Research

Utilization of the HPV Brief Motivational Interviewing Skills-Based Training Among University of Minnesota Dental Hygiene Alumni

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ABSTRACT

Purpose Despite the availability of a vaccine to prevent Human papillomavirus-related oropharyngeal cancer (HPV-OPC), its incidence has surpassed all other HPV-related cancers. Dental hygienists play an important role in patient education and vaccine counseling for the prevention of HPV-OPC. The purpose of this study was to assess the utilization of HPV Brief Motivational Interviewing (brief MI) Skills Based Training among the University of Minnesota (UMN) dental hygiene alumni.

Methods A quantitative study was conducted with a convenience sample of dental hygiene alumni (classes of 2020-2024; n=135) who completed HPV Brief MI Skills Based Training at the UMN. Multiple recruitment strategies were used including email, mail, social media, and snowball sampling. Participants completed a 37-item anonymous electronic survey via Qualtrics. The survey was adapted from previously used instruments to assess HPV knowledge, attitudes, current practices in HPV counseling, and the application of brief MI for the prevention of HPV-OPC.

Results Among the participants (n=51), 49% reported using MI strategies to counsel at least one patient on prevention of HPV-OPC infections and indicated high comfort and confidence in applying MI strategies. However, most participants (73%) acknowledged they do not routinely discuss HPV with patients. Barriers included time constraints, vaccine resistance, difficulty initiating conversations, and lack of confidence or comfort during discussions. Results indicate that knowledge retention and attitudes may be influenced by frequency of practice.

Conclusion Dental hygiene alumni from five consecutive cohorts who received HPV Brief MI Skills-Based Training reported comfort and confidence in HPV communication with patients. Findings suggest brief MI is an effective counseling strategy for HPV-OPC prevention and vaccine advocacy. Reported barriers to regular HPV-OPC prevention counseling suggest a change in dental practice culture may be needed.

Keywords motivational interviewing, brief motivational interviewing, vaccine counseling, dental hygienists, skills-based training

NDHRA priority area, **Professional development: Education** (educational models).

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INTRODUCTION

Human papillomavirus (HPV) is the most pervasive sexually transmitted infection.[1] Nearly all sexually active people will become infected at some point in their lives.[2] Although most infections are cleared by the immune system, some HPV types persist, notably types 16 and 18, leading to certain types of cancer, including oropharyngeal cancer (OPC).[3] The incidence of HPV-related OPC (HPV-OPC) has steadily increased over the past several decades and now outpaces cervical cancer.[4] Human papillomavirus-OPC is most often diagnosed in later stages after metastasis to cervical lymph nodes, owing to the lack of an identified precursor lesion.[1] Consequently, primary prevention is imperative. The HPV vaccine has been available since 2006 for the prevention of cervical cancer in girls.[5] In 2009, the vaccine was approved by the Food and Drug Administration (FDA) to include males.[6] Currently, the vaccine is approved for males and females, 9-45 years old.[7] In 2020, the indication for the HPV vaccine was expanded by the FDA for the prevention of HPV-related oral infections and OPCs.[8] A systematic review and meta-analysis was conducted to examine the effectiveness of the HPV vaccine in reducing oral vaccine-type HPV infections (including types 16 and 18) indicated that vaccinated individuals were 46% less likely to develop oral vaccine-type infection when compared to unvaccinated individuals.[9] Findings from the systematic review suggest that HPV vaccines can protect against oral vaccine-type HPV infection including high-risk HPV-16, thus reducing the incidence of HPV-OPC.[9]

Human papillomavirus vaccine uptake is dismal and falls below national goals in the United States (US).[9] According to the National Immunization Survey - Teen (NIS-Teen), in 2023 57.3% of adolescents aged 13-15 received the recommended doses of the HPV vaccine, leaving a gap between the Healthy People 2030 target of 80% and actual completion rates.[10] Further, in a 2022 survey of 2159 unvaccinated adults (18-26 years old) in the US, HPV vaccination coverage was low with 47.4% of the respondents reporting receiving one or more doses.[11] These suboptimal levels vaccination rates have drawn attention to the role of alternative health care providers in HPV counseling and vaccine administration. Health care provider recommendation and lack of knowledge have been identified as the top predictors of parents/guardians' intent to vaccinate their children against HPV.[12,13] Minnesota dentists and dental hygienists have reported discomfort in HPV discussions with patients and believe patients should receive their HPV vaccine information from their medical providers only.[14] However, parents of adolescents report comfort and confidence in having HPV-related discussions with their dental providers.[15] Additionally, adults at risk for HPV-OPC lack knowledge and awareness a vaccine is available for these cancers.[16] This emphasizes the important role and professional responsibility of dental providers in supporting and enhancing parents' and adults' HPV vaccine literacy for improved vaccination confidence.

Oropharyngeal cancer can be prevented by supporting patients' positive behavior change and improving HPV vaccine confidence and vaccine uptake.[14,17–19] Motivational interviewing (MI) is a person-centered collaborative counseling approach to support a positive behavior change; MI has been shown to have over 40 years of evidence on its efficacy for positive behavior change outcomes.[20–29] Current evidence has identified that brief motivational interviewing (brief MI), a derivative of MI, can be an ideal communication approach for HPV education and vaccine advocacy.[30–32] Applying brief MI strategies has been shown to improve dental providers' knowledge, comfort, and confidence in HPV education and vaccine advocacy during patient care.[30–32] Additionally, improving dental providers' perceptions may reduce the barriers to HPV conversations in the dental setting.

Dental hygienists play a key role in a medical-dental integrated health care system with responsibilities expanding beyond the traditional dental hygiene care, including HPV vaccine counseling for OPC prevention. Dental hygiene curricula must prepare students with skills for expanded roles in the broader health care system.[33] Specifically, the literature proposes the

inclusion of HPV content in dental hygiene curriculum to improve students' knowledge and communication skills for HPV-OPC prevention.[18] In response to this charge, educators and researchers at the University of Minnesota (UMN) School of Dentistry (SOD) developed the HPV Brief MI Skills-Based Training program to prepare future oral health care providers with the knowledge, confidence, and comfort to provide HPV education and vaccine counseling for patients, through the application of brief MI.[30–32] The UMN HPV Brief MI Skills Based Training focuses on the collaborative "Spirit of MI" and coaching for the application of MI principles to support patient autonomy.[20] The HPV brief MI curriculum for dental hygiene students includes the utilization of eight MI strategies with a focus on open-ended questions (O), affirmations (A), reflections (R), and summaries (S) (OARS) with the technique of elicit-provide-elicit (E-P-E) to evoke change conversations.[20,30–32,34,35] Additionally, the dental hygiene curriculum skills-based portion includes role-playing and feedback as students practice OARS with E-P-E to demonstrate MI RULES.[30–32,34,35] The MI RULES encompass resist the righting reflux (R), understand (U) the patient's ambivalence, listen (L) with empathy, and empower (E) the patient by building self-efficacy.[20,34,36] The HPV Brief MI Skills Based Training program was launched in 2019 with the first graduating cohort to have this skill set in 2020. Since then, a total of five cohorts (Class of 2020-Class of 2024) have graduated and are currently employed in their professional DH roles.

It is unknown whether the UMN DH alumni are applying the HPV Brief MI Skills Based Training in clinical practice to counsel patients on the prevention of HPV-OPC. The purpose of this study was to determine the utilization of the HPV Brief MI Skills Based Training among UMN DH alumni by assessing HPV and HPV vaccine knowledge, determining attitudes (comfort and confidence) of HPV counseling, and assessing application of MI strategies for HPV counseling.

METHODS

This quantitative study included a convenience sample of UMN DH alumni (n=135) from the classes of 2020–2024. This study (STUDY00024281) was deemed exempt from the UMN Institutional Review Board (IRB) oversight. The inclusion criteria were UMN DH alumni from the Class of 2020-Class of 2024. Exclusion criteria were UMN DH alumni prior to the Class 2020 or members of the Class of 2025 as well as dental hygienists who were not UMN alumni.

Sample recruitment

Multiple strategies were UMN IRB approved and used for recruitment. The UMN SOD Office of Alumni Relations and Development sent an email invitation to eligible participant email addresses with an anonymous link to an electronic survey (Qualtrics^{xm}, Provo, UT, USA) a total of three times during January-February 2025. Recruitment of alumni via their personal email addresses has historically resulted in a low response rate. Therefore, the UMN SOD Office of Alumni Relations and Development also mailed a paper invitation letter with an anonymous QR code to eligible participants' mailing address one time in February 2025. No personal email addresses or mailing addresses were shared with the research team. Invitations to participate were also sent via the social media networks (Facebook, LinkedIn) for the classes of 2020-2024. Snowball recruitment was also done through the study team's social media networks. Members of the class of 2024 received email invitations through their UMN student email address; all other cohorts have had their student email addresses disabled. All participants were given the opportunity to enter their email address to enter a raffle for a $50.00 gift card as an incentive for completing the survey. A total of 10 randomly selected participant email addresses received a pre-paid $50.00 gift card.

Instrument

The 37-item electronic survey consisted of 30 questions and seven demographic items. The survey was adapted from a previous questionnaire from Stull et al.[14] This instrument was previously pilot tested for face validity and has been used as an instrument of measure for HPV knowledge, attitudes and current practices.[14,31]

Of the 18 knowledge, attitudes and current practice items, seven questions were on a 4-point Likert scale (strongly agree, agree, disagree, strongly disagree) to measure attitudes regarding HPV vaccination. Four questions had "yes or no" choices on current practices with two of the four questions populating additional questions based on the response. Participants who answered "yes" to the question, "Do you routinely discuss the risk factors for oropharyngeal cancer with your patients?" were asked a follow-up question, "Do you discuss HPV as a risk factor?" For the question, "Do you discuss the importance of current efforts to provide HPV vaccination with your patients?" Participants who answered "yes" were asked a follow-up question, "What are the target ages for these discussions?" Participants were able to select all that apply to the provided age brackets (9-12 years; 13-17 years; 18-26 years; 27-45 years). The follow-up question for participants who answered "no" was, "What are the two primary reasons that you would not discuss these HPV vaccination efforts with your patients?" Participants were able to select multiple responses.

A total of 12 items focused on the application of MI in professional DH practice for the prevention of HPV-OPCs. These questions were adapted from an instrument pilot tested for face validity by DH programs to evaluate their MI curriculum and students' perceived importance and confidence of applying MI strategies.[30–32,37,38] The first MI question was a "yes or no," "Have you applied motivational interviewing strategies to counsel at least one patient for the prevention of HPV-related OPCs?" Participants who responded "yes" were asked to rate their perceived importance and confidence with the eight MI Strategies. An additional seven questions were on a 5-point Likert scale (strongly disagree, disagree, neutral, agree, and strongly agree) that focused on the participants' perceived value of MI, time during appointments, skills of application, the UMN HPV Brief MI Skills-Based Training program, comfort and confidence applying MI for discussing HPV with patients. All participants were asked a "yes or no" question on their interest for additional continuing education (CE) courses on the application of MI for HPV counseling. Additionally, two open-ended response questions asked for participants to share any challenges they have encountered in applying MI strategies to counsel patients for HPV-OPCs and to provide information on any additional health topics they apply MI for behavior change counseling. Participants could also provide their email address if they would like to be contacted for future HPV brief MI training for the prevention of OPCs.

Data analysis

Respondent characteristics were summarized using counts and percentages. Responses to Likert scale items regarding attitudes, practices, applications, and perceptions were summarized using means and standard deviations, counts and percentages. Correct responses to knowledge items were summarized using counts and percentages for each question. Themes identified in open response questions were summarized. Analyses were conducted using R version 4.4.2.

RESULTS

A total of 51 UMN alumni completed the survey for a 38% response rate. Demographic information is provided in Table I. The majority of the participants were female (n=48, 94%), White (n=38, 75%) and graduated from the class of 2020 (n=17, 33%). Most worked in private practice (n=42, 82%), full-time (n=38, 75%) and worked >31 hours per week (n=38, 75%). Since graduation, most of the participants were employed at one clinical practice setting (n=25, 49%) or 2-3 clinical practice settings (n=20, 39%).

Participants' general knowledge of HPV and HPV prevention education (true or false responses) are provided in Table II. Most identified the following statements as false: "All types of HPV infection can lead to oropharyngeal cancer" (n=44, 86%), "HPV is a relatively uncommon sexually transmitted infection" (n=44, 86%) and "Patients with a history of HPV infection should not be offered the HPV vaccine" (n=42, 82%). Similarly, most identified the following statement as true: "Oropharyngeal cancer is associated more with males than females" (n=40,

Table I. Respondent demographics (n=51)

	n (%)
Biological Sex	
Female	48 (94.0)
Male	3 (6.0)
Race/Ethnicity†	
American Indian or Alaskan Native	—
Asian	7 (14.0)
Black or African American	1 (2.0)
Hispanic or Latino	5 (10.0)
Middle Eastern or North African	—
Native Hawaiian or Pacific Islander	—
White	38 (75.0)
Prefer not to answer	2 (4.0)
Graduation Year	
Class of 2020 (n=28)	17 (33.0)
Class of 2021 (n=28)	9 (18.0)
Class of 2022 (n=26)	9 (18.0)
Class of 2023 (n=25)	8 (16.0)
Class of 2024 (n=28)	8 (16.0)
Practice Setting†	
Academic setting	5 (10.0)
Private practice	42 (82.0)
Public health setting	6 (12.0)
Other	3 (6.0)
Practice Status	
Full-time	38 (75.0)
Part-time	7 (14.0)
Temporary	6 (12.0)
Clinical Practice Hours Worked (per week)	
<10 hours	6 (12.0)
11-20 hours	3 (6.0)
21-30 hours	4 (8.0)
>31 hours	38 (75.0)
Number of different clinical practice settings have you worked? (Since graduation)	
1	25 (49.0)
2-3	20 (39.0)
4-5	—
>5	6 (12.0)

†Participants selected all that applied

78%). Participant responses were divided for "HPV is associated with a much-improved prognosis for patients with oropharyngeal cancer," with n=28 (55%) selecting true, the correct response.

Participant attitudes toward the role of dental providers in HPV prevention were positive. Table II shows the summaries (mean±SD) on a 4-point Likert scale. Most responded (strongly disagree or somewhat disagree) that medical providers should be the sole source of information for patients (2.45±0.99); it is necessary to discuss sexuality before recommending the HPV vaccine (1.73±0.87); HPV vaccine is not appropriate for my practice because it cannot help my patients (1.51±0.73); safety is not established (1.29±0.61); or efficacy is not established (1.25±0.56). However, most respondents were not routinely discussing risk factors of OPCs with patients (n=37, 73.0%). Among those who were discussing the risk factors (n=14, 27%), only a few were discussing OPC's for all age groups (n=3, 6%). Reasons for not discussing the HPV vaccination included limited time (n=18, 35%) and not remembering. However, most will discuss the vaccine if asked (n=37, 73%).

Participants who reported yes to the question, "Have you applied motivational interviewing strategies to counsel at least one patient for the prevention of HPV-related OPCs" (n=25, 49%), were asked about their perceptions of importance and confidence for each of the eight MI guiding strategies (Table III). Responses were all high on a 5-point Likert scale, with the exception of the importance RULER scoring lower (3.84±0.94). Similarly, respondents' confidence applying the eight MI guiding strategies were also high on a 5-point Likert scale, except for elicit change talk (3.88±0.73). Perceptions of MI for HPV-related OPC conversations are shown in Table IV. Respondents strongly agreed that MI was a valuable strategy (n=29, 100%); using MI helps patients understand HPV-OPC risks and prevention (n=26, 100%); the UMN HPV Brief MI Skills-Based Training was sufficient to apply brief MI for HPV discussions (n=22, 100%); and most were interested in additional continuing education courses for brief MI for HPV counseling (n=31, 61%).

Table II. Knowledge, Attitudes and Current Practices

Knowledge Of Human Papillomavirus (HPV) and HPV Prevention Education‡		
	True n(%)	False n(%)
All types of HPV infection can lead to oropharyngeal cancer.	7 (14.0)	44 (86.0)‡
The oral tongue is the principal oropharyngeal cancer site associated with HPV.	25 (49.0)	26 (51.0)‡
HPV is a relatively uncommon sexually transmitted infection.	7 (14.0)	44 (86.0)‡
HPV is associated with a much-improved prognosis for patients with oropharyngeal cancer.	28 (55.0)‡	23 (45.0)
Oropharyngeal cancer is associated more with males than females.	40 (78.0)‡	11 (22.0)
Patients with a history of HPV infection should not be offered the HPV vaccine.	9 (18.0)	42 (82.0)‡
All types of HPV infection can lead to oropharyngeal cancer.	7 (14.0)	44 (86.0)‡

Attitudes Regarding Human Papillomavirus (HPV) Vaccination					
	Mean±SD	Strongly Disagree (1) n (%)	Somewhat Disagree(2) n (%)	Somewhat Agree (3) n (%)	Strongly Agree (4) n (%)
Medical professionals should remain the sole appropriate source of information regarding the HPV vaccine.	2.45±0.99	11 (22.0)	13 (26.0)	20 (40.0)	7 (14.0)
It is necessary to discuss issues of sexuality before recommending HPV vaccines to patients.	1.73±0.87	26 (51.0)	15 (29.0)	8 (16.0)	2 (4.0)
Discussing the HPV vaccination is not appropriate in my practice because it cannot help my patients.	1.51±0.73	32 (63.0)	12 (24.0)	7 (14.0)	—
I am uncomfortable discussing HPV and the HPV vaccination with my patients and/or their parents.	2.10±0.96	16 (31.0)	19 (37.0)	11 (22.0)	5 (10.0)
The safety of the HPV vaccination has not been established.	1.29±0.61	39 (77.0)	10 (20.0)	1 (2.0)	1 (2.0)
The efficacy of the HPV vaccination has not been established for oropharyngeal cancer; therefore, it is inappropriate for me to discuss the vaccine with my patients.	1.25±0.56	41 (80.0)	7 (14.0)	3 (6.0)	—
I am religiously opposed to recommending HPV vaccinations to my patients and/or their parents.	1.20±0.45	42 (82.0)	8 (16.0)	1 (2.0)	—

Table II. Knowledge, Attitudes and Current Practices (continued)

Current Practices		
	Yes n (%)	No n (%)
Do you routinely discuss the risk factors for oropharyngeal cancer with your patients?	14 (27.0)	37 (73.0)
If **Yes**, do you discuss HPV as a risk factor?	5 (10.0)	9 (18.0)
Do you discuss the importance of current efforts to provide HPV vaccination with your patients?	6 (12.0)	45 (88.0)
		n (%)
If **Yes**, what are the target ages for these discussions?†		
13-17; 18-26; 27-45		1 (2.0)
18-26; 27-45		1 (2.0)
27-45		1 (2.0)
9-12; 13-17; 18-26; 27-45		3 (2.0)
If **No**, What are the reasons that you do not discuss HPV vaccination efforts with your patients?†		
Vaccines are not appropriate for most adults so my patients are not interested.		2 (4.0)
Safety and effectiveness of the HPV vaccine are not yet proven.		2 (4.0)
Discussing this vaccine is not part of my health care role.		3 (6.0)
I don't have the time.		18 (35.0)
I don't support the current effort to provide HPV vaccination for the prevention of HPV infections.		2 (4.0)
I do not want to discuss with patients how HPV is transmitted.		6 (12.0)
I don't remember to do it but will discuss if asked.		37 (73.0)
Patients I see are not benefited by the HPV vaccine and I don't want to discuss potential benefit to others (such as their children).		4 (8.0)
The HPV vaccine has not been proven to protect against oropharyngeal cancer.		2 (4.0)
Other		7 (14.0)

‡Correct response to true and false knowledge questions
†Participants selected all that applied

Participants shared challenges they have experienced applying MI strategies to counsel patients for HPV-related OPCs (n=15). Four themes emerged: time constraints, patient vaccine acceptance, difficulty initiating an HPV conversation, and provider confidence. Respondents also provided information on any health topics they apply their MI training to counsel patients for a positive behavior change (n=30). Eight topics emerged: caries, gingival diseases, tobacco cessation, home care, nutritional counseling, sleep/TMJ, treatment planning, consideration of oral health during pregnancy, cancer and injuries (Table V).

DISCUSSION

The findings of this study demonstrated that UMN dental hygiene alumni perceive brief MI as a valuable approach for HPV-OPC prevention counseling and vaccine advocacy. Additionally, participants reported the HPV Brief MI Skills Based Training they received as part of their dental hygiene education sufficiently prepared

Table III. Application of Motivational Interviewing strategies for HPV conversations

Have you applied motivational interviewing strategies to counsel at least one patient for the prevention of HPV-related OPCs					Yes 25 (49.0)‡	No 26 (51.0)
Importance of MI Strategy	**Mean±SD**	**Not at all Important (1)**	**Little Importance (2)**	**Neutral (3)**	**Somewhat Important (4)**	**Very Important (5)**
		n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**
Use of Open-Ended Questions	4.76±0.66	—	1 (4.0)	—	3 (12.0)	21 (84.0)
Make Affirmations	4.76±0.60	—	—	3 12.0)	4 (16.0)	18 (72.0)
Listen Reflectively	4.60±0.71	—	—	2 (8.0)	2 (8.0)	21 (84.0)
Summaries	4.48±0.71	—	1 (4.0)	—	10 (40.0)	14 (56.0)
Elicit Change Talk	4.44±0.77	—	—	4 (16.0)	6 (24.0)	15 (60.0)
Use Importance Ruler	3.84±0.94	—	2 (8.0)	7 (28.0)	9 (36.0)	7 (28.0)
Ask for Elaboration "What Else?"	4.40±0.87	—	1 (4.0)	3 (12.0)	6 (24.0)	15 (60.0)
Enhance Self-Efficacy	4.44±0.77	—	—	4 (16.0)	6 (24.0)	15 (60.0)
Confidence of MI Strategy		**Not at all Confident**	**Little Confidence**	**Neutral**	**Somewhat Confident**	**Very Confident**
Use of Open-Ended Questions	4.56±0.51	—	—	—	11 (44.0)	14 (56.0)
Make Affirmations	4.56±0.87	—	1 (4.0)	—	12 (48.0)	12 (48.0)
Listen Reflectively	4.40±0.7	—	2 (8.0)	—	5 (20).0	18 (72.0)
Summaries	4.08 (0.86	—	1 (4.0)	5 (20).0	10 (40.0)	9 (36..00)
Elicit Change Talk	3.88±0.73	—	1 (4.0)	5 (20.0)	15 (60.0)	4 (16.0)
Use Importance Ruler	4.04±1.06	1 (4.0)	—	7 (28.0)	6 (24.0)	11 (44.0)
Ask for Elaboration "What Else?"	4.40±0.76	—	1 (4.0)	1 (4.0)	10 (40.0)	13 (52.0)
Enhance Self-Efficacy	4.12±0.78	—	1 (4.0)	3 (12.0)	13 (52.0)	8 (32.0)

‡Only participants who answered "yes' were asked the importance and confidence of the MI strategies

them with communication skills for HPV discussions during patient care. However, respondents reported barriers of time constraints, patient vaccine acceptance, difficulty initiating HPV conversations, and provider confidence as reasons they did not engage in HPV discussions with their patients.

Positive attitudes regarding HPV vaccination discussions in the dental setting were high among the participants in this study. However, participants' attitudes (comfort and confidence) during HPV discussions were also influenced by noted barriers of a lack of time, low confidence in their HPV-related knowledge, forgetting to discuss HPV with their patients, difficulty in initiating HPV discussions, anti-vaccine climate, and patient resistance. In this study, patient resistance for HPV discussions was reported by 9% of the participants. Open responses suggest patient anti-vaccine beliefs may be perpetuated by the current political environment and patient resistance due to cultural or religious beliefs of vaccines. Similarly, Arnett et al. reported patient resistance as a frequently reported challenge to HPV vaccine counseling by dental hygiene students.[32] However, these findings contradict the perceptions of dental patients who have reported they are indeed comfortable discussing HPV vaccines with their dental providers, particularly with the knowledge that HPV is a risk factor for oropharyngeal cancer.[14,19,42–45]

Lack of HPV knowledge has been reported by dental providers previously, contributing to providers' lack of confidence and comfort for this particular health

Table IV. Participant perceptions of MI for HPV-related OPC conversations

	Unable to Answer	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
MI is a valuable strategy that can be used during clinical care to educate patients about HPV.	—	—	—	—	—	29 (100.0)
Using MI will help my patients understand the HPV-oropharyngeal cancer relationship, risk factors, and prevention, including vaccination.	—	—	—	—	—	26 (100.0)
I have enough time during appointments to incorporate MI strategies for HPV patient education and vaccine advocacy.	1 (8.0)	9 (75)	—	—	—	2 (17.0)
I have the skills I need to use MI strategies in the clinic for HPV patient education and vaccine advocacy.	—	—	—	—	—	11 (100.0)
The HPV brief MI curriculum at the University of Minnesota was sufficient in detail for me to understand the application of MI to HPV discussions.	—	—	—	—	—	22 (100.0)
Using MI improved my level of comfort in discussing HPV with my patient.	2 (16.7)	—	—	—	—	10 (83.3)
I am confident discussing the HPV vaccination with my patients.	—	1 (10.0)	—	—	—	9 (90.0)
Are you interested in additional CE courses to enhance your HPV counseling applying motivational interviewing?					Yes 31 (61.0)	No 20 (39.0)

topic.[19,40,41] Responses to the knowledge items indicated some confusion on the basics of oral HPV infections. When the participants in this study were students, their HPV knowledge increased.[31,32] However, as practicing clinicians, these participants reported a lack of HPV-related knowledge as a barrier to initiating HPV communication. This finding suggests that HPV knowledge may not be retained if HPV discussions are not practiced on a regular basis during patient care. Chairside fact sheets may help retain knowledge and confidence in HPV vaccine information. Knowledge retention may also be achieved through continuing education to clarify, confirm, and activate previously learned HPV information.[39]

Although the UMN HPV Brief MI Skills-Based Training provides suggestions for opportunities to initiate HPV-related discussions, most of the respondents (75%) reported forgetting to discuss HPV. One participant noted, *"One thing that helped in school was having the question on our medical form about the vaccine. It's easier now to forget about it."* Adding a question regarding HPV to the medical history form prioritizes the importance of HPV information and prompts dental providers to discuss HPV-related topics and increases patient awareness and motivation to seek more information. Participants also reported difficulty in initiating an HPV conversation, *"I often find it hard*

Table V. Selected open-ended responses

Please provide detailed information of any challenges you have experienced applying MI strategies to counsel patients for HPV-OPCs? (n=15)
Time Constraints
• "Do not feel I have the time to discuss"
• "I believe everyone in the office is so busy it is a difficult topic to remember to cover during an appointment"
• "I'm currently working at an FQHC that prioritizes encounters over patient education and doesn't give me enough time to do as much MI as I would like."
Patient Vaccine Acceptance
• "People don't like talking about vaccines"
• "Some of my patient population think any vaccine conversations are political, and I don't want to engage in those conversations. The challenge is more around the political stigma of vaccines, not so much MI strategies."
• "The region in which I work has a high precedence of non-vaccination of children in general; additionally, the population of the town I work is dominated by a certain religion where talking about HPV/STIs is HEAVILY frowned upon."
• "It's difficult to apply MI strategies as they relate to HPV in my specific area because I have found that many of my patients are against vaccines in general."
Difficulty initiating an HPV conversation
• "I often find it hard to switch my brain from yes or no questions/answers (like updating med history and CCs) to an open-ended conversation about a topic that is not often discussed at dental visits."
• "Sometimes it's hard opening up the topic to talk about HPV with patients."
Provider Confidence
• I think the U of M curriculum does a great job instilling MI strategy skills, but my retained knowledge about HPV-related information isn't strong enough where I'd feel confident at this point having a thorough discussion with my patients about the disease and the vaccine."
• "One thing that helped in school was having the question on our medical form about the vaccine. It's easier now to forget about it. I also have experienced patients who get alarmed when talking about cancer."

to switch my brain from yes or no questions/answers (like updating med history and CCs) to an open-ended conversation about a topic that is not often discussed at dental visits." Perhaps respondents who were not confident in using brief MI for HPV communication have not had sufficient time to practice open-ended questions or establish trusting relationships with their patients, both foundational aspects of MI practice. Patient education materials, such as brochures or posters, have been suggested to initiate patient engagement in HPV conversations.[46]

Despite most participants acknowledging that they do not routinely discuss HPV as a risk factor for OPC with patients (73%), nearly half (49%) reported applying MI strategies to counsel at least one patient for the prevention of HPV-OPC. These respondents strongly perceived the importance of applying brief MI for HPV counseling and reported high confidence in applying MI strategies. However, the noted challenges regularly encountered by practicing clinicians hindered the regular utilization of the HPV Brief MI Skills-Based Training participants received as a student. This supports the existing literature showing HPV-related communication in dental settings is rare.[40,47]

Lack of time has been reported as a common barrier to HPV communication across previous studies[14,40,48] as well as in the current study. This finding is surprising as brief MI is tailored for use in time-constrained settings. Brief MI emphasizes short encounters of less than five minutes. However, unless HPV prevention is prioritized by practice culture, it is understandable that practicing clinicians would perceive a lack of time. In this study respondents were divided, with 54% agreeing with the statement

that "Medical professionals should remain the sole appropriate source of information regarding the HPV vaccine." This is in contrast to previous research which showed dental hygiene students perceived their role in oral HPV prevention as important.[31] This change in perception may be a reflection of the dental practice culture prioritizing traditional billable dental hygiene services rather including the prevention of HPV-related OPC with HPV prevention counseling. Perhaps the dental hygiene workforce shortage has compelled practices to reduce time for services considered as non-essential.[41] Flynn et al. found that dentists who perceived adequate office infrastructure, including sufficient staffing, were 2.5 times more willing to recommend and administer the vaccine.[41]

Although over half (59%) reported consistently using their MI training to counsel patients, the majority reported using MI for caries, periodontal disease, and home care counseling. One potential solution to the lack of "chair time" is to utilize teledentistry for time-intensive health counseling sessions.[49] Ben-Omran et al. conducted a scoping review to explore the current uses of teledentistry for oral health services in older adults. They found that oral cancer education could be delivered successfully via teledentistry showing improved patient knowledge using a cancer risk assessment tool.[49] Further, using brief MI in conjunction with an oral cancer risk assessment tool may improve comfort and confidence in targeted approaches for HPV-OPC prevention counseling.

Study limitations include the small sample size of UMN DH alumni which does not reflect the general population of DH practitioners. Additionally, the UMN DH program has an extensive MI curriculum thread encompassing training (coaching, role-playing, and feedback) with peers and patients.[30–32,50] Further, the participants had been evaluated as students during an Objective Structured Clinical Examination (OSCE) with standardized patients (SP) to measure brief MI competency and receive feedback.[32]

Collectively, this study highlights the need for professional standards of care for HPV communication practices in the dental setting. Continuing education for all oral health providers is needed to improve practice culture, retain knowledge of HPV infections and prevention, and improve providers' confidence and comfort for HPV discussions. Continuing education should focus on brief MI (five minutes or less) with the application of OARS and E-P-E for HPV communication.

Future investigations should examine HPV Brief MI Skills Based Training within predoctoral dental programs and with licensed oral health care providers (dentists, dental therapists, and dental hygienists) from a wide-range of educational backgrounds and clinical practice experiences to determine the impact of the training on their knowledge, attitudes (comfort and confidence), and practice culture toward HPV counseling. Another direction would be to study the use of brief MI with oral cancer risk assessment tools for targeted approaches to HPV-OPC prevention for improved engagement. This evidence may inform larger-scale future studies for sustainable HPV vaccination counseling. Additionally, future research should investigate the impact of a HPV Brief MI Skills Based Training program for the entire dental team on practice culture for enhancing HPV-OPC prevention counseling.

CONCLUSION

This investigation demonstrated that dental hygiene alumni from five consecutive cohorts who received HPV Brief MI Skills Based Training as part of their dental hygiene education program reported comfort and confidence in HPV communication. Findings suggest brief MI is an effective counseling strategy for HPV-OPC prevention and HPV vaccine advocacy. Reported barriers to regular HPV-OPC prevention counseling suggest that a change in dental practice culture may be needed for increased engagement.

IMPLICATIONS FOR DENTAL HYGIENE PRACTICE

- Dental hygienists play a pivotal role in HPV-OPC prevention through patient education and vaccine advocacy.
- Brief Motivational Interviewing (MI) training appears to equip practicing dental hygiene graduates with the skills, confidence, and comfort needed to engage in sensitive conversations about HPV and vaccination with patients.
- Embedding brief MI approaches into standard dental hygiene practice and fostering a culture that normalizes HPV communication can enhance the preventive role of dental hygienists in reducing the burden of HPV-related oropharyngeal cancers.

DISCLOSURES

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