cancer \(^6\). According to Jègu et al., in 2013, isolated alcohol consumption contributed to 4% of head and neck cancer cases, while 33% were due to the use of tobacco alone and 35% to the combined use of these two substances \(^6\). The interaction between tobacco and alcohol exacerbates the risk of several types of cancer, including the oral cavity, oropharynx, hypopharynx, larynx and esophagus \(^7\).

The literature demonstrates the effects of smoking on the pathogenesis of head and neck cancer, highlighting mainly tobacco constituents such as nitrosamines and polycyclic hydrocarbons, which act as carcinogens. These substances covalently bind to DNA, causing genetic changes that can activate oncogenesis and inactivate tumor suppressor genes, such as TP53 \(^1\). Although tobacco is a significant risk factor for squamous cell carcinoma, non-smoking patients who have some degree of oral epithelial dysplasia may have an even greater risk of progression to cancer when compared to smoking patients \(^8\).

According to Anantharaman et al., in 2011, demonstrated that there is a strong association between smokers and alcohol consumption. The authors also stated that there is an increase in the incidence of a subgroup of head and neck cancer, caused by HPV \(^7\). Although the campaigns in this study have been present for more than 30 years, the rate of smoking patients continues to increase, as well as the diagnosis of papillomatous lesions that corroborate the diagnosis of Human Papilloma Virus infection of subtypes 16 and 18 \(^2\). HPV infection has been reported as an emerging risk factor for head and neck squamous cell carcinoma \(^10\).

Smoking and alcohol consumption are recognized as the main risk factors for esophageal cancer. Epidemiological studies have shown that smoking is strongly associated with an increased risk of developing this malignancy \(^11,^12\).
Oral cancer prevention campaigns play a significant role in educating the population, informing them that harmful habits are harmful and can increase the incidence of cancer. Furthermore, the campaigns promote the importance of early diagnosis. Therefore, the dental surgeon plays a fundamental role in the primary detection of oral conditions, including potentially malignant lesions.

5 CONCLUSION

The 30-year study of the prevention campaign in Paraná not only highlights the historical and ongoing importance of these initiatives, but also contributes to the accumulation of evidence on the effectiveness of oral cancer prevention and anti-smoking actions. This information is essential to guide public health policies, promote behavioral changes and improve oral health outcomes in the population.
REFERENCES


