RESEARCH ARTICLE

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Public Awareness on Oral Cancer: A Population- Based Study in Asturias

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Abstract

Objective: Through awareness campaigns, we can change the patient's abilities to detect oral cancer at an early stage and their ability to seek help. To focus these campaigns, we need to know the level of knowledge of the population and its interest in learning about this disease. The aim of this study was to assess the level of oral cancer awareness in Asturias and the interest of the population in learning about this pathology. **Methods:** A representative community-based survey was carried out online using Google Forms®. Responses were transferred to a Microsoft Excel and analysed using the R-program. The relationship between two qualitative variables was studied using Pearson's Chi-square test or Fisher's test. Univariate and multivariate logistic regression models were used to determine which factors are associated with knowledge of oral cancer. **Result:** We found that those having over 50 years and being health professionals are more likely to know about the existence of oral cancer. Almost 85.1% of participants mentioned tobacco as a risk factor, only 39.8% identified alcohol. The ulcer was the most frequently recognized alarm sign (70.6%). The primary care physician was chosen as the first option for consultation by the 56.5% of the sample. Only 12.4% of the participants reported knowing how to self-examine their mouth. The number of views of a video of how-to self-inspection oral cavity displayed at the end of the questionnaire increased in a 39.38% during our study period. **Conclusion:** This survey showed a worrying lack of awareness and knowledge about oral cancer among the population of Asturias, especially among those under 50 years old. The interest shown in increasing their knowledge, give us hope in the success of future awareness campaigns.

Keywords: Mouth neoplasms- early diagnosis- surveys and questionnaires- prevention and control

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Introduction

The most recent oral cancer incidence and mortality data noted 65,279 new cases and 24,575 deaths in Europe in 2020, ranking 18th and 20th of all cancers respectively (Sung et al., 2021).

Late diagnosis of oral cancer is probably the main reason the prognosis, regarding mortality rate, has not substantially improved in the last 50 years, despite advances in treatment. A longer time interval from first symptom to patient referral for definitive diagnosis has been found to be a significant risk factor for advanced stage and mortality. This interval can be longer because of patient delay or professional delay; the first one is the period between the patient noticing a symptom and their first consultation and it is influenced by early recognition of the signs and symptoms (Seoane et al., 2016).

Awareness of oral cancer and its risks factors of the general population has been revealed in several studies, from 11% (Rogers et al.,2011) to 59.60% (Nocini et al.,2019), but the intention of the interviewed population on improving its knowledge has not been evaluated yet.

Through awareness campaigns, we can change the patient's abilities to detect the disease at an early stage and their ability to seek help. To focus these campaigns, we need to know the level of knowledge of the population and especially its interest in learning about this disease. The aim of this study was to assess the level of oral cancer awareness and knowledge in Asturias and the interest of the population in learning about this malign pathology.

Materials and Methods

Study Design

This was a community-based survey that enrolled participants from a random sample of volunteers in Asturias (Spain). No incentive was given for participation and respondents were required to give their consent.

The survey was created on Google Forms® based on questionnaires of previous works (Rogers et al., 2011; Nocini et al., 2020; Varela-Centelles et al., 2021; Monteiro et al., 2012). It was anonymous, electronically answered, required 5 minutes to be completed, was in Spanish, and included 13 questions (4 demographic

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questions, 8 questions about oral cancer knowledge and 1 about the interest in learning about self-exploration) (Supplementary data file) A video of how to self-explore the oral cavity was displayed at the end of the questionnaire as an educational tool (https://www.youtube.com/watch?v=auFgb-6RjWE&t=4s, source: Consejo de Dentistas de España)

Participants and Setting

The sample size was determined for a population of 876,247 inhabitants as 666 with a 99% confidence interval (CI) and a 5% margin of error. Adults aged 18 and above living in Asturias were included.

An anonymous web-based questionary was diffused by URL sharing through different social networks: WhatsApp, Facebook, Instagram, Email, Twitter, and LinkedIn.

Statistical Analysis

Responses were transferred to Microsoft Excel (Microsoft Corporation, Redmond, WA, USA, version 2206), being subsequently analysed. Statistical analyses were performed using the R program (R Development Core Team), version 4.1.3 (R Core) and the level of significance level was set at 0.05.

Results

A total of 676 volunteers were enrolled in the study (median age 38.36, range: 18-83). Demographic characteristics are presented in Table 1. Results of the statistical analysis can be found in the supplementary data file.

Knowledge About Oral Cancer Existence and its Incidence in Spain

When asked to name all the cancers they know up to ten, the average name of responses was 8.59 (0-16). Breast, lung and colorectal were the cancers more mentioned within the responses (Table 2). Only 4.3% mentioned oral cancer in first place, 9.6% stated it within their first three responses and 24.8% mentioned it in other position. When mentioning oral cancer, 48.5% of the respondents specifically referred to tongue cancer. Head and neck cancer, including throat or thyroid cancer was mentioned by a remarkably high percentage of the population.

The second question asked specifically the knowledge about this neoplasm: "Were you aware of the existence of oral or mouth cancer?" About 82.25% of the sample reported awareness of oral cancer when it was mentioned in the question. Participants were also asked about the number of cases reported in Spain every year. A 52.5% of the participants believe that less than 2,500 cases are diagnosed every year. 28.7% chose between 2,500 and 5,000 cases and more than 5,000 was answered by a 18.8% of the study population.

Oral Cancer Risk Factors

Participants were also asked about risk factors, the average risk factors mentioned was 2.76 (0-7). Almost 85.1% participants mentioned tobacco, 67.8% as their first answer and 5.8% as the only risk factor that they knew. Only 39.8% identified alcohol. Hygiene was identified by 35.2% of the respondents, followed by diet (25.9%), genetics (24.9%) and sexual transmission related factors (13.5%).

Oral Cancer Lesions Recognition and its Management

Regarding recognition of warning signs, the ulcer was the most frequently chosen alarm sign (70.6%), followed by a lump (66.3%), and burning sensation (47.2%). White spot was chosen by 46% and red spot by the 35.2%. Respondents who associate oral cancer and burning mouth syndrome are younger than those who do not find this symptom associated with this pathology.

86.4% of the study population would wait 2 weeks to consult about a non-healing ulcer on the tongue. A 11.5% would wait 2 months and only a 2.1%, 4 months. Interval before consulting was found to be statistically different between health professionals and the rest of the population.

As the professional reference figure for consultation, 56.5% have chosen primary care physician while the dentist was chosen by the 30.8% of the sample. A significative association was found between the election

Table 1. Demographic Data of the Population and Factors Influencing Oral Cancer Awareness

		N (%)	OR (CI, p valor)
Gender	F	481 (71.2%)	0.93 (0.59-1.45, p=0.749)
	M	191 (28.3%)	
	Prefer not to say	4 (0.6%)	
Age	> 50 years	163 (24.1%)	5.12 (2.70-10.43, p<0.001)
	30 – 50 years	237 (35.1%)	1.26 (0.81-1.98, p=0.308)
	18 – 30 years	276 (40.8%)	
Place of residence	> 50,000 inhabitants	346 (51.2%)	0.94 (0.62-1.44, p=0.789)
	< 50,000 inhabitants	330 (48.8%)	
Occupation	Health professionals	163 (24.11%)	15.74 (6.35-52.51, p<0.001)
	Non dental related	106 (15.7%)	
	Dental related	57 (8.4%)	
	Non-health professionals	513 (75.9%)	

OR, Odds Ratio; CI, Confidence interval.

Table 2. Cancers Mentioned as First Response, among the First Three Responses and among the Ten Responses.

Cancer mentioned	Mentioned as first response	Mentioned in first 3 responses	Mentioned among all the responses
Breast	219 (32.4%)	367 (54.3%)	560 (82.8%)
Lung	77 (11.4%)	274 (40.5%)	540 (79.9%)
Colorectal	111 (16.4%)	285 (42.2%)	483 (71.4%)
Head and neck*	39 (5.8%)	123 (18.2%)	475 (70.2%)
Pancreas	40 (5.9%)	199 (29.4%)	455 (67.3%)
Skin	31 (4.6%)	97 (14.3%)	415 (61.4%)
Prostate	24 (3.6%)	115 (17.0%)	357 (52.8%)
Leukaemia	33 (4.9%)	80 (11.8%)	341 (50.4%)
Bone	10 (1.5%)	42 (6.2%)	274 (40.5%)
Liver	2 (0.3%)	47 (7.0%)	271 (40.1%)
Uterus	3 (0.4%)	60 (8.9%)	246 (36.4%)
Oral cancer**	29 (4.3%)	65 (9.7%)	233 (34.5%)
Lymphatic	19 (2.8%)	59 (8.7%)	244 (36.1%)
Stomach	6 (0.9 %)	26 (3.8%)	176 (26.0%)
Ovary	2 (0.3%)	39 (5.8%)	164 (24.3%)

*, Any mention of mouth, tongue, gingival, oral, head and neck, throat, or thyroid cancer; **, Any mention of mouth, tongue, gingival, or oral cancer.

of a professional for consultation and gender, age, place of residence and occupation. Hospital emergencies was selected mostly by people under 30 years old. Self-Inspection Knowledge and Willingness to Learn.

Only 12.4% of the participants reported knowing how to self-examine their mouth for signs of oral cancer. Among the other 87.6%, a high percentage wanted to learn (96.3%). Apart from the answer to the final question, we could also evaluate through YouTube analytics the interest of the population in improving its knowledge in this field. The total views of the video during a period of 4 months before the diffusion of the survey was 1,224 with 23.3 hours of watch time. The total views during the 4-month period of our study increased to 1,706 views with 30.8 hours of watch time.

Additionally, a multivariate logistic regression model was performed to find out who is more likely to know about the existence of oral cancer. We found that having over 50 years and being a health professional increases that possibility (Table 1).

Discussion

This cross-sectional study aimed to assess the level of oral cancer awareness and knowledge in Asturias and the interest of the population in learning about this pathology. The present work revealed a lack of awareness of oral cancer among the population of Asturias. However, this population showed interest in increasing their knowledge about this disease.

In Spain, almost 43 million out of 47 million people are internet users. The top social media platforms, in terms of daily usage, are WhatsApp (89.5%), followed by YouTube (89.3%), Facebook (79.2%), and Instagram (69%) (ThinkSpain, 2021). We decided to use these social networks, along with others, to reach a representative sample of the population of Asturias. Compared with a previous web-based survey study (Nocini et al., 2020) and despite of being targeted at a smaller population, we got a considerable number of answers. Moreover, the predominance of females is in accordance with previous studies but could lead to bias (Nocini et al., 2020; Monteiro et al., 2012).

Oral cancer was mentioned in the first place by the 4.3% of the study population and in the first three positions by the 9.7%. These results are more encouraging that the ones found by Varela-Centelles et al., (2021) (3% and 8.2% respectively) and by Rogers et al., (2011) (1% and 4% respectively). As occurred in previous studies, we found a stark difference between prompted and unprompted oral cancer mention (Varela-Centelles et al., 2021), being aware when it is mentioned the 82.25% of the respondents. When mentioning oral cancer, 48.5% of the respondents allude to tongue cancer, this percentage couldbe justified by the fact thay the 45.42% of the deaths for oral cavity cancer in Spain between 1980 and 2019 were tongue cancers (Infante-Cossio et al., 2022). Regarding top-3 mentioned cancer, we get the same results as Varela et al., (2021).

Adults over 50 years are more likely to know about the existence of oral cancer. Historically, it has been seen that the risk of having oral cancer increases with age and most cases occur in people aged 50 or over, but its incidence in young adults may be growing worldwide, so we should focus our awareness campaigns to also reach this part of the population (Hussein et al., 2017).

Our results are in line with previous studies identifying ulcer as the most frequent oral cancer lesion (Nocini et al., 2020; Varela-Centelles et al., 2021; West et al., 2006; Monteiro et al., 2012) but it is curious to note that burning sensation has been reported by a 47.2% despite of being a symptom usually linked to burning mouth syndrome (International Classification of Orofacial Pain, 2020). Considering, that the period between the patient noticing a

symptom and their first consultation is the most significant contributor to total delay, patients should be instructed in identifying potential lesions (Gigliotti et al., 2019). Concerning this interval of time, 86.4% of the respondents would wait 2 weeks to consult about a non-healing tongue ulcer, a similar percentage to that found by Nocini et al., (2020) in Italy (84.95%).

It is a worrying fact that about half of our respondents believed that less than 2,500 cases are diagnosed every year in Spain when the real data is almost twice this amount (Fan et al., 2022). Regarding risk factors, top-3 were tobacco, alcohol, and hygiene in the same order than in previous studies (Rogers et al., 2011; Nocini et al., 2020; Varela-Centelles et al., 2021). Tobacco and alcohol have a well-known role in the aetiology of oral cancer (Conway et al., 2018). Smoking was identified by most of the respondents, but alcohol was mentioned by only 39.8%. This finding aligns with those discovered among a group of medical and dental students, where, despite a higher percentage acknowledging alcohol as a risk factor (43% and 57.6% respectively), it is evident that there is insufficient awareness in this aspect among both healthcare professionals and the general population (Saleen et al., 2021).

Although dentist play a crucial role in early detection, we found that in case of having a non-healing ulcer on the tongue, the participants would consult the doctor (56.5%) before than the dentist (30.8%). Nocini et al. (2020) found that 48.92% would consult their doctor and 40.19%, their dentist and Rogers et al., (2011) found a 61% and 30% respectively. Nocini et al., (2020) reported a 11% of the population knowing how to perform a self-inspection, almost a half of this fraction of the population were professionals of the medical or dental field, these data are very close to our findings, 12.4% knew how to do it and more than a half were also health professionals.

The scarce knowledge of patients is one of the main causes of diagnostic delay and wide dissemination of information on oral cancer is needed (Lima et al., 2021). We find a high percentage among those who do not know how to self-inspect their oral cavity that wanted to learn. We also see an increasing of 39.38% of the views and 32.19% of watch time of the educational video. Other variables could have influenced, but surely our diffusion is responsible for a part of this increase. These findings, along with those of Somathunga et al., (2021) who determined that attending patients to the Peradeniya Dental Hospital did not have a satisfactory level of awareness about oral cancer, can provide valuable data for predicting the interest that future awareness campaigns may generate.

Our study has some limitations. The collected data were anonymous, this could allow some participants answer more than once to the questionnaire and lead to bias. Despite this, it can help to get more spontaneous answers. This survey showed a worrying lack of awareness and knowledge about oral cancer among the population of Asturias, especially among those over 50 years old. Despite this fact, the interest shown in increasing their knowledge, give us hope in the success of future awareness campaigns.

Author Contribution Statement

María García-Pola and Carlota Suárez-Fernandez contributed to the study conception and design. Material preparation, data collection and analysis were performed by Carlota Suárez-Fernández, Carlos Barrientos, and María García-Pola. The first draft of the manuscript was written by Carlota Suárez-Fernández, and all authors commented on subsequent versions of the manuscript. All authors read and approved the final manuscript.

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This study is part of a doctoral thesis at the University of Oviedo.

Ethical statement

This investigation was approved by the Ethics Committee for Research with Medicines of the Principality of Asturias. (CEImPA2022.364). This cross-sectional study was conducted according to the guidelines of the Declaration of Helsinki.

Availability of data

The data that support the findings of this study are available from the corresponding author on reasonable request.

Conflict of interest

The authors have no relevant financial or non-financial interests to disclose.

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