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Oral cancer – knowledge and perception of the population in the screening program during world oral, head and neck cancer awareness week

Oralni karcinom – znanje i percepcija populacije u probirnom programu tijekom Svjetskog tjedna svjesnosti o karcinomu glave i vrata

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Abstract. Aim: Oral cancer (OC) is characterized by a high mortality rate because most cases are diagnosed at an advanced stage. The purpose of this study was to assess population knowledge at screening for OC, risk factors, prevention, and early detection, and to determine whether factors such as level of education and gender affect knowledge of the respondents. **Material and Methods:** The study was conducted at the School of Dental Medicine University of Zagreb and the Faculty of Dental Medicine University of Rijeka using the attached questionnaire. Participants were patients who arrived for free screening examinations during World Oral, Head and Neck Cancer Awareness Week from 22–28 April 2017, and answered survey questions on their knowledge of OC. **Results:** One hundred and eighty-five participants attended the screening event. Some participants did not answer certain questions, so the statistics with each question were made only for those respondents who answered that question. Screening event has included 99 (57.9%) females and 72 (42.1%) males (14 participants did not answer). The median age of participants was 67 years. The majority of participants (115; 80.4%) had heard about OC, but had not heard about nor previously attended OC screening examination (71 or 51.1% of females and 123 or 86.6% of males). No significant difference between genders and between participants with different levels of education was observed. The majority of participants (111; 79.3%) knew that smoking was a risk factor for OC, and believed that their risk of getting OC was similar to other people in their age group and gender. **Conclusions:** Our results show that most participants have heard about OC, but have not heard about nor previously attend OC screenings. Future programs should be directed more to the high-risk population in order to achieve early detection and treatment of OC.

Key words: diagnostic screening programs; knowledge; secondary prevention; squamous cell carcinoma of head and neck

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Sažetak. Cilj: Oralni karcinom obilježen je visokom stopom smrtnosti jer je većina slučajeva dijagnosticirana u uznapredovanom stadiju. Svrha ove studije bila je procijeniti znanje populacije prilikom probirnog programa o oralnom karcinomu, čimbenicima rizika, prevenciji i ranom otkrivanju te utvrditi utječu li čimbenici kao što su razina obrazovanja i spol na znanje ispitanika. **Materijali i metode:** Istraživanje je provedeno na Stomatološkom fakultetu Sveučilišta u Zagrebu i Fakultetu dentalne medicine Sveučilišta u Rijeci primjenom upitnika. Ispitanici su bili pacijenti koji su došli na probirni pregled tijekom Svjetskog dana svjesnosti o karcinomu glave i vrata od 22. do 28. travnja 2017. Ispitanici su odgovarali na pitanja o oralnom karcinomu. **Rezultati:** U istraživanju je sudjelovao sto osamdeset i pet sudionika. Pojedini sudionici nisu odgovorili na određena pitanja te je statistika za svako

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pojedino pitanje rađena samo za one ispitanike koji su odgovorili na pojedino pitanje. Sudjelovalo je 99 žena (57,9 %) i 72 muškarca (42,1 %), a 14 sudionika nije odgovorilo. Srednja dob sudionika bila je 67 godina. Većina sudionika (115; 80,4 %) čula je za oralni karcinom, ali nisu čuli za program probira raka usne šupljine niti su ikada sudjelovali u njemu (71; 51,1 % i 123; 86,6 %). Nije bilo značajne razlike između muškaraca i žena i između sudionika s različitim stupnjem obrazovanja. Većina ispitanika (111; 79,3 %) znala je da je pušenje čimbenik rizika za nastanak oralnog karcinoma. Većina sudionika procijenila je svoj rizik obolijevanja od oralnog karcinoma sličnim drugim osobama njihove dobi i spola. **Zaključci:** Naši su rezultati pokazali da je većina sudionika čula za oralni karcinom, ali nisu čuli za program probira za oralni karcinom niti su u njemu sudjelovali. Budući programi trebali bi biti usmjereni više na populaciju visokog rizika za oralni karcinom kako bi se postiglo rano otkrivanje i liječenje bolesti.

Ključne riječi: oralni planocelularni karcinom; prevencija bolesti; probir; znanje

INTRODUCTION

Oral cancer (OC) is the sixth most common malignant tumor in humans and generally the most frequent tumor in the head and neck¹. The most common type of OC is squamous cell carcinoma. Generally, OC most often affects men over the age of 40 who consume cigarettes and alcohol², although recently there has been a higher incidence of the disease in women due to changes in their individual behaviour^{3,4}. According to the American Cancer Society, most recent estimates indicate that about 54.000 new cases of OC occurred in the United States in 2021, resulting in more than 10.000 deaths⁵. In the UK, there were more than 12.000 new cases (on average) in the period 2016 – 2018⁶. According to data from the Croatian Institute of Public Health for the year 2018, about 500 new cases of OC were recorded⁷ with 377 deaths, of which 299 were men⁸. The most significant risk factors are cigarette smoking, alcohol consumption and the greatest is their synergistic effect⁹. Constant exposure to strong sunlight is a risk for developing lip cancer³.

OC is characterized by a high mortality rate given that most cases are diagnosed at an already advanced stage¹⁰. It is mainly an asymptomatic disease, and symptoms occur in the late stage which is the main reason for late diagnosis. Early diagnosis and treatment remain the key to improving

survival rates among patients¹¹. Patients with cancer diagnosed at the initial stage have a five-year survival rate of 80%, whereas patients diagnosed with OC at the stage when regional lymph nodes are affected have a five-year survival rate of 40%⁵. Time from the onset of the first symptoms to the patient undergoing the initial examination is called the first lost time. Rogers et al. and Hollows et al., each in their own studies, examined the reasons for late visits to doctors and found that half of the patients thought the ail-

Oral cancer is one of the ten most common malignant tumors in humans and in general the most frequent tumor of head and neck mostly affecting men over age of 40 who consume cigarettes and alcohol.

ments would eventually disappear. One third of the patients (36%) started eating only soft foods before consulting a doctor, and only a small proportion of them (13%) thought their ailment was a serious illness. Most OC patients have a lower socioeconomic status, consume alcohol, have poor oral hygiene and lack the habit of visiting a dentist and doctor regularly^{12,13}. Another major reason for visiting a doctor too late is that the general population is poorly informed about OC. According to data in the literature, 30-50% of the population has never heard about OC. Unlike, for example, lung, breast, cervical, colon or prostate cancers, which the media regularly address, OC is not covered by the media. The general population is unaware of the risks and generally does not know the approach to prevention and early detection^{14,15}. It is extremely important that, in addition to dentists, the people are well informed and educated, which will motivate them to seek more frequent examinations of the oral cavity, and thus earlier detection of cancer. In 2004, Boundouki et al. demonstrated that sharing leaflets containing information on OC greatly increased the level of knowledge about the disease, reduced fear and anxiety of screening, and contributing to regular checkups compared to the control group which had not received the relevant information¹⁶. Early detection increases the chance of survival, ensures faster and easier

recovery of patients, reduces the number of mutilating operations, exerts less psychological pressure on patients and, of course, lowers treatment costs. The oral cavity can undergo a quick, painless, non-invasive and inexpensive examination and, if necessary, quick biopsy to confirm the respective diagnosis. More frequent screening of OC, with the possibility of raising public awareness of risks, factors and symptoms of this disease, can improve these statistics. Screening programs should achieve high participation rates for effective

Awareness about oral cancer among population is important in order to encourage regular visits to dentist.

tive and efficient testing, diagnosis, and treatment¹⁷. According to a meta-analysis by Speight et al., OC screening, in order to become a nationally organized program, needs solid evidence of effectiveness in reducing mortality or morbidity along with information indicating that its protocol is ethically and socially acceptable to health professionals and the public. The benefits of screening should outweigh psychological and physical harm caused by the actual procedure. A comprehensive program management and monitoring plan should exist, along with facilities run by adequately trained physicians¹⁸. Screening should also be cost effective in treating the underlying disease.

The purpose of this study was to assess population knowledge of OC, risk factors, prevention and early detection during screening, and to determine whether factors such as the level of education and gender affect knowledge. Furthermore, our aim was to assess the extent to which the profile of people attending screening events changes over time.

PATIENTS AND METHODS

The study was approved by the Ethics Committee of School of Dental Medicine University of Zagreb. It was conducted at School of Dental Medicine University of Zagreb and the Faculty of Dental Medicine University of Rijeka using the attached questionnaire. Respondents were patients who arrived for free screening examinations during World Oral, Head and Neck Can-

cer Awareness Week in the period 22- 28 April 2017. The purpose of the research was explained to all respondents who voluntarily agreed to participate in the research, as evident in the signed informed consents. The survey questionnaire was completely anonymous and did not allow entry of personal data of respondents such as name, surname, date of birth and residential address. The questionnaire consisted of 4 parts:

- First part: general and social parameters of the respondents (age, gender, completed education, employment status).
- Second part: respondents stated their habits with regard to smoking cigarettes and drinking alcohol (5 questions about smoking, i.e., do they smoke, if YES, how many cigarettes a day and how long have they been smoking, have they ever tried to quit smoking and are they considering quitting; and 6 questions about alcohol, i.e., have they consumed alcohol, how many times a week, did they think about drinking less, have other people criticized them for consuming alcohol, or did they ever feel guilty about drinking alcohol and did they ever have to drink in the morning to calmed or alleviated a hangover). One unit of alcohol consumption is equivalent to 3 dcl of beer, 1 dcl of wine, 0.03 dcl of spirits.
- Third part: awareness of OC among respondents (13 questions about their awareness of OC, its causes, frequency and mortality, and a personal assessment of a respondent's chances of developing OC in the future).
- Fourth part: completed only by respondents who declared themselves smokers, and included two questions related to assessing the risk of developing OC in the future compared to non-smokers and smokers of their age and gender.

The attitudes and awareness of respondents were measured on the Likert scale, which expressed the degree of information and knowledge about a particular statement (1-significantly lower than others to 5-significantly higher than others) or YES, NO, I DON'T KNOW the answers. Questions related to smoking and drinking habits required a YES or NO answer.

We also compared data from the OC screening event in 2012. The data from 2012 were not published but instead used for internal analysis.

Statistics

Data were organized into files (Microsoft Excel, Microsoft Inc. USA) and statistically processed using SPSS (IBM Inc, USA). Some participants did not answer certain questions, so the statistics with each question were made only for those respondents who answered certain question. Distribution normality was assessed using the Kolmogorov-Smirnov test. Non-parametrical tests were used due to the non-normal distribution. Nominal variables were presented as proportions and ordinal variables as the median (range). The difference between categorical variables was assessed using the chi-square test and differences between ordinal variables were assessed using the Mann-Whitney or Kruskal-Wallis test. Values of $p < 0.05$ were considered statistically significant.

RESULTS

In all, one hundred and eighty-five participants (99; 57.9% females and 72; 42.1% males; 14 participants did not answer) attended the screening event. The median age of the participants was 67 years (27–90) for females and 68 (28–86) for

males. The demographic characteristics of the participants are given in Table 1.

No significant difference in age was found between males and females ($p=0.597$, Mann-Whitney test). A significant difference between males and females was found in education ($p=0.007$, chi-square test). Women have lower levels of education than men.

Smoking and alcohol drinking patterns and differences between sexes are shown in Table 2 and between education levels in Table 3. No significant differences in the proportion of smokers and non-smokers were found between males and females, or among different education groups. However, participants with higher education were significantly more prone to contemplating quitting ($p=0.044$, chi-square test) and significantly more tried to quit ($p=0.008$, chi-square test).

Males more significantly reported drinking alcohol than females (<0.001 , chi-square test). Furthermore, participants with a higher education drank significantly more compared to participants with a lower education ($p=0.008$, chi-square test). Among the participants who drank alcohol, there were no significant differences in the number of drinks per week between males and females and between different education groups. Males were significantly more prone to

Table 1. Demographic characteristics of the participants

	Total	Females	Males	Differences among the sexes (p)	Differences in education (p)
Sex N (%) (14 missing)	171 (100)	99 (57.9)	72 (42.1)		0.007*
Age (median; min-max)	67 (27-90)	67 (27-90)	68 (28-86)	0.597**	0.333***
Education N (%) (18 missing)					
Elementary school	8 (4.8)	8 (8.4)	0	0.007*	
High school	76 (45.5)	49 (51.6)	27 (37.5)		
College degree	32 (19.2)	14 (14.7)	18 (25)		
University degree	51 (30.5)	24 (25.3)	27 (37.5)		
Employment N (%) (18 missing)					
Retired	119 (71.3)	49 (69)	70 (72.9)	0.668*	0.055*
Employed	33 (19.8)	14 (19.7)	19 (19.8)		
Unemployed	15 (8.9)	8 (11.3)	7 (7.3)		

*chi-square test; **Mann-Whitney test; ***Kruskal Wallis test

Table 2. Smoking and alcohol drinking patterns – differences between sexes

	Total	Females	Males	Sex differences (p)*
Smoking N (%) (15 missing)				
Yes	31 (18.2)	18 (18.2)	13 (18.3)	0.858
No	104 (61.2)	62 (62.6)	42 (59.2)	
Former smoker	35 (20.6)	19 (19.2)	16 (22.5)	
Years of non smoking (median; min-max)	20 (1-30)	20 (3-40)	20 (2-30)	0.879
Cigarettes a day (median min – max)	10 (1-40)	10 (1-20)	12.5 (2-40)	0.200
Years of smoking (median min – max)	25 (1-60)	27.5 (6-48)	20 (1-60)	0.475
Do you contemplate quitting? N (%) (1 missing)				
No	8 (26.7)	4 (26.7)	4 (26.7)	0.675
I plan to stop in the next 6 months	14 (46.6)	6 (40)	8 (53.3)	
I am currently in the phase of cessation	8 (26.7)	5 (33.3)	3 (20)	
Did you ever try quitting? N (%) (1 missing)				
Yes	24 (80)	12 (75)	12 (85.7)	0.657
No	6 (20)	4 (25)	2 (14.3)	
Alcohol drinking? N (%) (24 missing)				
Yes	47 (29.2)	14 (15.4)	33 (47.1)	<0.001*
No	114 (70.8)	77 (84.6)	37 (52.9)	
If yes, how many units a week? N (%)				
< 7 units a week	44 (81.5)	13 (86.7)	44 (81.5)	0.648
7 – 14 units a week	8 (14.8)	8 (14.8)	8 (14.8)	
> 7 units a week	2 (3.7)	0	2(3.7)	
Did you ever think you need to reduce drinking? N (%)				
Yes	21 (38.2)	3 (16.7)	18 (48.6)	0.022*
No	34 (61.8)	15 (83.3)	19 (51.4)	
Did other people ever criticize your drinking? N (%)				
Yes	6 (10.7)	2 (11.8)	4 (10.3)	0.867
No	50 (89.3)	15 (88.2)	35 (89.7)	
Did you ever feel guilty about your drinking? N (%)				
Yes	14 (22.2)	2 (8)	12 (31.6)	0.028*
No	49 (77.8)	23 (92)	26 (68.4)	
Did you ever have to drink in the morning to calm down or ease hangover? N (%)				
Yes	2 (2.7)	1 (3.3)	1 (2.3)	0.782
No	72 (97.3)	29 (96.7)	43 (97.7)	

*chi-square test

Table 3. Smoking and alcohol drinking patterns – differences between different education levels

	Elementary school	High school	College degree	University degree	Education differences (p)*
Smoking N (%) (8 missing)					
Yes	1(10)	10 (12)	7 (22.6)	14 (26.4)	0.145
No	8 (80)	55 (66.3)	18 (58.1)	28 (52.8)	
Former smoker	1 (10)	18 (21.7)	6 (19.4)	11 (30.6)	
Years of non-smoking (median; min-max)					0.799
Cigarettes a day (median min – max)	/ [§]	10 (1-40)	15 (8-20)	15 (10-20)	0.059
Years of smoking (median min – max)	/ [§]	20 (8-50)	30 (3-60)	20 (1-35)	0.640
Do you contemplate quitting? N (%) (154 missing)					
No	2 (100)	1(9.1)	2 (28.6)	3 (27.3)	0.020*
I plan to stop in the next 6 months	0	4 (36.4)	3 (42.9)	8 (72.7)	
I am currently in the phase of cessation	0	6 (54.5)	2 (28.6)	0	
Did you ever try quitting? N (%) (154 missing)					
Yes	0	8 (72.7)	7 (100)	11 (91.7)	0.044*
No	1 (100)	3 (27.3)	0	1 (8.3)	
Alcohol drinking? N (%) (16 missing)					
Yes	1(12.5)	15 (18.5)	11 (36.7)	22 (44)	0.008*
No	7 (87.5)	66 (81.5)	19 (63.3)	28 (56)	
If yes, how many units a week? N(%) (128 missing)					
< 7 units a week	1 (100)	16 (76.2)	10 (83.3)	18 (78.3)	0.391
7 – 14 units a week	0	5 (23.8)	2 (16.7)	2 (8.7)	
> 7 units a week	0	0	0	3 (13)	
Did you ever think you need to reduce drinking? N (%) (129 missing)					
Yes	0	12 (60)	3 (25)	8 (33.3)	0.089
No	0	8 (40)	9 (75)	16 (66.7)	
Did other people ever criticize your drinking? N (%) (127 missing)					
Yes	0	6 (27.3)	0	3 (12.5)	0.096
No	0	16 (72.7)	12 (100)	21 (87.5)	
Did you ever feel guilty about your drinking? N (%) (119 missing)					
Yes	0	8 (30.8)	2 (14.3)	7 (29.2)	0.543
No	2 (100)	18 (69.2)	12 (85.7)	17 (70.8)	
Did you ever have to drink in the morning to calm down or ease hangover? N (%) (108 missing)					
Yes	0	1 (3.1)	0	1 (3.7)	0.886
No	3 (100)	31 (96.9)	15 (100)	26 (96.3)	

[§] none of the respondents provided an answer to this question

*chi-square test

Table 4. Knowledge about oral cancer and risk perception

	Yes	No	Don't know / Unsure	Differences among the sexes (<i>p</i> *)	Differences in education (<i>p</i> *)		
Did you ever hear about oral cancer before? N (%)	115 (80.4)	28 (19.6)	N/A	0.743	0.070		
Did you ever hear about oral cancer screening before? N (%)	68 (48.9)	71 (51.1)	N/A	0.240	0.498		
Did you ever attend oral cancer screening before? N (%)	19 (13.4)	123 (86.6)	N/A	0.343	0.955		
Which of the following increases risk of oral cancer? N (%)							
Smoking	111 (79.3)	5 (3.6)	24 (17.1)	0.620	0.460		
Regular drinking	74 (58.6)	38 (28.6)	21 (15.8)	0.579	0.093		
Eating spicy foods	53 (38.7)	50 (36.5)	34 (24.8)	0.516	0.719		
Chronic mechanic trauma	50 (40)	28 (22.4)	47 (37.6)	0.264	0.646		
	Lowest of all cancers	Lower than other cancers	Equal to other cancers	Higher than other cancers	Highest of all cancers		
Oral cancer prevalence compared to other cancers (lung, breast, colon, prostate) N (%)	10 (7.8)	42 (32.8)	65 (50.8)	11 (8.6)	0	0.431	0.006
Oral cancer mortality compared to other cancers (lung, breast, colon, prostate) N (%)	8 (6.3)	33 (26)	65 (51.2)	19 (15)	2 (1.6)	0.144	0.003
	< 5 %	6 – 25%	26 – 50%	51 – 75%	76–100%		
Overall oral cancer mortality N (%)	23 (19)	40 (33.1)	35 (28.9)	16 (13.2)	7 (5.8)	0.332	0.043
	Significantly smaller than other people	Smaller than other people	Similar to other people	Higher than other people	Significantly higher than other people		
Compared to people of your age and sex , what is your chance of getting oral cancer? N (%)	23 (17.6)	26 (19.8)	68 (51.9)	11 (8.4)	3 (2.3)	0.617	0.249
Smokers only							
Compared to smokers of your age and sex , what is your chance of getting oral cancer? N (%)	4 (11.1)	7 (19.4)	15 (41.7)	8 (22.2)	2 (5.6)	0.210	0.423
Compared to non-smokers of your age and sex , what is your chance of getting oral cancer? N (%)	6 (15.4)	12 (30.8)	8 (20.5)	9 (23.1)	4 (10.3)	0.538	0.300

*chi-square test

thinking that they needed to reduce their drinking compared to females ($p=0.022$, chi-square test) and felt guilty about drinking ($p=0.028$) compared to females.

The knowledge about OC and risk perception is given in Table 4.

The majority of participants (115 or 80.4%) had heard about OC, but had not heard about nor previously attended OC screening (71 or 51.1% and 123 or 86.6%, respectively). No significant difference between males and females and between participants with different levels of education was observed.

The majority of participants (111 or 79.3%) knew that smoking was a risk factor for OC. The percentage of correct answers concerning other risk factors was smaller. No significant difference existed between males and females and between participants in terms of different levels of education. Participants with a higher level of education provided significantly more correct answers about OC prevalence and mortality.

Most participants estimated that their risk of acquiring OC was similar to other people of their age and sex. However, smokers most frequently estimated that their risk of acquiring OC was smaller compared to non-smokers of their age and sex. No significant difference between males and females and between participants with different levels of education was observed.

No significant difference in sex, age, smoking and drinking patterns was observed between participants attending the screening events in 2017 and 2012 (data not shown).

DISCUSSION

Our results show that the majority of the patients (49.7%) had a high school or college degree, indicating a higher level of education than the general Croatian population¹⁹. This points to the fact that educated people seek preventive check-ups more often and focus more on their health. Furthermore, participants with a higher level of education invested significantly more effort to quit smoking, although there was no difference in the proportion of smokers between groups.

Regarding alcohol consumption, our results show a significant difference between sexes and levels

of education. Males drank alcohol more often than women, and participants with a higher level of education drank more compared to participants with a lower level of education. Opposite to these results, there was no difference between smoking regarding sex and education.

An Indian study from 2005 examined the effectiveness of screening in reducing mortality from OC. In all, 29,102 people were examined once a year for three years. The examinations uncovered 5,145 lesions with 63% of them were sent for fur-

Future programs for oral cancer screening should be more aggressive and directed to high risk population in order to achieve early detection and treatment of this disease.

ther analysis. The authors concluded that cancer screening can prevent up to 37,000 deaths a year in India and there recommendation was that it become a routine method²⁰. A possible problem stemming from screening is that most patients who get examined do not belong to high-risk groups. In fact, each individual has the choice undergoing an examination or not, and it turns out that those in the highest risk groups usually opt not to undergo checkups²¹. In a large study with 9 years of follow up, Cheung et al.²² showed that the efficacy of OC screening was greatest in individuals at highest risk of OC. Our study shows that majority of screening participants are non-smokers or former smokers and do not drink alcohol (Table 2), which does not place them in high-risk groups for OC.

Regarding levels of education, our results show that patients with the lowest levels of education (primary school) more often stated that OC prevalence is highest, and that mortality is lower compared to other cancers, where the overall mortality is <5%. There were no differences regarding sex and education concerning knowledge on increased risks of OC. Most participants were aware that smoking and regular alcohol consumption increase the risk of OC (Table 4). This suggests that the level of education plays an important role in perceiving the severity of OC. A study by Joseph et al.²³ shows that knowledge

about signs and symptoms of OC reveals a highly significant difference in terms of levels of education and is consistent with our results. They also showed a significant difference regarding gender in that women have more knowledge about OC. Similar results were reported by Reddy et al.²⁴, contrary to ours which indicates no differences in knowledge about OC between males and females.

In all, 80.4% of participants in this study had heard about oral OC before screening. A recent study from Nepal showed that 41.80% of patients had not heard about OC²⁵.

Nagao et Warnakulasuriya²⁶ suggest that OC screening should target high/risk groups in combination with education on risky lifestyles, so that the overall incidence is reduced in the future. They also suggest modern professional education such as e-learning.

Our results do not show any difference in sex, age, smoking and drinking patterns between participants attending the OC screenings in 2017 and 2012, suggesting that awareness about risk habits within the population does not change. We might presume that OC screening always includes a share of the population with similar risk habits.

CONCLUSIONS

Our results show that the majority of participants have heard about OC, but have not heard about nor previously attended an OC screening. Future programs should be more focused on high-risk segments of the population in order to achieve early detection and treatment of OC.

Conflicts of Interest: Authors declare no conflicts of interest.

REFERENCES

1. Kumar M, Nanavati R, Modi TG, Dobarya C. Oral cancer: Etiology and risk factors: A review. *J Cancer Res Ther* 2016;12:458-63.
2. Abati S, Bramati C, Bondi S, Lissoni A, Trimarchi M. Oral Cancer and Precancer: A Narrative Review on the Relevance of Early Diagnosis. *Int J Environ Res Public Health* 2020;17:9160.
3. Ligier K, Belot A, Launoy G, Velten M, Bossard N, Iwaz J et al. Descriptive epidemiology of upper aerodigestive tract cancers in France: incidence over 1980-2005 and projection to 2010. *Oral Oncol* 2011;47:302-7.
4. Fu J-Y, Wu C-X, Zhang C-P, Gao J, Luo J-F, Shen S-K et al. Oral Cancer incidence in Shanghai – a temporal trend analysis from 2003 to 2012. *BMC Cancer* 2018;18:686.
5. Cancer.org. [Internet]. Kennesaw: Key Statistics for Oral Cavity and Oropharyngeal Cancers, Inc. c2022 [cited 2021 Nov 20]. Available from: <https://www.cancer.org/cancer/oral-cavity-and-oropharyngeal-cancer/about/key-statistics.html>.
6. Cancerresearchuk.org [Internet]. London: Head and neck cancers incidence statistics, Inc. c2022 [cited 2021 Nov 20]. Available from: <https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/head-and-neck-cancers/incidence>.
7. Hzzj.hr [Internet]. Zagreb: Cancer incidence in Croatia 2018, Inc. c2001 – 2022 [cited 2021 Nov 20]. Available from: https://www.hzzj.hr/wp-content/uploads/2020/12/Bilten_2018_final.pdf.
8. Hzzj.hr [Internet]. Zagreb: Izvješće o smrtnosti prema listi odabranih uzroka smrti u 2018., Inc. c2001 – 2022 [cited 2021 Nov 20]. Available from: https://www.hzzj.hr/wp-content/uploads/2020/01/Bilten_Umrlji_2018-2.pdf.
9. Paré A, Joly A. Oral cancer: Risk factors and management. *Presse Med* 2017;46:320-30.
10. Rivera C. Essentials of oral cancer. *Int J Clin Exp Pathol* 2015;8:11884-94.
11. Mehrota R, Gupta DK. Exciting new advances in oral cancer diagnosis: avenues to early detection. *Head Neck Oncol* 2011;3:33.
12. Rogers SN, Vedpathak SV, Lowe D. Reasons for delayed presentation in oral and oropharyngeal cancer: the patients perspective. *Br J Oral Maxillofac Surg* 2011;49:349-53.
13. Hollows P, McAndrew PG, Perini MG. Delays in the referral and treatment of oral squamous cell carcinoma. *Br Dent J* 2000;188:262-5.
14. Warnakulasuriya KA, Harris CK, Scarrott DM, Watt R, Gelbier S, Peters TJ et al. An alarming lack of public awareness towards oral cancer. *Br Dent J* 1999;187:319-22.
15. Hertrampf K, Wenz HJ, Koller M, Wiltfang J. Comparing dentist's and the public's awareness about oral cancer in a community-based study in Northern Germany. *J Craniomaxillofac Surg* 2012;40:28-32.
16. Boundouki G, Humphris G, Field A. Knowledge of oral cancer, distress and screening intentions: longer term effects of a patient information leaflet. *Patient Educ Couns* 2004; 53:71-7.
17. Sankaranarayanan R. Screening for cancer in low- and middle-income countries. *Ann Glob Health* 2014;80:412-7.
18. Speight PM, Palmer S, Morales DR, Smith DH, Henriksen M, Augustovski F. The cost of effectiveness of screening for oral cancer in primary care. *Health Technol Assess* 2006;10:1-144.
19. Dzs.hr [Internet]. Zagreb: Popis stanovništva, kućanstava i stanova 2011., Inc. c2006 – 2022 [cited 2021 Jun 20]. Available from: https://www.dzs.hr/Hrv_Eng/publication/2016/SI-1582.pdf.
20. Sankararayanan R, Ramados K, Thomas G, Muwange R, Thara S, Mathew B et al. Effect of oral cancer screening on reducing mortality in Kerala, India; a cluster randomized controlled study. *Lancet* 2005;365:1927-33.

21. Shuman AG, Entezami P, Chernin AS, Wallace NE, Taylor JMG, Hogikyan ND et al. A. Demographics and efficacy of head and neck cancer screening. *Otolaryngol Head Neck Surg* 2010;143:353-60.
22. Cheung LC, Ramadas K, Muwonge R, Katki HA, Thomas G, Graubard BI et al. Risk-Based Selection of Individuals for Oral Cancer Screening. *J Clin Oncol* 2021;39:663-74.
23. Joseph BK, Ali MA, Sundaram DB. Awareness of Mouth Cancer Among Adult Dental Patients Attending the Kuwait University Dental School Clinic. *J Cancer Educ* 2018;33:340-5.
24. Reddy BS, Doshi D, Reddy MP, Kulkarni S, Gaffar A, Reddy VR. Oral cancer awareness and knowledge among dental patients in South India. *J CranioMaxillo-fac Surg* 2012;40:521-4.
25. Bajracharya D, Gupta S, Sapkota M, Bhatta S. Oral Cancer Knowledge and Awareness in Patients Visiting Kantipur Dental College. *J Nepal Health Res Counc* 2018;15: 247-51.
26. Nagao T, Warnakulasuriya S. Screening for oral cancer: Future prospects, research and policy development for Asia. *Oral Oncol* 2020;105:104632.