



Expanding the Pediatric Preventive Oral Health Care Workforce

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Abstract

Background: An estimated 21.5 million children lack access to basic dental care. The Integration of Oral Health and Primary Care Practice suggested targeting nurse practitioners, nurse midwives, physicians, and physician assistants to fill the dental workforce gap and become the first point of access to preventive oral health for pediatric patients. Preventive oral health is not a standard of pediatric primary care nurse practitioner education. This descriptive study reports the successful integration of preventive oral health care and the associated clinical competencies into a pediatric primary care nurse practitioner program.

Method: The integration of preventive oral health care clinical competencies into the pediatric primary care nurse practitioner education was a four step process which included: 1) Completion of Smiles for Life: A National Oral Health Curriculum courses, 2) Participation in a low fidelity simulation experience conducted by a dentist, 3) Involvement in an interprofessional preventive oral health care clinical practicum and 4) Student documentation of the preventive oral health care clinical competencies performed in a primary care setting.

Results: A total of 28 students completed the four step integration process. Students' documentation demonstrated completion of 609 oral health exams, education of patients/parents, and application of fluoride varnish 88 times. Additionally, they performed 276 oral health risk assessments and identified early tooth decay or oral pathology in 110 patients which resulted in 154 referrals to a dentist.

Discussion: Oral disease can have social and emotional consequences on children's ability to learn and succeed. Integration of preventive oral health care and clinical competencies into primary care education will play a significant role in addressing oral health disparities and lack of access to preventive oral health care. This curricular innovation can easily be implemented as an evidenced based protocol for pediatric primary care educational programs.

Keywords: Pediatric preventive oral health care; Gaps in oral health workforce; Oral health clinical competencies; Oral health curriculum

Introduction

In the United States, an estimated 21.5 million children lack access to basic dental care, which is greater than the unmet needs for medical care [1,2]. Currently, there are 45 million Americans who live in communities with a ratio of one dentist to 5,000 patients [2]. Chou reports national statistics that estimate three-quarters of American children with dental caries have never received treatment [3]. Preventive oral health care is critical and cost effective during childhood. Children with dental caries have long-term health consequences due to poor nutrition, chronic pain, loss of school days, and decreased self-esteem [4]. Children who do not receive preventive oral health care are at greater risk of chronic dental complications and systemic health issues. Unmet preventive oral health care needs can result in an increased economic burden to both families and the health care system. The Pew Center suggests that the annual spending on dental services is predicted to increase from \$101.9 billion in 2009 to \$161.4 billion in 2018 of which 35% will be spent on children [5].

The need for preventive oral health care and dental care has persisted for decades. The Office of Disease Prevention and Health Promotion published Healthy People 2010 and 2020 describing specific goals to improve the health of the nation [6,7]. The Healthy People 2020 objectives OH-1.1 and OH-2.1 focus on improving access to dental care, as well as, reducing the number of dental caries and untreated tooth decay for children between the ages of three and five years [7]. Statistics show that 23.7% of children between the ages of two and five years have caries, and 18.7% of those remain untreated [8]. Furthermore, tooth decay rates increase to 56% for children between the ages of six and

eight years [8]. These statistics are thought to be an underestimation of the true prevalence of dental disease because they do not include the presence of white spot lesions (demineralization of the tooth enamel), which indicate the start of caries [9].

Compounding the problem, disparities in preventive oral health care combined with the lack of access to pediatric dental care increases the risk of dental caries in the primary teeth of children. Disparities in preventive oral health care include racial and ethnic minorities, immigrant families, patients with lower socioeconomic status, and participants in Medicaid insurance [10]. Due to socioeconomic disparities, one out of 16 children in the United States has never received oral health care [10]. In 2012, the prevalence of tooth decay in the United States was 46% for Hispanic and 44% for non-Hispanic black children compared to 31% of non-Hispanic white children [8,10]. In order to address disparities and lack of access, innovations in expanding the oral health workforce is one of the advocated and most viable solutions.

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Qualis Health published a white paper titled, Oral Health: An Essential Component of Primary Care, which discussed the benefits of primary care providers partnering with dentists to reduce the consequences of oral diseases [2]. The Institute of Medicine recognized the lack of access to dental care, a shortage of dentists, and the need for a long-term plan as the key issues to be addressed [10]. In response to the Institute of Medicine's call to action, the Health Resources and Services Administration published a consensus report, Integration of Oral Health and Primary Care Practice, [11] which targeted nurse practitioners, nurse midwives, physicians and physician assistants to become part of the solution. This report reinforced the urgent need to incorporate preventive oral health care clinical competencies (oral health risk assessment, oral health exam, education on oral health promotion, fluoride varnish application, and dental referrals) in primary care education [11].

Pediatric primary care providers have a unique opportunity to see children on a frequent basis due to the required well child physical exams and immunizations. Depending on the individual state requirements, children on CHIP or Medicaid are evaluated in the primary care office 9-11 times before the age of three [12]. This presents the perfect opportunity to screen, educate, and provide preventative oral health services such as fluoride varnishing and dental referrals as needed. Currently, there are 205,000 nurse practitioners (NPs) licensed in the United States, and 84.9% of those see patients covered by Medicare and 83.9% by Medicaid [13]. Of the total number of nurse practitioners, 86.5% are prepared in primary care and 5.3% are Pediatric Primary Care Nurse Practitioners [14]. When provided with education and clinical experiences, nurse practitioners can fill the preventive oral health care workforce gap [15].

Method

Initially primary care nurse practitioner faculty reviewed all didactic courses for inclusion of preventive oral health care content in the curriculum. Review found preventive oral health care knowledge threaded throughout courses, but with insufficient information and clinical experiences to acquire preventative oral health clinical competence. The educational framework for the integration of preventive oral health care and clinical competencies was a four-step process. The initial step of the educational process was incorporating a preventive oral health care didactic component, Smiles for Life: A National Oral Health Curriculum (SFL) [16]. The curriculum provided a nationally recognized educational resource with free online access. The pediatric primary care nurse practitioner students were assigned to complete the SFL courses 1-7. Students were instructed in the course syllabus how to access the course links by visiting the website www.smilesforlifeoralhealth.org [16] and clicking on the right margin under "Course Quick Links". Students completed a "Post Assessment" for each course with a mandatory passing score of 80% to receive a "Certificate of Completion". Course certificates were submitted into an assignment drop box on BlackBoard™ for faculty review. Students received 1.0 contact hour of continuing education credit through New York University College of Nursing's Center for Continuing Education in Nursing for each completed course. Other health care disciplines can also receive continuing education credits for completion of the online courses.

Step two incorporated a low-fidelity simulation experience designed to provide the students with an opportunity to apply the knowledge gained from SFL and practice preventative oral health clinical competencies in a controlled environment until mastery was

achieved. The American Academy of Pediatrics chapter referred a local dentist to present "Bright Smiles from Birth" [17] and to supervise the clinical simulation. Students completed oral health risk assessments, oral exams, and applied fluoride varnish to each other. These preventive oral health care skills were evaluated by both nursing faculty and the dentist. The dentist certified and recorded the students' names for potential reimbursement of preventive oral health care services in their future roles as primary care clinicians. In order to receive Medicaid reimbursement for preventive oral health care services, some states require specific training and a National Provider Identifier. Information regarding training requirements, reimbursed providers, dollar amount reimbursed, procedure codes, and frequency of reimbursement for services by state can be obtained by visiting the Children's Oral Health website <http://www2.aap.org/oralhealth/state.html#> [18] by the American Academy of Pediatrics.

Step three consisted of an interprofessional oral health clinical practicum. Local students were assigned to a four-hour clinical rotation at a Federally Qualified Health Care clinic, which provided pediatric primary care in conjunction with dental care. Distance students attended a dental practicum within their home state. Students directly observed and practiced the oral health clinical competencies in an interprofessional setting with a dentist. Discussion with the dentist allowed the students ample opportunity to identify early tooth decay, oral pathology, and learn when and how to refer to a dentist. Students obtained clinical hours for their dental practicum after submitting a log of completed hours signed by the dentist.

Step four involved student documentation of the preventive oral health care clinical competencies utilizing Typhon Nurse Practitioner Student Tracking System for Advanced Practice Nursing Programs. Faculty evaluated the synthesis and application of the preventive oral health care clinical competencies into the student's primary clinical settings through a custom procedure and skills set in Typhon™. The skill set included: 1) oral health risk assessment tool; 2) consult on child's oral hygiene; 3) consult on baby bottle/nursing tooth decay; 4) oral transmission of bacteria and tooth decay; 5) consult on fluoride in water; 6) consult on the importance of dental visits; 7) perform an oral exam during well child visit; 8) Identify early childhood tooth decay; 9) Identify signs of oral pathology; 10) application of fluoride varnish; and 11) dental referral.

Results

A total of 28 pediatric primary care nurse practitioner students completed the four step integration of the preventive oral health care process: 13 from the Master of Science in Nursing (MSN) and 15 from the Doctor of Nursing Practice (DNP) program. All students completed the SFL courses, submitted their "Certificates of Completion," and received continuing nursing education credits. All students participated in the oral health lecture and simulation experience and were certified by the dentist. Thirteen of the 15 MSN students attended the interprofessional oral health clinical practicum. The remaining two MSN students were unable to attend due to scheduling difficulties. Twenty-eight students submitted their signed clinical logs verifying attendance at the dental practicum.

Typhon documentation of preventive oral health clinical competencies was reviewed for 15 MSN students who participated in a primary care clinical two days a week for 15 weeks, and 15 DNP students who participated two days each week for 30 weeks. The table below represents documentation of preventive oral health clinical

competencies performed by the students in primary care clinical settings.

Review of the results provided evidence that the educational program improved access to preventive oral health care. Three MSN students implemented a preventive oral health care program in their respective primary care clinics as their capstone projects. Additionally, a DNP student initiated a preventive oral health care program at her clinical site within the United States Navy. Due to the success of her project, the U.S. Navy is interested in adopting the program at multiple sites across the country.

Discussion

In the past, large-scale, interprofessional preventive oral health care projects at NYU and Washington University have been grant-funded and extremely successful [19,20]. Without funding, most universities would not be able to replicate programs of this magnitude. This pilot study provides evidence that despite size or lack of funding, schools of nursing can integrate preventive oral health care and the associated clinical competencies into primary care education and practice. The straightforward four-step process of integration is easily reproducible and sustainable. The SFL curriculum is free, accessed online, and provides continuing education. Utilizing previously established university resources such as Typhon™ enables faculty to track changes in the learners' behaviors and monitor translation of educational concepts into practice.

Prior to integration, pediatric primary care nurse practitioner students had limited knowledge or skills related to preventive oral health care. The sequence of integration provided the students with new knowledge and skills. Demonstrating their clinical competence as preventive oral health care providers, the primary care students performed pediatric oral exams, identified patients at risk, performed preventive oral health services, and appropriately referred patients to a dentist.

Conclusion

Access to preventive oral health care is a public health issue that has not been adequately addressed. Children of lower socioeconomic status and racial minorities are the most vulnerable to oral health disparities. This curricular innovation has the potential to increase the oral health workforce, improve access to preventive dental services, and improve health outcomes for vulnerable children. Furthermore, the described process of integrating preventive oral health care into primary care education should not be limited to pediatric primary nurse practitioners. In fact, this process should be transferred into all primary care nurse practitioner, certified nurse midwife, physician assistant, doctor of osteopathic medicine, and traditional medical educational programs. Expansion of the primary care provider role in preventive oral health care can effectively address the workforce gap.

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