RESEARCH ARTICLE

Oral Health Practices and Oral Cancer Knowledge Attitudes and Behaviors among College Students

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ABSTRACT

Objective: This study examines the knowledge about the risk factors and symptoms of oral cancer, attitudes toward oral cancer and associated behaviors of college students using constructs of the Health Belief Model and the predictors of oral screening of college students.

Participants: College of Health Science students (N = 300) at a State university located in the Northeastern US were surveyed.

Methods: A 25-item questionnaire was administered during the Fall 2009 semester, which measured knowledge and behaviors related to oral cancer risk factors.

Results: Participants perceived their oral health to be good (63.6%), were unaware of dental diseases (95.5%), visited a dentist (60.5%), had a dental visit (62.2%) within the last 6 months, and scheduled one (66.3%) in the next 6 months. There was a significant correlation between the behavior of use of tobacco and the perceived susceptibility to oral cancer (t = 8.10, p < 0.05) and perceived severity (t = 2.22, p < 0.05) if a person got oral cancer. There were no significant variables which predicted oral cancer screening. Having a dental visit best predicted the scheduling of a future dental visit.

Conclusions: Findings from this study may further assist in future health education and dental screening programs for this population group across the US.

Keywords: Oral cancer, Oral health, Oral cancer screening, College students, Health belief model.

INTRODUCTION

The surgeon general has stated, "Oral health is essential to the general health and well-being of all Americans". There are important associations between poor oral health status and risk factors (e.g. tobacco use) for oral diseases and other systemic diseases, such as diabetes. Poor oral health also impacts nutrition and affects social activities, such as school and work.

According to NCI data, approximately 35,000 people in the US were diagnosed with oral cancer in 2008 (the third year in a row in which there had been an increase in the rate of occurrence of oral cancer).[1] It was found that 35,720 people (25,240 men and 10,480 women) were diagnosed with cancer of the oral cavity and pharynx in 2009, of which approximately 7,600 men and women died. For these cancers, the major etiological factors were found to be tobacco and excess alcohol use. The disease is largely preventable. Early diagnosis greatly increases a patient's chances of survival, however, there is poor public awareness of the signs and symptoms of oral malignant and premalignant lesions.

Oral health and diseases are related to behaviors. Studies have shown association between increased knowledge and better oral health. Several studies have been conducted in industrialized countries, such as the United Kingdom, Italy, Sweden, Norway, Turkey, Lebanon, Saudi Arabia and Kuwait, among others. Although oral cancer typically is associated with older populations, educating the younger populations and

targeting them would be more successful, and discouraging long-term tobacco and alcohol use and build other risk factor awareness. Oral cancer has a long latent period, and hence awareness about the cancer is essential at an early age. Health students specialize in preventive information and health promotion, so their knowledge and behavior is important in promoting health behavior and educating individuals and groups. Health personnel play an important role in oral health promotion when they start working in health care systems. Understanding the communities in which we work is paramount, when attempting to appropriately assess their assets, strengths and limitations in regard to serving societal needs and addressing popular demands.

Oral Health Status

The World Health Organization (WHO) defines oral health as "a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects, such as cleft lip and palate, periodontal (gum) disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity". Leading risk factors for oral diseases include unhealthy diet, tobacco use, alcohol use and poor oral hygiene.[2] While most oral diseases are not life threatening, they lead to pain, discomfort and functional problems. Dental problems may lead to negative social image and emotional problems in adolescence, with impaired facial features leading to negative

social judgments about the intelligence, personality and performance of the individual. The physical, social and psychological health of adolescents is influenced by their oral health behaviors.[3]

Oral diseases in the US are responsible for 20.9 million lost days of productive activities annually, more than 6.4 million days spent in bed and a total of more than $27 billion in expenditures.[3] Traditional treatment for oral disease is extremely costly. It is the fourth most expensive disease to treat in most industrialized countries. Traditional curative dental care is a significant economic burden for many industrialized countries where 5 to 10% of public health expenditures relates to oral health. Over the past years, savings in dental expenditures have been noted in industrialized countries, which have invested in preventive oral care and where positive trends have been observed in terms of reduction in the prevalence of oral diseases.[4]

Preventive Dental Behavior

Preventive dental behavior is significantly associated with oral health.[5] Of the studies related to preventive oral health practices of college students, many have been done internationally. A study conducted among undergraduate college students in Lebanon, shows that only one-third of the students surveyed visited a dentist for preventive treatment.[6] This finding is consistent with other studies, which also indicates that dental visits tend to be treatment oriented.[6-9] Also, the international recommendation of brushing twice a day for good oral health is not typically met. Most adolescents had a positive dental attitude and perceived their oral health to be good, however poor knowledge and behavior were demonstrated. Girls had better knowledge about oral health and effects of tobacco on oral health than boys.[9] A general lack of awareness and practice of international standards for brushing is found most commonly among males than in females. Tooth brushing two or more times a day was more common among females than males, a consistent finding globally.[6, 8, 9] This trend has also been found to be associated even among health science and nursing students. A study conducted to investigate oral health knowledge and behavior among nursing students in a Nigerian tertiary hospital showed that about 68% of the surveyed students had never visited a dentist and about 53% of the students brushed only once a day. By virtue of their professional role, nursing personnel may play a vital role in health promotion and preventive information dissemination. It is important that they have knowledge about oral health.[8] A study conducted among male health science students in Kuwait recommended that interventions be conducted to improve dental knowledge among dental students, other university students and teachers.[7]

Importance of Dental Health Education

Interventions during a student's adolescence provide a special opportunity to introduce, reinforce, and establish healthy dental practices.[10] It was found in a study that 61% of surveyed participants received oral hygiene instructions from a dentist during a dental visit and 71% of these students brushed two or more times a day. An improvement is needed in oral self-care practices.[5] A WHO report also cited the need for global strengthening of public health programs through implementation of effective oral disease prevention measures and stated the need to identify common risk factors approach to integrate oral health with national health programs.[4]

Epidemiology of Oral Cancer in United States

Oral cancer is a significant component of the global burden of cancer. In 2000, head and neck cancer was the eighth leading cause of cancer death worldwide. According to an American Cancer Society report, oral cancer accounts for 3% of all diagnosed malignancies in the United States, where oral cancer affects 30,000 people a year. Oral cancer leads to disfiguration and results in severe loss of oral function and chronic discomforts including difficulty in chewing, swallowing and speaking. Oral cancer may affect any part of the oral cavity, including lips, gum tissues, cheek lining, tongue, hard or soft palate and pharynx. From the time of diagnosis, the quality of life for every patient and survivor is affected in some way either socially, physically, psychologically and/or spiritually.

The 5-year survival rate with oral cancer is directly related to the stage at which the cancer is diagnosed. It is important to diagnose it early. According to the American Dental Association, early diagnosis and treatment could boost the survival rate by 75 to 80%. Patients diagnosed early have a 5-year survival rate of 80% whereas patients diagnosed in advanced stages have survival rate of 40%. Unfortunately, more than one-half of all oral cancers in the United States are diagnosed at late stages.

According to the surveillance, epidemiology and end results (SEER), there will be an estimated 35,720 men and women (25,240 men and 10,480 women) diagnosed with oral cancer leading to 7,600 deaths. From 2002 to 2006, approximately 0.6% were diagnosed under age 20, 2.4% between 20 and 34, 6.8% between 35 and 44, 20.9% between 45 and 54, 26.2% between 55 and 64, 21.3% between 65 and 74, 16.1% between 75 and 84, and 5.8% in the 85 and more years of age. Based on the rates from 2004 to 2006, 1.02% of men and women born today will be diagnosed with oral cancer at sometime during their lifetime, representing one in every 98 men and women being diagnosed with oral cancer. As of January 1, 2006, the prevalence rate of oral cancer in the United States was approximately 244,473 men and women.[11]

Two objectives cited in Healthy People 2020, pertaining to oral cancer is to increase the proportion of oral and pharyngeal cancers detected at the earliest stage (target: 50%), and increase the proportion of adults who, in the past 12 months, reported of having had an examination to detect oral and pharyngeal cancers (target: 20%).[12]

Cost of Cancer Treatment

The financial costs of cancer treatment are often a burden to people diagnosed with cancer, their families, and society as a

whole. Cancer treatment cost was more than $72 billion in 2004 representing 4.67% of the total US spending for medical treatment. The additional economic burden of cancer due to morbidity and premature mortality is estimated to be over $120 billion resulting in a total economic burden of cancer in 2004 of $192.4 billion.[13] Between 1995 and 2004, the overall costs of treating cancer increased by 75%. In the near future, it is expected that cancer costs may increase at a faster rate than overall medical expenditures. As the population ages, the absolute number of people treated for cancer will increase faster than the overall population and cancer cases will increase relative to other disease categories, even if cancer incidence rates remain constant or decrease somewhat. Costs are also likely to increase at the individual level as new, more advanced, and more expensive treatments are adopted as standards of care. The head and neck cancer contributes to about 4.4% of all cancer treatment expenditures.[14] Health education and early detection of oral cancer not only improves the survival rate but also reduces the economic burden caused by oral cancer.

Oral Cancer Risk Factors

Most oral cancers can be prevented by avoiding risk factors, such as tobacco and alcohol use, excessive sun exposure, and sexual behaviors leading to exposure to the human papilloma virus (HPV). In 1957, cigarette smoking was first identified as an independent risk factor for oral cancer. Later, the use of tobacco products was confirmed, along with the use of alcohol, to be the major risk factors for the development of this type of cancer. Smoking and tobacco use are the most important oral cancer risk factors in the Central European population.[17] Excessive sun exposure can lead to cancer of lips. Recent studies have identified infection with human papilloma virus to be a risk factor for oral cancer.[15-17] A New England Journal of Medicine study showed that HPV-positive tumors were strongly associated with multiple oral sex partners.[18] Another study identified oral sex and open-mouthed kissing associated with development of oral HPV infection among college-aged men. Oral HPV infection was more strongly associated with the number of recent oral sex and open-mouthed kissing partners than with recent vaginal sex partners.[19]

A study conducted among American college students to delineate patterns of smokeless tobacco use showed that 8% of college students in the Northeast United States and 15% of students in the South Central United States used smokeless tobacco.[20] The study also found that many smokeless tobacco users believed that smokeless tobacco is less harmful than smoking and that earlier the age of initiation of smokeless tobacco, more likely the individual is to remain a user. The authors state that unless prevention efforts target this population, the problem will continue to increase and ultimately could result in an oral cancer epidemic.

Oral Cancer Knowledge, Attitude and Behavior

Early diagnosis greatly increases a patient's chance of survival as the mouth is very accessible for clinical and self-examination.

However, there is poor public awareness of the signs and symptoms of oral cancer and its risk factors. A study conducted in Great Britain to determine the public awareness and knowledge about oral cancer found that oral cancer was one of the least heard cancers by the public with only 56% of the participants being aware of oral cancer, whereas 96% heard of skin cancer, 97% lung cancer and 86% cervical cancer. There was 76% awareness of the link between smoking and oral cancer but only 19% were aware of its association with alcohol use.[21] This was consistent with another study conducted in New York City in an oral cancer screening program where 76% of the participants were aware of the link between smoking and oral cancer, whereas only 25% associated alcohol consumption with oral cancer. Furthermore, exposure to the sun was identified as a risk factor to oral cancer by only 25% of the participants. The study also identified knowledge as an independent predictor of oral cancer awareness and lack of awareness of existence of an oral cancer examination.[22] With regards to risk factor identification, the same trend was observed in a study conducted among students in South Texas.[23,24] The study found that students were ill-informed about the signs of oral cancer. There is a need to inform the public about the known risk factors of oral cancer, and to educate them on preventive behaviors of self-examination symptoms.

A study conducted in India evaluated the feasibility of mouth self-examination for high risk populations (all participants with tobacco use and/or aged 30 years and older). It was found that 3% of the participants who reported to the clinic after mouth self-examination using brochures and educational materials had oral cancer and 34% had precancerous lesions. Early detection of oral cancer increased the survival rates of these participants.[25]

Attitudes toward Oral Cancer

In a study conducted in Great Britain, 43% of the public surveyed was of the opinion that whether an individual develops cancer or not is a matter of chance. A fatalistic attitude to health may be a critical obstacle to changing lifestyles.[26] Education of the public, especially youth, may help change the common attitude that cancer affliction is a matter of chance. In a study conducted among American college students to assess their attitude towards a smoke-free campus to avoid the effects of tobacco use on health, 44% of the participants indicated disapproval to the policy indicating a negative attitude towards smoking reduction.[27]

Oral Cancer Risk Behaviors

A study conducted among adolescent high school students in South Texas found that alcohol consumption and smokeless tobacco use in male students were strong predictors of smoking behavior and increased risk for oral cancer among Mexican-American adolescent population.[23] Another study conducted among Indiana college students identified that 59.1% of the participants were consuming alcohol, 27.9% used cigarettes, 18.2% used marijuana and 4.2% used smokeless tobacco.[28]

A study conducted among US college students found that 8% of college students in the Northeast and 15% of students in the South Central US were using smokeless tobacco. In that study, the smokeless tobacco users were 17% American Indians, 14% Mexican-American, 12% White and 4% Black students. Almost 63% of the participants were planning to continue the habit, a serious problem in American colleges.[20]

Given the lack of awareness about preventive dental behaviors and regular oral health practices, such as brushing twice a day and visiting a dentist for preventive care among adolescent populations, the present study will assess the preventive behavior among college students at a state university in the Northeast United States. This study will focus on health science students, since previous studies have noted the potential role these professions can play in delivering health information regarding oral health. Health students specialize in preventive information and health promotion, hence their knowledge and behavior is important in promoting health behavior and educating individuals and groups. The literature also suggests that there is a need to improve oral cancer awareness and the knowledge level of populations. Although oral cancer typically is associated with older populations, educating younger populations, which may lead to avoidance of risk factors associated with oral cancer, may reduce its incidence and prevalence among older populations.

This study will assess the knowledge about the risk factors and symptoms of oral cancer, attitudes toward oral cancer and associated behaviors of college students. The study will identify correlations among the knowledge, attitudes and behaviors about the risk factors to oral cancer. The study will use the constructs of the Health Belief Model (perceived susceptibility and perceived severity) to determine the attitude of the students toward oral cancer. An understanding of this population may assist in the planning of interventions, which may promote healthy dental practices. The study will also examine predictors to oral cancer screening behavior of college students.

METHODS

Sample

A quantitative study was conducted among undergraduate and graduate students in the College of Health Science at a state university located in the Northeastern United States. The population was selected based on previous research studies and the assumption that health science students would have a better knowledge about oral health than the other college students, and that it is important that they have a good knowledge about health issues to serve the community in the future. Among the 1,300 students from the College of Health Sciences, a convenience sample of 300 students was selected. The sample size was determined based on the largest sample needed to conduct the analyses. The sample of students was selected to include the various departments within the College of Health Sciences to determine their knowledge, attitudes and behaviors related to oral cancer.

Instrument

A questionnaire was developed based on a CDC oral health questionnaire and previous peer-reviewed research studies. These research studies were related to oral health practices and oral cancer awareness covering oral health practices, such as brushing, tooth paste use, fluoride use, dental visits and substance use. The questionnaire had 25 structured questions and took about 15 minutes to complete. The survey was reviewed by health science faculty and Institutional Review Board (IRB) committee members, along with the proposal for the research and the informed consent document that was used during the data collection. The instrument had questions on general demographics of the students, including gender, age, academic standing, major, living arrangement, ethnicity and marital status.

In order to check regular oral health practices, a question on the frequency of tooth brushing, use of fluoride tooth paste, previous and next dental visits, purpose of the previous dental visit (prevention and treatment) were included. The questionnaire also included the students' perception about their oral health condition (good, fair, poor) and their knowledge about the presence of any dental disease (yes, no, don't know).

The knowledge of oral cancer addressed risk factors of alcohol consumption, excessive exposure to sun, HPV, tobacco products and unprotected oral sex. The questions also included a few other options, which are not identified as risk factors to oral cancer, such as air borne infection, kissing and food preservatives as distracters. The other part of the knowledge component identified in the literature was the identification of signs of oral cancer, which was assessed using a question on the precursors to oral cancer or what conditions come before getting oral cancer. The options included a sore on the lip/mouth that would not heal, dental caries, headache, difficulty or pain while swallowing, discoloration of teeth, red/white patch in the oral cavity and unexplained bleeding in the mouth.

The behavioral component was assessed by including an item on tobacco use (cigarettes, cigars, cigarillos, chewing/spit tobacco, other tobacco products). The questions also included the amount/number consumed per day, alcohol consumption and quantity, use of illicit drugs, having unprotected vaginal sex and having unprotected oral sex. The age of initiation was also an item on the questionnaire, since behavioral change with regards to smoking, alcohol and smokeless tobacco use depends on the age of initiation. The questionnaire also had an item related to the attitude towards quitting tobacco use.

There were questions on the oral cancer screening behavior included in the questionnaire. The survey also used the perceived susceptibility and perceived severity components of the Health Belief Model to assess the attitude towards oral cancer. The questions were "I am susceptible to oral cancer" and "if I get oral cancer it can kill me". The options used a Likert scale of strongly agree, agree, disagree, strongly disagree.

Procedure

During Fall 2009, 12 classes were selected from within the College of Health Sciences because they included students from a diversity of majors within the university, including graduate students. Prior permission was obtained from the faculty to conduct the survey after class. The students were informed about the purpose of the research and that the survey was anonymous, voluntary, and would be kept confidential. The survey questionnaire was distributed to the students in the class. The completed surveys were collected from each student without their identification. The same procedure was followed in all classes throughout the data collection period.

Analysis

The data was analyzed using SPSS version 18. A phi coefficient analysis was done to determine the correlation between the knowledge about the risk factors (unprotected oral sex, tobacco use, alcohol use) and engagement in the behaviors. An independent sample t-test was done to determine whether the attitude towards oral cancer correlated with the student indulged in the risk behaviors of having unprotected oral sex, used tobacco and alcohol.

A logistical regression was conducted to see if the oral cancer screening behavior could be predicted using the variables of the knowledge about the risk factors, attitudes toward oral cancer and risk behaviors. The dependant one was oral cancer screening and the independent variables were knowledge of the risk factor of oral cancer (overall correct score), able to identify the precursors of oral cancer (overall correct score), use of tobacco products, alcohol use, having unprotected sex, perceived susceptibility to oral cancer and its severity.

RESULTS

The survey was conducted among Health Science College undergraduate and graduate students.

Demographic Characteristics

The sample consisted of 39.5% male and 60.1% female undergraduate and graduate students (Table 1). The age of the participants varied from 18 to 52 years with a majority of them being between 19 and 23 years. Off-campus resident students comprised 67% of the sample and 33% lived on-campus. The survey included various majors in the College of Health Sciences consisting of health and physical education (30.2%), nursing (26.5%), athletic training (12.7%) and public health (23%). The majority of the students were white (85.6%).

Oral Health Knowledge Attitude and Behavior

Among participants, 63.6% perceived their oral health to be good, 34.7% perceived it to be fair and 1.7% perceived it to be poor (Table 2). Most students (95.5%) reported that they were not aware of any current dental disease. Regarding preventive

Table 1: Demographics

Gender	%
Male	39.5
Female	60.1
Type of residency	
On-campus	33.0
Off-campus	67.0
Major	
Health and physical education	30.2
Nursing	26.5
Athletic training	12.7
Public health	23.0
Others	7.6

Table 2: Oral health practices

Perceived oral health	%
Poor	1.7
Average	34.7
Good	63.6
Tooth brushing	*%*
More than twice a day	18.9
Twice a day	62.5
Once a day	16.5
Every few days	2.1

oral health, 16.5% of the participants brushed only once a day, 2.1% brushed every few days, 60.5% visited dentist for preventive care 62.2% had a dental visit within the last 6 months, 25.8% had a dental visit more than 6 months ago, 12% had a dental visit more than a year ago and 66.3% had scheduled for a dental visit in the next 6 months.

Oral Cancer Knowledge

The questionnaire included questions on the risk factors and signs of oral cancer. Almost all (94.5%) of the participants identified that tobacco was a risk factor for oral cancer, and less than half (47.1%) identified alcohol as a risk factor for oral cancer. Only 34.4% of the participants identified HPV to be a risk factor for oral cancer. The knowledge about the sun as a risk factor was also poor with only 23.7% of the participants identifying the sun as a risk factor for oral cancer. Less than half (45.7%) reported that unprotected oral sex was a risk factor.

Students reported the following as signs of oral cancer: dental caries (23.7%), discoloration of teeth (33%), and 49.1% did not identify pain/difficulty while swallowing as a possible sign of oral cancer. The majority of participants correctly identified a sore on the lip that would not heal (75.6%), a red/white patch (79.4%) and unexplained bleeding (75.9%) as signs of oral cancer.

Risk Behaviors

Of the participants using some form of tobacco, the age of initiation ranged from 12 to 22 years. Students reported engaging in the following risk behaviors related to oral cancer: 22.5% used tobacco, 79.4% of the participants used alcohol,

7.2% used some form of illicit drugs and 39.9% indulged in unprotected oral sex. Of those who used tobacco, 17.9% said they were not planning to quit within the next 6 months. Few (3.8%) of the participants were advised by their dentists that they were at risk for oral cancer and 91.8% of the participants reported never having an oral cancer screening before.

Susceptibility and Severity

The majority of participants (67%) did not think that they were susceptible to oral cancer, however 79.3% perceived that if they suffer, it would be very severe and could kill them.

Knowledge about Risk Factor and the Related Behavior

Three separate chi-square tests were conducted to determine if there was a correlation between knowledge about the oral cancer risk factors of tobacco use, alcohol use, and having unprotected oral sex and engaging in the behaviors (Table 3). There was no significant correlation in having knowledge about tobacco ($\chi^2 = 1.63$, $p > 0.05$), alcohol use ($\chi^2 = 0.005$, $p > 0.05$) and having unprotected oral sex ($\chi^2 = 0.28$, $p > 0.05$) as risk factor of oral cancer and engaging in the behaviors.

Risk Behaviors and Attitudes toward Oral Cancer

Six separate independent t-tests were conducted to determine if there was a relationship between tobacco use, alcohol use, and having unprotected oral sex, and perceptions of susceptibility and severity of getting oral cancer (Table 4). There was a significant correlation between the behavior of use of tobacco and the perceived susceptibility (t = 8.10, $p < 0.05$) and perceived severity (t = 2.22, $p < 0.05$) if a person got oral cancer. There was no significant correlation between

Table 3: Oral cancer knowledge, attitude and behavior

Risk factor knowledge vs behavior	χ^2
Tobacco	1.63
Alcohol	0.005
Unprotected oral sex	0.28

*$p < 0.05$

Table 4: Correlations of risky behaviors with attitudes

Risky behaviors and attitudes	t
Tobacco use and perceived susceptibility	8.10*
Alcohol use and perceived susceptibility	1.56
Unprotected oral sex and perceived susceptibility	0.22
Tobacco use and perceived severity	2.22*
Alcohol use and perceived severity	0.85
Unprotected oral sex and perceived severity	0.52

*$p < 0.05$

alcohol use and having unprotected oral sex with perceived susceptibility and severity of getting oral cancer.

Three separate logistical regression analyses were conducted. The independent variables of knowledge about oral cancer, attitudes and behaviors leading to oral cancer were used to predict the dependent variables of oral cancer screening, informed by the dentist of being at risk for oral cancer and scheduling a future dental visit. There were no significant variables which predicted oral cancer screening. Knowledge about the risk factors was the only variable predicting whether a participant was informed about the risk of developing cancer. The Max-rescaled R^2 was 0.06, which indicates that 6% of the variance is explained by the logistic regression model. A logistical regression analysis was undertaken to determine which independent variable best predicted the scheduling of future dental visit among the participants. The only variable, which predicted the scheduling of a future dental visit was previously having a dental visit. The Max-rescaled R^2 was 0.27, which indicates that 27% of the variance of scheduling a future dental visit is explained by the logistic regression model.

COMMENT

The purpose of this study was to identify and describe the oral health practices and oral cancer knowledge, behavior and attitudes among college students. While the practice of recommended oral health practices like brushing teeth twice a day, visiting a dentist every six months for preventive care was not always performed, it was high when compared to previous studies conducted.[5-8] This level of performance may be explained due to the fact that the study was conducted in an industrialized country, such as the United States and among health science students. The health science students included health education, athletic training, nursing and other majors, who specialize in health. Also, the perceived oral health of the participants and their awareness towards present oral disease was also found to be better than that reported in these previous studies. One-third of the population surveyed showed irregular dental visits, which could be related to high costs, lack of insurance or unavailability of dentists or for other personal reasons.

While looking at knowledge about the risk factors of oral cancer, tobacco was easily identified by most of the participants as a risk factor whereas the association between alcohol and oral cancer was not identified by the majority of the participants. This is consistent with the other studies conducted in New York City, Texas and worldwide,[21-24] and this could be due to the increased awareness, social campaigns and policy changes made in several parts of the world to create awareness about the ill effects of tobacco and its products. Among college students, the use of alcohol is a common risk behavior. Consistent with previous studies, the findings from the current study also suggest the need to educate students on the risk factors and behaviors associated with oral cancer. The attitude of the students also reflected the knowledge about tobacco as

a risk factor with only the tobacco users' behavior being correlated with the perceived susceptibility construct of the Health Belief Model.

There is also a need for awareness toward unprotected oral sex behaviors and the HPV as a risk factor for oral cancer. Given the age of the participants and the long latent period of oral cancer, these behaviors are of high risk. The correlation with unprotected oral sex behavior and attitude was not significant, indicating a need for education in this area. All correlation tests identified a need for educating the students on the ill effects and consequences of the risky behaviors, as there was no significant correlation found between their knowledge about risk factors and their behavioral choices.

The logistic regression tests also predicted that the knowledge about risk factors is the only variable that could predict whether a participant is informed about the risk of developing oral cancer. This test also indicates the importance of educating this population about the risky behaviors. Also, the study predicted the importance of routine oral health behavior by predicting the last dental visit made as the predictor of scheduling for the next dental visit.

LIMITATIONS

This nonexperimental, quantitative research study has certain limitations. The study was conducted among a purposive sample in the College of Health Sciences. Also, the instrument used was modified from another validated instrument to fit the general population. These two limitations, sample selection and instrumentation may pose a threat to the internal and external validity of this study. Since the sample selected was the College of Health Science students, the knowledge about the risk factors could be higher than the general college students of the same age group leading to sampling threats to the internal and external validity. Further, studies in the area of oral cancer risk behaviors among these population groups should focus on the HPV related risky behaviors.

CONCLUSION

This study adds to the growing literature on oral cancer screening with special emphasis on educating college student populations on the risk factors and signs of oral cancer, and hence improves the attitude and reduces risky behavior. It was evident that the use of tobacco was lower relative to other risky behaviors like alcohol consumption and unprotected oral sex. Since the knowledge about these risk factors was low, it may lead to college students not having an appropriate attitude toward related behaviors, especially toward alcohol consumption and HPV related exposure behaviors. As a result, these risk factors may be more likely to affect college students risk of getting oral cancer than other factors. Additionally, education should focus on the signs of oral cancer, aid in the self-examination and screening, and also identifying the condition in its early stage. These screening methods will help to lower the mortality rate of the cancer by interrupting the progression of the condition.

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