

Improving Health and Dental Care Access in North Dakota

Evaluation of Medical-Dental Integration in one Family Medical Center

Health of the mouth has historically been separated from overall health. Individuals who are underinsured, uninsured, or on public assistance are less likely to visit a traditional dental clinic but more likely to need dental services. Adults also report they are more likely to visit a primary care provider annually than a dental provider. Recognizing this health inequity, the North Dakota Department of Health (ND DoH) Oral Health Program (OHP) hired a public health hygienist (PHH) in 2018 to work at the University of North Dakota (UND) Center for Family Medicine (CFM) clinic located in Bismarck, North Dakota. This work was funded by the Health Resources and Services Administration. This report provides a review of the program along with recommendations for future medical-dental integration in North Dakota.



Dental Care Provided at UND CFM

In this role, the PHH provided dental screenings, fluoride varnish application, and oral health education for patients and their families. The PHH also provided dental referrals for those needing dental care and provided education and training for clinical staff and medical residents.

Fluoride Varnish

Fluoride varnish is a sticky, colorless and tasteless paste that contains high levels of fluoride that helps prevent cavities. If cavities are in the early stages, the fluoride can slow or even stop the cavity process. The entire process is fast, painless and takes less than five minutes to apply.

Summary of Key Findings

- In 30 months of services, the PHH completed 1,385 dental screenings at the UND CFM.
- Of those 1,385 screenings, 22% had NEVER visited a dental office.
- On average, the PHH saw a larger number of patients per month prior to the COVID-19 pandemic.
- In the most current grant year (September 2021 – May 2022), the PHH provided fluoride varnish application for 60% of the patients screened.
- Clinicians and medical residents who attended lunch and learns with the PHH highly rated the trainings and requested additional education on their roles in oral health prevention.
- Completing medical residency in a facility that integrates medical and dental care has a positive impact on the oral health knowledge and experience of medical providers.

Understanding Medical-Dental Integration: Role of the PHH

The PHH provides direct preventive dental care services and oral health education to pediatric patients and their families. The PHH works as a member of the medical care team, participating in team huddles, provider meetings and treatment planning. In addition to providing care and educational resources during a patient's visit, the PHH worked with the UND CFM to add dental-related resources in the waiting room, though all waiting room materials were removed in March 2020 in response to the COVID-19 pandemic. The PHH also provided Lunch and Learn educational sessions on oral health topics for both medical residents and medical staff.

The PHH and OHP have developed a manual to assist other primary care clinics and family medical centers in adopting a similar medical-dental integration model in North Dakota. This [Medical-Dental Integration Manual](#)² is continually revised.

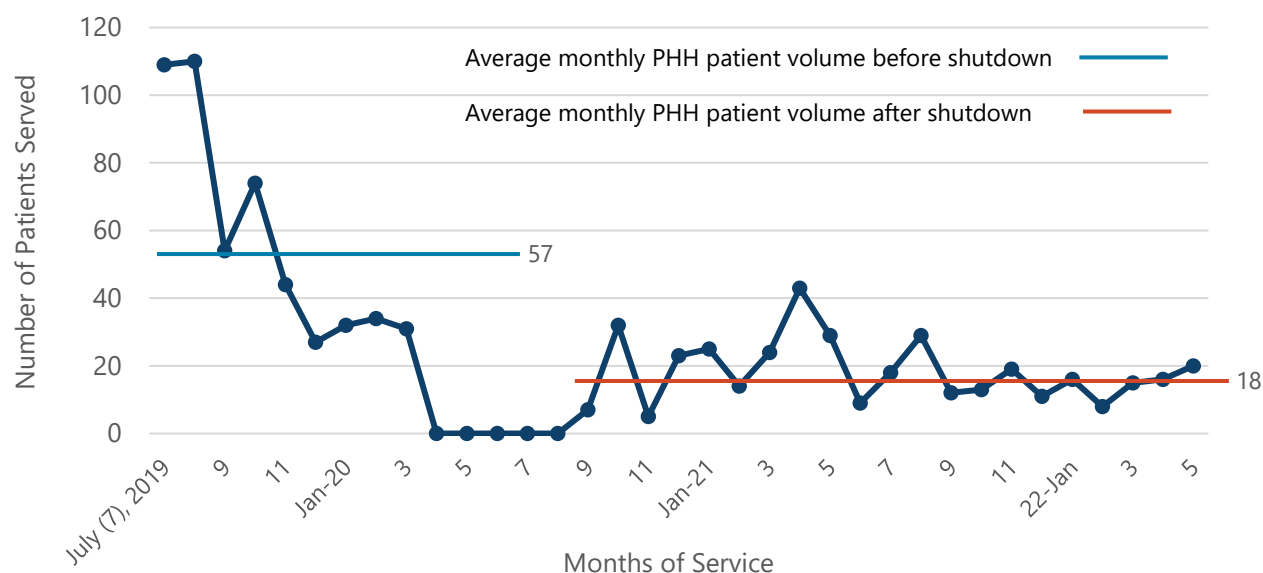
COVID-19 Response

On March 18, 2020, the UND CFM began operating with essential staff in response to the global health pandemic (COVID-19). The PHH halted patient education and services. The PHH returned to direct patient care on September 22, 2020 and continued through May 27, 2022.

Community Impact: Patient Reach

Between July 2019 and March 2022, the PHH completed 1,390 dental screenings at the UND CFM. Omitting the five months of no care provision due to the pandemic, the PHH saw an average of 30 patients a month. However, on average, the PHH saw a larger number of patients per month prior to the COVID-19 pandemic. These patients received oral health screenings, fluoride varnish applications, dental supplies and dental referrals as needed while already seeking regular health care services at their primary care facility.

Number of Patients Served by the PHH at the UND Center for Family Medicine, by Month



Annual grant periods run September 1 through August 31. In year one, services did not begin in the main clinic until November 2018 and expanded to also serve patients in UND CFM’s asthma clinic in July 2019. Year two saw a five-month suspension of services that carried into year three in response to the COVID-19 pandemic. Year four direct patient services ended in May 2022.

Number of Patients Served by the PHH at the UND Center for Family Medicine

	Year One ^a	Year Two ^b	Year Three ^c	Year Four ^d
Referred to PHH	475	296	440	174
Refused Screening	4	12	10	17
Fluoride Varnish	345	198	309	105
Dental Supplies	430	228	332	154
Brochure	258	174	252	158
Dental Education	449	279	421	171
Dental Referral	209	93	144	19
Sought Treatment	2	5	6	n.d.

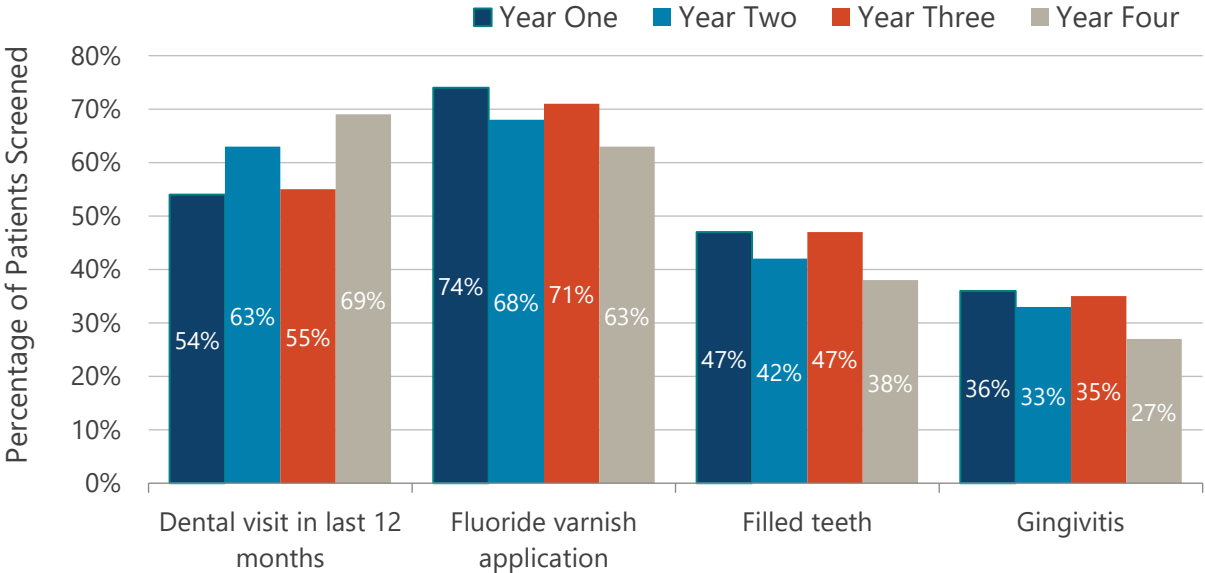
a. Asthma clinic data, July 2019 – August 2019. Main clinic data, November 2018 – August 2019.
 b. Data for both the main clinic and the asthma clinic, September 2019 – March 11, 2020,
 c. Data for both the main clinic and the asthma clinic, September 22, 2020 – August, 2021.
 d. Data for both main and asthma clinic combined, September 1, 2021 – May 27, 2022

n.d. = no data

Reach in Year Four (September 1, 2021 – May 31, 2022)

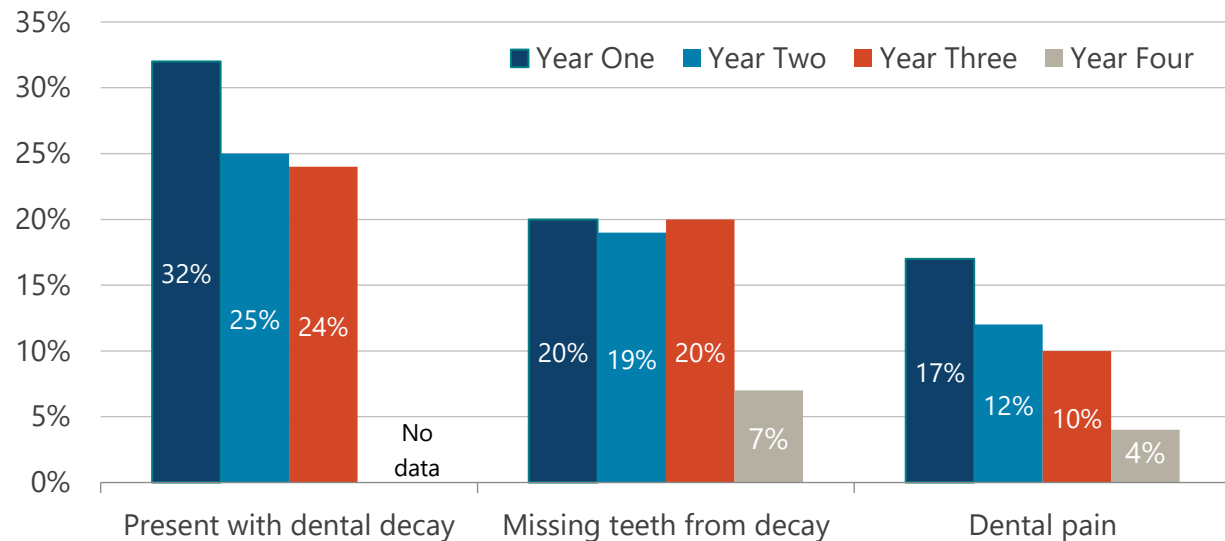
Of the 174 patient visits in year four, 89% left the office with a new toothbrush, 99% discussed good dental hygiene practices with the PHH, 91% left with educational materials and 11% were referred to a dental provider. There was no significant variability by year for patients presenting with dental concerns until the most recent year.

Dental Visits, Varnish Application and Patients Presenting with Dental Concerns in Years One - Four



The percentage of patients screened by the PHH who presented with teeth missing from decay, filled teeth, gingivitis and dental pain decreased annually with the most significant decline in year four. Although data cannot indicate causation or correlation, potential explanations for improved oral health may be that these patients have received dental hygiene education and fluoride varnish over the four years of service and that the percentage of patients with dental visits was higher in year four as well. Good personal dental hygiene and regular preventive dental visits are imperative for improved oral health.

Percentage of Patients Presenting with Dental Concerns, Years One - Four



Training Medical Residents and Clinical Care Providers

The PHH hosted six, one-hour training sessions in year four. The topics focused on medical-dental integration workflow and fluoride varnish application. Attendees included clinicians, staff and medical residents at the UND CFM. The training on how to apply fluoride varnish was also recorded and continues to be available for new medical residents and new direct care providers hired at the UND CFM.

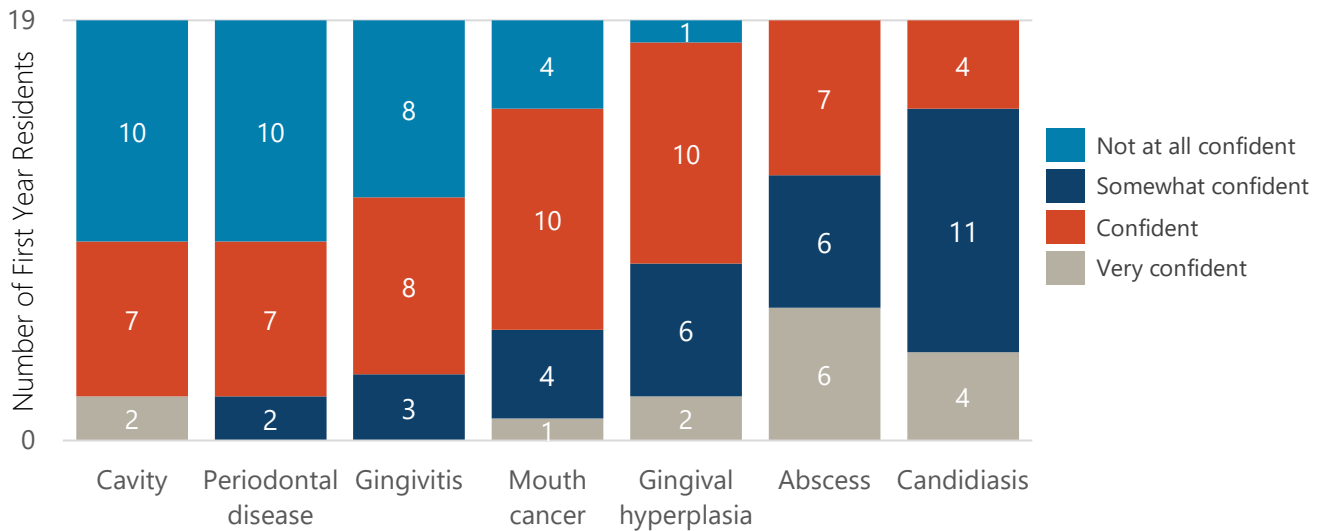
Between eight and 25 medical residents and clinical care professionals attended each session. Participants completing a training evaluation indicated, on average, that they agreed or strongly agreed that the sessions were relevant to their career, well organized, useful for their work and enhanced their clinical skills. All but one either agreed or strongly agreed that they would recommend these sessions to their colleagues.

First and Third-Year Residents: Knowledge and Confidence

Nineteen first-year residents were surveyed prior to beginning their residency in the summers of 2019, 2020, 2021 and 2022. Among the 19 total first-year residents, 37% had received formal training in medical school related to oral health. Only five (26%) had ever conducted a basic oral health screening, and all but one agreed or strongly agreed that oral health is an important

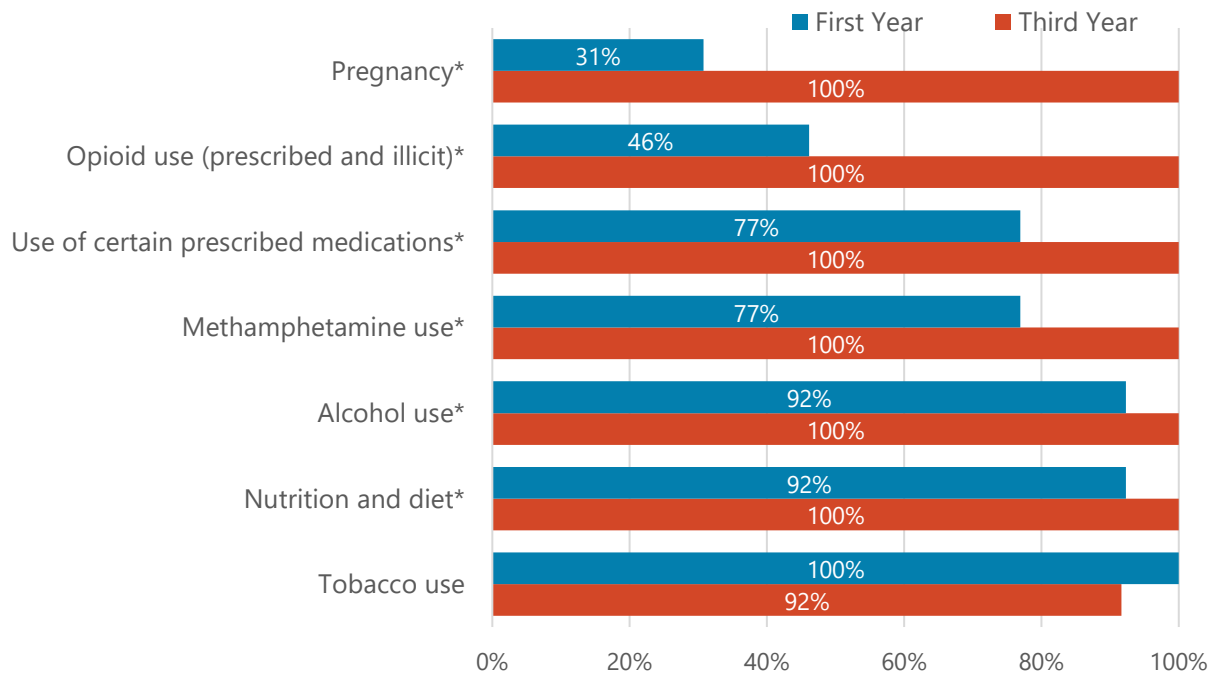
factor in overall health. When asked to score their level of comfort in identifying a variety of oral health concerns, on average, residents were more comfortable identifying abscess, candidiasis and gingival hyperplasia. They were less confident in their ability to identify a cavity or periodontal disease.

Number of First-Year Medical Residents by Comfort Level Identifying Common Oral Health Concerns



Completing residency in a facility that integrates medical and dental care has a positive impact on the oral health knowledge and experience of these providers. See the figure below.

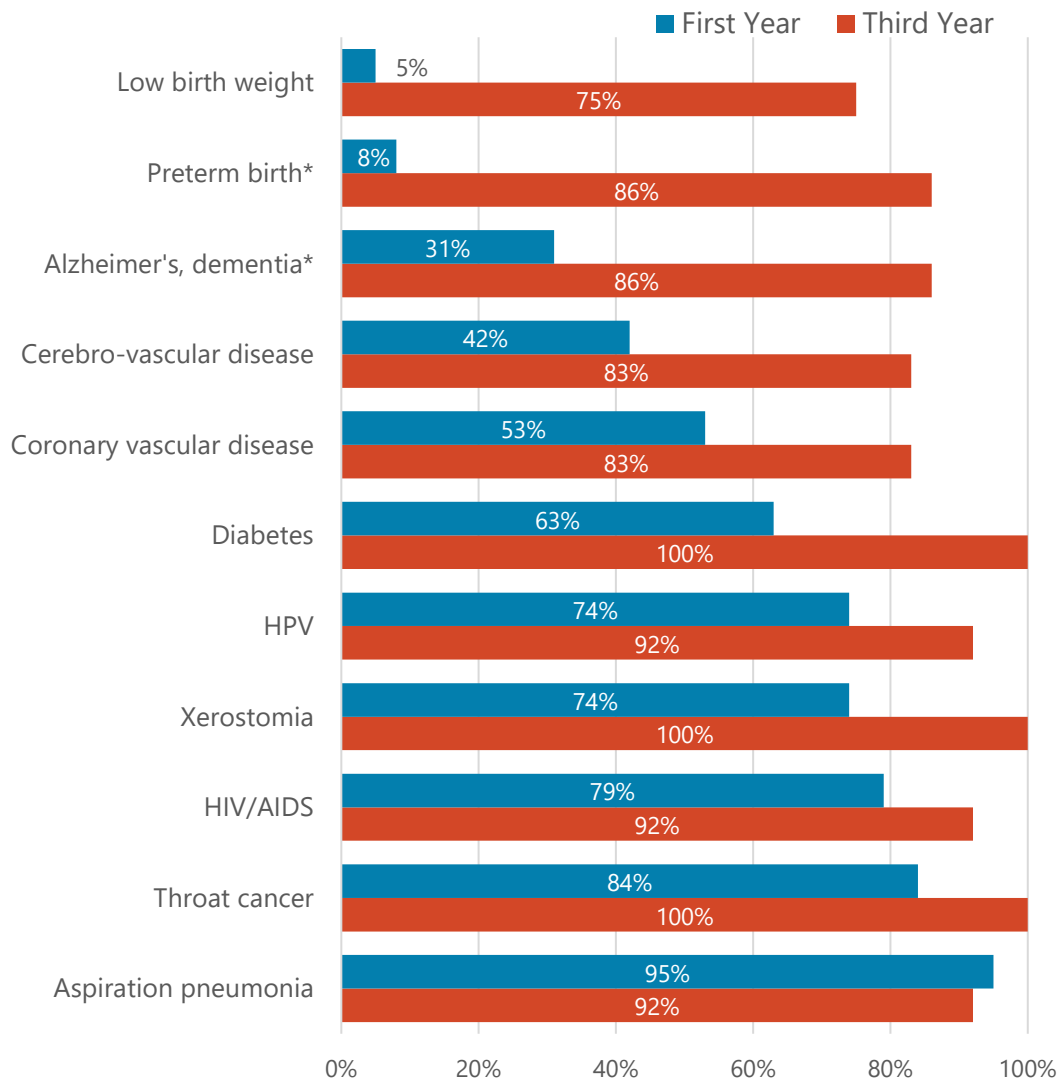
Percentage of First and Third-Year Medical Residents who were Aware of the Relation between Behaviors and Oral Health: 2019-2022



* Note: Added in year two; residents in grant year one did not report knowledge on these measures

First-year residents were largely unaware of the relation between poor oral health and preterm birth, low birth weight, and coronary and cerebrovascular diseases. Conversely, nearly all third-year residents were aware, with the exception of one who was still unaware, of the relation between oral health and aspiration pneumonia. See the below figure presenting the percentage of medical residents who were aware of the relation between one's oral health and various other health conditions.

Percentage of First and Third-Year Medical Residents who were Aware of the Relation Between Oral Health and Other Health Conditions: 2019-2022

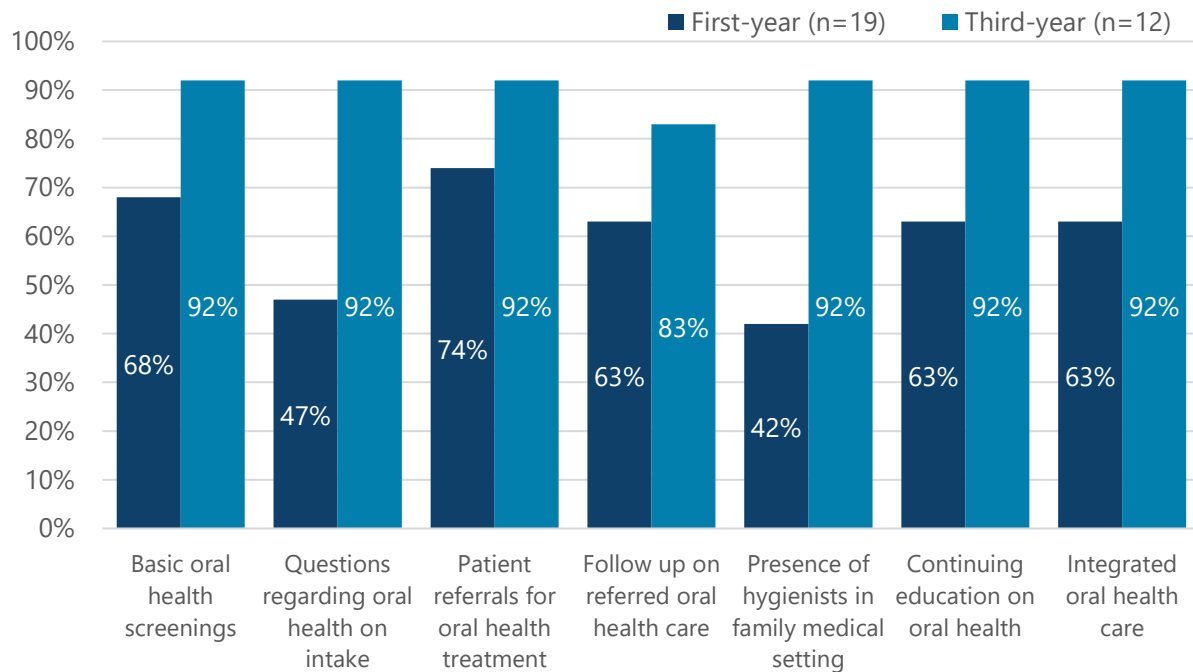


* Note: These conditions and behaviors were added to the survey in year two and were not collected in year one

An added benefit of completing a medical residency in a facility that integrates preventive dental services is a recognition of how important it is to provide such services in a family medical setting. After completing the program, 11 of the 12 third-year residents indicated that it was *very important* that family medical centers integrate oral health services.

The same was true for how important it was to conduct oral health screenings, provide follow-up care and offer education for clinical care staff on oral health screening and prevention. Most notable is that less than half of first-year medical residents believed it was very important to have a hygienist on staff in a family medical setting. However, after completing the residency, all but one found this to be a very important practice. See the figure below.

Percentage of First and Third-Year Residents Indicating Each Is “Very Important” to Address in a Family Medical Center, 2019-2022 Combined



Summary and Recommendations

Patient Reach

Benefits to patients from this program included increasing the frequency of early identification of dental needs and providing preventive care to patients who would otherwise be unlikely to receive oral health services. Over the four years of the program, fewer than 1 in 3 patients screened by the PHH had seen a dentist in the 12 months prior. In year four, 1 in 5 had never seen a dentist. During the four-year grant period, despite the major effect of the COVID-19 pandemic in reducing the ability to provide care, the PHH provided fluoride varnish to 975 patients and dental referrals to 465 patients. Across all four years, between 75-98% of patients received dental supplies and education, which promoted healthy dental hygiene habits.

It is recommended that the OHP continue to assess the sustainability of medical dental integration (MDI), and the interest among other family medical centers to implement such a model. In the absence of MDI, the OHP should continue to offer training and support for oral health screenings and fluoride varnish application to be completed by primary care clinicians and medical residents.

Education

The reach and impact of the MDI program demonstrates clear benefits to patients and clinical care staff. There was an increase, in the percentage of residents who perceived it was important that a family medical center include oral health services, and in the percentage who were aware of the relation between various behaviors and health conditions, and one's oral health status. Regardless of care provision, it is important that medical residency programs continue to offer training on how to conduct oral health screenings, how to apply fluoride varnish, and what the relation is between oral health and various behaviors and health conditions.

MDI as a Model of Care

This model demonstrates that few people are offered a dental screening when visiting their medical provider will refuse screening, and that relatively large percentages of those screened benefit from dental care and education that can either be provided on site by a PHH or referred to other dental providers. Therefore, careful analysis of placement of this model in additional primary care facilities based on unmet oral health need could alleviate a considerable percentage of the unmet care needs in the state, especially if it is sustained over time and if this becomes part of standard of care in medical education. This will require additional efforts to ensure the facility can be reimbursed for preventive services provided by the PHH.

Evaluation Plan

The OHP subcontracts with Dr. Shawnda Schroeder and her team at the UND School of Medicine & Health Sciences, Department of Indigenous Health, to complete program evaluation. Activities include review of patient data, training evaluation, and assessments of medical resident knowledge and experiences. These activities have been approved by UND's Institution Review Board.

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Citations

1. Public Health Hygienist in a Family Medical Setting: Program Details, hhs.nd.gov/public-health/oral-health-program/medical-dental-integration
2. North Dakota Medical Dental Integration Manual, ruralhealth.und.edu/assets/3816-16057/medical-dental-integration-manual.pdf