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# Factors influencing knowledge about early signs and causes of oral cancer in Korean elders

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## 1. Introduction

Oropharyngeal cancer is estimated to be the ninth most common cancer worldwide<sup>1</sup>. The World Health Organization predicts a continuing worldwide increase in the numbers of patients with oral cancer and this trend will be extending well into the next several decades<sup>2</sup>. The majority of oropharyngeal cancers originate from the base of the tongue and tonsils, and more than 90% are squamous-cell carcinoma<sup>3-5</sup>.

However, the survival rates for oral cancers are not good because more than half of cancers have metastasized at the time of diagnosis<sup>6,7</sup>. The five-

year oral cancer survival rate for advanced cases is 19%, compared to 78% for localized lesions<sup>8</sup>. Approximately 30-40% of patients with intra-oral cancers will survive five years. The short survival time is caused, largely, by the late detection<sup>9,10</sup>. When detected early, the prognosis for survival is much better than with many other cancers<sup>11</sup>.

A first line of defense against oral cancer could be a self-examination<sup>12,13</sup>. While not designed to take the place of a professional examination, self-examinations can be incorporated as a secondary preventive technique for detecting early oral-facial lesions<sup>12,13</sup>. Stage I and II oropharyngeal cancers are characterized by a 5-year survival rate ranging

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from 70% to 90%, and the management of these early carcinomas is usually of a short duration, easy and very cost-effective<sup>14</sup>.

In Korea, 76,868 new cancer cases were diagnosed in 1998 and 350,000 cancer patients were suspected<sup>15</sup>. 42.7% of the disease was localized at a specific organ, whereas 47.6% had metastasized to other organs<sup>16</sup>. Oral and pharyngeal cancer involved 5% of them<sup>17,18</sup> and 1,200 patients died as a result of the oral cancer<sup>20</sup>.

As with most other cancers, when oral cancer is detected early, the prognosis is greatly improved. Individuals need to be aware of the risk factors along with the signs and symptoms of oral cancers. In addition, individuals need to know how to obtain a thorough oral examination. They will then have the information to make intelligent decisions regarding the prevention of these cancers<sup>21</sup>. Since, public awareness of oral cancer is low and this contributes to delays in diagnosis<sup>22</sup>, public campaigns will be necessary to make patients aware of oral cancer.

The objectives of this study were two-fold: 1) to determine factors influencing the knowledge about early signs and causes of oral cancer and 2) to evaluate the impact of these factors.

## 2. Material and Methods

A cross-sectional survey was conducted using a telephone interview to meet the objectives of this study.

### 2.1. Subjects

Using three-stage stratification according to the

area, gender and age group, an estimated sample of 4,342 Korean elders aged 55 or older were randomly selected as the sample cohort of the Korean National Interview Survey of Oral Health Status (KNISOH) in the year of 2000<sup>23</sup>. A letter for informed consent including the information of this study, a request for their acceptance and the questionnaires for the interview was mailed to all members in the cohort two weeks before a repeated telephone call to obtain the acceptance from the target population. Of them, 1,032 subjects agreed to willingly participate in the telephone interview, 23.8% of the cohort<sup>23</sup> formed the subjects of this study. The subjects' age ranged from 55 to 85 years, with a mean age of 67.2 years (SD=6.7). The proportion of subjects was 44.3% for males and 55.7% for females. The distribution of subjects by gender, age group and denture status is shown in Table 1.

### 2.2. Data collection

The data was obtained by a telephone interview from January to February in the year 2003. For the survey, 10 telephone interviewers were trained and calibrated regarding the guideline of the questions for this survey in order to reduce bias among the interviewers. The guidelines consisted of instructions about the questions and cautions in the interview that had been obtained from the preliminary survey. Questionnaires and information about this survey were sent by mail two weeks prior to the main telephone interview and the agreed subjects answered the questions by the interviewers.

The main questionnaires regarding oral or

mouth cancer consisted of six items as a modification of the Maryland study which had five items (Q2-5) and more sophisticated responses<sup>20</sup>:

Q1. Have you had some concern on oral or mouth cancer? (Very much, Much, Some, A bit, None)

Q2. Have you heard about oral or mouth cancer? (Yes, NO)

Q3. What is one early sign of oral or mouth cancer? (Open ended)

Q4. In your Opinion what causes mouth or lip cancer? (Open ended)

Q5. Have you heard of an oral cancer examination? (Yes, NO)

Q6. Have you ever had a test or exam for oral or mouth cancer in which the doctor or dentist pulls on your tongue, sometimes with a gauze wrapped around it, and feels under the tongue and inside the cheeks? (Yes, May be, No, Don't Know)

The present and past medical history, information regarding the present medication and the history of orofacial pain (OFP) during the past 6 months were checked up in the questionnaires. Behavior related to health such as the smoking habits and sociodemographic characteristics such as age, gender, area where the subject lived, the education level and the dentition status were also obtained.

### 2.3. Analysis

For evaluating proportion of persons related to the five main questionnaires about oral or mouth cancer, the data of each five questions were dichotomized. Those who replied one of these three responses, "White patches in the mouth that

are not painful" or "Red patches in the mouth that are not painful" or "Sore/lesions in the mouth that does not heal", were classified as those who knew the early signs of oral cancer. Those who replied one of five responses, "Excessive unprotected exposure to sunlight" or "Drinking a lot of alcohol" or "Smoking" or "Viruses" or "Not eating fruits and vegetables", were classified as people who knew the causes of oral or lip cancer. The other variables except the education level and smoking history were dichotomized. The education level was classified into three subgroups, six or less, seven to nine and ten or more. The smoking history was also classified into three subgroups, non-smokers, past-smokers, and smokers. The difference in the proportion of the person with the information related to oral cancer was assessed by chi-square tests.

Multiple multivariate logistic regression analyses were performed to determine the factors influencing the knowledge of early signs and causes of oral cancer. Knowledge of early signs and causes of oral cancer was made by putting the five cases of the knowledge of one early sign into the knowledge of a cause of oral cancer. For each main explanatory variable, the negative response, age of 55-64, male, urban, denture wearer and non-smokers were designated the reference category. The interaction terms were also assessed. For the final model, the change in the -2 Log likelihood and 10 % change in Odd Ratio (OR) were assessed during multiple logistic regression modeling.

Structural equation modeling was used to evaluate the impact of factors influencing the

knowledge of the early signs and causes of oral cancer. By using factor analysis, having heard of oral cancer and having heard of oral cancer test were added into "Hearing of oral cancer & oral cancer test", and the present and past medical history and present medication status made "Systemic health".

The level of statistical significance for the main effects was set at 0.05.

### 3. Results

Approximately 37 % of respondents had ever heard of oral cancer and 20% of them had ever heard of a oral cancer examination. However, only 4% of the respondents reported having had a test or examination for oral cancer, while 47% of them reported having concern on oral cancer. Only five of the 1,032 respondents could correctly identify one early sign of oral cancer, while 86% of them responded that "they did not know" and 14% reported incorrect responses. Seven percent of the respondents had a correct knowledge of one cause of oral cancer, while 85% of them replied that "they did not know" and 8% had incorrect responses (Table 1).

#### 3.1. Bivariate analyses

According to the results of bivariate analyses, age, gender, the education level, dentition status, the smoking habit, orofacial pain and medication status were the significant variables on the difference in the proportion of the person with the information related to oral or mouth cancer (Table 1). The respondents aged 65 or older showed

lower proportion in all six questions except the prevalence in two items such as persons who had an examination of oral or mouth cancer and persons who knew one early sign of oral or mouth cancer than the other respondents aged 55 to 64. The female respondents showed lower proportion in all six questions except the proportion of persons who knew one early sign of oral or mouth cancer than the male respondents. The 10 years or more educated person showed the higher proportion of persons who have heard of oral or mouth cancer than the others. The denture wearer showed lower proportion of persons who have heard of oral or mouth cancer, persons who have heard of a test or exam of oral or mouth cancer and persons who have had concerns on oral or mouth cancer than the dentate, respectively. The past smokers showed the higher proportion of persons who have heard of oral or mouth cancer, persons who have heard of a test or exam of oral or mouth cancer, persons who have had concerns on oral or mouth cancer, persons who had an examination of oral or mouth cancer and persons who knew one cause of oral or mouth cancer than the smoker or nonsmoker, respectively. The present medicating persons showed the lower proportion of persons who have heard of oral or mouth cancer (Table 1).

#### 3.2. Factors influencing on the knowledge of the early signs and/or causes of oral cancer

Male respondents were 2.1(95% confidence interval (CI, 1.27-3.62) times more likely to know the early signs and/or causes of oral cancer than females. The respondents who had taken a test or

Table 1. Proportion of persons with the knowledge, concern about oral cancer and having oral cancer examination by variables

Variable	N	% Person who have heard of oral cancer	% Person who have heard of a test of oral cancer	% Person who had an exam of oral cancer	% Person who had concern on oral cancer	% Person who knew an early sign of oral cancer	% Person who knew a cause of oral cancer
Total	1032	36.9	19.5	4.0	47.3	0.5	7.0
Age(year)							
55-64	508	46.1	24.8	5.1	56.2	0.6	9.3
65+	524	28.1	14.3	2.9	38.7	0.4	4.8
p-value*		0.000	0.000	0.064	0.000	0.682	0.005
Gender							
Male	473	50.1	27.7	5.4	51.5	0.7	10.5
Female		0.000	0.000	0.045	0.020	0.657	0.000
p-value*	559	26.8	13.2	2.9	44.2	0.3	4.3
Area							
Urban	473	40.7	22.8	5.5	51.9	0.7	7.6
Rural	559	35.4	18.2	3.4	45.6	0.4	6.7
p-value*		0.117	0.096	0.112	0.067	0.624	0.631
Education (years)							
≤6	268	35.1	16.4	3.4	46.6	0.7	7.8
7-9	426	33.8	18.3	3.5	44.5	0.2	7.3
10+	338	42.3	23.4	5.0	51.5	0.6	5.9
p-value*		0.041	0.073	0.476	0.151	0.842	0.622
Dentition status							
Dentatus	605	40.5	22.6	4.3	51.0	0.7	7.9
Denture wearer	427	31.9	15.0	3.5	42.2	0.2	5.6
p-value*		0.005	0.002	0.525	0.005	0.654	0.151
Smoking							
Non-smoker	578	30.8	15.4	3.1	45.5	0.5	5.4
Past-smoker	218	50.5	29.8	6.9	48.8	0.0	10.1
Smoker	236	39.4	19.9	3.4	50.4	0.8	8.1
p-value*		0.000	0.000	0.046	0.390	0.721	0.050
Orofacial pain							
No	338	34.9	18.0	6.5	37.9	0.3	5.3
Yes	694	37.9	20.2	2.7	51.9	0.6	7.8
p-value*		0.351	0.418	0.004	0.000	1.000	0.146
Medical history							
No	205	38.5	22.9	6.3	45.4	0.5	8.3
Yes	827	36.5	18.6	3.4	47.8	0.5	6.7
p-value*		0.592	0.163	0.052	0.529	1.000	0.409
Medication							
No	408	40.9	22.3	4.4	46.6	0.7	7.4
Yes	624	34.3	17.6	3.7	47.8	0.3	6.7
p-value*		0.031	0.064	0.559	0.691	0.389	0.701

\*: p-value obtained from chi-square statistic

Table 2. Adjusted OR of explanatory variables in logistic regression models

Output variable	Explanatory variable	Adjusted OR (95% CI)	p-value*
Knowledge of early signs and causes of oral cancer <sup>†</sup> (no:0 vs yes:1)	Age group (55-65:0 vs 65+:1)	0.609(0.362,1.204)	.061
	Gender (Female:0 vs Male:1)	2.147(1.274,3.617)	.004
	Hearing oral cancer test (no:0 vs yes:1)	2.484(1.061,5.816)	.036
	Hearing oral cancer (no:0 vs yes:1)	1.950(1.139,3.338)	.015
	Concern on oral cancer (no:0 vs yes:1)	1.812(1.067,3.077)	.028
Hearing oral cancer <sup>‡</sup> (no:0 vs yes:1)	Age group (55-65:0 vs 65+:1)	0.587(0.411,0.839)	.003
	Gender (Female:0 vs Male:1)	2.737(1.646,4.552)	.000
	Hearing oral cancer test (no:0 vs yes:1)	127.050(45.748,352.841)	.000
	Concern on oral cancer (no:0 vs yes:1)	2.552(1.799,3.620)	.000
Concern about oral cancer <sup>§</sup> (no:0 vs yes:1)	Age group (55-65:0 vs 65+:1)	0.592(0.451,0.776)	.000
	Orofacial pain (no:0 vs yes:1)	1.733(1.308,2.297)	.000
	Hearing oral cancer (no:0 vs yes:1)	2.506(1.771,3.547)	.000
Hearing oral cancer test <sup>  </sup> (no:0 vs yes:1)	Orofacial pain (no:0 vs yes:1)	0.268(0.123,0.588)	.001
	Present past medical history (no:0 vs yes:1)	0.393(0.144,1.073)	.068

\* P-value determined from Wald chi square statistic

<sup>†</sup> Model Chi-square=48.854, df=9, P=.000, -2Log likelihood=488.672, Adjusted R square=.05, OR was adjusted for education level, orofacial pain, medication and mutually.

<sup>‡</sup> Model Chi-square=519.639, df=14, P=.000, -2Log likelihood=838.626, Adjusted R square=.396, OR was adjusted for education level, living area, denture status, smoking, orofacial pain, medical history, medication, hearing of oral cancer test and mutually.

<sup>§</sup> Model Chi-square=101.996, df=14, P=.000, -2Log likelihood=1324.338, Adjusted R square=.094, OR was adjusted education level, gender, living area, denture status, smoking, orofacial pain, medical history, medication, hearing of oral cancer test, having oral cancer examination and mutually.

<sup>||</sup> Model Chi-square=160.411, df=14, P=.000, -2Log likelihood=184.363, Adjusted R square=.144, OR was adjusted for age group, education level, gender, living area, denture status, smoking, medication, hearing of oral cancer, hearing of oral cancer test, having concern on oral cancer and mutually.

examination for oral cancer were 2.5 (95% CI, 1.06-5.82) times more likely to know the early signs and/or causes of oral cancer than the respondents who had not undergone the test. The respondents who had heard of oral cancer were 2.0(95% CI, 1.14-3.34) times more likely to know early signs and/or causes of oral cancer than the respondents who had never heard of oral or mouth cancer. The respondents who had concerns about oral cancer were 1.2 (95% CI, 1.07-3.08) times more likely to know the early signs and/or causes of oral cancer than respondents who were not concerned (Table 2).

### 3.3. Factors influencing on having heard of oral cancer

The respondents aged 65 or older were 0.6 (95% CI, 0.41-0.84) times less likely to have heard of oral cancer than the other respondents aged 55 to 64. Male respondents were 2.7(95% CI, 1.65-4.55) times more likely to have heard of oral cancer than females. The respondent who had taken a test or examination for oral cancer were 127.0 (95% CI, 45.75-352.84) times more likely to have heard of oral cancer than the respondents who did not. The respondent who had concern about oral cancer were 2.6 (95% CI, 1.80-3.62) times more likely to have heard of oral cancer than the respondents

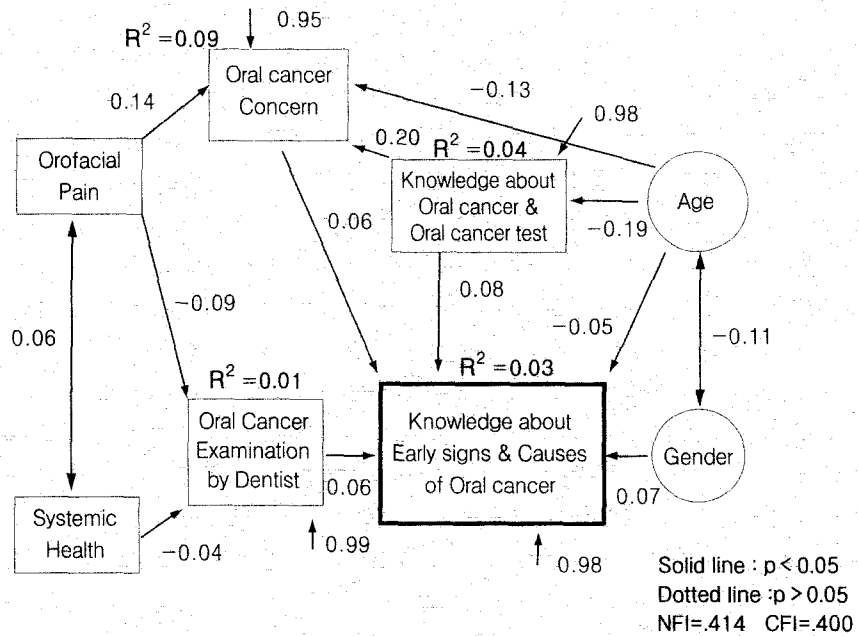


Fig 1. Structural equation model on the Knowledge about early signs and causes of oral cancer

who did not (Table 2).

### 3.4. Factors influencing on concern about oral cancer

The respondents aged 65 or older were 0.6 (95% CI, 0.45-0.78) times less likely to be concerned about oral cancer than the other respondents aged 55 to 64. The respondents with orofacial pain were 1.7 (95% CI, 1.31-2.30) times more likely to be concerned about oral cancer than the respondents without. The respondent who had ever heard of oral cancer were 2.5 (95% CI, 1.77-3.55) times more likely to be concerned about oral cancer than respondents who had never heard of oral cancer (Table 2).

### 3.5. Factors influencing on a test or examination of oral cancer

Respondents with orofacial pain were 0.3 (95%

CI, 0.12-0.59) times less likely to have taken a test or examination for oral cancer than the respondents without it. A present or past medical disease history was not associated with having taken a test or examination for oral cancer (adjusted OR=0.39; 95% CI, 0.14-1.07) (Table 2).

### 3.6. Impact of factors influencing the knowledge of early signs and/or causes of oral cancer

According to the results of the structural equation model, the knowledge about the early signs and causes increased by 8% for having heard of oral cancer or oral cancer test, 7% for male and 6% for having taken oral cancer examination (Fig 1). In terms of the total impact on the knowledge of the early signs and causes of oral cancer, having heard of oral cancer or an oral cancer test was 9.4%, gender was 6.6% and having taken an oral cancer examination was 6.2%.

## 4. Discussion

Relatively little attention has been given to educating the general public about the risk factors as well as signs and symptoms of oral cancer in addition to the elements of a screening examination for oral cancer. This lack of knowledge could result in simply ignoring a sign of oral cancer, which could have serious consequences. Although 25% adults correctly identified one early sign of oral cancer in America<sup>23</sup>, only 0.5% of elders did in Korea (Table 1). Without accurate and appropriate information, people can neither make nor be expected to make informed, intelligent decisions regarding their own health<sup>25</sup>.

**Risk factors of oral cancer:** The primary risk factors for oral cancers in the United States include the past and present use of tobacco and alcohol products; for lip cancer, the primary risk factor is exposure to the sun<sup>4,9,20,52</sup>. Compared to nonsmokers, smokers have a 2-24 times higher risk of developing oral cancer<sup>53,56</sup>. The reduction or elimination of smoking and drinking represents another critical strategy for preventing oral and pharyngeal cancer. In this study, the information on the smoking habit was added, but that for alcohol was not, which could be one limitation of this analysis.

**Smoking habit:** According to the adjusted OR of this study, the smoking habit was not associated with any of the outcome variables: the knowledge about the early signs and causes of oral cancer, having heard of oral cancer, concern about oral cancer and having taken an examination for oral

cancer. These results did not coincide with the previous finding that smokeless tobacco users had increased odds of knowing one of the early signs of oral cancer<sup>23</sup>. Although the smoking does not automatically result from a lack of knowledge, the further study will be needed to verify the association between smoking and the knowledge of the early signs and causes of oral cancer in Korean adults.

**Age:** Compared to the older age group, subjects aged 55 to 64 had an increased odds to have heard of oral cancer and to have some concerns about oral cancer. This result supported the result of a previous study<sup>23</sup>. But, age was not associated with the knowledge of early signs or causes of oral cancer ( $p = 0.06$ ) (Table 2). Therefore, the further study recommended.

**Gender:** The odds to know the early signs and/or causes of oral cancer was two times higher in male than in females, which was different from the Maryland adults' result in that there was no gender difference<sup>23</sup>. The odds having heard of oral cancer was 2.7 times higher in males than females. Gender had 6.6% of the total impact on the knowledge of the early signs and causes of oral cancer, which was higher than the impact of having taken an oral cancer examination. Hence, the further study is required to clarify the gender difference in the odds of knowing the early signs and/or causes of oral cancer.

**Having heard of oral cancer:** The respondents who had ever heard of oral cancer had 2 times higher odds to know early signs and/or causes of oral cancer than the respondents who had never heard and 2.5 times higher odds to have concern



about oral cancer than respondents who had never heard of oral cancer. Having heard of oral cancer and an oral cancer test had the largest 9.4% of the total impact on the knowledge about the early signs and causes of oral cancer in this study. A lack of knowledge tends to increase the fatalistic attitudes toward cancer and the other diseases and fosters misinformation, which leads to a delay in seeking care for the symptoms<sup>37)</sup> and encourages individuals to forgo a screening examination<sup>38)</sup>. Simply having the knowledge about a factor does not automatically translated into a change in behavior, but having the correct and current knowledge or information is necessary to make intelligent decisions<sup>39)</sup>.

**Having a test or examination of oral cancer:** The respondents who had taken a test or examination for oral cancer showed 2.5 times higher odds of knowing the early signs and/or causes of oral cancer than the respondents without it and 127.0 times higher odds having heard of oral cancer. These results supported the result that knowledge of oral cancer was associated with having an oral cancer examination<sup>24)</sup>. It is speculated that if individuals do not know anything about risk factors and the signs of oral cancer, they will not seek an oral cancer examination. Since only 4% of Korean elders (Table 1) and 15% of American adults<sup>40)</sup> had a test or examination for oral cancer, education about the need for and providing oral cancer screenings, particularly among a high-risk group, is essential. Since healthcare professionals can examine the mouth with much greater ease than many other parts of the body<sup>22)</sup>, a case finding and targeting are viable and cost-effective

interventions for oral cancer when these form a part of the routine practice of primary care providers<sup>12,43)</sup>.

**Having some concern about oral cancer:** The result of structural equation modeling determined that having some concern about oral cancer was not significantly associated with the knowledge of the early signs and/or causes of oral cancer, the respondents who had some concern about oral cancer had 1.2 times higher odds of knowing the early signs and/orcauses of oral cancer than the respondents without it and 2.6 times higher odds of having heard of oral cancer than the respondents without it. These results support the previous results that showed that the stronger belief in health resulted in a higher level of compliance for preventive health behavior among adults aged 40 to 59<sup>41)</sup>.

**Limitations and a need of the further information:** Two responses out of six had the forced choice with yes or no, i.e. there was no don't know/can't remember. For getting the real answers, the forced option should have escaped. When the further study will be planned after implementing an appropriate intervention to help educate Koreans about oral cancer, this type of limitation will be corrected.

Structural equation modeling has been used extensively in the behavioral and social sciences for examining the interrelationships between manifest and latent variables<sup>45)</sup>. Although the structural equation model of this study showed the low normed fit index (NFI) of 0.414 and the low comparative fit index (CFI) of 0.400, it was speculated that this model could be profitable to

compare the impact among the influencing variables. With more information about the oral cancer, the fitness of the model will increase to the recommendation value of 0.9.

The most appropriate role of nutrition preventing oral precancerous lesions is the emphasis on the benefits of increasing the intake of fruits and vegetables<sup>29, 46, 511</sup>. The degree of chromosomal instability present in premalignant oral lesions such as leucoplakia is associated with the risk of developing oral cancer<sup>22, 321</sup>. Of all interventions available for cancers, none had as great an impact upon survival as much as early detection<sup>1, 521</sup>. Mortality rates of oral cancer are high in populations who have poor access to the health care system<sup>5, 55, 591</sup>.

**New initiatives:** A vigorous agenda that includes education, policy and research initiatives is essential to enhance oral cancer prevention and early detection in order to increase the patient survival and quality of life and to decrease the consumption of health care resources<sup>11, 551</sup>. Although oral cancer is an ignored or, at best forgotten disease, and has frequently been accorded a low

priority by both health care providers and the public<sup>561</sup>, an annual oral cancer examination should be universally covered and a reimbursable service for dentists and physicians. Once in place, health care providers and public need to be educated to foster the use of an oral cancer examination<sup>10, 57, 581</sup>.

## 5. Conclusion

The factors influencing the knowledge of the early signs and/or causes of oral cancer were having an oral cancer examination, having heard of oral cancer, gender and having some concern about oral cancer. Regarding the total impact, having an oral cancer examination had the largest impact, which was followed by having heard of oral cancer and gender. Therefore, new initiatives should be directed at prevention in addition to an early diagnosis using education for health professionals and the public.

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## 국문초록

## 55세 이상 성인에서 구강암의 초기증상과 원인에 관한 지식의 영향요인에 관한 연구

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**색인:** 구강암, 지식, 증상, 원인, 교차비

**연구목적 :** 본 연구의 목적은 구강암의 초기 증상과 원인에 관한 지식에 영향을 주는 요인들을 파악하고, 이러한 요인들의 영향을 평가 하는 것이다.

**연구방법 :** 연구대상은 2000년 한국 구강건강조사연구집단인 55세 이상 4,342명의 한국 성인 중에서, 전화설문에 참여하겠다고 응한 1,032명이었다. 주요 질문들은 병력, 현재투약상황, 구강주위안면통증, 흡연여부와 사회인구통계학적 특징과 메릴랜드 연구를 변형한 6개의 구강암에 관련 질문이었다. 요인들의 영향력을 교차비로 파악하기 위하여, 이변량 분석과 로지스틱 회귀분석, 그리고 구조함수모형이 사용되었다.

**연구결과 :** 남자들은 여자들보다 2.1배(95%신뢰구간:1.27-3.62) 더 많이 구강암 증상과 원인들에 대해 알고 있었다. 구강암 검사를 했던 응답자들은 그렇지 않았던 응답자들보다 2.5배(95%신뢰구간:1.06-5.82) 더 많이 증상과 원인들에 대해 알고 있었다. 구강암에 대해 들어본 적이 있었던 응답자들은 구강암에 대해 한번도 들어보지 못했던 응답자들보다 2.0배(95%신뢰구간:1.14-3.34) 더 많이 증상과 원인들에 대해 알고 있었다.

**연구결론 :** 구강암의 증상과 원인에 대한 지식에 영향을 주는 요인들은 구강암의 검사경험, 구강암에 대해 들어본 경험, 성별과 구강암에 대한 관심이었다. 전체 영향에 관해서, 구강암 검사가 가장 큰 영향을 미쳤고, 그 다음으로 구강암에 대해 들어본 경험, 성별 순이었다.