Continuing Education in Oral Cancer Prevention for Dentists in Spain


Abstract: Continuing education (CE) can have a large impact on dentists’ oral cancer attitudes, knowledge, and behavior. Reading scientific journals is a key component of CE. The objective of this study was to assess preventive and clinical attitudes of the participants in an educational intervention on oral cancer in Spain based on scientific journals. Members of the Spanish Board of Dentists and Stomatologists participated in an online, cross-sectional study, using an anonymous, self-administered questionnaire. There were 791 general dental practitioners (GDPs) invited to participate in the study. The large majority reported that they deliver tobacco-cessation counseling (93.6 percent) as well as advice on alcohol consumption (66.6 percent), but advice on vegetable intake was less frequently provided (42.4 percent). Alcohol intake advice, routine mucosa exploration, and biopsy performance on lesions suspicious of malignancy are preventive attitudes related to training. Compared with those who did not benefit from CE courses or did so only once, the GDPs who took four or more CE courses showed a doubling in the odds of giving alcohol advice to their patients and a tenfold increased odds of performing mucosa check on a routine basis; they were 3.5 times as likely to take biopsies of suspicious lesions. A longer experience as a GDP did not increase the probability of adopting preventive attitudes. In addition to presenting the results of this study, the article also discusses the general usefulness of other preventive measures in oral cancer.

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Oral and pharyngeal cancer is the sixth leading cancer in the world and ranks in the top three cancers in high incidence areas. Furthermore, with a worldwide incidence of 3.8 cases per 100,000 person-years and a mortality rate of 1.9 cases per 100,000 person-years, oral cancer accounts for 1.7 percent of all cancer deaths, according to 2010 data from the International Agency for Research on Cancer. This disorder was the seventh most prevalent malignancy in Europe in 2004. Survival remains unaffected despite recent therapeutic advances, mainly due to delay in the diagnosis. However, if this malignancy were diagnosed and treated at early stages, survival rates would probably exceed 80 percent.

Professional diagnostic delay is strongly related to tumor stage at the time of diagnosis. Determinants of professional diagnostic delay include lack of knowledge about oral cancer, lack of experience in the disease, absence of full clinical examination, and presence of comorbidity. Dentists play a critical role in the early diagnosis of oral cancer. Many authors have identified specific training in medical and dental students as a key means of reducing the incidence and mortality of oral cancer through effective cancer control strategies. These strategies include advice on reducing tobacco consumption, promotion of healthier diet and lifestyle, and, most importantly, early detection through screening examinations and adequate follow-up. It is then of paramount importance to develop appropriate initiatives to increase dentists’ knowledge and favor preventive attitudes both at the university and the professional level, using continuing education (CE) in the latter.

CE courses have a positive influence on oral cancer attitudes, knowledge, and behavior of the attendees, which are key needs for oral cancer control. Reading scientific journals is often a key
component of CE.\textsuperscript{19-22} In this regard, professional
dental organizations in the United States (the Ameri-
can Dental Association) and the United Kingdom
(the British Dental Association) have implemented
CE initiatives aimed at providing training on new
treatments, recent research advances, and business
practices, using their newsletters or journals. How-
ever, we are not aware of any oral cancer-related CE
effort using scientific journals aimed at general dental
practitioners (GDPs).

The Spanish Board of Dentists and Stomatolo-
gists (SBDE; COE in Spanish) recently carried out
a pilot experience in CE in oral cancer by means of
scientific journals. The objective of this study was
to assess preventive and clinical attitudes related to
oral cancer among GDPs.

\section*{Methods}

We carried out a cross-sectional study in
January and December 2009 among GDPs affili-
ated with the SBDE (affiliation is compulsory for
dental practice) who accessed an online CE program
based on the board’s journal (\textit{Revista del Consejo de
Odontólogos y Estomatólogos, RCOE}). This journal
is distributed to or freely accessed every trimester by
the 25,000 members of the board.

As a special collaboration with our study, the
\textit{RCOE} published in April 2009 a monograph on oral
cancer written by a panel of experts, which focused
on early detection of lesions suspicious of malign-
ancy.\textsuperscript{23} A customized platform was designed to host
an anonymous and confidential self-administered
questionnaire designed for our study, as well as an
online exam on the content of the monograph that had
to be submitted to the accreditation board in order to
pass the CE course.

The questionnaire was a modified version of
previous survey instruments.\textsuperscript{14,15} To ensure feasibility,
we carried out a pilot study among a small sample
of the participants. The questions were broadly
grouped into three sections: GDP profiling questions
(demographics and practice), questions on preventive
attitudes towards oral cancer, and specific questions
about clinical practice oriented towards early detec-
tion (systematic examination of the oral cavity and
biopsy of suspicious oral lesions). Ethical approval
was granted by the Bioethical Committee of the
University of Santiago de Compostela.

Statistical analysis was performed using SPSS+
11.0 statistical package (Chicago, IL, USA). To
determine which factors were related to preventive
attitudes, we used a multiple logistic regression ana-
lysis to obtain odds ratios (ORs) and their 95 percent
confidence intervals (95 percent CI). The outcome
was one of the following preventive attitudes: anti-
tobacco advice, alcohol advice, fruit intake advice,
routine mucosa check, or biopsy performance. The
exposure variables were those related to training,
such as the number of CE courses or the amount of
professional experience. The estimates were adjusted
by age, gender, and the rest of the exposure variables.
Hence, each of our OR estimates is free of potential
confounding due to personal variables or to other
variables related to training.

\section*{Results}

Our study population consisted of 791 GDPs
with a mean age of 35±9.6 years, most of whom
were females (61.7 percent) and more than one-
third of whom had ten years or more of practice.
About one-fourth of the participants acknowledged
that their only postgraduate training on oral cancer
was reading the issue of the newsletter used in this
study, while 36.3 percent had attended more than two
courses on oral malignancies. Table 1 summarizes the
distribution of key variables in the study population.

The large majority (93.6 percent) said they deliver
anti-tobacco advice to their patients, and two-thirds
reported advising their patients to reduce alcohol
intake. However, only 42.4 percent said they recom-
mend that their patients have an adequate intake of
fruit and vegetables. As for routine clinical attitude,
90.3 percent reported checking their patients’ oral
mucosa, but only 28.7 percent said they perform
biopsies on suspicious oral lesions.

From the multivariate analysis (Table 2), we
observed that no variable was significantly related
to anti-tobacco advice delivery. This means that ad-
vice was given independently of the background or
training of the GDPs. We also observed that recom-
recommendations on fruit intake were significantly more
frequent among older GDPs, but no other factor,
especially those referring to training, was related to
this preventive attitude.

Alcohol intake advice, routine mucosa explora-
tion, and biopsy performance on lesions suspicious
of malignancy are preventive attitudes related to
training factors. Compared to those who did not
benefit from CE courses or did so only once, the
GDPs who took four or more CE courses showed a
Our results found that CE courses are useful to increase GDPs’ preventive attitudes about oral cancer, especially those related to clinical practice (routine mucosa exploration and biopsy performance). Specific courses were found to be useful to increase biopsy-taking but do not seem to improve other preventive attitudes. The paradoxical association between a decrease in mucosal exam and biopsy-taking and an increase in years in practice could well be explained by the fact that less experienced GDPs (<10 years) have benefited from improved CE and have received undergraduate training entirely at dental schools. Similar findings have been reported from Italy, where the school of graduation (dental school vs. medical school) seems to influence these preventive practices.

Our study is limited by the fact that it is a cross-sectional study based on a convenience sample. In particular, the main disadvantage of this design is that it does not allow for proper causal inference as exposure and outcome are measured at the same time and temporality is not firmly established. However, this type of study has proved useful for health services management to improve clinical practice and to identify educational problems. There is a potential for selection bias in our data due the absence of randomization of the participants. However, the population of our study is representative of the Spanish general population of GDPs as far as age, years of professional experience, geographic distribution, and doubling in the odds of giving alcohol advice to their patients and a tenfold increased odds of performing mucosa checks on a routine basis. They were 3.5 times as likely to take biopsies of suspicious lesions and twice as likely to give alcohol advice to their patients. Also, those who had taken two or three CE courses doubled their odds of performing mucosa checks. Having taken specific oral cancer courses increased by 50 percent the likelihood of performing biopsies when indicated. Finally, a longer experience as a GDP (measured by years of practice in the field) did not seem to increase the probability of adopting preventive attitudes. On the contrary, experienced doctors were less likely to take biopsies. However, older GDPs were found to perform more biopsies on suspicious lesions.

### Discussion

Whereas continuing education is compulsory for dentists in the United States, this requirement is not uniform in the European countries, where, in general, it is considered a moral duty for each dentist. Such countries as Austria, Cyprus, Estonia, Finland, The Netherlands, Norway, Sweden, and Spain maintain a voluntary scheme for their CE system. Therefore, the results of our study cannot be compared directly with those countries where CE is mandatory for dentists.

<table>
<thead>
<tr>
<th>Table 1. Distribution of covariables by preventive attitudes among dentists in study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-tobacco advice</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
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<tr>
<td>Advice on alcohol consumption</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Advice on fruit intake</td>
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<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Routine mucosa exploration</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Biopsy</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

Our results found that CE courses are useful to increase GDPs’ preventive attitudes about oral cancer, especially those related to clinical practice (routine mucosa exploration and biopsy performance). Specific courses were found to be useful to increase biopsy-taking but do not seem to improve other preventive attitudes. The paradoxical association between a decrease in mucosal exam and biopsy-taking and an increase in years in practice could well be explained by the fact that less experienced GDPs (<10 years) have benefited from improved CE and have received undergraduate training entirely at dental schools. Similar findings have been reported from Italy, where the school of graduation (dental school vs. medical school) seems to influence these preventive practices.
Table 2. Odds ratios (OR) and 95 percent confidence intervals (95% CI) of dentists’ preventive attitudes according to continuing education variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Anti-Tobacco Advice</th>
<th>Alcohol Advice</th>
<th>Fruit Intake Advice</th>
<th>Mucosa Exploration</th>
<th>Biopsy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
</tr>
<tr>
<td>Total number of courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–1</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
</tr>
<tr>
<td>2–3</td>
<td>1.96</td>
<td>0.84–4.58</td>
<td>1.11</td>
<td>0.73–1.70</td>
<td>0.96</td>
</tr>
<tr>
<td>≥4</td>
<td>2.18</td>
<td>0.76–6.22</td>
<td>1.95</td>
<td>1.12–3.40</td>
<td>1.37</td>
</tr>
<tr>
<td>Specific oral cancer course</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
</tr>
<tr>
<td>Yes</td>
<td>1.05</td>
<td>0.50–2.19</td>
<td>1.00</td>
<td>0.70–1.43</td>
<td>1.33</td>
</tr>
<tr>
<td>Years of practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–3</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
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<tr>
<td>4–7</td>
<td>0.59</td>
<td>0.11–3.17</td>
<td>1.50</td>
<td>0.75–3.03</td>
<td>1.10</td>
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<tr>
<td>8–15</td>
<td>0.22</td>
<td>0.03–1.68</td>
<td>0.84</td>
<td>0.35–2.02</td>
<td>0.57</td>
</tr>
<tr>
<td>≥16</td>
<td>0.70</td>
<td>0.07–7.45</td>
<td>1.33</td>
<td>0.44–4.05</td>
<td>0.83</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;28</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
</tr>
<tr>
<td>28–32</td>
<td>1.90</td>
<td>0.33–10.93</td>
<td>0.86</td>
<td>0.42–1.76</td>
<td>1.54</td>
</tr>
<tr>
<td>33–41</td>
<td>1.74</td>
<td>0.24–12.69</td>
<td>1.93</td>
<td>0.79–4.74</td>
<td>4.60</td>
</tr>
<tr>
<td>≥42</td>
<td>1.01</td>
<td>0.11–9.59</td>
<td>1.26</td>
<td>0.41–3.88</td>
<td>3.58</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
<td>Reference</td>
<td>1.00</td>
</tr>
<tr>
<td>Female</td>
<td>1.78</td>
<td>0.83–3.83</td>
<td>0.98</td>
<td>0.67–1.44</td>
<td>1.11</td>
</tr>
</tbody>
</table>

Note: Data in all columns adjusted for gender, age, and years of practice.
preventive attitudes about oral cancer.\textsuperscript{15} Confounding by other variables cannot explain our results. We have adjusted our results by those factors that may be related to the outcome and the main exposure (preventive attitudes and training). The relative risk estimates are robust to this adjustment. However, as in any observational study, we cannot rule out the presence of residual confounding due to unknown or unmeasured variables.\textsuperscript{25-28}

Prevention offers the most cost-effective strategy for cancer control.\textsuperscript{29,30} Despite the fact that advice on smoking cessation, alcohol intake moderation, and healthy eating is an essential and ethical part of the dentist’s role, gaps in knowledge have been described previously.\textsuperscript{31} Regarding smoking, previous studies found a significant reduction in the risk of oral cancer among quitters, which approximates that of never smokers approximately ten years after cessation.\textsuperscript{32} Our study found that a high proportion of the GDPs reported using their position to advise patients on tobacco cessation. A similar proportion has been reported in the United Kingdom.\textsuperscript{33} Alcohol consumption is considered excessive when it exceeds an average of one (for females) or two (for males) drinks per day.\textsuperscript{34} Recommendations to reduce alcohol intake have the potential to reduce the incidence of oral cancer and oral premalignant lesions in non-smokers and smokers alike. However, only two-thirds of our population advised their patients on alcohol consumption. Contrary to earlier impressions, it has been found that patients do accept alcohol screening and alcohol counseling by the dentist.\textsuperscript{35} Finally, regardless of the existence of studies that support the beneficial effects of high intake of vegetables and fruits on the risk of developing cancers of the oral cavity and on reducing recurrences and mortality (overall and specific),\textsuperscript{36} the lower consumption of fruits and vegetables is a less-known risk factor for oral cancer both in Europe and the United States.\textsuperscript{9,16}

Our study’s findings agree: only 42.4 percent of the participants said they received information on oral cancer, for the first time since graduation, through reading activities. It is therefore important to promote strategies to increase reading activities.

Early diagnosis of oral cancer is critically essential and may have a dramatic impact on survival rates and cure.\textsuperscript{15} The standard diagnosis relies on detection during visual examination followed by tissue biopsy for histopathological diagnosis.\textsuperscript{37} However, other techniques may prove useful as complementary tools such as light-based detection systems, specific blood tests (CEA, SCCAA, IAP, CYFRA, ANXA1, and others), specific saliva tests, and imaging.\textsuperscript{37} Opportunistic screening (offering patients a screening test when they attend a clinic for some other unrelated reason) may be cost-effective particularly in general dental practice.\textsuperscript{38} However, including high-risk groups in this screening is not feasible as these groups do not visit a dental practice on a regular basis.\textsuperscript{39} Selective opportunistic high-risk screening may be a more realistic and effective solution for areas with low incidence of oral cancer.\textsuperscript{40}

When dealing with smokers or excessive alcohol consumers, it is advisable for the clinician to remain alert for signs of potentially malignant lesions or early-stage cancer during visual and tactile exploration of all patients.\textsuperscript{41} A large majority of respondents (90.3 percent) in our study said they perform a systematic exploration of oral soft tissues to rule out oral cancer. This proportion is close to that found in previous studies in Europe and the United States (83 to 86 percent).\textsuperscript{42,43} The proportion of GDPs who perform biopsy tests is low, however, in spite of existing recommendations.\textsuperscript{44} The number of primary care dentists who offer oral biopsies, either on a routine or on a selective basis, has been found to be low in some countries (e.g., 12 percent in Northern Ireland\textsuperscript{45} and 21 percent in the United Kingdom\textsuperscript{41}), probably due to the lack of specific training. However, recent reports have found that this proportion is increasing.\textsuperscript{15,18} The fact that, in our study, men were found to perform biopsies more frequently than women is consistent with the findings in an earlier study.\textsuperscript{46}

Our study found that the GDPs taking CE oral cancer courses had positive preventive attitudes in oral cancer, especially about delivering counseling on alcohol consumption and performing routine exploration of the oral mucosa and biopsy. Reading
scientific journals is the cornerstone of CE, so oral cancer prevention and detection should be periodically included in dental newsletters and journals.

REFERENCES


