

Human papillomavirus (HPV) and its vaccine: awareness and opinions of clinical dental students in a UK dental school

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Key points

Shows that students in the Bristol Dental School understood the links between HPV and oropharyngeal carcinoma and its vaccination process.

Shows that students demonstrated that they believe oral healthcare practitioners have a role to play in health promotion regarding oral and oropharyngeal cancer but desired more teaching on the topic.

Shows that students felt unprepared to discuss the disease and associated risk factors with patients but further clarification as to why is needed.

Introduction Dental clinicians are in a position to educate their patients on the subject of HPV as part of a primary healthcare multidisciplinary team and to detect HPV-related disease. Attention needs to be paid to dental undergraduate teaching on the topic. This study aims to ascertain awareness and opinions of our dental undergraduate students about HPV, its relation to oral health and its vaccine. **Method** A questionnaire was distributed to undergraduate dental students in clinical years 3, 4 and 5 of the BDS programme at Bristol Dental School. **Results** Dental students demonstrated an understanding of HPV and oropharyngeal cancer and expressed that they felt dentists should play a role in health promotion in relation to oropharyngeal cancers. They also wished for more teaching on the subject and suggested topic areas that they wished to know more about. **Conclusion** New teaching strategies on the topic of HPV should be considered for inclusion into undergraduate dental programmes and encompass both knowledge and communication skills training to prepare future dentists for their role in confronting this preventable disease.

Introduction

The human papilloma virus (HPV) is established as an aetiological risk factor for oropharyngeal cancer.¹ The number of cases of oropharyngeal cancer in the UK has risen significantly over the last two decades with the age-specific greatest increase in incidence seen in the 40–69 year old age group² and a similar increase in cases has been noted in other countries.³ HPV, in particular HPV-16, has seen a significant rise

in association with oropharyngeal cancer over the last decade⁴ and is identified in approximately 50–60% of cases.^{2,4–6} HPV is thought to explain the pattern of oropharyngeal cases in the under 60, heterosexual, non-smoking, low alcohol drinking male cohort. Evidence suggests transmission of HPV is via high-risk sexual activity⁷ and is associated with the number of sexual partners and oral sex partners over a lifetime.^{8–10} Tumour HPV status is considered to be a major prognostic factor for patients with oropharyngeal carcinoma¹¹ with survival for patients with HPV positive tumours being better.^{12,13} Management of patients with HPV-related oropharyngeal cancer is a high interest area of current research¹⁴ as effective treatment modalities differ from their non-HPV-related counterparts.

Oral health professionals can play a role in the prevention of HPV-related oropharyngeal cancers by educating patients about the risks of HPV transmission, instructing about lifestyle change and by encouraging patients and their relatives to participate in HPV vaccination

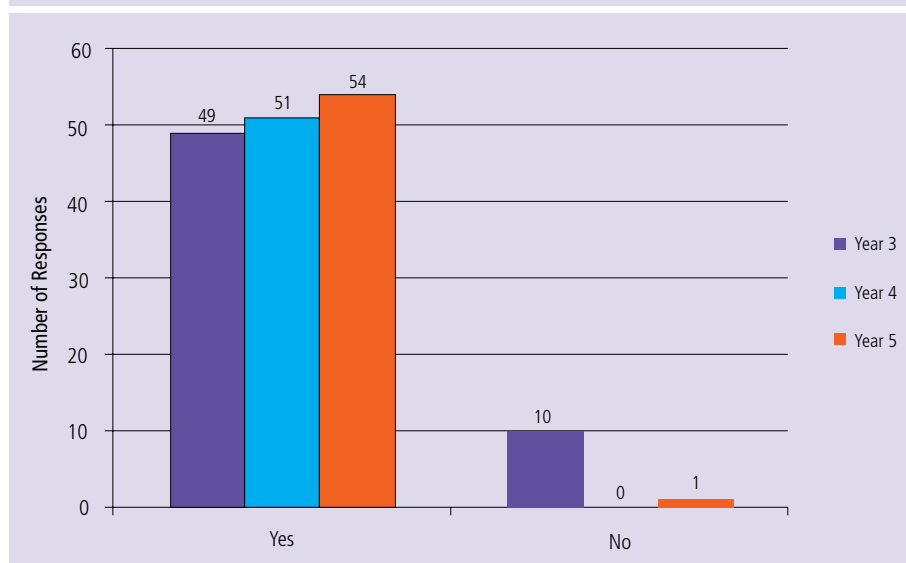
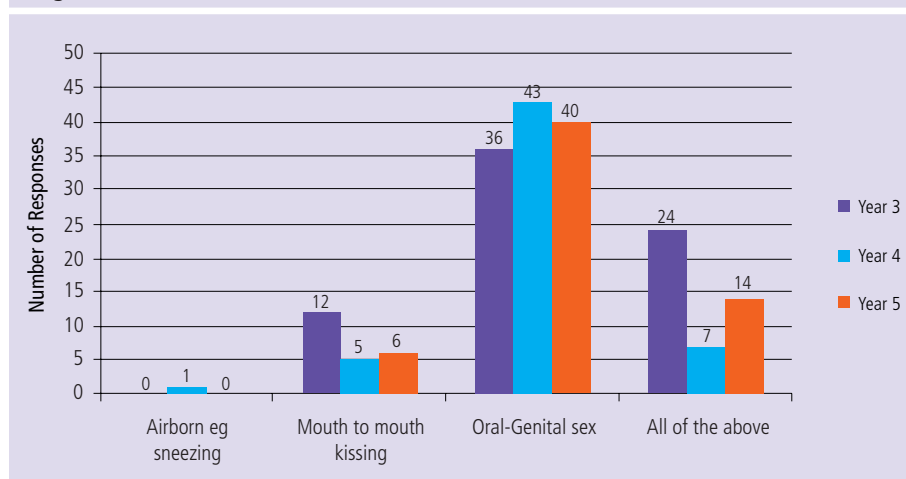
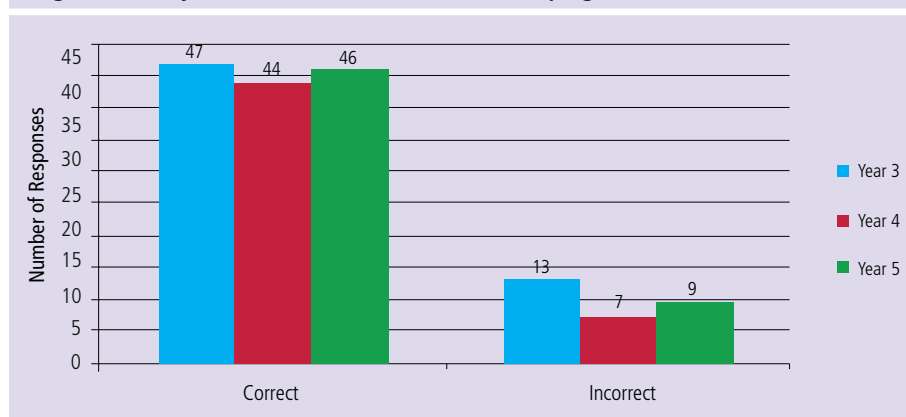
programmes.^{15–17} There is a view in the United States that dental healthcare providers should be involved in education of their patients about HPV and its link to oropharyngeal cancers^{18,19} and some suggest oral health professionals should be at the forefront of confronting the 'HPV related oropharyngeal cancer epidemic'.¹⁸ Given that 28.9 million people accessed NHS dental care in the 24 months ending 31 December 2016,²⁰ dental teams have a real opportunity to engage with a significant number of people about this escalating disease.

Since 2008, the current HPV vaccination programme in the UK has included girls aged 11–13, aimed at prevention of cervical cancers. Thus far, it is reported to have decreased cancer rates by 86% in those women eligible for the vaccination as adolescents.²¹ Many organisations, including the British Dental Association²² have successfully campaigned to include vaccinations for adolescent boys as well. The HPV vaccination became available for men who have sex with men in April 2018 after successful pilots in the UK²³ and, most recently, the HPV vaccine has been

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Fig. 1 Can HPV cause oropharyngeal cancer?**Fig. 2 How is HPV contracted?****Fig. 3 Who do you think receives the HPV vaccine in programmes within the UK?**

proved to be cost effective in teenage boys and it is now to be offered to those in this cohort.²⁴

Articles on the subject of HPV have been presented more recently in dental literature in the UK^{25–28} and a recent study concluded that

UK dental students lack confidence in communicating with patients about HPV.²⁹ It is clear that educational interventions are required to keep all dental professionals up to date with the rapidly changing landscape of oral and

oropharyngeal cancer,³⁰ in addition to training in communication skills to connect sensitively with their patients about potentially delicate subjects around sexual activity.

The present study has been conducted, as part of our teaching evaluation and development process, with an aim to ascertain the current awareness and opinions of HPV and its vaccine among our dental undergraduate students. The outcome of the study will inform the undergraduate dental teaching programme review process to ensure our students graduate to carry out effective health promotion on this subject.

Methods

A cross-sectional study was performed among undergraduate dental students in years 3, 4 and 5 of the five-year Bachelor of Dental Surgery programme at Bristol Dental School. A questionnaire (Appendix 1) was developed using previous literature^{8,29} and validated by means of a round table discussion. Ethical approval was obtained via the University of Bristol, Faculty of Medicine and Dentistry Ethics Committee.

The clinical dental undergraduate students were selected because all these students had received some teaching about HPV, the extent of which depending on which year of the programme they were enrolled in. The students were advised by email one week ahead of questionnaire distribution that they would be surveyed using a hard copy of the questionnaire at the end of a specified lecture. Students in all years were given the opportunity to leave without completing the survey. Questionnaires were deposited by students in a drop box after they had completed them. Completed questionnaires were immediately entered in to a secure password protected university accessed database. Descriptive analysis was applied to the data.

Questions were developed to acquire qualitative data to assess dental students':

- Current awareness about HPV and its link to oropharyngeal cancer (yes/no answers)
- Knowledge of the methods of HPV transmission (single best answer)
- Knowledge of the current UK vaccination schedule (single best answer)
- Opinions on the importance of the role that general dental practitioners play in health promotion related to oral and oropharyngeal cancer (four point Likert scale)
- Views on how much more information regarding HPV and its vaccine they would like to be taught (4-point Likert scale).

In addition, a free text area was included to gain further information regarding what else students would like to know about HPV.

Results

Response rates

A total of 167 questionnaires were returned from the 211 students across the three clinical years, giving a response rate across all years of 79%. Students from third year responded highest with a 92% response rate, followed by year 5 at 74% and then year 4 with a response rate of 72%. The absolute number of responses follows this trend with 61, 55 and 51 responses respectively.

Responses to questions regarding HPV awareness

The results to the questions relating to students' awareness of HPV and its link to oropharyngeal cancer, awareness of HPV transmission and the HPV vaccine are illustrated in Figures 1 to 3. There was a slight decrease in responses to individual questions. The questions represented by Figure 1 had two respondents not answer and Figure 3 lacked one answer. In summary: 93% of students knew HPV can cause oropharyngeal cancer, 71% knew it could be contracted via oral-genital sex and 83% correctly identified the cohort eligible for the vaccine under the NHS at the time. With regard to the latter point, half of those who responded incorrectly chose answers that included the correct cohort.

Role of the dentist

Students were asked how important they thought the role of the dentist is in health promotion related to oropharyngeal cancer. In total 143 (86%) students responded that the role of the dentist was either important or very important. Only two students, both from year 3, responded that the dentist's role was not important at all. The results are illustrated in Figure 4.

Dental education

When the students were asked how much more they felt they needed to know about HPV and its vaccine, 139 (83%) of 167 responders answered 'some more' or 'lots more' as illustrated in Figure 5. Only three students (2%) felt they knew enough about HPV and its vaccine.

The free text answers to 'What more would you like to know about HPV and its relation to oral health?' were categorised into 'knowledge'

Fig. 4 How important is the role of the dentist in health promotion regarding oral and oropharyngeal cancer?

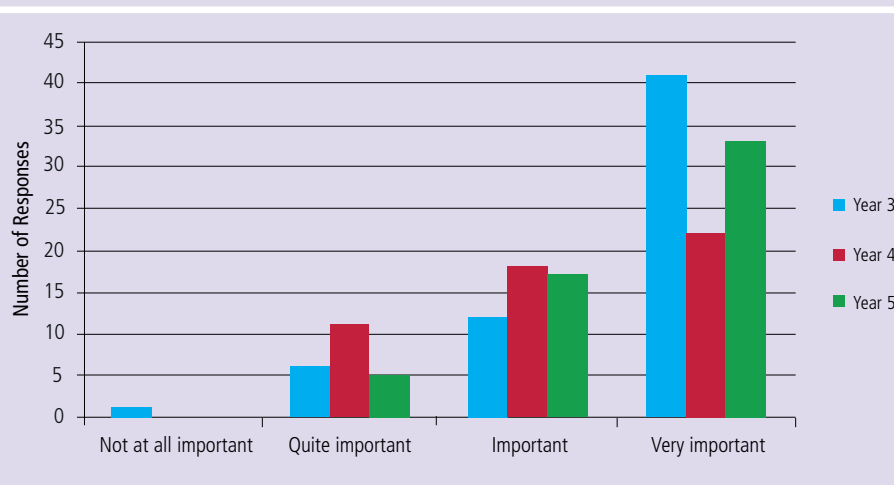
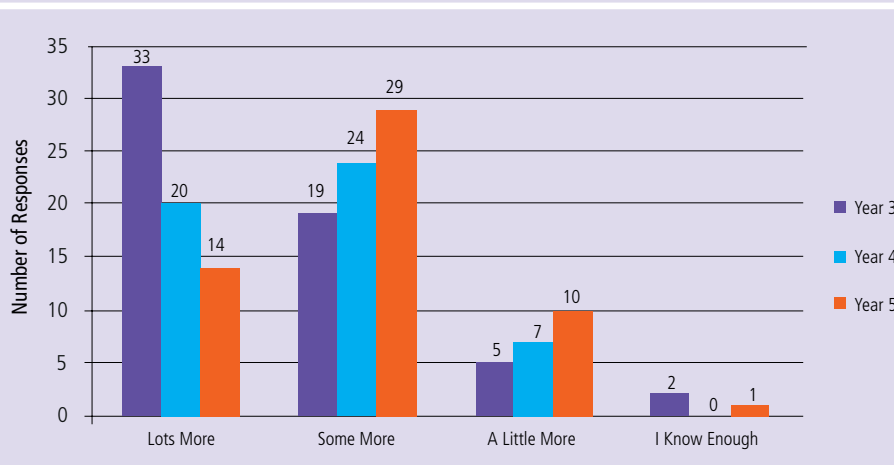


Fig. 5 How much more do you feel you need to know about HPV and its vaccine to inform your patients?



and 'communication' themed comments. The responses are summarised in Table 1. Across all three years, there is a rough 2:1 ratio between students' desire for more knowledge of HPV and its vaccine and teaching in communication of these topics with their patients.

Respondents tended to show a desire for more knowledge in prevention, vaccination and risk management. With regards to communication, students desired teaching about how and what to be advising to their patients about HPV and its vaccination.

Discussion

The position that the oral healthcare professional has a role to play in health promotion regarding HPV, oral and oropharyngeal cancers and its vaccine, clearly resonates with our undergraduate dental students – all but one registered that it has importance. It follows that

for this to be possible, knowledge of the virus and its sequelae should be taught to students so they can adopt this role when they begin to practice. It is worth noting that the question did not have an answer for equally important (that is, a shared responsibility) between the dental and medical team.

The question arises as to what dentists need to know about HPV, how they are expected to use that information to care for their patients, and indeed how much time is dedicated to this topic in a busy undergraduate dental curriculum. A learning outcome relating to health promotion and disease prevention in the GDC's dental undergraduate curriculum document *Preparing for practice* states that dentists are expected to 'provide patients with comprehensive and accurate preventive education' and 'underpin all patient care with a preventive approach that contributes to the patient's long-term oral and general health.'³¹

With no specific guidance available, some authors have attempted to propose a level of knowledge about HPV that dentists should aim for, focusing on understanding the pathophysiology of HPV and oropharyngeal cancer, associated risk factors and on available vaccination programmes.^{1,7,8} Others advocate that national organisations representing oral health professionals should develop campaigns to offer education on HPV as part of continuing professional development.^{18,30}

In light of no reliable screening tools for oral HPV, prevention and early detection of disease is paramount. Education about lifestyle risk factors, vaccination programmes and the virus itself should be available to patients if they enquire, especially if the patient falls within the ever-expanding cohort of those who are offered the vaccination on the NHS. With respect to detection, practitioners should be able to identify oral and oropharyngeal carcinomas at their early stage and provide appropriate referral and council.

Most of the students (93%) surveyed had an understanding that HPV and oropharyngeal cancers are causally linked, however, just under a third – across all year groups – did not know that it could be contracted via oral-genital sex. This is significant as lack of knowledge about transmission may lead to patients being misinformed about their actual risk of the disease. Van der Valk and Walker¹⁷ found similar results in 2014, finding that two-thirds of newly qualified dentists in the Berkshire area felt poorly trained on discussing HPV with their patients. It is apparent then that there is a need for further education around this topic. A wider-reaching study including multiple institutions would be beneficial and may highlight places where students are very well prepared to deal with HPV.

Fortunately, the vaccination programme in the UK was better understood with 91% of respondents choosing an answer including the correct cohort. This is important because the danger with poor knowledge of vaccination programmes is lack of referral and education, not over-education or over-referral. However, this should not lead to complacency as new developments in the eligible vaccination cohort mean continued education is needed.

It is not just the author's opinion, however, that more teaching is needed here. The majority of our students expressed that they felt they needed to know 'some more' or 'lots more' about HPV and its vaccine (Fig. 5) to inform patients. There were many knowledge themed

Table 1 Tabulated free text responses by year group as received verbatim (Cont. on page 980)

Year 3	
Knowledge	Risk factors/signs/symptoms
	I don't really know anything, just that it can occur
	Likelihood of HPV contraction [sic], chances of cancer development, mode of transmission
	Everything. The only health link I was aware of was HPV and cervical cancer
	How to prevent infection. The exact implications of HPV
	How to prevent infection. Treatments
	Prevalence.
	What can we do to reduce the risk?
	Signs and symptoms, consequences, action that needs to be taken
Communication	Risks and prevalence
	Where to advise patients to gain more info/vaccination
	A lecture on it and how to give advice
	What to tell patients
	How to approach subject with patient
	How can we make people more aware without worrying them?
Year 4	
Knowledge	Vaccines available
	How to identify risks to patients and clinical signs of symptoms in patients
	Be able to confidently diagnose oral warts
	The risks/benefits of HPV vaccine. How it acts. Who it's available to
	Causes. How caught. Consequences. Treatment
	Causes, signs and symptoms, prognosis, when to refer
	Exactly how it impacts oral health and how big the risk is for oropharyngeal cancer
	We have not had any practical teaching
	Its aetiology, effects, public health info and programmes currently in place
	Key presentation signs
Communication	Risks of vaccine. Stats
	How to communicate this risk to patients with reference to HPV. Communication training to extract this info from patients
	We haven't had much teaching on HPV communication skills
	How do you talk to patients about HPV?
	Advice to give patients. Who to target the advice towards? Screening programme
	Ways to discuss with patients their risk of oropharyngeal cancer
	When appropriate to bring this up with patients
	Who you should tell and when
	How to discuss the issue sensitively with patients

free text comments supporting this (Table 1) such as what are the 'risks and prevalence?' of HPV and 'what can we do to reduce the risk?' Acquiring this data about gaps in our students' knowledge is key to improving our teaching

programme so that students are given the information they need to help educate their patients in the future.

Dental students are conventionally well trained in discussing risk factors related to oral

Table 1 Tabulated free text responses by year group as received verbatim (Cont. from page 979)

Year 5	
Knowledge	About the possible vaccines – when they are available and what protection they convey to the patients
	About the vaccine, epidemiology of HPV and oral cancer [sic]
	Exact effects
	The vaccine
	Management
	What to do if you have a problem
	HPV prevalence, treatment,% of people that develop cancer, screening/detection
	How to prevent. Who to talk to about it. Consequences and risk rates
	Statistics. Can an oral 'wart' progress to cancer?
Communication	What to tell patients
	Advising patients
	What we should be advising to patients
	How to advise patients
	What should be advised to patients to reduce risk? Who should we give this advice to?

cancer with patients, such as tobacco use and alcohol consumption,²⁹ however, HPV and its relation to oropharyngeal cancer is a relatively new topic in the dental programme. There were several communication themed free text comments that demonstrated students may not be confident in communicating with patients about HPV, for example 'how do you talk to patients about HPV?' and 'when appropriate to bring this up with patients?' (Table 1). A recent study found that only 14% of dental students felt confident in discussing the risks of HPV in relation to oral health and 16% felt confident in advising on HPV vaccination programmes.²⁹ It is not clear, however, that this is a function of students' lack of knowledge more than the fact that discussion of oral-genital sex, cancer and high-risk lifestyles is inherently difficult. Particularly when those patients are young girls and boys under the age of 18. The ability to broach these topics professionally and with confidence is unlikely to come from the classroom and more from dedication to communications teaching and experience in practice.

It is beneficial for patients and practitioners alike that dental education does not lag behind its practice, as some authors have alluded to in other areas of dentistry.³² Given that this is a quickly changing field, there is potential here for more modern and alternative teaching methods, such as online courses or

seminars, that can be easily spread, digested at leisure and updated with new developments remotely. Further research into why students and dentists are not comfortable discussing the above topics, and indeed whether this feeling persists with veteran oral healthcare professionals, would help guide both content and teaching methods and delivery.

Conclusion

The rise in HPV-related oropharyngeal cancer is recognised by the dental profession and attention must be given to training in this topic in contemporary dental undergraduate programmes. The study highlights that, despite a good acknowledgement of the disease and its sequelae, students from the Bristol Dental Hospital would like further teaching regarding the communication and prevention of HPV. Undergraduate dental programmes should aim to incorporate training in knowledge about HPV, as well as communication skills teaching, focused on prevention, referring patients appropriately and answering patients' questions in order to educate them as part of a multidisciplinary primary healthcare approach to tackling this preventable disease. Future studies should assess novel ways to improve dental students' knowledge and awareness of oral and oropharyngeal cancer, including HPV as a risk

factor, and examine methods to develop dental students' confidence in communicating with patients on the subject.

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Appendix 1 Questionnaire

Human papilloma virus - dental undergraduate awareness study

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We are conducting a study to assess undergraduate dental students' awareness of human papilloma virus (HPV) and its relation to oral health.

We would be very grateful for your assistance with our research and ask if you would kindly complete the following questionnaire with honest responses. The information you provide is anonymous and participation is entirely voluntary.

Please circle or write as indicated.

- | | | |
|--|---|--------------------|
| Q1. What gender are you? | Male | Female |
| Q2. Which year of the BDS programme are you currently in? | Year 3 | Year 4 Year 5 |
| Q3. HPV can cause benign and malignant conditions? | Yes | No |
| Q4. HPV can cause genital warts? | Yes | No |
| Q5. HPV can cause cervical cancer? | Yes | No |
| Q6. HPV can cause oropharyngeal cancer? | Yes | No |
| Q7. HPV has several subtypes. Do you think all subtypes of the HPV can cause cancer? | Yes | No |
| Q8. How do you think HPV is contracted? Please choose one answer. | Airborne eg sneezing
Mouth-to-mouth kissing
Oral -Genital sex
All of the above | |
| Q9. How do you think the risk of contracting HPV can be minimised? Please choose one answer | Avoid mouth-to-mouth kissing
Practise safe sex using barrier methods eg condoms
Avoid contact with people who have coughs and colds
All of the above | |
| Q10. Who do you think receives the HPV vaccine in programmes within the UK? | Both boys and girls aged 12-13 years
Both boys and girls aged 25 years
Only girls aged 12-13 years
Only boys aged 12-13 years
Only boys aged 25 years
Only girls aged 25 years | |
| Q11. How important do you think the role of the dentist is in health promotion related to oral and oropharyngeal cancers? | Not at all important Quite important Important Very important | |
| Q12. Do you think discussing the risks associated with HPV is something that the patient's medical practitioner only should deal with? | Yes | No |
| Q17. How much more do you feel you need to know about HPV and its vaccine to inform your patients? | Lots more Some more A little more I know enough | |
| Q18. What more would you like to know about HPV and its relation to oral health? | <hr/> <hr/> <hr/> | |

Thank you for your participation.