



HPV and Oropharyngeal Cancer: A Study on the Level of Knowledge in Dental Students in Uniandes

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Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 11 Sept 2023	The aim of this research study was to evaluate the level of knowledge about the human papillomavirus (HPV) associated with oropharyngeal cancer in dental students. A mixed methodological approach was used, combining qualitative and quantitative elements. The sample consisted of eighty-seven students from the 9th and 10th semester courses of the Regional Autonomous University of Los Andes. Direct observation of academic activities was used and a survey with a 21-question multiple-choice questionnaire was administered to assess the level of knowledge of the participants. Data were coded and analyzed using Microsoft Excel, using descriptive statistics to summarize responses. The results revealed a need to improve the level of knowledge in dental students about HPV and its relationship with oropharyngeal cancer. Areas of deficiency were found in the understanding of etiology, epidemiology, risk factors, prevention methods, and treatment. These findings highlight the importance of more comprehensive and focused education on this topic. This study provides a comprehensive view of the level of knowledge of dental students about HPV and oropharyngeal cancer. The results obtained contribute to awareness and education in this field, as well as to the identification of possible areas for improvement in the training of future dental professionals.
CC License CC-BY-NC-SA 4.0	Keywords: Human Papilloma Virus, Oropharyngeal Cancer, Knowledge level, UNIANDES students

1. Introduction

The human papillomavirus (HPV) is a tiny DNA virus that was first discovered in 1950 in the skin and mucous layer of the skin, where it causes a variety of lesions. Since then, a close relationship has been established between this virus and the pathogenesis of cervical cancer. In addition, important characteristics related to head and neck cancer have recently been identified, which has positioned HPV as the main infectious etiological agent in this type of cancer (1,2).

Oropharyngeal cancer is a disease that affects approximately 100,000 people a year worldwide, and ranks sixth in terms of global incidence, after colorectal, breast, prostate, bladder and uterine cancer. Despite accounting for only 15-20% of all cancers of the respiratory and digestive tract, most of these cases correspond to squamous cell carcinomas (3,4). These carcinomas have a significant impact on vital functions such as swallowing, as they affect the integrity of complex anatomical areas (3).

In Ecuador, the cancer situation and the epidemiology of HPV are complex and uncertain. Cervical cancer is the second leading cause of death from malignant tumours in women in the country. Anatomical regions such as the oropharynx and anogenital area are sites of affinity for approximately 40 sexually transmitted HPV genotypes, considered potentially oncogenic (5). However, research and information on oropharyngeal cancer and its relationship to HPV are scarce in Latin America.

A study conducted in Chile in 2005 evaluated the morbidity and mortality of oral and oropharyngeal cancer, revealing that this represents only 1% of all cancers, and that malignant tumours are mostly squamous cell carcinomas of the mouth and oropharynx, with a predilection for the tongue (6). Oropharyngeal cancer refers to tumours that originate at the base of the tongue, tonsils, soft palate, and back wall of the pharynx. Approximately 80% of HPV-induced carcinogenesis occurs in the oropharynx, especially in the tonsils (53.9%) and in the posterior third of the tongue (47.8%), as these sites facilitate viral infection (7,8).

Oropharyngeal cancer occurs in two main variants: one associated with HPV, which is related to high-risk viral genotypes, mainly subtype 16, although prevalence of subtype 18 has also been observed; and another not associated with HPV, which usually develops due to alcohol and tobacco consumption, manifesting as premalignant lesions of the oropharyngeal and laryngeal mucosa that can lead to carcinogenesis (4,9). Although tobacco, alcohol and poor oral hygiene are recognized as risk factors for oropharyngeal cancer, HPV infection is becoming increasingly relevant. Therefore, it is essential to establish primary prevention measures and ensure early diagnosis and accurate identification of the type of cancer for secondary prevention (4, 10, 11).

While the incidence of HPV-related cervical cancer is decreasing, there is an increase in the incidence of HPV-associated oral and oropharyngeal cancer, which has led to HPV-positive oral tumours being considered an epidemic. In addition, it is important to note that the highest rates of oral HPV infection occur in men (9,12). Therefore, HPV-associated oropharyngeal cancer should be considered equally relevant as certain types of anogenital cancer and cervical cancer, forming part of the classification of sexually transmitted diseases due to its route of infection, which increases the prevalence of this infection. Other common risk factors include alcoholism and smoking (3).

Unlike non-HPV-associated oropharyngeal cancers, patients with HPV-positive tumours are usually more sensitive to radiation and have a better survival rate. These cases usually manifest in white men under 60 years of age who have little or no relationship with alcohol or tobacco use, but are more related to the number of sexual partners throughout their lives, oral sexual practices and contact with people of the same sex. It has also been mentioned that early sexual activity can be a risk factor (13-15).

In North America, approximately 26 million people are infected with HPV, according to studies conducted in the United States. The prevalence of HPV-related head and neck cancer has increased over the past 15 years, including oropharyngeal cancer, and has been observed to increase in young men and developed countries (16,17). In the United States, there has been an incidence of more than 53,000 cases and 11,000 deaths due to this disease in 2013. Although precancerous lesions are rare, their malignant transformation is relevant since their early detection can help us develop prevention strategies in high-risk groups. Therefore, examinations performed by dentists should be based on a thorough examination, especially in patients with risk factors for head and neck cancer (18, 19).

Although HPV-associated oropharyngeal cancers do not have keratinizing dysplasias, they usually present with smaller tumours and greater lymph node involvement. Histologically, these tumours have a nonkeratinizing morphology, and the presence of keratinization should be less than 10% if present (8). The main challenge in detecting HPV-associated oropharyngeal cancer is that it is often diagnosed in advanced stages, as symptoms are scarce and usually only a mass is seen in the neck. In contrast, cases not related to HPV often present with signs of local invasion, such as sore throat, dysphagia, odynophagia, bleeding, or weight loss. Therefore, identification of the virus has been recommended as part of the diagnosis, and the American College of Pathologists suggested increasing routine pathologic examination in oropharyngeal cancer biopsies (6).

Early diagnosis and appropriate treatment in the early stages of non-HPV-associated oropharyngeal cancer is crucial. To achieve this, it is advisable to minimize risk factors, treat premalignant lesions, follow a balanced diet and lead a healthy lifestyle. In addition, pharmacological or surgical treatments can be employed, along with rigorous follow-up. On the other hand, considering the importance of oropharyngeal cancers associated with HPV infection, preventive measures should be adopted in the practice of oral sex. Vaccination against the different HPV genotypes can also be considered as a preventive measure, although its efficacy is yet to be determined (4).

The main treatments for oropharyngeal cancer include radiation therapy, surgery, and chemotherapy. However, research is currently underway to reduce the intensity of treatment in HPV-positive patients, as they tend to respond more favourably compared to non-HPV-related cases. Despite this trend, not enough evidence has yet been collected to establish differentiated therapy for each type of carcinoma. Therefore, the current treatment for both types of cancer is similar (7,8).

The choice of treatment is based on TNM stage (tumor, nodule, metastasis) and anatomical location. HPV-associated oropharyngeal cancer responds better to treatment with radiation therapy, especially intensity-modulated radiation therapy, and has a higher survival rate. In approximately 80% of cases, radiation therapy may be sufficient, as it probably affects the capacity of HPV E6/E7 proteins or induces apoptosis in carcinomas through the presence of TP53 (7,20). However, each patient presents with a unique diagnosis, involving different treatments, which may include neoadjuvant, adjuvant or concomitant chemotherapy, as well as early-stage surgery to avoid the adverse effects of other treatment methods, or extensive surgery in advanced stages (8).

Although there have been numerous investigations in the field of medicine on this subject, which has allowed access to extensive information, the same does not happen in the field of dentistry, despite the fact that HPV is a common virus in the oral cavity. Therefore, research on this topic is inconclusive and continues to be studied (21,22). Consequently, the objective of this article is to determine the level of knowledge about the human papillomavirus associated with oropharyngeal cancer in 9th and 10th semester students of the dentistry career at the Autonomous Regional University of Los Andes during the academic period from October 2020 to March 2021.

2. Materials And Methods

This Research Design: This study was conducted using a blended approach that combined qualitative and quantitative elements to obtain a comprehensive understanding of the level of knowledge about human papillomavirus (HPV) associated with oropharyngeal cancer in 9th and 10th semester dental students. Two main instruments were used: observation and a survey with a questionnaire of 20 multiple-choice questions.

Participants: The sample consisted of a total of 87 students of the dentistry career of the Regional Autonomous University of Los Andes. These students were selected from the 9th and 10th semester courses during the academic period from October 2020 to March 2021.

Procedure: Initially, a direct observation of the students' academic activities in the classroom was made to obtain an overview of their level of knowledge on the topic of HPV and oropharyngeal cancer. Subsequently, a survey consisting of a questionnaire of 21 multiple-choice questions was administered. This questionnaire was specifically designed to assess students' level of knowledge regarding HPV and its association with oropharyngeal cancer. The questions covered various aspects of the topic, including its etiology, epidemiology, risk factors, prevention methods and treatment.

Data Analysis: Once the data was collected, it was coded and analyzed using Microsoft Excel. Descriptive statistics were used to summarize the responses of the survey participants. Frequencies and percentages were calculated for categorical data, allowing an overview of students' knowledge and perceptions of HPV and oropharyngeal cancer.

This blended methodological approach, which combined observation and survey, provided a comprehensive and enriching perspective on dental students' understanding of HPV and its relationship to oropharyngeal cancer. The results obtained through this study will contribute to improving awareness and education in this field, as well as identifying possible areas for improvement in the training of future dental professionals.

3. Results and Discussion

The results of the questionnaire applied are set out below:

The oropharynx is made up of palatine and lingual tonsils, soft palate and:

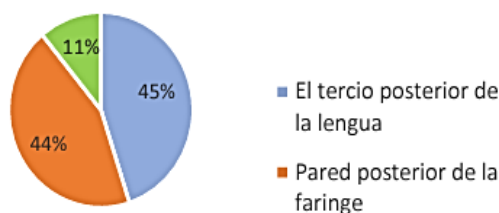


Figure 1. Answer to question 1. Source: Authors.

Regarding how the oropharynx is formed, 5% of the students answered correctly; 45% mentioned that it is made up of the posterior third of the tongue, 44% that it is the posterior wall of the pharynx and 11% the floor of the mouth.

Pregunta 1. You consider all HPV genotypes to be oncogenic

43% of students answered this question correctly and 57% do not consider HPV genotypes to be oncogenic.

Pregunta 2. Which of the following areas do you think is affected by HPV?

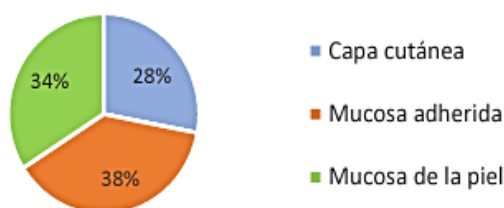


Figure 2. Answer to question 3. Source: Authors.

4% of students answered this question correctly; 28% mentioned that the affected area is skin layer, 38% adhered mucosa and 34% believe that it is skin mucosa.

Pregunta 3. Do you consider HPV16 to be linked to oropharyngeal cancer

82% of the students answered this question correctly while 18% stated that oropharyngeal cancer is not related to the HPV-16 subtype.

Pregunta 4. Do you think the HPV vaccine is only for women

63% of students answered this question correctly, but 37% of students say the vaccine is only for women.

Pregunta 5. The presence of HPV in the oral cavity may be a risk factor for oral or oropharyngeal cancer.

94% of the students answered this question correctly and 6% stated that the presence of HPV is not a risk factor for oral or oropharyngeal oncogenesis.

Pregunta 6. Which of the following risk factors do you think is most important for developing oropharyngeal cancer?

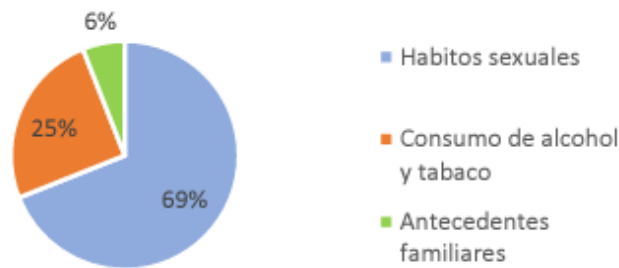


Figure 3. Answer to question 7. Source: Authors.

25% of the students answered this question correctly mentioning that the risk factors are the consumption of alcohol and tobacco, however, that a risk factor is family history while 6% that are sexual habits.

Pregunta 7. You think that the risk factor that is most related to the development of HPV-associated oropharyngeal cancer is sexual habit.

88% of the students answered this question correctly, but 12% state that the risk factor that is most related to HPV is not the sexual habit.

Pregunta 8. Do you regularly have a clinical diagnostic exam for precancerous lesions or possible oral or oropharyngeal cancer?

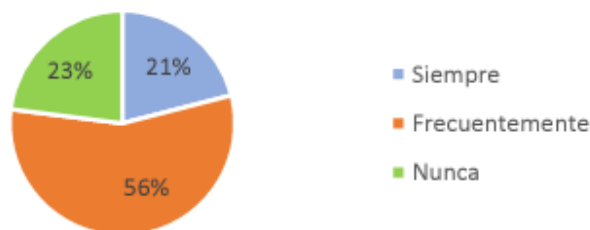


Figure 4. Answer to question 9. Source: Authors.

21% of the students of the Universidad Regional Autónoma de los Andes of 9th and 10th semester always perform a diagnostic clinical examination to detect precancerous lesions or possible oral or oropharyngeal cancer, while 56% perform it frequently and 23% do not.

Pregunta 9. For the diagnosis of oropharyngeal carcinomas, you think it is important to perform the initial examination, visual examination, palpation of the mucous membranes, and palpation of lymph nodes for the detection of certain masses or lymph nodes.

98% of students consider it important to perform clinical examination for the detection of oropharyngeal carcinomas, however, 2% do not consider it important.

Pregunta 10. HPV-associated oropharyngeal cancer usually has:

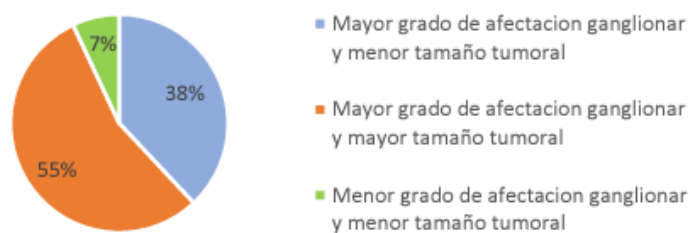


Figure 5. Answer to question 11. Source: Authors.

38% of the students who completed the questionnaire answered this question correctly, mentioning that they have a greater degree of lymph node involvement and smaller tumor size, while 55% state that HPV-associated oropharyngeal cancer usually has a greater degree of lymph node involvement and a larger tumor size, and 7% consider that it has a lower degree of lymph node involvement and smaller tumor size.

Pregunta 11. You consider that among the symptoms that usually occur in the diagnosis of oropharyngeal cancer associated with HPV are signs of local invasion, such as sore throat, dysphagia, odynophagia, bleeding or weight loss.

10% of students answered this question correctly and 90% consider HPV-associated oropharyngeal cancer to show signs of local invasion.

Pregunta 12. What are the anatomical sites of preferential involvement in the HPV-associated oropharyngeal?

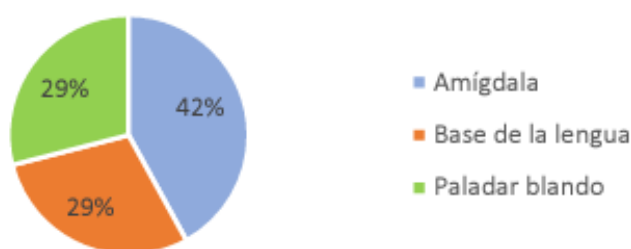


Figure 6. Answer to question 13. Source: Authors.

13% of the students answered this question correctly mentioning the amygdala and base of the tongue as a site of affection; 42% mention the tonsil, 29% consider it the basis of the tongue and the other 29% think it is the soft palate.

Pregunta 13. In most cases of HPV-associated oropharyngeal cancer, is men at higher risk than women?

Pregunta 14. 39% of the students answered correctly however 61% consider that men have no greater risk than women in HPV-associated oropharyngeal cancer.

Pregunta 15. You believe that patients younger than 60 years of age have a higher prevalence of HPV-associated oropharyngeal cancer.

67% of the students answered this question correctly, although 33% consider that patients under 60 years of age do not have a higher prevalence

Pregunta 16. Which of the. The following considers to be the common histological morphology of HPV-associated oropharyngeal cancer.

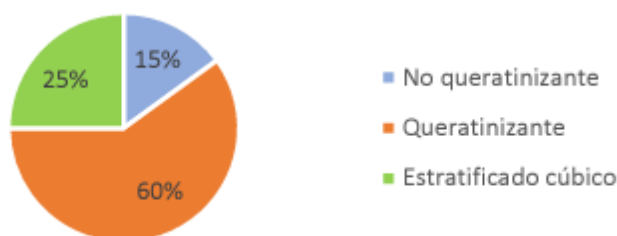


Figure 7. Answer to question 17. Source: Authors.

Of the students, 15% answered correctly mentioning that the common histological morphology of HPV-associated oropharyngeal cancer is nonkeratinizing, while 60% consider it to be keratinizing and 25% mention it is cubic stratified.

Pregunta 17. What do you think is the best treatment for HPV-associated oropharyngeal cancer?

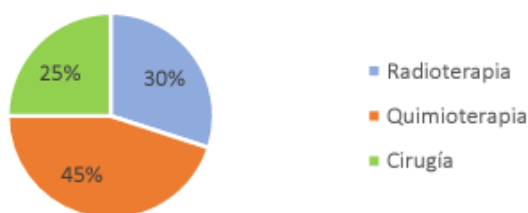


Figure 8. Answer to question 18. Source: Authors.

30% of students consider that the optimal treatment is radiotherapy, 45% think that it is chemotherapy and the remaining 25% mention that it is surgery.

Pregunta 18. Due to its clinical and histopathological characteristics, HPV-associated oropharyngeal cancer presents:

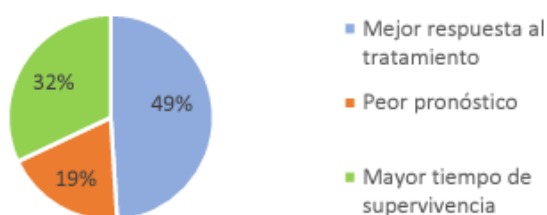


Figure 9. Answer to question 19. Source: Authors.

7% of students answered this question correctly; 49% mentioned that they have a better response to treatment, 19% think they have a worse prognosis and 32% consider that they have a longer survival time.

Pregunta 19. How he considers his university training on HPV associated with oropharyngeal cancer

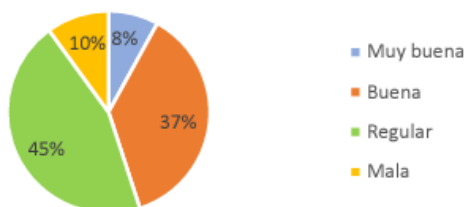


Figure 10. Answer to question 20. Source: Authors.

8% of students said that the training is very good, 37% that it is good, 45% mention that it is fair and the remaining 10% that it is bad.

Pregunta 20. How important it is for you as a future dentist to have knowledge about oropharyngeal cancer.

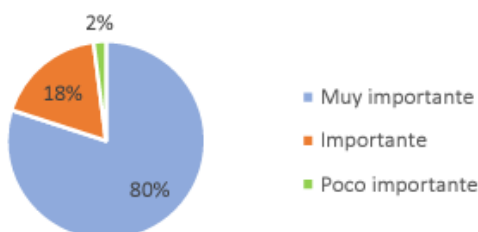


Figure 11. Answer to question 21. Source: Authors.

The importance of having knowledge about oropharyngeal cancer for 80% of students is very important and for 18% it is important while for 2% this topic is unimportant.

There are different types of specialties within dental practice that allow us to assess the variety of pathologies presented by patients. Within the world population there is a high incidence of oropharyngeal cancer occupying the sixth place. Generally, when talking about oropharyngeal cancer, it is associated with tobacco and alcohol consumption, therefore its relationship with HPV is little studied. As it could be seen from the results, the knowledge that dental students have about HPV-associated oropharyngeal cancer is regular, since the average is 38.94%.

Several studies comment:

- the knowledge of students regardless of their area is limited; therefore, they suggest that it is necessary to implement HPV study and prevention programs to raise awareness among people especially in health care (23).
- the knowledge of dental students about the risk factors, symptoms and prevention methods of HPV-related cancer in which a moderate level of knowledge was evidenced (24).
- medical students showed basic knowledge correctly identifying risk factors and less than a quarter identified HPV as a potential risk factor. Although in dental students' knowledge about HPV and its relationship with head and neck cancer was considerably low by less than 50% of students. The students did not know certain information among them that the average age of patients decreased and that patients are more likely to lack risk factors such as tobacco and alcohol (25).
- university students had a knowledge of 95.9%, that is, excellent, about the virus and its relationship with cancer, however, it does not coincide with what was published by Bustamante Ramos et al, since the latter author also reported that there was 14x clinical pressure of infection due to ignorance among students about viruses and cancer (26, 27).
- One of the essential points about the role of the dentist in the face of this virus is the importance of informing patients about the existence of HPV, discussing the pros and cons of vaccination against the virus, as well as making early diagnosis. Dental schools should add this topic to their curriculum for proper preparation of students and their future professional roles (28).
- the participation of the dentist as the first line of care of the oral cavity is of great relevance for early identification, so updating knowledge about HPV is a growing need, in order to (29). be able to identify mucosal changes due to HPV in a timely manner.

Hence the importance of always evaluating the level of knowledge of the specialists who will tend to patients to insert adequate training with specific topics in case any need is detected. This will raise the quality of life of the patient and the level of medical care of the institution with a high level of professionalism. (30, 31)

4. Conclusion

As evidenced from the results obtained from the present study on the level of knowledge of dental students at the Universidad Regional Autónoma de los Andes is regular, the findings reveal the need to reinforce knowledge about HPV infection and its association with oropharyngeal cancer. Future dentists should be aware of the importance of cancer screening so they should be familiar with the risk factors, clinical manifestations and their treatment therefore the prevention practice and issues about HPV associated with head and neck cancers should dentally schools. It is essential that health teams and especially dentists have up-to-date information on HPV in order to thoroughly investigate the current situation of the virus in these carcinomas, since the main neoplasm associated with HPV is oropharyngeal cancer that occurs more and more frequently in young patients who have little or nothing What to do with known predisposing factors such as alcohol or tobacco.

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