

Perception and Utilization of Oral Screenings and Fluoride Application in Medical Offices Following the Michigan Caries Prevention Program Training

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Abstract

Purpose: The Michigan Caries Prevention Program (MCP) aimed to reduce the burden of childhood dental disease in the state of Michigan by offering training programs to implement preventive oral health services during well-child medical visits. The purpose of this study was to elicit feedback from the participants of the MCP and determine which oral health services were implemented post-training, identify implementation barriers and assess provider comfort levels in performing oral screenings and fluoride applications.

Methods: A descriptive electronic survey was utilized for data collection. A 15-item survey consisting of multiple choice and Likert scale questions was sent to medical providers who had participated in the MCP from 2015-2017 (n=1115). Descriptive statistics were used to analyze the data.

Results: A total of 170 surveys were completed for a 15% response rate. The majority of the participants were physicians (82%, n=134). Nearly all participants reported performing oral screenings and fluoride varnish application post-training (93%, n=153). Participants felt more comfortable applying fluoride varnish than performing oral screenings (80%, n=121 vs 70%, n=112), respectively. Barriers included lack of time, understaffed, staff resistance, feeling that procedures were outside of their scope of practice and disinterest from parents or safety concerns. A majority (70%, n=112) reported that the MCP training did not help to establish new relationships with community dental providers.

Conclusion: Medical providers indicate that the MCP training was beneficial and that they were willing and able to incorporate oral health screenings and fluoride varnish applications in their practice, but that they face challenges in developing relationships with dental care providers. Opportunities for dental hygienists to work in non-traditional medical-dental integration practice settings may help to increase oral health services offered to patients and improve communication between health care providers.

Keywords: interprofessional collaboration, Michigan Caries Prevention Program, early childhood caries, caries risk assessment, oral screening, fluoride

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Introduction

Interprofessional collaboration has been defined as the process of developing and maintaining effective interprofessional working relationships with learners, practitioners, patients, clients, families, and communities with the goal of enabling optimal health outcomes.¹ In 2000, the United States (US) Surgeon General's Report, Oral Health in America, highlighted the potential collaboration of

all health care professions to improve oral health.² Ten years later, the World Health Organization (WHO) published the "Framework for Action on Interprofessional Education and Collaborative Practice" in order to promote interdisciplinary team-work for health care providers, as well as policy makers.³ More recently, the US Department of Health and Human Services Health Resources and Services Administration

(HRSA) issued “Integration of Oral Health and Primary Practice” as a way to advocate for increasing oral health proficiency in primary care physicians, underscoring the need to address oral health in medical care.⁴

The Affordable Care Act (ACA) was signed into law in 2010 as a means to make healthcare coverage affordable to all. In addition to promoting affordability, the ACA has served as motivation for the implementation of interprofessional collaboration and education in health care.⁵ Not only is interprofessional collaboration seen as the most efficient path to patient-centered care, it also allows patients to receive optimal health care through integrated clinical networks in an affordable manner, a primary goal of the ACA. Furthermore, the ACA has supported the medical-dental integration (MDI) model of care, with the goal of intentionally connecting these services to improve access to care.⁶ This model also provides an innovative setting for dental hygienists to be employed as in-office advocates for oral health.⁷ By implementing interprofessional workforce models, providers can collaborate and provide services that improve patients’ overall healthcare outcomes, leading to increased levels of patient and provider satisfaction.^{8,9}

Despite efforts to improve oral health for Americans, vulnerable populations, particularly low-income children, the elderly, and ethnic minorities, still face challenges accessing preventive oral health services.^{9,10} Although oral health-related diseases are preventable, low-income children face multiple barriers accessing care, including affordability, shortages of dentist providers for public-insured populations, and dependence on caregivers.^{10,11,12} According to the National Health and Nutrition Examination Survey (NHANES) 2009-2010 data, 14% of children aged 3-5 years had untreated dental decay.¹³ Additionally, untreated dental caries was significantly higher in children aged 3-5 and 6-9 from low-income families as compared to cohorts living above the poverty level.¹³ According to a 2011 Institute of Medicine report, over four million children did not receive necessary dental care because their families could not afford it.^{10,14} Interprofessional collaboration with other health professionals, such as medical providers, may help to address the oral health crisis affecting these vulnerable populations.¹⁵

Healthy People 2020 acknowledged the lack of access to oral health care as a public health concern and identifies two areas of need specific to children and adolescents, reduce the proportion of children and adolescents with dental caries or untreated decay in their primary or permanent teeth.¹⁶ These priorities emphasized the need for improvement in preventive oral health services for children, as well as better access to care. The American Dental Association recommends that a child’s

first dental visit take place at the time of the eruption of the first tooth or around six months of age⁵ while the American Academy of Pediatrics, recommends that parents take their child to see a pediatrician at least six times in their first year of life.¹⁷ When these guidances are followed, a pediatrician will see a child much more frequently than a general dentist during the first year of life.^{8,17,18,19} These early pediatric visits are crucial to a child’s development, and if proper oral education and caries prevention strategies are also provided, early childhood caries rates have the potential to decrease.^{17,18} Pediatricians have the potential to address early childhood caries (ECC) incidence in their pediatric patients by learning how to perform oral screenings and apply fluoride varnish.^{10,18}

Research indicates that pediatricians are willing and eager to provide oral health services to their patients, but challenges exist^{18,19,20,21} with lack of dental insurance and/or inability to pay for care being the most common barrier.²⁰ Interestingly, only about a third of respondents reported lack of professional training as a barrier.²⁰ Lewis et al. investigated barriers primary care physicians face and found that lack of oral health knowledge was a significant barrier as well as insufficient time, space and staffing for varnish application, in addition to the belief that the procedure should remain in the scope of a dental professional. Physicians reported experiencing difficulty referring certain groups, such as uninsured and Medicaid patients, to a dentist.²¹ Additional barriers to fluoride application cited in a study by Nelson et al. included staff not agreeing to implement recommendations, limited time during patient visits, uncertain reimbursement opportunities, as well as parents opinions on the importance of oral health.²²

The Michigan Caries Prevention Program (MCP) was created in 2014 by the Altarum Institute, in collaboration with the University of Michigan School of Dentistry, Delta Dental Michigan, and the Michigan Department of Health and Human Services. This program aimed to reduce the burden of childhood dental disease in the state of Michigan by offering training programs to implement preventive oral health services during well-child visits.²³ The Michigan Caries Program provided training on oral health screenings, oral health risk assessments, and fluoride varnish application to primary care physician offices all over the state of Michigan who accept Medicaid, from 2015 to 2017.²³ A total of 2,783 medical providers (physicians and nurse practitioners), received training via the Smiles for Life curriculum. The MCP utilized a multi-faceted approach which included oral hygiene services, fluoride varnish application, parent education, and dental referral.²⁴

In a study conducted by Fontana et al., the initial implementation of the MCPP was assessed in two pilot locations by determining the barriers to adoption of services, as well as factors influencing successful outcomes.²⁴ The results demonstrated that participants felt more comfortable applying fluoride varnish following the training (78% compared to 54%).²⁴ In regards to barriers, “lack of patient/provider acceptance” was most commonly cited.²⁴ Additional barriers included “inadequate program monitoring and support,” “lack of expertise,” “time,” “integrating procedure into work flow,” and “reimbursement.”²⁴ Fontana et al. found that the availability of an “oral health champion” was crucial in order to overcome barriers and long-term sustainability.²⁴ The role of the champion was to promote the adoption of fluoride varnish on a regular basis, and engage participants in problem-solving and quality-improvement strategies.²⁴

While some outcomes from the MCPP have been reported previously by Fontana et al., it is unclear which oral health services have been implemented post training and the impact of the program on the participants. The purpose of this study was to elicit feedback from the participants of the MCPP and determine which oral health services were implemented post-training, identify implementation barriers and assess provider comfort levels in performing oral screenings and fluoride applications.

Methods

An electronic survey was used for this study. Surveys were sent to 1,115 MCPP participants who had provided e-mail addresses to the Michigan Department of Health and Human Services at the time of the program training. The study was deemed exempt by the Health Sciences and Behavioral Sciences Institutional Review Board of the University of Michigan.

The survey was first developed in consultation with the Oral Health Director and the Early Childhood Oral Health Coordinator of the Michigan Department of Health

and Human Services. The University of Michigan Survey Research Center was consulted during the survey development to establish content validity. The survey was pilot tested by two members of the Michigan Department of Health and Human Services, Division of Oral Health who were directly involved in the training program in addition to six dental hygiene educators. Survey modifications were made based on reviewer feedback.

The 15-item survey, administered by Qualtrics (Provo, UT, USA), was emailed on September 17, 2018; a reminder e-mail was sent one week later. The survey was only open for two weeks, due to time constraints. Inclusion criteria were any medical provider who had participated in the MCPP training. Survey items included participants’ roles within the medical office, reasons for taking the MCPP training, knowledge of fluoride, opinions of oral health, barriers to providing services, and comfort level of providing services. All questions were multiple choice, with the exception of two Likert Scale questions. Data were analyzed with SPSS Version 25 (IBM; Armonk, NY) software and descriptive statistics were used to report results.

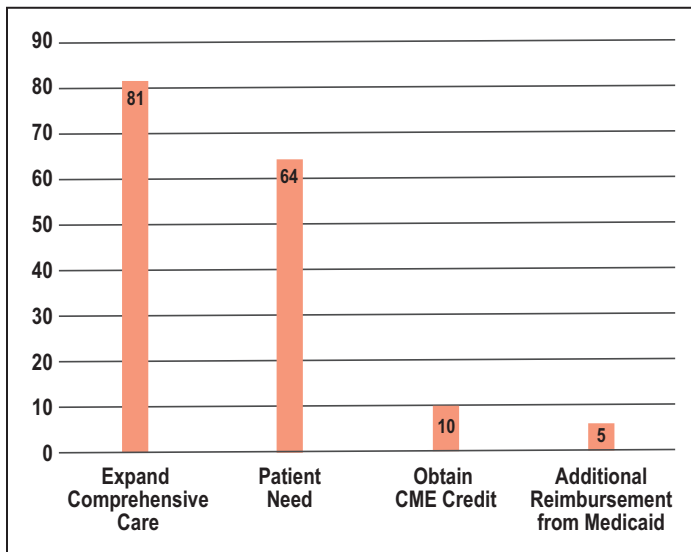
Results

A total of 170 completed surveys were returned (n=170) for a response rate of 15.24%. The majority of respondents were physicians, followed by nurse practitioners, physician assistants, nurses, and medical assistants (Table I). When asked what the primary reason was for participating in the Michigan Caries Prevention Program, over half (n=81, 51%) responded that it was to expand comprehensive care to their patients. The second most frequent response was to fulfill a patient need for oral health care (n=64, 40%). Reasons for participating in the MCPP are shown in Figure 1. Of those practices which have implemented these services, physicians were the most frequently reported person responsible for completing oral screenings (76%, n=122) and both the

Table I. Respondent demographics (n=170)

Survey item	Physician	Nurse Practitioner	Physician's Assistant	Nurse	Medical Assistant	Other
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
What is your profession?	134 (82)	15 (9)	9 (6)	3 (1)	1 (1)	1 (1)
Who is the primary member of your office responsible for providing oral screenings in the practice?	122 (76)	5 (3)	9 (6)	5 (3)	13 (8)	7 (4)
Who is the primary member of your office responsible for applying fluoride varnish in the practice?	75 (47)	3 (2)	5 (3)	13 (8)	59 (37)	5 (3)

Figure 1. Respondents' primary reason for participating in the MCPP (n=160)



physician (47%, n=75) and medical assistant (37%, n=59) were responsible for applying fluoride varnish. Participant and practice setting demographics are shown in Table I.

Prior to the MCPP training, almost three-quarters of the participants (74%, n=121) reported low levels of knowledge regarding fluoride varnish. When asked whether or not MCPP training increased general knowledge of oral health, nearly all participants provided a positive response, (95%, n=154). The vast majority of the participants had no additional oral health training upon completion of the MCPP (90%, n=147). Nearly all participants reported implementation of oral screenings and fluoride varnish services following the MCPP training (93%, n=153). Respondents who indicated that they had not implemented oral screenings and varnish applications were asked to identify barriers to implementation. Results included lack of time (33%, n=3), considered oral health care services outside of their scope of practice (22%, n=2), and “other” (44%, n=4). Written responses to “other” included, being understaffed, staff resistance, and parents not interested fluoride treatment or concerns regarding fluoride safety. Post MCPP training program outcomes are shown in Table II.

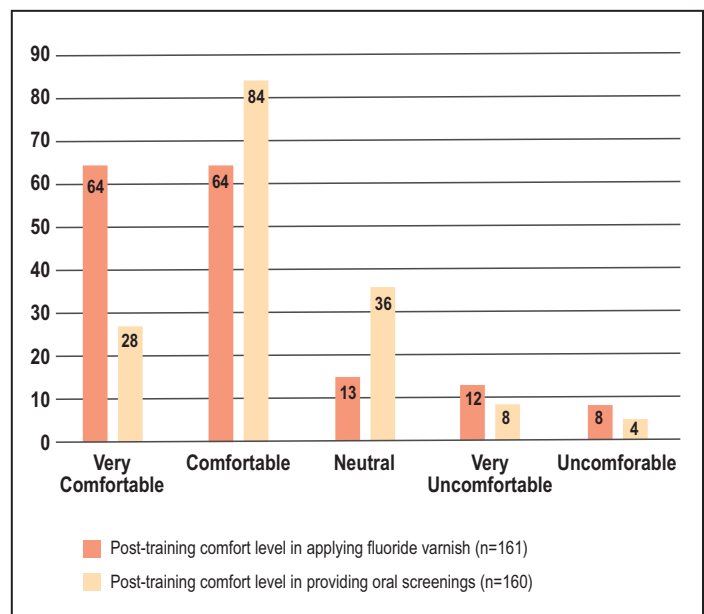
Participants were asked to rate their comfort level in applying fluoride varnish and oral screenings. More participants indicated that they were “very comfortable” (40%, n=64) applying fluoride varnish than performing an oral screening (18%, n=28) (Figure 2). Regarding caries risk assessments, well over half of the participants indicated that the training helped them improve their caries risk assessment skills (86%, n=138). However, the vast majority of participants indicated that the training did not help the office establish new relationships with the local dental community (70%, n=112) (Table II).

Table II. Post-training assessment items (n=170)*

Post-training assessment	Frequencies n (%)
Did the MCPP Program increase your understanding of oral health? (n=163)	
Yes	154 (94.5)
No	3 (1.8)
Undecided	6 (3.7)
After the MCPP training, has your office implemented the oral screening and fluoride varnish services into the practice? (n=164)	
Yes	153 (93.3)
No	11 (6.7)
After the MCPP, are you better able to assess the caries risk level of your pediatric patients? (n=160)	
Yes	138 (86.3)
No	6 (3.8)
Undecided	16 (10)
Has your MCPP training helped your practice establish new relationships with the local dental community? (n=161)	
Yes	49 (30.4)
No	112 (69.6)

* n's vary since not all of the respondents incorporated oral health programs in their settings and some response items were left blank

Figure 2. Respondents' comfort level in fluoride varnish application and oral screenings



Discussion

Low-income children suffer the consequences of access to oral health care disproportionately more than their wealthier counterparts. Results of this study demonstrated that medical providers are motivated to expand comprehensive care to their patients by integrating oral health services. These results mirror the previous findings of Quinonez et al. and Lewis et al. regarding the willingness of physicians to provide oral health services when proper training and resources have been provided.^{20,21} Findings from this study are consistent Lewis et al. regarding implementation barriers including the belief that fluoride varnish application should remain within the scope of professional dental practice.²¹ Despite the fact that results from this study showed that the medical providers were comfortable providing fluoride varnish, there appears to be a challenge to whether they accept this procedure as falling under their scope of practice.

Results from this study demonstrated that while most participants reported significant gains in their level of oral health knowledge, the MCPP training did not help establish new relationships with the local dental community. It should be mentioned that the MCPP did not include specific content addressing how to establish a dental home for patients; adding this content to future trainings may prove beneficial.

The majority of participants felt very comfortable with fluoride varnish applications, however fewer respondents expressed the same comfort levels towards providing oral screenings. One reason for this difference may be related to the skill levels required for the two procedures. Differentiating between normal versus deviations from normal findings during an oral screening, are second nature to a dentist or dental hygienist. This skill is developed over time and with consistent practice. It may be that the participants of this study have not had enough time to establish a solid comfort level when performing oral screenings. Also, while applying fluoride varnish may appear to be a simple procedure, there may be a false sense of confidence in these findings. Proper technique is required in order for fluoride varnish to have its maximum effects.

In a study by Quinonez et al. to determine the attitudes, practices, and barriers related to oral health of pediatricians (n=790), fewer than 10% of participants described their ability to provide fluoride varnish as “very good” or “excellent,” prior to a training program.²⁰ However, when participants had training, more than 20% described their ability to provide fluoride varnish as “very good” or “excellent.”²⁰ In regards to caries risk assessments, 20% described their ability as “very good” or “excellent” prior to training, as compared to 37%

following oral health training.²⁰ While the Quinonez et al. study measured providers’ pre- and post-training perceptions regarding fluoride varnish applications and caries risk assessments, a secondary finding from this study was the providers reported increased ability to assess the caries risk level of their patients.²⁰

Additionally, while more than 50% of the participants felt “comfortable” completing an oral screening, it was evident that more participants felt “very comfortable” administering fluoride varnish. One reason for this disparity may be that medical providers feel that diagnosing caries is more difficult than simply applying fluoride and may be more hesitant to do so. Another reason may be that providers do not feel that diagnosing caries is within their scope of practice.

This study had limitations, including the 15% response rate. There are several reasons that may have contributed to the low response rate. One major reason may be the length of time that has elapsed since the MCPP initial training. Another possible reason may be that some of the participants were medical residents at the time of the MCPP training and were no longer associated with the e-mails provided. Another limitation to the generalizability of the findings is that the positive responses may have come from a few large medical practices that had implemented oral screenings and fluoride varnish applications following the MCPP training. Fontana et al. studied outcomes data from a sample of medical practices that had completed the MCPP training and found that medical offices with an “oral health champion” reported higher frequencies of oral screenings and varnish applications than offices without this type of team member.²⁴ Also, there the geographic distribution of the respondents was unknown, therefore it was not possible to track the distribution of the participants. Furthermore, MCPP training was not provided in all counties in Michigan, limiting the generalization of the results in regards to health care providers in the state.

Suggestions for future research include following-up with the MCPP providers to better understand the long-term program outcomes. Program trainers could follow-up 3-6 months post training in order ensure medical providers are able to implement the practices, assist with fluoride varnish ordering and billing, and address any questions. It would also be beneficial to introduce an “oral health champion,” into these pediatric setting to advocate for the utilization of oral health services and serve as a leader towards adopting new behavioral norms.²⁴ Additionally, future training should emphasize establishing relationships with the local dental community for patient referrals.

An additional area requiring follow-up is evaluating which providers are receiving the MCPP training. Results of this study showed that in some cases medical assistants are applying fluoride varnish, however only physicians and nurse practitioners were part of the MCPP, suggesting that these services were delegated to other health care providers. However, it is important to remember that technique is imperative for effective fluoride varnish application. All staff members need to be trained to ensure that the services provided are effective. There may also be opportunities for dental hygienists to play supporting roles in the education and training of medical providers.

Conclusion

The MCPP had a positive impact on increasing preventive oral health services in the pediatric population in Michigan. Program participants felt comfortable with fluoride varnish applications, however they were less comfortable performing oral screenings following the MCPP training. While participants felt indicated increased understanding of oral health and comfort in providing oral health care services, there was still a lack of communication between medical and dental providers. Strategies to be considered in the future include emphasizing interprofessional collaboration and communication between medical and dental providers, establishing oral health advocates into medical office settings and long-term program outcome evaluations. Dental hygienists can play integral roles supporting improved patient outcomes in interprofessional collaborations with medical providers.

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