Are dental providers the next line of HPV-related prevention? Providers’ perceived role and needs

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ABSTRACT
The rise in HPV-related oropharyngeal cancer incidence necessitates novel prevention efforts including multiple provider types. Although dental providers screen for HPV-related oropharyngeal cancers, little is known about their needs to advance “primordial prevention,” or interventions at the earliest possible stage, to prevent HPV-related cancers. This study assessed dentists’ and dental hygienists’ perceived roles and needs regarding HPV-related primordial prevention.

We conducted a mixed-method study with data from focus groups with dentists (n = 33) and dental hygienists (n = 48) and surveys from both provider types (n = 203) among providers from a diverse set of practice settings and geographic communities. Data were analyzed using qualitative thematic analysis and chi square tests. Participants affirmed dental professionals’ roles in preventing HPV-related cancers and identified needs to overcome barriers to fulfilling prevention objectives. Barriers included: (1) practice environment and patient characteristics, and (2) the sensitive topic of HPV. Further, participants identified needs to improve HPV-related cancer prevention.

Findings from this study suggest that dental providers may become the next line of prevention for HPV-related cancers. Dental providers’ professional associations have provided guidance on HPV and oropharyngeal cancers, but our study reveals dental providers’ needs for following professional organizations’ guidance to advance prevention efforts and reduce HPV-related cancer incidence.

1. Introduction
Over the past 30 years, oral cancer incidence in the United States has decreased due to reducing tobacco exposure [1]. Nonetheless, the incidence of a subset of human papillomavirus (HPV)-related oropharyngeal cancers is on the rise [2], with evidence indicating that the relationship between HPV and oropharyngeal cancers is an emerging public health concern [3]. Between 1984 and 1989 the prevalence of HPV among oropharyngeal cancers was 16.3%, increasing dramatically to 72.7% during 2000-2004 [2]. Data from 2008 to 2012 revealed that oropharyngeal cancers were the one of the most common HPV-associated cancers with an average of 11,000 cancers annually estimated to be HPV-attributable (2000 for females and 9100 for males) [4]. In 2009, new cases of oropharyngeal cancers accounted for 37.3% of all HPV-associated cancers, whereas cervical cancer represented 32.7% of all HPV-associated cancers [5]. Further, approximately 63% [95% CI 50–75%] of all oropharyngeal cancers are attributable to HPV and may be preventable [6,7], demonstrating a need for public health interventions to reduce HPV-related oropharyngeal cancer incidence. In response to HPV-related oropharyngeal cancers as a growing public health concern, the American Dental Association (ADA) released a statement instructing dental providers “to educate themselves and their patients about the relationship between HPV and oropharyngeal cancer [8]”. The dental profession has historically been involved in prevention
efforts related to a number of health concerns, including tobacco use, diabetes, cardiovascular disease, human immunodeficiency virus, and disordered eating [9–15]. Dental providers have engaged in secondary prevention methods related to HPV and oropharyngeal cancer, and may be well positioned to engage in other HPV-related prevention efforts. Several HPV-related cancers (e.g., anogenital) can be prevented through HPV vaccination, which can protect against up to 9 types of HPV including those primarily responsible for cancer (i.e., HPV 16 and 18). The HPV vaccine is licensed for males and females 9–26 years of age, but recommended for 11 and 12-year-old adolescents [16,17]. Although the vaccine is not yet approved for preventing HPV-related oropharyngeal cancers, molecular and epidemiological data support a causal role for HPV in oropharyngeal cancers [18] and the ADA has called for additional research to investigate the efficacy of HPV vaccines for preventing oropharyngeal cancers [8].

Given the connection between HPV and oropharyngeal cancer and oral health professional organizations’ statements about HPV-related prevention efforts, dental providers may be the next line in HPV prevention. While dental providers already screen for oral cancer, their prevention efforts can expand to education and recommendations regarding additional prevention efforts such as the HPV vaccine [6]. Previous studies have shown that dental patients have significant informational needs related to HPV and oral cancers [19]. Acknowledging patients’ knowledge gaps and the increasing awareness about HPV vaccines, researchers have suggested that the causative link between HPV and oropharyngeal cancer and the availability of HPV vaccines may result in larger numbers of dental patients seeking information about HPV vaccination as a way to prevent oral cancer infections [20,21]. This possibility requires dental providers to be prepared to answer patients’ questions about HPV and educate them about the connection between HPV and oropharyngeal cancer [22]. Accordingly, researchers have argued that oral health professionals “can take the lead in confronting the HPV- oropharyngeal cancer epidemic” [23], especially through interprofessional collaboration, such as referring patients to relevant clinicians to receive vaccinations and any needed follow-up care [23]. Interprofessional collaboration highlights some dental providers’ acceptance of HPV vaccination efforts, but existing evidence suggests that large numbers of current and future dental providers are not yet ready to discuss HPV vaccines with patients [24], and dental students have expressed willingness to discuss HPV with patients but still have concerns about information deficits [25,26]. Discussing HPV with patients would allow dental providers to engage in primordial prevention efforts—a form of “intervention at the most distal point in the chain of causality” [27] that focuses on preventing risk factors and the social and environmental conditions that lead to disease [28].

Whereas screening for HPV-related cancers consists secondary prevention, and vaccination would constitute primary prevention, primordial prevention would encompass educating patients about HPV. Primordial prevention has proven effective in intervening in health concerns that have oral-systemic health links, such as cardiovascular disease [29]. Moreover, primordial prevention is consistent with dental providers’ professional practice since preventing health concerns as early as possible fits into oral health efforts that focus on early prevention, such as ensuring children have sufficient exposure to fluoride to prevent carries. However, without understanding dental providers’ needs for having HPV-related conversations with patients, and their perceived roles as primordial prevention agents in HPV-related oropharyngeal cancer, improving patient care and changing clinical practice related to this issue will remain challenging. With the ADA recommendation for dental providers to educate their patients, the purpose of this study was to assess dentists’ and dental hygienists’ perceived roles in HPV prevention and their needs in order to discuss HPV-related oropharyngeal cancer prevention with their patients. Understanding providers’ roles and needs can facilitate efforts to address providers’ needs and ultimately influence practice efforts to prevent HPV-related oropharyngeal cancer and thus improve patient outcomes.

2. Methods

2.1. Overview

We used a mixed-method approach to guide this study since dental practices fit within a complex system, including different provider types (e.g., dentist, dental hygienist, dental assistant), practice structures (e.g., private, public), and associations with professional organizations [30]. Accordingly, this study included stakeholders representing these different system levels to understand oral health providers’ needs in effectively discussing HPV prevention with patients. Specifically, this study included two data collection types: (a) focus groups with dentists and dental hygienists; and (b) surveys with dentists and dental hygienists. This approach was used to compare, contrast, and triangulate data to ensure accuracy of results and provide an in-depth approach to understanding dental providers’ roles in HPV prevention [31]. The university’s Institutional Review Board approved this study.

2.2. Participants and inclusion criteria

Dentists attending a regional conference in the Southeastern United States and dental hygienists attending a national US conference were recruited to participate in focus groups in 2016 and 2015, respectively. Conference organizers sent recruitment emails to all registered attendees. Inclusion criteria were: (a) possess a current dental/dental hygiene license; (b) graduate of an accredited US dental/dental hygiene program; (c) in practice for more than one year; and (d) over 21 years of age. Four focus groups were conducted with 8–10 dentists each (N = 33) and four focus groups were conducted with 10–12 dental hygienists (N = 48). Participants completed a demographic questionnaire asking identified gender, race and ethnicity, age, number of years in practice, and practice type (private, public, combination, other). During the focus groups, participants were asked to describe what they need to facilitate a discussion of HPV and oral cancer risks with their patients.

As part of four continuing education sessions on HPV-related oropharyngeal cancer at the large, regional dental conference where dentists were recruited, attendees were asked to complete a pre- and post-test. A total of 55 dentists and 228 dental hygienists initiated at least some part of the surveys; however, for the purpose of this analysis, the sample was restricted to those completing key questions from the pre-test: roles and needs for HPV discussion, and barriers and facilitators for HPV discussion. The survey questions and focus group guide were informed by preliminary interviews with key opinion leaders in the dental profession, including leaders of professional organizations and governmental agencies. We adopted this approach by following the diffusion of innovations theory, which considers how health-related innovations are disseminated and suggests opinion leaders can play a role in dissemination and have unique insights [32,33]. Dentists (n = 37) and dental hygienists (n = 166) completed these sections of the paper-and-pencil survey. Individual names and the name of the conference participants attended have been omitted to protect participants’ identities.

2.3. Analysis

Data were analyzed using both qualitative and quantitative methods. The qualitative focus groups were audio-recorded and transcribed verbatim. We used a thematic analysis approach to analyze qualitative data, which involves systematically identifying and quantifying major themes [34], allowing us to inductively identify the primary needs for discussing HPV and oral cancer with patients. The quantitative survey data were transferred to an electronic database. Frequencies for each type of barrier/facilitator were calculated and chi-
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