Critical Review:
Are university students equipped with sufficient knowledge of HPV-related oropharyngeal cancers to implement preventative measures?

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This critical review examined the evidence gathered on university students' current knowledge of Human Papillomavirus related oropharyngeal cancer(HPV+OPC). All of the examined studies involved survey research – an appropriate design for assessing knowledge, but with inherent challenges to generalizability. The suggestive evidence converged on the findings that knowledge deficiencies characterized students across different campus environments. In particular, university students appeared to know little about HPV+OPC and perceived little to no risk of developing the disease.

Introduction

The Human Papillomavirus(HPV) is known as the most common sexually transmitted infection affecting both men and women. The frequently asymptomatic virus is transmitted via skin to skin contact, and with over a hundred different strains, it is estimated that nearly 75% of sexually active individuals will develop an infection at some point in their life (Canadian Cancer Society, 2017.) Furthermore, individuals under the age of 25 are at the highest risk for contracting an infection (as cited in Davis, 2015., Trad & Caraveo, 2013.) Many strains of HPV pose little to no risk on overall health and are eliminated easily by the body's immune system. However, some higher risk strains have been linked to increasing incidences of cancers of the cervix, vulva, penis, anus, and oropharynx (The Society of the Gynecologic Oncology of Canada 2016.)

Over the past two decades there has been a shift in the causal link of oropharyngeal cancer(OPC) from tobacco and alcohol to the Human Papillomavirus (HPV). Chaturvedi et al. (2011) specifically identified HPV as the sole cause of a 225% increase of OPC in America from 1984 to 2002, and similar trends exist in other developed countries worldwide (Chaturvedi et al., 2013). Furthermore, yearly cases of HPV-positive oropharyngeal cancer (HPV+OPC) are expected to rise above the yearly incidence of cervical cancer by 2020 (Chaturvedi et al., 2011). Currently, the incidence of HPV+OPC is presenting in younger adults of higher socioeconomic status, and disproportionately so in men (The Society of the Gynecological Oncology of Canada, 2016). Knowledge of HPV as a sexually transmitted infection associated with cervical cancer has become more common following a push for young women to be vaccinated. This begs the question of whether or not the public are aware, let alone knowledgeable of the risk of oral HPV transmission and the predicted epidemic of HPV+OPC (Ramqvist & Dalianis 2010.) With the majority of cases of HPV+OPC presenting in younger adults of higher SES, it is worthwhile to investigate knowledge levels of the issue within university students. An identifiable knowledge gap could inform healthcare practitioners to develop educational initiatives to provide young persons with the knowledge necessary to implement preventative measures. With their knowledge of oropharyngeal health and

experience working with survivors of OPC, Speech-Language Pathologists would be uniquely qualified to contribute to such initiatives.

Objectives

The objective for this critical review was to examine the current literature for regarding knowledge of HPV+OPC in university populations.

Methods

Search strategy: Articles related to the topic of interest were found using the following computerized databases: Medline, CINAHL, PubMed and the University of Western Ontario Libraries. Some articles were additionally selected after reviewing the reference pages of articles retrieved through web search. Search terms used for the database search were as follows:

"Students"[Mesh] AND "Head and neck neoplasms"[Mesh];

"Human Papillomavirus" and "cancer" and "Knowledge“ and "Students“

The search was limited to articles written in English.

Selection Criteria:
Studies selected for inclusion in this critical review were required to address HPV+OPC knowledge at least once in the design. Sampling requirements included students attending university from at least two different faculties. The rationale for this decision was to identify trends in knowledge across varying academic backgrounds.

Data Collection
Results of the search yielded 6 papers, all of which used survey research as the primary method for collecting data.

Results

White et al. (2014) conducted a study to assess differences in knowledge of HPV-related head and neck cancer(HPV+HNC) between three different populations: attendees at a NASCAR race(n=491), medical students (n=158), and undergraduate students (n=186). Methods for selecting participants were only partially discussed, and one participant group (med students) was more than a decade older than the other two groups on average. Responses from med students in this study may not be representative of other, younger medical student populations. The questionnaire was adapted from previously validated questions used to assess smokers' risk perceptions of cancer and assessed knowledge of HPV cancer risks and HPV transmission. Participants were also asked how often a healthcare worker had spoken to them about HNC and HPV respectively.

Appropriate statistical methods revealed significant differences in knowledge between groups with med students being more aware of risk factors, associated cancers, and modes of transmission whereas the NASCAR attendees were more aware of transmission via kissing. Females were more aware of modes of HPV transmission and had been spoken to by a healthcare provider more frequently. NASCAR attendees were found to have been counseled by healthcare professionals more frequently about head and neck cancer, whereas undergraduate and medical students were found to have been counseled more on HPV. Nevertheless, effect sizes for these group differences were small leading the authors to conclude that the similarities

between the populations may carry more implications for improved education.

Overall, this study provides suggestive evidence that knowledge gaps exist in the understanding of HPV-related oropharyngeal cancers in university students.

Trad and Caraveo (2013) reported on a author-developed web-based survey assessing general knowledge of HPV among 361 freshman students (72% female; M=19 yrs; range= 18-27+) attending their first semester at Texas State University. Invitations to the survey were sent by email, and the response rate of 10.7% was argued by the authors to be typical for these types of studies. The questionnaire development was based on an extensive literature review, and assessed HPV-knowledge (transmission, risk factors, prevention, related diseases), HPV-education, demographics.

Appropriate statistical analyses were reported. Results revealed no significant differences in knowledge were found across different demographic variables. As well, low levels of HPV+OPC knowledge were observed overall.

Overall, this study showed suggestive evidence that knowledge of HPV+OPC is deficient in undergraduate students.

Merten et al., (2016) used an existing tool developed by the Mayo Clinic to survey 758 students (72% female; M=21 yrs, range=18-25 yrs) to assess their general understanding of cancer risk factors. HPV was among the seven major cancer risk factors assessed by the survey. E-mail invitations were sent out to 6343 students attending summer session yielding an overall response rate of 12%. The Authors admit to specific limitations to generalizability, arguing that results may have been different if the sample had taken place during fall/winter sessions.

Among the items on the tool, students were asked to assign a level of cancer risk to various risk factors and report their perceived risk of developing cancer. Appropriate statistical analyses revealed an imbalance in knowledge of HPV and associated cancers. For example, while 82% of respondents were able to correctly identify HPV as a risk factor for cervical cancer, only 24% were able to identify HPV as a risk for head and neck cancer.

Overall, this study provides suggestive evidence that undergraduate students' knowledge of HPV as a risk factor for head and neck cancer is low.

Burlamaqui et al.'s 2016 study assessed general HPV knowledge in 194 first and second year medicine, nursing, speech-language pathology and audiology students at a Brazilian university. The authors argued that the sample represented a high-risk population with high numbers of sexual partners, decreased condom use, and that the sample was alike the general population's understanding of HPV as none of the students had completed coursework in HPV. No further demographic information was provided.

The authors did not report information on development of their tool or its validity. Appropriate statistical analyses revealed gaps in knowledge of HPV+OPC. In particular, while the vast majority students correctly identified genital to genital HPV transmission (98.5%), fewer were able to correctly identify orogenital HPV transmission (65.5%). Additionally, while respondents were easily able to identify the link between HPV and cervical cancer(91.2%), fewer were able to recognize a link between HPV and pharyngeal(21.1%) or laryngeal(19.1%) cancers.

Overall, this study provides suggestive evidence that students' knowledge of HPV transmission and association with different types of cancer is incomplete.

Osazua-Peters and Tutlam (2016) created a paper-based survey of 58 validated questions to assess risk factors and knowledge of oral and oropharyngeal cancer in non-health science students (42% female). Out of the 115 students who received an in-person request to participate, 100 were eligible, yielding a response rate of 86%.

After completing the survey, Participants were assigned knowledge scores based on number of correct answers. Appropriate statistical analyses revealed both low knowledge and risk perception. 81% of respondents produced low knowledge scores (0-7 out of 14) while 2% of respondents perceived any risk of developing OPC. OPC Knowledge was found to be significantly associated with STD prevention and perception of cancer risk appeared to be positively associated with number of sexual partners. Very few (7%) individuals reported receiving an OPC screening in their lifetime.

Overall, the evidence herein showed suggestive evidence of a gap in student's knowledge of OPCs. However, the association of STD prevention and knowledge suggests that those who are aware of OPC may be taking preventative measures – an implication that educational efforts may be beneficial for reducing HPV risk factors among university students.

Davis' 2015 dissertation sought to identify gaps in current awareness and knowledge of HPV, HPV+OPC and the HPV vaccine by sampling a population estimated to be at the highest risk for developing HPV infections. 1005 students (71% female; M=21 yrs, Range=18-30 yrs) representing all major faculties at the University of Western Ontario completed the survey consisting of 42 items adapted from previously validated surveys. Davis argued that the study may have favoured students from faculties with higher female enrollment (health sciences and social science) accounting for the disproportionate number of female respondents. Two methods, face to face invitation and classroom announcements, were used to recruit students to participate in the web-based survey. An overall response rate of 19.3% was achieved.

Individual knowledge scores for each category were calculated based on number of correct responses, and a total combined knowledge score was assigned to each survey. A mean total knowledge score of 14.95 out of 28 was identified across all participants. Further statistical testing compared knowledge scores across genders demographic variables. Overall, females presented with a higher mean total knowledge score. Under the category of OPC knowledge, the vast majority of respondents felt they knew "nothing" or "very little" about OPC, and while over 90% of respondents were able to correctly identify tobacco as a risk factor for OPC, only half were able to identify HPV as a risk factor. Less than half of respondents correctly identified a rise in the cases of OPC in Canada. Additionally, less than half of the respondents were able to identify a high number of oral sex partners as a risk factor for OPC.

This study provides strongly suggestive evidence of gaps in knowledge of OPC and associated risk factors. The author concluded that young adults may be participating in certain activities without fully understanding the risks they pose to oropharyngeal health.

Discussion

Overall, findings from the studies all indicate that gaps in knowledge related to HPV+OPC

exist among university students. Furthermore, there is evidence indicating that few students find themselves at immediate risk of developing HPV+OPC. Therefore, it is likely that students are participating in sexual practices without being fully informed of the inherent risks.

Survey research is the best experimental design for addressing questions related to knowledge. However, the strength of this particular design is considered to be low with some challenges to the generalizability of the data. One factor which can strengthen or weaken the results of a survey is the quality of the sample. In order to draw conclusions based on the results of survey research, the survey sample needs to be representative of the population from which it was selected. Many samples in this review showed an underrepresentation of male students when demographic data was compared to enrolment data. Furthermore, many of the studies produced low response rates. This may be due to the fact that most of the surveys were provided to students through email invite which may go easily ignored.

Despite the relative weakness of survey design, the conclusions drawn on university student's HPV+OPC knowledge across studies are in agreement and should not be ignored: students know very little about this kind of cancer and more education is needed. In order to develop relevant and targeted educational materials, it is important that future researchers create specific goals to build representative samples. Furthermore, researchers should centre selection methods less on convenience and focus on achieving higher response rates by connecting directly with students.

Clinical Implications

Speech-Language Pathologists(SLPs) are among a set of professionals with expertise in the area of oropharyngeal health. Furthermore, many SLPs work directly with survivors of HPV+OPC as they adjust to swallowing and communication difficulties following surgical resection, reconstruction, and side-effects of chemoradiation. These professionals understand the level of disability, challenge and decrease in quality of life that may persist in survivors of OPC. Therefore, SLPs are uniquely qualified to act as double agents in the rehabilitation of HPV+OPC survivors, as well as the prevention of the disease and promotion of HPV+OPC knowledge. The HPV+OPC epidemic is already occurring, and with evidence of knowledge deficiencies among populations most at risk, it is important that healthcare professionals take initiative to improve education. SLPs along with other oropharyngeal health experts, such as dentists and otorhinolaryngologists, should work as a team to:

- Educate young persons on oral HPV risks and prevention methods.
- Inform government policy to improve sexual education curricula.
- Develop oral cancer screening programs.
- Lobby for better access to dental dams and vaccination coverage for men.

A group of SLP Western University students, including this author, have already made efforts to spread HPV+OPC knowledge. "Promoting HPV-related Oropharyngeal Cancer Knowledge – Student Initiative" (PHOCK-SI) aims to spread knowledge about rising rates of HPV+OPC, and to empower individuals to make informed decisions about sexual practices.

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