INTEGRATING ORAL HEALTH INTO A DOCTOR OF NURSING PRACTICE CURRICULUM

by

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A scholarly project submitted in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice in Family and Individual

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I dedicate this doctoral scholarly project in memory of my husband, Les, and to my children, Connor and Lauren. Les encouraged me to begin this journey and would have been so proud to see it come to fruition. When completion of this project seemed to be an impossible task, I often remembered one of his favorite quotes: “Go over, go under, go around, or go through, but never give up.”

Connor and Lauren, without your constant support, encouragement, and unwavering faith in me, I would not have been able to complete this project. To Lauren, a special thank you for always assisting me with formatting and technical difficulties and doing so with a smile, even when my lack of technical savvy drove you crazy.

This work is also dedicated to my family and friends who cheered me on every step of the way. I am so blessed.

With God all things are possible. Matthew 19:26
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Currently, the United States oral health care delivery system does not reach the populations with the highest need for oral health services, resulting in continued oral health disparities in underserved populations. Incorporating oral health education in the formal education of primary care providers is a strategy to achieve the overall goals of primary health care by improving care for individuals and populations and lowering overall health care costs. The role of nurse practitioners in improving oral health outcomes and expanding access to care is dependent upon the improvement of oral health education in graduate nursing curricula.

The purpose of this DNP professional project was to incorporate oral health content into one course in the DNP curriculum and to explore the potential opportunities for expanding oral health education throughout the DNP curriculum.

The PDSA Model of Improvement (Institute for Healthcare Improvement, 2017) was utilized to pilot the integration of oral health content into a graduate health assessment course and to review ten DNP courses for oral health content. Graduate students enrolled in the class were surveyed regarding oral health perceptions and experiences.

The majority of participants indicated that patients in their agencies had unmet dental needs. Participants reported knowledge of the oral-systemic health connection. Participants indicated that oral health should be included in the overall health assessment of patients and that oral health education should be included in non-dental curricula such as nursing. Student responses were consistent with the literature indicating the most common barriers to implementing oral health in practice were time, lack of oral health education, and lack of referral mechanisms. Although oral health content was noted in nine of the ten DNP courses reviewed, the content was highly variable throughout the courses. Oral health was not a thread throughout the curriculum.

There is a need for integration of oral health content in graduate nursing curricula. The first step for developing a nursing workforce with core competencies in oral health promotion is to prepare nurse practitioner students with oral health knowledge, skills, and abilities.
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CHAPTER ONE — INTRODUCTION

Introduction and Background

Montana State University (MSU) College of Nursing (CON) initiated a Doctor of Nursing Practice (DNP) degree in September 2013. The author, a Family Nurse Practitioner and a student in the DNP program, was interested in oral health and national initiatives to incorporate oral health into primary health care curricula. The author explored various aspects of curriculum development in anticipation of developing a plan to integrate oral health into one or more DNP courses at Montana State University College of Nursing.

MSU, located in Bozeman, Montana is a land-grant institution with approximately 16,400 undergraduate and graduate students. The MSU-CON was founded in 1937 and has been nationally accredited since 1949 (MSU, n.d.). The CON is the sole provider of graduate nursing education in the state of Montana, offering a rurally focused DNP program that prepares students for certification as family nurse practitioners (FNPs) and family psychiatric mental health nurse practitioners (FPMHNPs) in addition to a Master of Nursing (MN) Clinical Nurse Leader program. The graduate nursing program is a rural multi-site program with approximately 94 graduate students enrolled in the DNP (81 students) and MN (12 students). DNP students receive clinical education in a variety of settings, including rural communities and are prepared to provide primary care services in rural settings upon graduation. Approximately, 80% of MSU DNP/MN
graduates stay in Montana with many providing care to rural and underserved populations (D. Williams, personal communication, September 6, 2016).

To be consistent with national recommendations from the American Association of Colleges of Nursing (AACN) 2004 DNP position statement that called for a transformational change in education for nurses who practice at the most advanced level of nursing, the MSU CON began the journey of developing a DNP curriculum. The MSU CON graduate academic affairs committee (GAAC) which has oversight of all the CON graduate programs utilized the AACN DNP Essentials (AACN, 2006) as a framework to compare the previous FNP curriculum with the recommended essentials for DNP curricula, identifying areas for new courses. Work groups were convened to develop course objectives for each DNP course, again using the AACN DNP Essentials (2006) as a guide. Draft courses were brought to the faculty for discussion and revision before finalizing with a majority faculty vote of the DNP curriculum. The DNP program was launched in Fall of 2013 and graduated its first class of eight students in May, 2016. The curriculum was fully accredited by AACN in the Spring of 2016.

**Project Purpose**

The purpose of this DNP professional project was to incorporate oral health content into one course in the DNP curriculum and to explore the potential opportunities for expanding oral health education throughout the DNP curriculum.
Oral health is essential to general health and quality of life and is the most common unmet health care need (U.S. Department of Health and Human Services [USDHHS], 2000, Culyer, Brown, & Kelly, 2014). The Surgeon General’s (2000) report, *Oral Health in America* reported that oral and dental diseases were a “silent epidemic” in the United States. This report discussed several key areas related to oral health including identification of dental care as the most common unmet health need; that oral diseases can affect systemic health; oral diseases are preventable or at least controllable; that there are significant disparities related to oral health and access to care across the lifespan, and that an interdisciplinary approach to oral health care is needed to obtain oral and overall general health (USDHHS, 2000). The *National Call to Action to Promote Oral Health* recommended the integration of oral health be incorporated into overall health care, yet, for more than ten years this report gained little momentum and tooth decay remains the most prevalent chronic disease affecting children in the United States (USDHHS, 2003; USDHHS, 2014). Even with increased access to health care the United States (U.S.), certain populations continue to struggle with access to oral health care, especially in vulnerable populations such as children, the elderly, disabled, mentally ill, and persons with special needs (USDHHS, 2014). Dental diseases are preventable; however, if left untreated, can progress causing pain, infection, tooth destruction, and in rare cases, death (Jablonski, Mertz, Featherstone & Fulmer, 2014).

The Institute of Medicine (IOM) reports, *Advancing Oral Health in America* (IOM, 2011a) and *Improving Access to Oral Health Care for Vulnerable and...*
Underserved Populations (IOM, 2011b) highlighted glaring gaps in oral health services in the U.S. and report that there is a need to build workforce capacity to meet the need for gaps in oral health care. National organizations and guidelines recommend that all health professionals (physicians, nurse practitioners, physician assistants, nurses, pharmacists) receive education and training regarding oral health in order to improve access to oral health care, increase awareness of the connection between oral health and overall health, promote prevention, and improve oral health literacy of health providers and patients alike (USDHHS, 2014; IOM, 2011a, 2011b). Dental professionals cannot meet all the oral health needs of individuals across the lifespan. Therefore, there is a need to expand the oral disease prevention workforce across disciplines and intervene earlier in the course of the disease to effectively combat oral disease (Qualis Health, 2015). Equipping all health professionals with basic oral health competencies will reduce oral disease and promote health equity (Northeastern University, 2016).

It is important to distinguish between the concepts of oral health, oral health care, and dental care, all of which are closely related, but distinct. Oral health is defined as “a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual’s capacity in biting, chewing, smiling, speaking, and psychosocial well-being” (World Health Organization [WHO], 2012).

Oral health care, “or the care of oral health is a part of overall patient care and includes risk assessment, health promotion and education, and referral for dental care” and can be provided by non-dental providers such as nurse practitioners, physicians, and
physician assistants (Qualis Health, 2016, p. 10). Dental care is an essential “component of oral health care and includes health services focused on maintaining, attaining, or restoring oral health” (Qualis Health, 2016, p. 10).

Prevalence of Oral Disease

The most common oral diseases according to WHO (2012) are dental cavities, periodontal (gum) disease, oral cancer, oral infectious diseases, trauma from injuries, and hereditary lesions. “Dental caries or tooth decay is a highly preventable, infectious chronic disease that impacts all populations across the lifecycle including children, adults and the elderly” (USDHHS, 2000, p. 2).

Worldwide, 60-90% of school children and nearly 100% of adults have dental cavities. According to the American Academy of Periodontics and the American Academy of Pediatrics (2014), early childhood caries (ECC), which is defined as one or more decayed, missing or filled tooth surfaces in any primary tooth in a child under the age of six, is the most common disease of childhood, five times more common than asthma, and affects up to 50% of low-income children. Approximately 25% of low-income children enter kindergarten without ever having seen a dentist (Larsen, Larsen, Handwerker, Kim, & Rosenthal, 2009).

Good oral health is important to a child’s social, physical, and mental health. According to the National Health and Nutrition Examination Survey (NHANES, 2015) data, 92.4% of American children and 82% of adults had seen a physician or ambulatory care provider in 2012, yet only 61% of adults visited a dentist (USDHHS, 2016). There are significantly lower dental visit rates for unemployed, uninsured, low-income,
Hispanic and African-American adults and those adults with Medicare or Medicaid coverage (Qualis Health, 2015). Approximately 44% of children with Medicaid coverage were reported as visiting the dentist at least once per year compared to 58% of children with commercial insurance (Qualis Health 2015).

Oral health care continues to be unmet need for children and adults, necessitating the importance of implementing strategies such as oral health assessment in primary care to assure that all children and adults have a medical and dental home (Dye, Thornton-Evans, Li & Iafolla, 2015a). Data from NHANES (2015) report that approximately 37% of children aged two to eight years had experienced dental caries in primary teeth and 14% had untreated tooth decay in primary teeth. The incidence of caries in this age group was higher for Hispanic (46%) and non-Hispanic black (44%) children when compared to non-Hispanic white children (31%) (Dye, et al., 2015a)

The incidence of dental caries in permanent teeth in children aged six to eleven in 2011-2012 was 21% with six percent of these children having untreated tooth decay in permanent teeth (Dye, et al., 2015a). Caries prevalence in permanent teeth was higher in Hispanic children (27%), ages six to eleven years compared with non-Hispanic white children (19%). Dental caries affect not only children but ultimately affects over 95% of all adults at some point in the life (Jablonski, Mertz, Featherstone & Fulmer, 2014).

According to the American Dental Association (ADA, 2016), low-income adults are ten times more likely to rate the overall condition of their mouth and teeth as “poor” compared to high-income adults. In addition, low-income adults are twice as likely to have problems biting or chewing and the appearance of their teeth is reported to affect
their ability to interview for a job. The ADA (2016) noted that 25% percent of adults report that they avoid smiling because of the condition of their mouth or teeth and approximately 20% report experiencing anxiety over the condition of their teeth.

There is a growing oral health need among the U.S. elderly. Nearly 25% of U.S. adults over the age of 65 are edentulous placing them at risk for altered nutrition and other complications (Qualis Health, 2015). Dye et al. (2015b) note that during 2011-2012, approximately 27% of adults aged 20-64 had untreated tooth decay in permanent teeth. Older adults are at risk of developing poor oral health for a variety of reasons including the prevalence of chronic disease in the older adult population; low income; homebound or institutionalization, disability, and a lack of specialized geriatric dentists (Clark et al., 2010). Elderly individuals have high levels of oral disease with 32% of elderly individuals in the U.S. reporting caries and 23% having severe periodontal disease. Fifty percent of older adults perceive their dental health as poor or very poor (Clark et al., 2010). Only 43% of older adults in the U.S. visit the dentist and 70% lack dental insurance in part because Medicare does not cover preventive and outpatient dental treatment (Clark et al., 2010). Poor oral health in rural communities is a persistent issue due to geographic isolation, lack of adequate transportation, a higher poverty rate, a larger elderly population, dental provider shortages, and difficulty finding providers willing to treat Medicaid patients (Rural Health Information Hub [RHIH], 2002-2017a).
The Role of Primary Care Providers in Promoting Oral Health

Numerous resources document the need for higher quality oral health care and better access to oral health care in the United States (USDHHS, 2014; IOM, 2011a, 2011b; USDHHS, 2010). There is a growing body of evidence indicating that early intervention in the form of education and screening for high-risk populations, will decrease the incidence of ECC (Carvalho, Salazar, deOliveira, & Coutinho, 2010; Marrs, Trumbley, & Malik, 2011). Qualis Health (2015) identifies a lack of education regarding oral health risks, prevention of oral disease, self-care challenges, and limited access to dental care as barriers to achieving optimal oral health. Primary care providers, including nurse practitioners, physicians, physician assistants and nurse midwives, have the knowledge, skills, and abilities to participate in the prevention and early detection of oral health problems for their patients (Qualis Health, 2015). The primary care setting is an ideal setting to offer a holistic approach to preventive oral health care and education across the lifespan. Individuals in the U.S. are much more likely to visit a primary care provider than a dentist and the inclusion of preventive oral health care in primary medical care expands access for many patient populations, especially those at high risk (Blackwell, Lucas, & Clarke, 2014, Qualis Health, 2015). According to the U.S. Summary of Health Statistics, approximately 82% of adults and 93% of children visited a physician or ambulatory care provider in 2012; however, only 61% of adults visited a dentist. Blackwell et al. (2014) reported that the uninsured, unemployed, low-income, Hispanic, African-American adults and individuals with Medicare or Medicaid coverage have significantly lower rates of dental visits.
The frequency of visits with primary care clinicians provides benefits for at least three high-need populations: pregnant women, children, and individuals with diabetes (Qualis Health, 2015). Nearly 75% of pregnant women receive prenatal care in the first trimester of pregnancy from a primary care provider, midwife, or obstetrician, yet only 50% of pregnant women with a dental problem visit a dentist during their pregnancy (Hartnett, Haber, Krainovich-Miller, Bella, Vasilyeva, & Kessler, 2016). Primary care providers see the vast majority of children for preventive well-child care and immunizations (Clark et al., 2010). Children age five and under who attend all recommended well-child assessments will have visited their health care provider 14 times (American Academy of Pediatrics [AAP], 2015). Educating primary health care providers such as nurse practitioners to screen for oral health conditions is essential since they are often the providers conducting well-child assessments during the first years of life (Berg & Coniglio, 2006). Inclusion of preventive oral health care in well-child visits expands access to oral health care and identifies children and adolescents needing oral health referrals (Qualis, 2015).

Preventive oral health care for individuals with chronic diseases such as diabetes also fits well in primary care. Individuals with diabetes are at high risk for oral health disease and untreated oral health disease may worsen diabetes symptoms (Clark et al., 2010). Primary care providers can play an integral role in educating patients and families about oral health practices including brushing, flossing, and healthy diet choices (Jablonski et al., 2014).
Educating non-dental providers such as Advanced Practice Registered Nurses (APRNs) regarding preventive oral health care and education aligns with the following oral health goals of Healthy People 2020:

(a) OH-1 – Reduce the proportion of children and adolescents who have dental caries experience in their primary or permanent teeth;

(b) OH-2 - Reduce the proportion of children and adolescents with untreated dental decay;

(c) OH-3 - Reduce the proportion of adults with untreated dental decay;

(d) OH-4 - Reduce the proportion of adults who have ever had a permanent tooth extracted because of dental caries or periodontal disease:

(e) OH-5 - Reduce the proportion of adults aged 45 to 74 years with moderate or severe periodontitis;

(f) OH-6 - Increase the proportion of oral and pharyngeal cancers detected at the earliest stage;

(g) OH-7 - Increase the proportion of children, adolescents, and adults who used the oral health care system in the past year;

(h) OH-8 - Increase the proportion of low-income children and adolescents who received any preventive dental service during the past year;

(i) OH-11 - Increase the proportion of patients who receive oral health services at Federally Qualified Health Centers each year (USDHHS, 2010)
Prevention and early detection are foundational to effective primary care. Nurses, and in particular nurse practitioners, are in a unique position to screen for tooth decay, gum disease, oral cancer and provide health education regarding fluorides, oral health, sealants, nutrition, and how oral diseases can affect other health conditions during routine office visits (Fulmer & Cabrera, 2012, Qualis, 2016).

Institute of Medicine reports (2011a, 2011b) provide specific oral health recommendations that advocate the use of non-dental health professionals to improve oral health through assessments, patient education, and preventive care in the primary care setting. In addition, these reports discuss the need to eliminate compartmentalization of the oral cavity from the rest of the body and treat the entire person. Interprofessional education will help to build the primary care oral health workforce and assist in decreasing health disparities related to oral health. Additionally, the integration of oral health in primary care will increase access to preventive dental services, especially for young children living in low-income families (Duderstadt, 2014).

The Institute of Medicine (2011a, 2011b) recommended that the Health Resources and Services Administration (HRSA) develop oral health core competencies for healthcare professionals, specifically nurse practitioners, nurse midwives, physicians, and physician assistants to address the need for improved access to oral health care (USDHHS, 2014). In response, HRSA developed The Integration of Oral Health and Primary Care Practice initiative to “improve access to early detection and preventive interventions by expanding oral health clinical competency of primary care clinicians” and provide a framework for a competency-based, interprofessional practice model to
integrate oral health and primary care (USDHHS, 2014, p. 5). HRSA identified five core domains which include risk assessment, oral health evaluation, preventive intervention, communication/education, and interprofessional collaborative practice to be integrated into the education of primary care clinicians. The Integration of Oral Health and Primary Care Practice initiative endorses the following strategies as methods to increase oral health care access in the U.S.:

- Clinicians should incorporate the oral health core clinical competencies in patient care.
- Healthcare professional education and training, as well as continuing education curricula, should incorporate the oral health core clinical competencies.
- Accreditation and certification bodies should integrate the oral health core clinical competencies into primary care practitioner standards” (USDHHS, 2014, p. 16).

Primary care providers routinely perform risk assessments for hypertension, cardiovascular disease, diabetes, hypercholesterolemia, and obesity. Patients who are identified at high risk based on the risk assessments are provided education and in high-risk situations, the patient is referred to a specialist. In a similar manner, primary care teams can engage patients and families in the prevention of oral disease, provide interventions such as fluoride, detect early signs of disease, and refer those at high risk or in need of treatment (Qualis Health, 2015).
According to Qualis Health (2015), primary care providers are prevention experts, providing comprehensive care across the lifespan utilizing a holistic approach to health and wellness. The incorporation of oral health care is an extension of what primary care practitioners already do such as education regarding diet and nutrition, tobacco cessation, and alcohol reduction which are essential oral health topics. Techniques such as teach-back, goal setting, and motivational interviewing are utilized in primary care and are documented to assist individuals to employ self-care management of other chronic diseases such as asthma, diabetes, and obesity (Qualis Health, 2015).

Consequences of Poor Oral Health

Oral health is linked to overall health and is essential for healthy growth and development as well as aging (IOM, 2011a, IOM 2011b, Griffin, Jones, Brunson, Griffin & Bailey, 2012). Poor oral health is significantly associated with major chronic diseases such as diabetes, obesity, coronary artery disease, stroke, metabolic syndrome, and adverse pregnancy outcomes (Mealey, 2006; Clothier, Stringer & Jeffcoat, 2007; Janket, Baird, Chuang & Jones, 2003; Al-Zahrani, Bissada & Borawkit, 2003; Clark et al., 2010). The consequences of poor oral health are numerous and include: pain, infection, speech difficulties, poor nutrition due to pain and difficulty chewing; sleep problems; diminished quality of life; higher risk of continued poor oral health; costly restorative treatment; increased Emergency Department visits and hospitalizations; for adults, the loss of income/work; and for children the loss of school days and diminished capacity to learn (Clark et al., 2010).
The Surgeon General’s report (USDHHS, 2000) describes the mouth as the mirror of health and disease occurring in the rest of the body. There is increasing evidence that oral health not only reflects general health conditions but can also exacerbate them (IOM, 2011a). The exact mechanisms of poor oral health and the link with systemic disease are believed to be related to chronic inflammation (Clark, 2010; Jablonski, Mertz, Featherstone & Fulmer, 2014; Han, 2011; Padilha, Hilgert, Hugo, Bos, & Ferrucci, 2008). The consequences of poor oral health are reflected across the lifespan. The presence of poor oral health and dental disease may affect a child’s academic achievement (Blumenshine, Vann, Gizlice, & Lee, 2008). Children with poor oral health are three times as likely to miss school as children with good oral health (Jackson, Vann, Kotch, Pahel, & Lee, 2011). Children with poor oral health do not perform as well academically as their peers with good oral health (Blumenshine et al., 2008).

Hyde, Satariano, & Weintraub (2006) report a positive relationship between oral health and employability; as oral health increases, employment improves. Low-income and unemployed adults experience access barriers to oral health care and are more likely to raise children with poor oral health.

Unfortunately, despite the growing body of literature that validates the connections between oral health and overall health, in practice, oral health care often remains separated from overall general health care. Many health professionals know little about oral health.
CHAPTER TWO — REVIEW OF LITERATURE

Review of Literature

“There is increasing evidence that oral health is an essential component of overall health and that poor oral health may lead to initiation or exacerbation of chronic inflammatory diseases/conditions and adverse pregnancy outcomes” (Hein, Schonwetter, & Iacopino, 2011). Oral health is an essential component of systemic health and has profound implications for the healthcare workforce and serves as the impetus for a paradigm shift in the education of health care professionals. Access to oral health services is influenced by demographics, socioeconomic, behavioral, and oral health system factors.

Development of Dental Caries

Four components are required for the development of dental caries: teeth, bacteria, carbohydrate exposure, and time (Clark & Slayton, 2014). Teeth become colonized with cariogenic bacteria, most often sucrose, which metabolize carbohydrates and create acid (Marrs, Trumbly, & Malik, 2011). The acid causes demineralization of the tooth enamel and over time the enamel surface collapses resulting in a cavity (Clark & Slayton, 2014). Colonization of the oral cavity by Streptococci mutants is a strong risk factor for the development of ECC (Marrs, Trumbly, & Malik, 2011; Ramos-Gomez, Crystal, Tinanoff, & Featherstone, 2010; Parisotto, Steiner-Oliveira, Sliva, Rodrigues, & Santos, 2010). Dietary habits are another factor in the development of dental caries, especially ECC with infants being at greatest risk because their newly formed teeth are
exposed for long periods of time to sugary foods such as milk and juice (Parisotto, Steiner-Oliveira, Sliva, Rodrigues, & Santos, 2010). Factors that may increase an individual’s risk of developing caries or oral diseases include: poor oral hygiene; eating disorders, drug or alcohol abuse; lack of professional dental care; orthodontic treatment; high levels of caries-causing bacteria in the mouth; poor diet; decreased salivary flow; medications that cause dry mouth; and cancer treatment (American Dental Association [ADA], 2007).

Factors that are protective and help to re-mineralize the enamel include tooth exposure to fluoride, decreasing the frequency of carbohydrate consumption, practicing good oral hygiene habits, choosing less cariogenic foods, participating in regular dental care, and delay of bacterial colonization (Clark & Slayton, 2014). The process of developing carious lesions can be stopped or reversed by modifying risk factors.

**Guidelines for Oral Health Maintenance**

Periodontal diseases and dental caries are preventable diseases. Prevention of dental diseases is related to individual behaviors and primary prevention. The American Academy of Periodontics and American Academy of Pediatrics (2014) recommends that oral health risk assessment begins before the first tooth erupts, prior to six months of age.

The U.S. Preventive Services Task Force recommendations state that primary care providers prescribe fluoride supplementation for children aged six months to five years whose water supply is deficient in fluoride, and that primary care providers provide fluoride varnish applications for all children from the time of first tooth eruption through age five (U.S. Preventive Services Task Force, 2014; Moyer, 2014). Fluoride varnish
applications are effective and can reduce the incidence of caries by 25-45% in children and adults (Clark et al., 2010). Weintraub et al., (2006) report the use of fluoride treatments alone results in a decrease of dental caries; however, the addition of oral health counseling in addition to topical fluoride treatments show an even greater reduction in the incidence of ECC. According to the American Academy of Pediatrics (AAP, 2014), all parents should receive education regarding dental hygiene for their children. Parents should begin cleaning the gums of their children before their teeth erupt with a washcloth or soft toothbrush to help decrease bacterial colonization. Teeth should be brushed twice daily with fluoridated toothpaste. For children under the age of two, a smear about the size of a grain of rice should be used and for children ages two to five years, a pea-sized amount of toothpaste is recommended (AAP, 2014). Children older than five years of age through adulthood should brush twice daily with fluoride toothpaste, floss daily, and see a dentist twice yearly, and eat a well-balanced diet. (Centers for Disease Control [CDC], 2014). Adults are advised to avoid tobacco products and limit alcoholic drinks due to the increased risk of gum disease and oral cancer (CDC, 2016). Individuals taking medications that cause dry mouth (xerostomia) are encouraged to notify their healthcare professional, drink plenty of water and chew sugarless gum (CDC, 2016). It is important for persons with diabetes to keep their glucose readings in control to decrease the risk of complications such as gum disease associated with elevated blood sugar readings (CDC, 2016).
Oral Healthcare Costs

In 2013, the cost of dental care in the U.S. exceeded $11 billion dollars with much of the expenditures related to interventions that could have been avoided with adequate prevention, early detection, and intervention (Qualis Health, 2016). Approximately one percent of all emergency department visits occurring in the U. S. are related to dental conditions (Allareddy, Rampa, Lee, Allareddy, & Nalliah, 2014). One of the most expensive health conditions among young children is a restorative treatment for ECC due to the hospitalization and general anesthesia required for young children (Tinanoff & Reisine, 2009). Over 50 million school hours are lost each year due to oral health related illness, pain, and infection (Clark et al., 2010).

Demographics and Oral Health in Montana

In 2015, the estimated population of Montana was 1,032,949 with 668,207 individuals living in rural Montana (RHIH, 2004-2017b). Montana ranks 49th in population density with approximately 6.8 people per square mile (DPHHS, 2016). Of the 56 counties in Montana, 45 counties are classified as frontier, 10 counties are classified as rural and one is classified as urban. Montana has 122 incorporated cities and towns with only seven communities that have populations over 20,000 people (MT DPHHS, 2016). Seventy-four of 122 towns have populations less than 1,000 people (MT DPHHS, 2016). The poverty rate in rural Montana counties is 16% compared to 14% in urban areas. Fifty-one of the 56 counties in Montana have a primary care provider shortage designation, and in many rural and frontier counties, advanced practice registered nurses and physician assistants are the only primary care providers (MT
In 2014, Montana had 76 dental health professional shortage areas (MT DPHHS, 2017). Shortages of pediatric providers and dentists who will accept Medicaid clients were also reported. Individuals in Montana often must travel long distances to obtain dental care creating a significant access barrier.


Unfortunately, the poor oral health status of older adults in Montana remains higher than the national average. One out of six adult Montanans over the age of 65 (16.7%) have lost all their natural teeth compared to 14.9% of U.S. citizens over the age of 65 (MTDPHHS, 2016). Approximately 62% of Montana adults visited the dentist in the last year compared to 64% in the U.S. Over one-third (36.5%) of Montana adults over the age of 65 stated that they had not visited a dentist in the past year (Montana DPHHS, 2017). Twenty percent of low-income Montana adults reported that their mouth or teeth are in poor condition. The percentage of Montana adults who feel embarrassed due to the
condition of their teeth and experience anxiety regarding the condition of their mouth and teeth was 28% percent (ADA Health Policy Institute, 2017).

**Oral Health in Rural Communities**

Rural children are less likely than urban children to have received any dental care in the past year (RHIH, 2002-2017a). Access to oral health care in rural communities is a continual problem due to a variety of factors including geographic isolation, lack of adequate transportation, larger elderly population; higher poverty rate, dental provider shortages, and difficulties finding providers that are willing to treat Medicaid patients (RHIH, 2002-2017b). In the United States, rural adults experience edentulism at significantly higher rates than urban adults (32.6% v. 25.7%) (RHIH, 2002-2017a).

**Patient Barriers to Obtaining Oral Health Services**

Qualis Health (2015) reports significant patient barriers to achieving oral health including limited access to dental care, lack of education on oral health risks and prevention of oral disease, in addition to challenges with self-care. Nasseh & Vujicic (2015) note that utilization of dental care services in the U.S. has changed considerably since 2000. More adults and children moved to Medicaid or the Children’s Health Insurance Plan and private dental benefits decreased (Yarbrough, Nasseh & Vujicic, 2014). An increasing number of children are receiving dental care, with the largest increases coming from low-income children; however, adult dental care utilization rates have been steadily falling for all income groups and also those with private dental coverage during the past decade (Vujicic & Nasseh, 2015).
In 2013, dental care utilization among children (48.3%) was at its highest since 1996 when the Medical Expenditure Panel Survey began tracking data (Nasseh & Vujicic, 2015). Dental care utilization continued to slowly increase from 2005-2013 among adults 65 and older (42.2%) while dental care utilization among adults aged 19-64 continued to decline to reach a low of 35.4% in 2012, the lowest since 2000 (Nasseh & Vujicic, 2015). The decline among non-elderly adults was due to a decrease in private dental coverage, increases in public health insurance and not dental coverage in this age group (Wall, Nasseh & Marko, 2014).

In the U.S., the primary reason cited for individuals not seeking professional dental care was financial with the level of financial barriers being highest among low-income non-elderly adults ages 19-64 (Wall et al., 2014). Other reasons for not seeking dental care include lack of time, difficulty traveling to a dentist, anxiety, and difficulty finding a dentist that accepts Medicaid (Yarbrough et al., 2014: Fulmer & Cabrera, 2012).

Provider Facilitators and Barriers to Implementation of Oral Health Assessment in Practice

Bernstein et al. (2016) collected data from six federally qualified health centers identifying facilitators and barriers to the integration of oral health into pediatric primary care. The authors reported data from observations and interviews identified upper-level administration with the vision to see the value of integration, designated team leaders, and champions. Barriers to integration of oral health in the clinical setting included: lack of training and expertise, limited time, low caregiver literacy, and lack of shared medical
and dental electronic records (Bernstein, et al., 2016). Fulmer & Cabrera (2012) identified barriers to incorporating oral health in primary as minimal education or formal training regarding oral health; lack of practitioner confidence; time constraints; lack of referral mechanisms, and reimbursement. Lack of attention to oral health by non-dental professionals such as nurses, physicians, physician assistants, and pharmacists is an additional barrier to quality oral health care (IOM, 2011a; IOM, 2011b). Traditionally, reimbursement for medical and oral health care has been separate, creating a barrier for primary care providers due to the inability to bill for oral health services. Currently, over 40 states, including Montana allow medical providers, including nurse practitioners to receive reimbursement from Medicaid and other insurances for preventive oral health services (Jablonski et al., 2014).

Nursing and Health Professional Education Recommendations Regarding Oral Health

Oral health is an essential component of systemic health and has profound implications for the healthcare workforce and is the impetus for a paradigm shift in the education of health care professionals (Qualis Health, 2015). Historically, oral health care has been separated from routine medical care. The mouth and the body had been divided by medicine and dentistry with separate educational programs, payment structures, and delivery systems (Qualis Health, 2015). Oral health care was solely provided in private practice settings by dental professionals (IOM, 2011a). Nurses, physicians, and other healthcare professionals have typically not received education in providing oral health
screenings or services (Danielsen, Dillenberg, & Bay, 2006; Mouradian et al., 2005). The Institute of Medicine (2011a) recommends:

That non-dental health professionals play an increased role in oral health care, but they require additional education and training and that core competency development, education and training be implemented to allow for the use of all health care professionals in oral health care and that interprofessional, team-based approaches are utilized for the prevention and treatment of oral diseases” (p. 9-10).

Qualis Health (2015) recommends two key changes to the overall delivery of patient care in the U.S., 1) include the oral cavity and oral health in the overall care of all patients, cease the compartmentalization of the oral cavity from the rest of the body and 2) include oral health screening, oral health risk assessment, and referrals as part of primary care practice.

Unfortunately, the majority of health professional curricula have minimal, if any oral health content and oral health clinical experiences (Haber et al., 2015). Ferullo, Silk, & Savageau (2011), report that 70% of U.S. medical schools have four hours or less of oral health content in their curricula and that 10% have no oral health at all. Several authors concur that there is a lack of defined oral health curricular knowledge, oral health content, and oral health competencies in nurse practitioner and nurse midwifery education (Haber et al., 2015; Dolce, Haber, & Shelley, 2012; National Organization of Nurse Practitioner Faculties [NONPF], 2014). A survey of 219 nurse practitioner and certified nurse midwives reported that their nursing education did not include oral health in the curriculum, and as a result felt that they were not adequately trained to provide oral health examinations and referrals (Wooten, Lee, Jared, Boggess, & Wilder, 2011).
Clemmens & Kerr (2008), report that oral health has not been a high priority for practicing nurses. Jablonski (2012) conducted a review of seven pre-licensure nursing fundamentals textbooks which revealed that approximately 0.6% of the content focused on oral health and hygiene and that nearly every textbook contained outdated or inaccurate information.

Several studies have demonstrated the positive effects of educating primary care providers and changing practice. Kressin et al. (2009), implemented a practice-based intervention in a pediatric outpatient clinic treating children at risk for early childhood caries, compared to a similar clinic whose providers had not participated in the intervention. Pediatricians were educated about oral health, risk factors, pathogenesis including that it is a transmissible bacterial disease; how to perform and oral health and caries risk assessment, anticipatory guidance, oral screening, and the application of fluoride varnish. Pediatricians who received oral health education were compared to the control group who did not receive oral health education. Oral health education was successful in changing pediatrician’s behavior (Kressin et al., 2009). Children at the intervention site had a 77% reduction in risk for developing ECC one year following the intervention (Kressin et al., 2009).

The 2006 American Academy of Pediatrics Survey of Graduating Residents examined the perception of 611 residents about their oral health training and their attitudes about performing oral health screenings (Caspary, Krol, Boulter, Keels, & Romano-Clarke, 2008). Results showed that oral health education during residency increased pediatrician confidence in participating in oral health promotions activities such
as anticipatory guidance, oral screenings, and oral health risk assessment (Caspary et al., 2008).

Hein, Schonwetter & Iacopino (2011), explored the amount of oral-systemic health information being taught in predoctoral/undergraduate professional curricula of pharmacy, nursing, and medical schools in English-speaking universities around the world. The authors reported that 60% of the survey respondents rated their curricula in oral-systemic health as inadequate. Approximately 50% of the faculty surveyed reported that there was an absence of, or a limited amount of, oral health content in their curricula and that students were not receiving instruction on how to perform oral health examinations. Faculty reported obstacles to implementing and developing an educational module about oral health in their curricula included: lack of interest among faculty; lack of teaching resources; lack of faculty incentives; lack of evidence of outcomes of oral health interventions; lack of appreciation for the relevance of oral-systemic science within the discipline; absence of accreditation standards or competencies related to oral-systemic science; and lack of opportunities for interprofessional collaboration with dental schools (Hein et al., 2011).

Integration of Oral Health in Primary Care Practice

In recent years, efforts have been made to incorporate oral health care into primary care education. Since 2006, all family medicine residencies are required to include training in oral health (Douglass et al, 2009). The University of Washington Medical School developed and implemented an oral health curriculum for medical students (Mouradian et al, 2005). In 2005, New York University, placed a College of
Nursing within the College of Dentistry as part of an interdisciplinary model to have nurse practitioner students work alongside dental students when providing care in school clinics and Head Start programs (Hallas & Shelley, 2009). New York University College of Nursing implemented an interprofessional curriculum for graduate nursing students in 2012 (Dolce et al., 2012).

In 2011, a nationwide organization, The National Interprofessional Initiative on Oral Health (NIIOH), was introduced to increase oral health in education and practice for primary care clinicians. The vision of this organization is to eradicate dental disease by engaging primary care clinicians to be 1) alert to their patients’ oral health needs, 2) ready and willing to deliver oral health preventive services for all ages, 3) effective at partnering with dental specialists, 4) and to learn from, with, and about each other (NIIOH, 2011). The NIOH provides education and training that supports clinicians from disciplines including medicine, pediatrics, nursing, physician assistants, obstetrics/gynecology, dental, and pharmacy (NIIOH, 2011).

Leading the charge for nursing education in response to the national oral health initiative is New York University College of Nursing which developed the Oral Health Nursing Education and Practice program to prepare the “nursing workforce with the competencies to prioritize oral disease prevention and health promotion, provide evidence-based oral health care in a variety of practice settings, and collaborate in interprofessional teams across the healthcare system” (Dolce et al., 2012, p.1). The overall goal of this national initiative is to integrate oral health in undergraduate and graduate nursing curricula by creating an “educational infrastructure for the nursing
profession that advances nursing’s contribution to reducing oral health disparities across the lifespan” (Dolce et al., 2012, p.1). The Oral Health Nursing Education and Practice program is the “nursing arm” of the NIOH. This program features nationally prominent nursing leaders addressing the opportunity for the nursing profession to be a “partner in prevention” along with family medicine, pediatrics, physician assistants, and dentists (New York University College of Nursing, n.d.). In an effort to increase oral health knowledge and competencies among non-dental health professionals, the Oral Health Nursing Education and Practice program sponsored oral health workshops at the American College of Nurse-Midwives annual meeting for the past three years. In 2016, the organization surveyed all directors of midwifery programs in the U.S. regarding oral health in their curricula. Ninety percent of the program respondents (27 of 30 programs) stated that they include oral health in their curricula (Hartnett et al., 2016).

Haber et al. (2016) studied the effectiveness of interprofessional oral health education, clinical simulation, and case study experiences of 318 nurse practitioner, midwifery, dental, and medical students. Self-reported interprofessional competencies improved significantly from pre to posttest for all students (Haber et al., 2016).

An educational and clinical innovation initiated by New York University is the concept of transitioning from the traditional head, ears, eyes, nose, and throat (HEENT) assessment to HEENOT which includes the oral cavity (teeth, gums, mucosa, tongue, and palate). New York University’s nursing, dental, medical students and faculty have successfully incorporated the concept of HEENOT in interprofessional classroom, clinical experiences, and simulation (Haber et al., 2015). There is growing momentum for
this national movement of “putting the mouth back in the head” (Haber et al., 2015). The focus of this crusade is that practitioners can “NOT” omit oral health from the HEENT examination. At New York University, health profession students integrate the HEENOT concept into the history, physical examination, risk assessment, and management plan of their patients and are challenged to think about oral health as a part of overall systemic health (Haber et al., 2015). Students are challenged with “W” questions: “why/when/what.”

1. Why would the examiner perform an oral health assessment?

2. When would the examiner perform an oral health examination?

3. What chronic diseases may have clues in the oral cavity or health implications? (Haber et al., 2015, p.).

New York University nursing faculty have integrated oral health throughout the nurse practitioner program, beginning in the advanced health assessment course and increasing in complexity as students’ progress to the diagnosis and patient management courses (Haber et al., 2015). The Smiles for Life (Clark et al., 2010) an online interprofessional oral health curriculum is utilized as the foundation of the oral health curriculum in addition to didactic, clinical and simulation experiences (Haber et al., 2015).

The Qualis Health (2016) Oral Health Integration Implementation Guide identifies essential clinical content to be included in oral health curricula for primary care clinicians in three key areas:
1. Content on the anatomy, physiology, and pathophysiology of saliva and its role in the promotion of oral health in addition to knowledge of medications that alter normal salivary function, teeth, gums, and soft tissue of the mouth. The nurse practitioner (NP) should have an understanding of oral health, caries development and periodontal disease as a chronic infectious disease. The NP should be able to distinguish a normal mouth from and abnormal mouth.

2. Oral health content for target populations including children, adults with diabetes, and pregnant women. Content to be included regarding the oral health of children includes education on the development of deciduous and permanent teeth; knowledge regarding the development of caries; dietary instruction regarding the carcinogenicity of specific foods and eating/snacking practices; application of fluoride varnish; oral health of the entire family to reduce exposure to cariogenic bacteria; and referral for sealants in older children. Information to be included regarding pregnant women includes periodontal disease, acid reflux, and dental referrals for preventive dental care during pregnancy. Incorporation of information regarding adults with diabetes and the importance of glycemic control, the link between diabetes and periodontal disease; reduction of bacterial growth; proper oral hygiene practices; and referral to dental providers for active periodontal disease is also identified as essential content to be included in oral health curricula.

3. Content utilizing the Oral Health Delivery Framework in primary care to protect and promote oral health. The Oral Health Delivery Framework identifies five steps that primary care providers and teams can take to promote oral health. Five
categories of the framework include: Ask, Look, Decide, Act, and Document & Follow Up (Qualis, 2016).

Changing the standard of care in health care education and practice is extremely challenging; however, research demonstrates that this change can be successful if the providers are given education and the necessary tools to make this change.

Nursing Call to Action

Nursing programs are called to prepare graduates with “core competencies to identify risk for oral disease, conduct an oral examination, provide oral health information, connect oral health information with diet and lifestyle counseling, and make referrals to dental professionals” (Dolce, Haber & Shelley, 2012, p. 1). Additionally, nurse educators are called to change perceptions of oral health and prioritize oral health as an essential component of overall health (Dolce, 2014).

The American Association of Colleges of Nursing (AACN) Doctorate of Nursing Practice Essentials document identifies eight foundational essentials and provides basic information regarding competencies and content for DNP curricula (AACN, 2006). Incorporation of evidenced-based oral health recommendations into a DNP curriculum is consistent with three DNP Essentials:

Essential III: Clinical scholarship and analytical methods for evidence-based practice. Essential III calls for DNP graduates to “engage in advanced nursing practice and provide leadership for evidence-based practice” which requires translation of research into practice related to oral

Essential VI: Interprofessional collaboration for improving patient and population health outcomes. DNP graduates are “prepared to play a central role in establishing interprofessional teams and participating in the work of the team” (AACN, 2006, p.14). Incorporation of oral health into their practices allows the DNP to practice to the full extent of their training.

Essential VII: Clinical prevention and population health for improving the Nation’s health. Clinical prevention is “defined as health promotion and risk reduction/illness prevention for individuals and families” (AACN, 2006, p. 15). Population health includes community, environmental/occupational, and cultural/socioeconomic dimensions of health (AACN, 2006).

Implementation of oral health prevention, screening, and education in nursing curricula is essential to achieving national oral health goals and the oral health as well as general health of U.S. citizens

Inclusion of oral health in DNP curricula is consistent with the third NONPF Nurse Practitioner Core Competency recommendation:

Practices independently managing previously diagnosed and undiagnosed patients. The NP provides the full spectrum of health care services to include health promotion, disease prevention, anticipatory guidance… and uses advanced health assessment skills to differentiate between normal, variations of normal, and abnormal findings (NONPF, 2014, p. 14).

Suggested curriculum content for these “competencies include, but is not limited to:
physical; psychosocial; developmental; family; psychiatric mental health; and oral health” (NONPF, 2014, p. 12).

Changing the standard of care in health care education and practice is extremely challenging; however, research demonstrates that this change can be successful if health care providers are given education and the necessary tools to make this change.

There are numerous resources available for faculty and primary care clinicians to utilize when beginning the journey of integrating oral health into healthcare curricula and practice. Appendix A (Oral Health Resources for Faculty and Clinicians) provides a compilation of essential resources for oral health integration in nursing curricula.

**Theoretical Framework**

The framework used to guide this project was the Plan, Do, Study, Act or PDSA model is a four-stage problem-solving model utilized for process improvement or carrying out a change (USDHHS Agency for Healthcare Research and Quality [AHRQ], 2013). PDSA also referred to as rapid cycle improvement is useful for small-scale changes because it enables rapid assessment, the flexibility to adapt changes according to the results, provides the opportunity to build evidence for change, and engages stakeholders as confidence in the intervention increases (Taylor et al., 2013, USDHHS AHRQ, 2013). Industrial models have influenced how quality is measured in healthcare and the PDSA model is likely the most widely accepted and frequently used quality model in healthcare today (Pelletier & Albright, 2010). PDSA has its origins in manufacturing and industry dating back to the 1930’s. Originally, named the PDCS (plan-do-check-act) process, terminology has changed to PDSA, although, the terms
PDCA and PDSA are used interchangeably (Taylor et al., 2013). The PDSA cycle is shorthand for testing a change by planning it, trying it, observing the results, and acting on what is learned (USDHHS AHRQ, 2013). This pragmatic scientific method for testing changes in complex systems and the four stages mirror the scientific experimental method of formulating a hypothesis, collecting data to test the hypothesis, analyzing the results and making recommendations (Taylor et al., 2013).

When utilizing PDSA, three questions are asked: 1) What are we trying to accomplish? 2) How will we know that a change is an improvement? 3) What change can we make that will result in an improvement? (Taylor et al., 2013).
Stage One: Plan. In this phase, an aim statement is drafted, the test or observation is planned, and a plan for collecting data is developed. Objectives of the project are also identified in this phase. A plan to test the change is developed identifying the who, what, when, and where of data collection (IHI, 2017).

Stage Two: Do. During this stage, the test is piloted on a small scale. The implementation plan is started and data is collected along the way to assist in evaluating the plan.
Stage Three: Study. The data are analyzed and the results are studied in this stage. Using the aim statement drafted in Stage One and the data gathered in Stage Two, the outcomes of the plan are determined. Describing the results and how they compared to predictions occurs in stage three (IHI, 2017).

Stage Four: Act. The change is refined based on what was learned from the test. Reflection of the plan and outcomes occurs at this stage in addition to identifying plan modifications that need to be made for the next cycle. A plan is then developed for the next cycle of change (IHI, 2017). Standardization of the improvement and periodic re-examination of the process to determine how it can be further improved occurs in Stage four. If change is needed, the change agents return to Stage one: Plan, and develop a new and different plan, and begin the cycle again. The PDSA cycle is ongoing and continuous.

Utilization of the PDSA model fit well with this improvement project. The model supports the implementation of change in small steps such as integration of oral health into one DNP course. Based on the results of the first PDSA cycle, piloting oral health education in NRSG 601 Advanced Health Assessment, a second PDSA cycle was developed to explore where oral health was being taught in the DNP curriculum.
CHAPTER THREE — METHODS

Methods

The purpose of this DNP professional project was to incorporate oral health education into one course in the DNP curriculum and to explore the potential opportunities for expanding oral health education in the DNP curriculum. Objectives of this professional project were to:

1. Pilot integration of oral health content into one graduate course, NRSG 601 Advanced Health Assessment.
2. Identify areas where oral health is currently included in ten DNP courses: NRSG 601 Advanced Health Assessment, NRSG 602 Advanced Pathophysiology, NRSG 603 Advanced Pharmacology, NRSG 607 Diagnostic Reasoning, NRSG 620 Advanced Pharmacology II, NRSG 621 Advanced Clinical I, NRSG 622 Advanced Clinical II, NRSG 623 Advanced Clinical III, NRSG 630 Advanced Psychopharmacology II, and NRSG 631 Advanced Clinical I.

Discussion of the two interventions for this professional project follows.

Intervention One Pilot Integration of Oral Health Content into a Graduate Course

A PDSA model (Table 1) was utilized to pilot integration of oral health content into, NRSG 601, Advanced Health Assessment. This graduate course was offered during the first semester of the MN and DNP programs. The course was also open to
postgraduate students who were not enrolled in graduate nursing curricula. Advanced Health Assessment is primarily an online course supplemented by three or four face-to-face or video conference classes during the semester. Students complete required readings, discussions, and assessments of an online computerized simulated patient assessment, in addition to performing a complete patient assessment on a live patient at the end of the semester. Oral health content was introduced to students enrolled in NRSG 601-Advanced Health Assessment via a live lecture during the first face-to-face class of the semester.

Table 1: PDSA Cycle One

<table>
<thead>
<tr>
<th>Aim:</th>
<th>Describe the test of change:</th>
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<tr>
<td></td>
<td>Incorporate oral health education into NRSG 601-Advanced Health Assessment in the DNP curriculum.</td>
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<th>Stage One-Plan:</th>
<th>List the tasks needed to set up this test of change.</th>
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<td></td>
<td>Obtain MSU Institutional Review Board (IRB) approval</td>
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<td></td>
<td>Review DNP Essentials, NONPF guidelines, College Mission, Strategic Plan, graduate outcomes, and curriculum</td>
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<td>Review Master Resource Outline and course objectives for NRSG 601-Advanced Health Assessment for oral health content.</td>
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<td>Discuss potential for incorporating oral health education with Course Coordinator for NRSG 601 and Graduate Associate Dean. Obtain course faculty buy-in.</td>
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<td>Review current course materials in NRSG 601 to identify content related to oral health.</td>
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<td></td>
<td>Review results of oral health course content and collaboratively identify with course faculty oral health education and methodologies to deliver oral health content.</td>
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<td></td>
<td>• Develop oral health course objectives, identify appropriate materials needed for faculty and student education.</td>
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<td>• Develop Oral Health Overview lecture and hands-on laboratory experience based on discussion with course faculty (Appendix D).</td>
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<td>• Develop evaluation tools</td>
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<td>• Obtain oral health supplies</td>
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<tr>
<td><strong>Predict what will happen when the test is carried out.</strong></td>
<td><strong>Measures to determine if predictions succeed.</strong></td>
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<td></td>
<td>• Students will participate in one-hour oral health overview lecture and hands-on oral health laboratory experience.</td>
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<td>• Students will demonstrate beginning knowledge, skills, and abilities related to oral health assessment.</td>
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<td>• Student responses to a fifteen item pre-oral health education survey (Appendix B).</td>
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<td>• Student responses to a nine-item post-oral health education survey (Appendix C).</td>
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<td>• Discussion with NRSG 601 course faculty regarding their evaluation of effectiveness and overall experience.</td>
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**Stage Two-Do:**

**Describe what happened.**

- IRB approval obtained
- On September 8, 2016, the author presented a one-hour “Oral Health Overview” face-to-face lecture and hands-on laboratory experience for 30 students enrolled in NRSG 601
- 30 pre-oral health education surveys were completed by students.
- 27 post-oral health education surveys were completed by students.
- Discussion with course faculty regarding evaluation of experience

**Stage Three-Study:**

**Describe results and how they compared to predictions.**

- The didactic Oral Health Overview was well-received by students. There were many questions and comments regarding oral health challenges experienced in their clinical settings.
Table 1 Continued

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<th>Stage Four-Act:</th>
<th>Describe modifications to the plan for the next cycle and what was learned.</th>
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<td></td>
<td>• Student and faculty responses for PDSA this cycle were positive.</td>
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<td>• Determine faculty willingness to continue oral health in NRSG 601-Advanced Health Assessment next year.</td>
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<td>• Revise Pre-and Post-Oral Health survey for NRSG 601 as needed for future PDSA cycles.</td>
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<td>• Begin PDSA cycle two</td>
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Sample

The population of interest for this quality improvement project included a convenience sample of 30 DNP, MN, and non-nursing graduate students enrolled in NRSG 601-Advanced Health Assessment at MSU during Fall semester 2016. The author conducted a one-hour, face-to-face oral health overview lecture and class discussion in addition to a 30-minute hands-on oral health assessment laboratory on September 8, 2016.

Protection of Human Subjects

The policy outlined by the MSU Institutional Review Board (IRB) was followed by the author submitting an application for IRB approval of the project. The MSU IRB
process was an expedited review based on the analysis of low risk to subjects. IRB Exempt status approval was received (Appendix B).

**Instruments and Procedure for Data Collection**

A modified version of the PDSA Worksheet for Testing Change (IHI, 2017) was utilized to plan and conduct PDSA cycles one and two (Tables 1 and 2).

Pre-and Post-Oral Health Education surveys (Appendices C and D) were designed by the author to obtain information regarding the participant’s knowledge and beliefs about oral health. A fifteen-item Pre-Oral Health Education survey was administered at the beginning of the Oral Health Overview lecture. A nine-item Post-Oral Health Education survey was administered at the end of the oral health assessment laboratory.

The purpose of the Pre-Oral Health Education survey was to identify student perceptions regarding oral health and to collect demographic data. The Pre-Oral Health Education Survey (Appendix C) consisted of three demographic questions; four questions related to the respondents’ beliefs about oral health and oral health assessment; one question for each of the following topics: current oral health practice, oral-systemic health, non-dental health care providers, oral health education, patients with unmet dental needs, payment for services, and additional comments.

The purpose of the Post-Oral Health Education survey was to assist the author in evaluating the Oral Health Overview class and laboratory in addition to changes in oral health beliefs of the participants. The Post-Oral Health Education Survey (See Appendix D) consisted of four questions regarding oral health beliefs, three questions related to integration of oral health in practice, and one question for each of the following topics:
oral health barriers, oral-systemic health, and additional comments. There were four common questions on the pre-and post-surveys: 1) Do you believe that oral health should be included in the overall health assessment of patients? 2) Do you believe that oral health screening should be provided by non-dental providers? 3) Do you feel that you have an understanding of oral health and its’ relationship to other diseases? 4) Do you believe that it is important to include education regarding oral health in non-dental curricula such as nursing?

Procedure for Data Collection

The Pre-Oral Health Education class survey was distributed to each of thirty students in NRSG 601 at the beginning of class. Completion of the survey was voluntary and considered consent to participate. Participants were advised that they could choose to not answer any of the survey questions and could stop at any time. Participation or nonparticipation would not affect the participant’s grade or class standing. No identifying data was on the survey. Participants returned the Pre-Oral Health Education survey, whether completed or not, in an envelope distributed throughout the class. The envelope was collected and sealed.

The Oral Health Education Overview (Appendix E) was developed by the author utilizing the Smiles for Life curriculum and oral health guidelines as a framework for the class. The class was presented by the author allowing time for discussion and comments during class. For the hands-on laboratory portion of the class, participants were provided the necessary supplies (gloves, tongue blade, 2 X 2 gauze pad, pen light) needed to perform an oral health assessment on a classmate. Students performed oral assessments
under the guidance of the author and lead faculty member of the NRSG 601 course. At the end of the laboratory session, prior to leaving class, students were given the option of completing the Post-Oral Health Education survey. Again, participants were informed that they could choose to not answer any of the survey questions and could stop at any time and that participation or nonparticipation would not affect the participant’s grade or class standing. Participants were instructed to avoid placing identifying data on the survey. Participants returned the Post-Oral Health Education survey regardless of whether they chose to complete the survey in an envelope located outside of the classroom when they left the room.

Intervention Two: Identify Areas Where Oral Health is Currently Included in Ten DNP Courses

Prior to integrating oral health into the DNP curriculum, it was necessary to identify if oral health was taught in the current DNP curriculum. If oral health was being taught, what topics were covered and in which courses? PDSA Cycle Two (Table 2) was developed to identify where oral health content was taught in ten DNP courses. Based on the PDSA results, recommendations were formulated regarding potential integration of oral health in the DNP curriculum.
Table 2: PDSA Cycle Two

| PDSA Cycle Two | PDSA Worksheet for Testing Change  
(Adapted from the Institute for Healthcare Improvement, 2017) |
|----------------|-------------------------------------------------------------------|
| **Aim:**      | Describe the test of change.  
• Identify where oral health is currently being taught in the DNP curriculum. |
| **Stage One:**| List tasks needed to set up this test of change.  
• Review the College of Nursing DNP program objectives and terminal objectives for oral health content.  
• Review the Master Resource Outlines for ten DNP courses: NRSG 601 Advanced Health Assessment; NRSG 602 Advanced Pathophysiology; NRSG 602 & 620 Advanced Pharmacology I & II; NRSG 607 Diagnostic Reasoning; NRSG 621, 622, & 623Advanced Clinical I, II, & III; NRSG 630 Advanced Psychopharmacology; and NRSG 631 Advanced Clinical I for oral health content.  
• Meet with course coordinators of each of the above-named courses to discuss the oral health content taught in each course.  
• Review syllabi in above courses.  
• Review textbooks and course materials for above classes for oral health content  
Predict what will happen when the test is carried out.  
• Oral health content will be taught in NRSG 622 Advanced Clinical II as this course has utilized the Smiles for Life curriculum and a hands-on lab for fluoride varnish for the past three years.  
• Small pockets of oral health content may be taught in the other courses.  
• Oral health is not a curricular thread woven throughout the curriculum.  
Measures to determine if predictions succeed.  
• Verbal and written interviews with faculty were conducted and reviewed by the author. |
| **Stage Two-Do:** | Describe what happened.  
• Review of the DNP program and terminal objectives occurred during October 2016.  
• Review of the Master Resource Outlines of the courses identified above occurred during October 2016.  
• Interviews with lead faculty in the ten courses identified above to discuss oral health in each course occurred from November 2016 through February 2017.  
• Review of course syllabi and textbooks for oral health content occurred during February 2017. |
Table 2 Continued

<table>
<thead>
<tr>
<th>Stage</th>
<th>Describe results and how they compared to predictions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three-</td>
<td>• Review of the DNP program and terminal objectives are broad</td>
</tr>
<tr>
<td>Study:</td>
<td>and did not specifically address any content areas including oral health.</td>
</tr>
<tr>
<td></td>
<td>• Review the CON Master Resource Outlines of ten courses</td>
</tr>
<tr>
<td></td>
<td>revealed no specific objectives related to oral health.</td>
</tr>
<tr>
<td></td>
<td>• Interviews with lead faculty identified significant oral health</td>
</tr>
<tr>
<td></td>
<td>content being taught in NRSG 621 Advanced Clinical I and NRSG</td>
</tr>
<tr>
<td></td>
<td>622 Advanced Clinical II. A small amount of oral health content</td>
</tr>
<tr>
<td></td>
<td>was taught in NRSG 602 Pathophysiology; NSRG 603 Advanced</td>
</tr>
<tr>
<td></td>
<td>Pharmacology; NSRSG 607 Diagnostic Reasoning; NSRG 623</td>
</tr>
<tr>
<td></td>
<td>Advanced Clinical III; and NRSG 630 Advanced Pharmacology II</td>
</tr>
<tr>
<td></td>
<td>Psych/Mental Health; with no oral health content in NRSG 620</td>
</tr>
<tr>
<td></td>
<td>Advanced Pharmacology II; or NRSG 631 Advanced Clinical I.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Stage</th>
<th>Describe modifications to the plan for the next cycle and what was learned.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four-Act:</td>
<td>• Significant oral health is taught in two DNP courses. Small amounts of oral health</td>
</tr>
<tr>
<td></td>
<td>are taught in five courses and no oral health is covered in two DNP courses.</td>
</tr>
<tr>
<td></td>
<td>• Oral health is not threaded throughout the DNP curriculum</td>
</tr>
<tr>
<td></td>
<td>• Share findings with CON Graduate Academic Affairs Committee (GAAC).</td>
</tr>
<tr>
<td></td>
<td>• Based on GAAC feedback potential recommendations could include:</td>
</tr>
<tr>
<td></td>
<td>• Share oral health resources with faculty</td>
</tr>
<tr>
<td></td>
<td>• Identify faculty oral health champions.</td>
</tr>
<tr>
<td></td>
<td>• Develop oral health committee.</td>
</tr>
<tr>
<td></td>
<td>• Provide oral health education for faculty</td>
</tr>
<tr>
<td></td>
<td>• Review remainder of DNP courses for oral health content.</td>
</tr>
<tr>
<td></td>
<td>• Identify potential content to be taught in the courses named above.</td>
</tr>
<tr>
<td></td>
<td>• Meet with faculty teaching in DNP courses to determine willingness to include oral health in their courses.</td>
</tr>
<tr>
<td></td>
<td>• Assist with implementation of oral health into specific courses.</td>
</tr>
</tbody>
</table>

Future PDSA cycles might include:  
• Revision of the Pre-and Post-Oral Health Survey for NRSG 601 Advanced Health Assessment. Continue oral health education in NRSG 601.
Table 2 Continued

<p>| | |</p>
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<th></th>
<th></th>
</tr>
</thead>
</table>
|  | • Determine faculty support of integration of oral health education in both the undergraduate and graduate curriculum.  
  | • Determine faculty support of integration of oral health education in both the undergraduate and graduate curriculum.  
  | • Development of an overall evaluation plan.  
  | • Exploration of interprofessional oral health education with medical students.  
  | • See additional recommendations Chapter 5 of this paper |

**Analysis**

Descriptive analysis was utilized to evaluate the Pre-and Post-Oral Health Education class surveys. There were four common questions on the Pre-and Post-Oral Health Education class surveys. Mosaic plots were used to examine the distribution of responses (yes, no, uncertain) to the four common questions before and after the intervention (Barbour, Lin, & Anderson, 2017). Mosaic plots display data from two or more categorical variables and make it possible to recognize categorical relationships between different variables (Barbour, Lin, & Anderson, 2017). Responses from a given individual before and after the Oral Health Overview class could not be matched; therefore, statistical tests could not be utilized to identify changes in responses following the intervention.

A total of 30 participants completed the Pre-Oral Health Education survey. Twenty-seven of the participants were graduate nursing students and three participants were non-nursing students. Data were analyzed on the Pre-Oral Health Education survey collectively for all 30 participants, and separately for the 27 graduate nursing students.
and three non-nursing students. A total of 27 participants completed the Post-Oral Health Education survey.

Participant comments to the open response questions were reviewed by the author and major topic areas were identified. Faculty interview data was documented by the author.
CHAPTER FOUR — RESULTS

Results

The purpose of this DNP professional project was to incorporate oral health education into one course in the DNP curriculum and to explore potential opportunities for expansion of oral health education in the DNP curriculum. A one-hour Oral Health Overview class and 30-minute oral health assessment lab was presented in NRSG 601-Advanced Health Assessment during September 2016. Prior to the class, 30 first-semester graduate students completed a Pre-Oral Health Education survey to gather participant demographic data, perceptions, and knowledge of oral health. After completion of the didactic Oral Health Overview class and oral health assessment lab, 27 of 30 students elected to complete the Post-Oral Health Education survey. Individuals were not required to answer all questions in the survey. Participant identifiers were not noted on either survey.

The pre-oral health survey consisted of 15 questions and the post-oral health survey consisted of nine questions. Four questions were the same on the pre-and post-oral health survey. Individual responses between the pre-and post-survey could not be matched as participants were not assigned a unique number. Mosaic plots were utilized to describe the relative proportion of participants’ responses to questions from the pre-and post-intervention surveys.
Results of PDSA Cycle One (Table 1)

The purpose of PDSA Cycle One was the pilot implementation of an oral health overview class in NRSG 601 Advanced Health Assessment. The first step in the PDSA process was to review the CON mission, vision, and strategic plan which revealed that incorporation of oral health was consistent within these documents and the overall philosophy of the organization. A review of the course syllabus, objectives, and content in NRSG 601 Advanced Health Assessment was completed. Course objectives were broad, none were specific to oral health. Inclusion of oral health assessment was consistent with four of the five NRSG 601 course objectives.

Review of the course content specific for head, ear, eye, nose, and throat identified information that briefly addressed cultural implications related to tooth decay among African Americans and Native Americans, the incidence of oral cancer, and health history questions regarding pain, bleeding gums, ulcerations, dentures, tooth loss, dental appliances, malocclusion, and medications. Also included in NRSG 601 Advanced Health Assessment course content, was a brief description of assessment of teeth for color/stains, number of missing teeth, occlusion/alignment, wear, notches, and caries (NRSG 601, HEENT D2L content module, 2016). The current assessment textbook required for NRSG 601 revealed minimal oral health assessment information. Two paragraphs were dedicated to history questions for dental problems and mouth lesions in addition to three pages describing assessment of the mouth and oropharynx (Ball, Dains, Flynn, Solomon, & Stewart, 2015).
An extensive review of the literature was conducted to identify the state of the science regarding oral health integration in primary care. In consultation with the lead faculty for NRSG 601, the author developed an Oral Health Overview lecture and discussion in addition to a hands-on lab oral health laboratory experience which was presented at the first face-to-face class in September 2016.

Objectives for the Oral Health Overview class included:

- Discuss the prevalence and sequelae of oral health disease.
- Recognize the interrelationships between oral and systemic disease.
- Discuss the role of non-dental professionals in the promotion of oral health.
- Perform an oral health assessment identifying normal findings.
- Discuss how collaborative practice can increase the provision of comprehensive oral health services.

Topic areas in the oral health overview included: prevalence and sequelae of oral disease, oral health recommendations, interrelationship between oral and systemic disease, oral health paradigm shift, non-dental providers’ role in oral health, how to perform an oral health assessment, and hands-on oral health laboratory experience assessing the oropharynx (Appendix D). The class was interactive, with students asking questions and sharing situations of the challenges of poor oral health in the clinical setting (Table 3).
Table 3: Student Comments during the Oral Health Overview Class

<table>
<thead>
<tr>
<th>Participant Comments and Discussion During Oral Health Overview Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty dealing with dental issues related to methamphetamine use.</td>
</tr>
<tr>
<td>Problems with Medicare/Medicaid patients who have no dental coverage and limited access to dental care for this patient population.</td>
</tr>
<tr>
<td>Difficulty with dentists who insist on treating dental problems that the dentist feels are important, but the patients do not feel the same way.</td>
</tr>
<tr>
<td>Patient pain perceptions related to dental care, therefore they avoid dental care.</td>
</tr>
<tr>
<td>Limited access to dental care in rural Montana especially if specialized dental care is needed.</td>
</tr>
<tr>
<td>RN lack of knowledge about proper tooth brushing and the amount of fluoride toothpaste required to be adequate.</td>
</tr>
<tr>
<td>Frustration with “dental days” in the operating room. “Kids wake up asking for soda or candy that was promised by the parents as a treat for having the surgery.”</td>
</tr>
</tbody>
</table>

Results of Pre-Oral Health Education Survey

There were an inconsistent number of participant responses to each question on the survey. The number of participant responses for each question on the Pre-Oral Health Education survey ranged from a minimum of 26 to a maximum of 30.

Demographic Information

Question 1: Current employment. Twenty of the twenty-six respondents (76.9%) reported working in acute care, three individuals (11.5%) reported working in clinics and three respondents (11.5%) reported working in “other” settings.

Question 2: Years of practice as a nurse. Twenty-six respondents answered this question. Years of nursing experience ranged from two to 29 years with a mean of 8.4 years and a median of 8 years of experience.

Question 3: Which of the following applies to you? CNL, DNP, other?
Of the 30 total participants, 11 respondents (36.6%) were CNL students, 16 respondents (53.3%) were DNP students and three respondents (10.0%) were non-nursing students.

Question 4: Do you believe that the patient’s seen in your health care agency have unmet dental needs? Please explain. Twenty-six of the 28 respondents (92.8%) reported that patients seen in their health care agencies had unmet dental needs. One respondent (3.7%) reported that patients in their facility did not have unmet dental needs and two respondents (7.1%) reported being uncertain regarding unmet dental needs. Participant comments related unmet dental needs included drug use, patient finances, living situations such as homelessness, lack of insurance, lack of access to dental health providers, prevalence of high Native American populations, types of services offered at their health care agencies, and numbers of patients seen in emergency departments due to dental problems. See Appendix E for participant comments related to unmet dental needs.

Question 5: How do the majority of patients seen in your health care agency pay for their services? Medicare, Medicaid, Insurance, Uninsured, Self-pay, Uncertain. Participants could select more than one answer for this question. Figure 2 displays the responses to question five on the pre-oral health survey regarding how the majority of patients seen in their healthcare agency pay for their services. Medicaid was the highest payment method reported (60% of respondents), followed by Medicare (46.6%), private insurance (36.6%), and uninsured (33.3%). Six respondents (20%) responded as uncertain regarding patient payment method and two respondents (6.6%) were reported as self-pay.
Figure 2: Pre-Oral Health Education Survey Question 5: How do patients pay for their care? (Barbour, Lin, & Anderson, 2017)

<table>
<thead>
<tr>
<th>insurance</th>
<th>medicaid</th>
<th>medicare</th>
<th>selfpay</th>
<th>uncertain</th>
<th>uninsured</th>
</tr>
</thead>
<tbody>
<tr>
<td>no</td>
<td>19</td>
<td>12</td>
<td>16</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>yes</td>
<td>11</td>
<td>18</td>
<td>14</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Question 8: Is completing an oral health assessment currently part of your practice? If an oral health assessment is part of your practice, please describe. Twenty of 28 respondents (71.4%) reported that oral health assessments were not a part of their current practice with eight of 28 respondents (28.6%) reporting that completing oral health assessments is a part of their current practice. Participants who currently perform oral health assessments in their practices had comments such as: only if related to injury or illness; not in depth; most often done by the physician; only if the patient has an oral
issue; and for long-term care. See Appendix E for a complete list of participant comments.

Question 12: What three things come to mind when you think about oral health? The top three comments were related to dental hygiene (seven respondents), cavities (five respondents), and heart disease (five respondents). See Appendix F for a complete list of comments.

Question 13: Have you received any training or education regarding oral health from someone other than your dental provider? If yes, where and from whom did you receive this education? Twenty-three of 29 respondents (79.3%) reported they had not received oral health education or training from someone other than a dental provider. Six of 29 respondents (20.7%) reported receiving oral health training or education from someone other than a dental provider. One participant commented that oral health education occurred in nursing school.

Question 14: Does your non-dentist health care provider include oral health as a part of your care? Twenty-seven of 29 respondents (93.1%) reported that non-dentist health care providers did not include oral health as part of their practice while two of 29 respondents (6.9%) reported that they were uncertain.

Question 15: Do you have any additional thoughts or comments regarding oral health? No respondents answered this question.
Post-Oral Health Education Survey Results

There was an inconsistent number of participant responses to each question on the survey. Numbers of responses for each question on the Post-Oral Health Education survey ranged from a minimum of 24 to a maximum of 27.

Question 3: Do you anticipate integrating oral health into your practice? Twenty of 27 respondents (74.1%) anticipated integrating oral health into their practices. Six of 27 respondents (22.2%) were uncertain and one respondent (3.7%) did not anticipate integrating oral health into their practice.

Question 4: Please circle a number that represents the likelihood that you will integrate oral health assessment into your practice.

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 (high)</td>
<td>10 (37.0%)</td>
</tr>
<tr>
<td>4</td>
<td>8 (29.6%)</td>
</tr>
<tr>
<td>3</td>
<td>8 (29.6%)</td>
</tr>
<tr>
<td>2</td>
<td>1 (3.7%)</td>
</tr>
<tr>
<td>1 (low)</td>
<td>0</td>
</tr>
</tbody>
</table>

Ten of twenty-seven individuals (37.0%) responded with a “5”, eight of 27 individuals (29.6%) responded with a “4”, eight of 27 individuals (29.6%) responded with a “3”, one of 27 respondents (3.7%) responded with a “2”, and none of the 27 individuals responded with a “1”. Overall, 66.6% of the respondents seemed likely to integrate oral health assessment into their practice.
Figure 3: Likelihood that participants will integrate oral health assessment into their practice (1=low, 5=high) (Barbour, Lin, & Anderson, 2017).

Question 5: Do you anticipate any barriers to integrating oral health into your practice?

Fifteen of 27 respondents (55.6%) anticipated barriers to oral health integration in practice. Five of 27 respondents (18.5%) were uncertain and seven of 27 respondents (25.9%) did not anticipate barriers to integrating oral health into their practice.

Question 8: Did you learn additional information from this class?
Twenty-three of 24 respondents (95.8%) stated that they learned new information from the class. One of 24 respondents (4.2%) reported that they did not learn new information from the class.

Question 9: What additional information would be helpful to you regarding oral health?

Participant comments included topics such as: how floor nurses can make referrals; resources for dentists in the area; how to do a thorough assessment; request for additional oral health information; resources in the community for low-income, at-risk patients; and the effects of bleaching teeth.

Examination of the Four Common Questions between Pre and Post-Oral Health Education Surveys

Do you believe that oral health should be included in the overall health assessment of patients? (Pre-Oral Health Education survey question # 6; Post-Oral Health Education survey question #1) Twenty-eight of 29 respondents (96.6%) answered, “yes,” and one respondent (3.4%) was “uncertain” in the pre-intervention survey. In the post-intervention survey, 27 of 27 of respondents (100%) answered “yes”.

Do you believe that oral health screening should be provided by non-dental providers? (Pre-Oral Health Education survey question #7; Post-Oral Health Education question # 2)

The pre-intervention survey revealed that 18 of 30 of respondents (60.0%) believed that oral health screening should be provided by non-dental providers (Figure 4). Ten of 30 respondents (33.3%) were uncertain and two of 30 respondents (6.7) did not
believe that oral health screening should be provided by non-dental providers. Post-intervention surveys showed 27 of 27 respondents (100%) believed that oral health screening should be provided by non-dental providers.

Figure 4: Non-dental providers should perform oral health screenings. (Barbour, Lin, & Anderson, 2017).

<table>
<thead>
<tr>
<th></th>
<th>pre_intervention</th>
<th>post_intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>no</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>uncertain</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>yes</td>
<td>18</td>
<td>27</td>
</tr>
</tbody>
</table>
Do you believe that it is important to include education regarding oral health in non-dental curricula such as nursing? (Pre-Oral Health Education survey question # 10; Post-Oral Health Education question # 6)

Prior to the intervention, 27 of 29 respondents (93.1%) reported that it was important to include oral health education in non-dental curricula, with two of 29 individuals (7.4%) being uncertain. None of the 27 respondents reported that the inclusion of oral health education in non-dental curricula is not important. On the Post-Oral Health Education survey, 27 of 27 respondents (100%) responded that it was important to include oral health education in non-dental curricula such as nursing.

Do you feel that you have an understanding of oral health and its relationship to other diseases? (Pre-Oral Health Education survey question # 11; Post-Oral Health Education question # 7)

In the Pre-Oral Health Education survey, 18 of 29 respondents (62.1%) reported understanding the relationship of oral health to other diseases. Seven of 29 respondents (24.1%) reported that they were uncertain, and four of 29 respondents (13.8%) reported that they did not have an understanding of oral health and its relationship to other diseases. On the Post-Oral Health Education survey, 24 of 24 respondents (100%) reported having an understanding of oral health and its relationship to other diseases (Figure 5).
PDSA Cycle Two Results

The PDSA Worksheet for Testing Change Cycle Two (Table 2) was developed to explore opportunities for expanding oral health in the DNP curriculum. A review of the DNP program and terminal objectives was completed by the author. The program and terminal objectives were broad and did not specifically address content areas, including oral health. A review of the Master Resource Outlines of NRSG 601-Advanced Health
Assessment, NRSG 602 Advanced Pathophysiology, NRSG 603 Advanced Pharmacology, NRSG 607 Diagnostic Reasoning, NRSG 620 Advanced Pharmacology II, NRSG 621 Advanced Clinical I, NRSG 622 Advanced Clinical II, NRSG 623 Advanced Clinical III, NRSG 630 Advanced Pharmacology II, and NRSG 631 Advanced Clinical I was completed by the author. The results of the Master Resource Outline review showed broad objectives in all courses, with none of objectives specific to oral health. Interviews with the course coordinators of the previously named courses were conducted to determine if oral health content was taught in each course (Appendix G). Of the ten DNP courses reviewed, eight reported including oral health with responses varying from minimal to extensive oral health content being taught (Appendix H). One course, NRSG 620 Advanced Pharmacology II reported no oral health content.

The author reviewed syllabi, textbooks, and class materials for the ten previously named courses (Appendix I). The table of contents and index of each textbook was reviewed using key words (dental, oral, oral health, lesions, cancer, mouth, and xerostomia) to identify oral health content. Results of the textbook review ranged from two sentences to seven pages of oral health information.

NRSG 601 Advanced Health Assessment didactic content briefly covered cultural implications related to tooth decay, the incidence of oral cancer, oral health history questions, in addition to a brief description of assessment of teeth. There were two paragraphs in the textbook related to dental problems and mouth lesions in addition to three pages describing assessment of the mouth and oropharynx (Appendix I).
NRSG 602 Advanced Pathophysiology didactic content briefly discusses risk for oral cancer, salivation, swallowing, and cleft lip/palate (Appendix H). The textbook includes a half page discussing the physiology of the oral cavity, mouth, esophagus, and saliva (Appendix I). There is no information on teeth or the oral-systemic disease connection.

NRSG 603 Advanced Pharmacology includes brief didactic content related to the presentation and treatment of dental abscesses and aphthous ulcers (Appendix H). The textbook includes four lines that list mouth agents, antifungals, and chlorhexidine rinse (Appendix I).

NRSG 607 Diagnostic Reasoning utilizes The Kayser-Jones Brief Oral Health Status Examination for older adults in addition to discussion of unintentional weight loss due to poor dentition. The three textbooks for the course include a total of ten sentences covering topics of dental abscess, malocclusion, and oral lesions to include aphthous ulcers, Herpes Simplex Virus, and cancer (Appendices H and I).

NRSG 620 Advanced Pharmacology does not discuss oral health. The course utilizes online resources and no textbooks.

NRSG 621 Advanced Clinical I Primary Care for Childbearing and Childrearing Families includes Smiles for Life modules 1 and 2: Child Oral Health and Pregnancy and Women’s Health, in addition to a 24-page chapter on Pediatric Dental and Oral Disorders (Appendices H and I).

NRSG 622 Advanced Clinical II Primary Care for Midlife Families contains extensive oral health content. Modules 1-8 of the Smiles for Life curriculum, a two-hour
oral health lecture and hands-on laboratory including the application of fluoride varnish, in addition to the article, Early Childhood Caries and the Role of the Pediatric Nurse Practitioner (Mahat, Lyons, & Bowen, 2014) is included in this course (Appendices H and I).

NRSG 623-Advanced Clinical III for Aging Families includes seven pages in the text related to throat and mouth guidelines and one slide related to oral health in the Medicare Annual Wellness Visits discussing the need to include oral health in the HEENT examination of older adults (Appendix I). Of note, the Cash & Glass (2014) textbook recommends that children have their first dental visit at age three which is not consistent with national guidelines.

NRSG 630-Advanced Psychopharmacology includes information related to xerostomia and side effects of psychiatric medications. Textbooks for this course include information regarding oral side effects such as xerostomia of specific medications (Appendix I).

NRSG 631- Advanced Clinical I, Advanced Nursing Practice and Psychiatric Care Formulation students learn to ask about oral health on psychiatric intake evaluations and follow-up visits. The five textbooks for this course did not contain oral health content (Appendix I).

In the current DNP curriculum, oral health is discussed in detail in NRSG 621-Advanced Clinical I and 622-Advanced Clinical II, with a small amount in NRSG 623-Advanced Clinical III. These are direct patient care courses that cover birth to the older adult and are critical for weaving oral health across the lifespan.
Pre-and Post-Oral Health Education Survey Data

Participants who attended the Oral Health Education Overview class in NRSG 601 Advanced Health Assessment were encouraged to provide feedback via a pre and a post-survey identifying their perceptions regarding oral health care. The number of participant responses for each question on the Pre-Oral Health Education survey ranged from 26-30. Responses on the Post-Oral Health Education survey ranged from 24-27.

The majority of respondents (26 of 29) indicated that patients in their agencies have unmet dental needs. Most respondents (27 of 29) believed oral health is an important component of a patient’s overall health. Twenty-three of 29 respondents had not received any training or education regarding oral health from someone other than a dental provider and 27 of 29 respondents stated that non-dental providers are not including oral health as part of their practice.

Participants who responded to the survey prior to the Oral Health Overview class (28 of 29 respondents) reported oral health should be included in the overall health assessments of patients. Before the Oral Health Overview class, the majority of respondents (27 of 29 participants) reported that oral health education should be included in non-dental curricula such as nursing. Prior to the Oral Health Overview class, 18 of 29 respondents reported having an understanding of oral health and its relationship to other diseases.
Following the Oral Health Overview class, all respondents (27 of 27) reported that oral health should be included in the overall health assessment of patients and that oral health education should be included in non-dental curricula such as nursing. After the Oral Health Overview class, all respondents (24 of 24) reported having an understanding of oral health and its relationship to other diseases.

Participant comments regarding unmet dental needs were consistent with those found in the literature such as lack of insurance and emergency department visits for oral health. A majority of these issues could be decreased if primary care providers were providing oral health screening and referrals. Student responses indicating the most common barriers to implementing oral health in their practice concurred with the literature. Responses included: lack of time in the workplace due to high acuity patients; inadequate referral mechanisms; and challenges in obtaining physician support. Additional information requested by intervention participants included how registered nurses can make referrals, how to perform a thorough oral health assessment, and available resources for low income and at-risk patients.

Oral Health Content in Current DNP Curriculum

Oral health information was discovered in nine of the ten DNP courses reviewed. The oral health content was highly variable throughout the courses and ranged from no content to a few sentences in a textbook, to very extensive content including eight Smiles for Life modules in addition to a two-hour oral health class and laboratory experience. In the current DNP curriculum, oral health is discussed in detail in NRSG 621-Advanced Clinical I and 622-Advanced Clinical II. Two key courses in the DNP curriculum, NRSG
602 Advanced Pathophysiology and NRSG 623 Advanced Clinical III Aging Families have little oral health content. In order for oral health education to be effective and to become a routine part of a practitioner’s practice, oral health education should be reinforced in numerous courses and woven throughout the curriculum.

**Project Strengths**

There were several strengths of the project. Integration of oral health in primary care is relatively new. There is little data regarding the number of nursing schools that implement oral health in their curricula. This project provided the template for the MSU College of Nursing to begin the journey of oral health integration into the DNP curriculum, and ultimately other graduate and undergraduate programs.

The Oral Health Overview class presented in the first semester of the DNP and MN curriculum served as a pilot for introducing content early in the graduate the curriculum. The Pre-and Post-Oral Health Education surveys provided students the opportunity to share knowledge of oral health as they enter a graduate curriculum, which serves as a baseline on which to build and incorporate additional oral health content in the curriculum. Understanding practicing nurses’ knowledge of the potential barriers to integration of oral health in practice is essential when planning strategies for oral health implementation in primary care. It was not the intent of the survey to obtain a large amount of qualitative data regarding oral health. However, the survey responses provided rich data from the student perspective that lends itself to more detailed analysis and likely future studies and publications. Identification of where and what content is currently
being taught in the DNP curriculum provides a foundation on which to explore potential integration of oral health in the DNP curriculum.

**Project Limitations**

Several limitations may affect the validity of this project. The Pre- and the Post-Oral Health Education surveys were developed by the author to assess student experience with oral health and their perceptions regarding oral health. External validity limitations include a small, convenience sample size of thirty participants. A small sample size was anticipated since NRSG 601 Advanced Health Assessment course is only offered once yearly; therefore, the results of this project are applicable only to the cohort of students surveyed. In addition, student participants in the Oral Health Overview class were not required to complete the surveys or to answer all questions on the surveys, this led to inconsistencies in the number of responses for each question. The respondents were not randomly assigned; therefore, causal relationships could not be established between the Pre-and Post-Oral Health Education surveys.

Individual responses before and after the Oral Health Overview class could not be matched; therefore, statistical analysis could not be used to examine for changes in responses after the Oral Health Education class. Having identifiers that link together a single individual’s responses between the Pre-and Post-Oral Health Education surveys would allow for direct comparisons of how an intervention can affect responses and examination of relationships that may be present in the data. Without linking these two sources, information is lost that could be utilized to guide future research (Barbour, Lin, & Anderson, 2017). In addition, the results of the curriculum review focused on ten of
seventeen DNP courses offered at Montana State University and findings cannot be generalized to the entire curriculum or other universities.

**Recommendations**

The first step for developing a nursing workforce with core competencies in oral health promotion is to prepare nursing faculty with knowledge and skills regarding oral health best practices. Numerous resources (Appendix A) are available for faculty regarding oral health education. The most comprehensive, user-friendly, and easily accessible resource for faculty and students is the Smiles for Life curriculum (Clark et al., 2010). This online curriculum serves as a framework for faculty enrichment and competency development in oral health across the life cycle. Case studies, simulation, and clinical situations can be utilized to correlate a patient’s oral manifestations of systemic disease and pathophysiology (Clark et al., 2010). In addition, the Northeastern University Innovations in Oral Health Toolkit (2015) consists of a plethora of teaching resources that can be utilized by faculty to easily incorporate oral health into a variety of courses.

Recommendations and implementation strategies for oral health integration in a DNP curriculum are described in Table 4. Tabular format for the discussion of recommendations was selected to serve as a readily available reference for faculty who may be interested in integrating oral health into the curriculum.
<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify oral health content in every DNP course</td>
<td>• Continue examination of the current graduate curriculum, identifying oral health content.</td>
</tr>
<tr>
<td></td>
<td>• Discuss findings of this project with CON Graduate Academic Affairs Committee.</td>
</tr>
<tr>
<td>Assess faculty knowledge, skills, and attitudes about oral health</td>
<td>• Survey faculty oral health knowledge</td>
</tr>
<tr>
<td></td>
<td>• Modify the Oral Health Knowledge Survey developed by Northeastern University (2016) and utilize as a template for the faculty survey.</td>
</tr>
<tr>
<td>Determine readiness of the faculty to implement a curricular change</td>
<td>• Discuss findings of this project with graduate faculty.</td>
</tr>
<tr>
<td></td>
<td>• Discuss faculty desire to make curricular change.</td>
</tr>
<tr>
<td>Expand and enhance oral health content in the DNP curriculum. Course recommendations.</td>
<td>• NRSG 601: Advanced Health Assessment continue to include Oral Health Overview class to serve as the foundation and introduction to oral health in the curriculum</td>
</tr>
<tr>
<td>Expand and enhance oral health content in the DNP curriculum. Course recommendations.</td>
<td>• NRSG 602: Advanced Pathophysiology - include oral health and systemic disease connection.</td>
</tr>
<tr>
<td></td>
<td>• NRSG 621: Advanced Clinical I - continue with current content regarding oral health in children, pregnancy, and women’s health utilizing the Smiles for Life modules 2 &amp; 5.</td>
</tr>
<tr>
<td></td>
<td>• NRSG 622: Advanced Clinical II - continue with Smiles for Life modules 1-8 and two-hour oral health lecture/lab.</td>
</tr>
<tr>
<td></td>
<td>• NRSG 623: Advanced Clinical III - add a section on oral health of older adults.</td>
</tr>
<tr>
<td></td>
<td>• NRSG 631: Advanced Clinical I - add a section on oral health and mental illness.</td>
</tr>
<tr>
<td></td>
<td>• Develop a plan to address identified gaps in faculty knowledge, skills, and abilities related to oral health.</td>
</tr>
<tr>
<td>Obtain leadership support</td>
<td>• Obtain support of CON Graduate Academic Affairs Committee.</td>
</tr>
<tr>
<td></td>
<td>• Discuss with CON leadership.</td>
</tr>
<tr>
<td>Create a shared vision and oral health awareness</td>
<td>• Identify faculty champions who are already incorporating oral health into their courses discuss with others.</td>
</tr>
</tbody>
</table>
Table 4 Continued

| Faculty development | • Educate faculty regarding resources available (Appendix A).
|                    | • Provide faculty with resources such as the Smiles for Life curriculum, case studies, simulation learning, and hands-on workshops facilitated by oral health faculty champions.
|                    | • Investigate opportunities for faculty and students to acquire hands-on experience via service learning in the community such as school screenings.

| Develop an evaluation plan | • Gather data from faculty and students to measure knowledge, skills, and attitudes regarding oral health.
|                        | • Discuss oral health content implementation with graduate faculty at annual/biannual College course meetings.

| Integrate oral health in the graduate program | • Utilize the above steps to incorporate oral health in graduate nursing curriculum.

| Establish opportunities for Interprofessional education | • Discuss faculty willingness to participate in interprofessional education with other disciplines such as medicine via the Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI) program at MSU.

Suggestions for Future Studies

The findings of this project highlight the need for continued work on integrating oral health in the graduate curriculum at MSU with the possibility of introducing oral health in the undergraduate curriculum in the future. Pre- and Post-Oral Health Education surveys provided insight into student perceptions and previous experiences regarding oral health. However, in future studies, there should be consistency in the numbering of pre and post- survey questions as well as assigning individual participant numbers so that data can be matched without the risk of bias and the ability to measure change. In
addition, assessment of students’ knowledge, skills, and attitudes regarding oral health at the beginning and at the end of the DNP curriculum will provide information regarding the effectiveness of the curriculum.

Implications for Practice

Oral health is integral to overall health and a key component in providing comprehensive care for our patients. There are over 222,000 nurse practitioners and three million registered nurses in the United States (American Academy of Nurse Practitioners, 2016). With adequate education in oral health, the nursing workforce has the potential to have a major impact on improving quality and access to oral health care.

Preparing nurses who are competent in oral health promotion and disease prevention are essential. Before nursing students can be educated about oral health, nursing faculty must have the skills, abilities, attitudes, and knowledge regarding best practices in oral-systemic health (Dolce, 2012). Several resources are available for faculty competency development in oral health across the lifespan (Table 1). Two essential resources to assist faculty with oral health integration in nursing curricula include The Smiles for Life National Oral Health Curriculum and the Oral Health Nursing Education and Practice Faculty Toolkit (NYUCN, n.d).

Oral health risk assessments, examinations, referrals, and anticipatory guidance are within the scope of nursing practice. Incorporating oral health education in DNP curricula provides APRNs with the oral health knowledge needed to lead the way in creating a climate of change in provider practice by making oral health the standard of care. APRNs are in the unique position to be advocates for oral health in their practice.
Oral health education should be emphasized during well-child visits, and general adult visits by APRNs so that their patients understand the importance of incorporating oral hygiene and health into their everyday lives. Use of non-dental providers such as nurse practitioners providing oral health preventive services in primary care settings is one strategy to improving oral health outcomes.

Integration of oral health into primary care practices is a relatively new concept and in many instances, it will be the DNP’s who are the leaders and practice champions spearheading the change. It is essential that professional nursing education programs provide opportunities for faculty education regarding oral health, review and revise curricula to include oral health across the lifespan, and begin to integrate interprofessional oral health education.

Conclusion

The current U.S. oral health care delivery system does not reach the populations with the highest need for oral health services, resulting in continued oral health disparities for low-income, minority, rural, and other underserved populations. Incorporating oral health education in the formal education of primary care providers, such as nurse practitioners, adheres to national recommendations and guidelines, and is a strategy to achieve the overall goals of primary health care by improving care for individuals and populations and lowering over health care costs. The role of nurses in improving oral health outcomes and expanding access to care is dependent upon improving oral health education in graduate and undergraduate nursing curricula. DNP educational programs are encouraged to expand their curricula to include oral health competencies.
REFERENCES CITED


APPENDIX A

ORAL HEALTH RESOURCES FOR FACULTY AND CLINICIANS
Appendix A. Resources for Implementation of Oral Health in DNP Curricula

<table>
<thead>
<tr>
<th>Audience</th>
<th>Resource</th>
<th>Description/Type of Resource</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>Innovations in Oral Health Technology, Instruction, Practice, and Service (2016)</td>
<td>This web-based curriculum developed by Northeastern University Bouve College of Health Sciences includes a detailed faculty toolkit complete with a step-by-step guide on how to begin the process of oral health integration into health profession curricula, instructor guides to help educate faculty about oral health and oral health integration, learning objectives, instructor guides for teaching basic oral health competencies, case studies, simulations, discussion questions, service-learning programs, templates of faculty/student surveys and program evaluation tools.</td>
<td><a href="http://www.northeastern.edu/oralhealth">http://www.northeastern.edu/oralhealth</a></td>
</tr>
<tr>
<td>Faculty, students, Primary care clinicians</td>
<td>Smiles for Life National Oral Health Curriculum (Clark et al, 2010.)</td>
<td>This is a comprehensive web-based, interprofessional oral health curriculum that serves as the cornerstone for curriculum integration and development, faculty, student, and clinician development. The curriculum consists of eight modules, quizzes, presentations, presenter resources, and the opportunity to obtain no-cost continuing education credits.</td>
<td><a href="http://smilesforlifeoralhealth.org">http://smilesforlifeoralhealth.org</a></td>
</tr>
<tr>
<td>Faculty</td>
<td>Teaching Oral-Systemic Health (TOSH) program</td>
<td>The web-based interprofessional TOSH program sponsored by New York University is designed to prepare APRNs with “a set of core competencies to prioritize oral-systemic health promotion and disease prevention in primary care and collaborate in interprofessional teams (TOSH, 2016). The Faculty Toolkit contains curriculum guides, PowerPoint slides, case studies, quizzes, and IPE simulations to be used when implementing oral health in nursing curricula.</td>
<td><a href="http://toshteam.org/about-tosh/">http://toshteam.org/about-tosh/</a></td>
</tr>
<tr>
<td>Faculty</td>
<td>Oral Health Nursing Education and Practice Interprofessional Oral Health Faculty Toolkit</td>
<td>This online program is intended to assist faculty with integration of oral-systemic health content and clinical competencies into nurse practitioner and midwife curricula. Included in the Faculty Toolkit are curriculum guides to assist faculty in integration of oral health core competencies in a variety of nurse practitioner programs. (NYUCN, n.d.).</td>
<td><a href="http://ohnep.org/faculty-toolkit">http://ohnep.org/faculty-toolkit</a></td>
</tr>
<tr>
<td>Faculty, students, primary care clinicians</td>
<td>Association for Prevention Teaching and Research (APTR) Oral Health Across the Lifespan module</td>
<td>This program highlights interprofessional oral health core competencies and integration into health care. It consists of five interprofessional online lectures focusing on oral health disparities, access, and health outcomes (APTR, n.d.).</td>
<td><a href="http://www.aptrweb.org/?PHLM_15">http://www.aptrweb.org/?PHLM_15</a></td>
</tr>
<tr>
<td>Faculty, students, primary care clinicians</td>
<td>Open Wide Oral Health Training Program</td>
<td>This online training program consists of four modules designed to help health professionals promote oral health for infants, children, and their families. Modules provide information about tooth decay and prevention, risk factors, how to perform oral health risk assessments and oral health screening, in addition to anticipatory guidance for parents. Open wide (National Maternal and Child Oral Health Resource Center, 2010).</td>
<td><a href="https://www.mchoralhealth.org/OpenWide/">https://www.mchoralhealth.org/OpenWide/</a></td>
</tr>
<tr>
<td>Faculty, students, primary care clinicians</td>
<td>Expanding Access to Oral Health Care: Nurses Make a Difference</td>
<td>This video produced by Oral Health Nursing Education and Practice Initiative showcases the role of nurses in promoting oral health.</td>
<td><a href="http://ohnep.org/">http://ohnep.org/</a></td>
</tr>
<tr>
<td>Faculty, students, primary care clinicians</td>
<td>Oral Health Assessment Tool for Dental Screening</td>
<td>This is a simple, eight category screening tool that can be used for screening the oral health of adult patients (Chalmers, Johnson, Tang, &amp; Titler, 2004).</td>
<td><a href="https://www.healthcare.uiowa.edu/igec/tools/oralhealth/OHAT.pdf">https://www.healthcare.uiowa.edu/igec/tools/oralhealth/OHAT.pdf</a></td>
</tr>
<tr>
<td>Faculty, students, primary care clinicians</td>
<td>Oral Health Risk Assessment Tool (AAP, 2011)</td>
<td>The oral health risk assessment tool developed by the American Academy of Pediatrics and endorsed by the National Interprofessional Initiative on Oral Health is a simple and quick tool that is intended for documenting caries risk in children (AAP, 2011).</td>
<td><a href="http://www2.aap.org/oralhealth/docs/riskassessmenttool.pdf">http://www2.aap.org/oralhealth/docs/riskassessmenttool.pdf</a></td>
</tr>
</tbody>
</table>
APPENDIX B

INSTITUTIONAL REVIEW BOARD EXEMPTION
MEMORANDUM

TO: Janice Hausauer and Elizabeth Kition

FROM: Mark Quinn, Chair

DATE: July 15, 2016

RE: "Educating ONP Students to Integrate Oral Health Assessment into Primary Care Practice" (JH071515-EX)

The above research, described in your submission of July 13, 2016, is exempt from the requirement of review by the Institutional Review Board in accordance with the Code of Federal regulations, Part 46, Section 101. This specific paragraph which applies to your research is:

- X (b) (1) Research conducted in established or commonly accepted educational settings, involving normal educational practices such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

- X (b) (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior, unless: (i) information obtained is recorded in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects; and (ii) the disclosure of the human subjects’ responses outside the research would reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects’ financial standing, employability, or reputation.

- (b) (3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) or state law(s) except those that pertain to the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

- (b) (4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens; if these sources are already publicly available, or if the information is to be recorded by the investigator in such a manner that the subjects cannot be identified, directly or through identifiers linked to the subjects.

- (b) (5) Research and demonstration projects which are conducted by, or subject to the approval of, department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under such programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under such programs.

- (b) (6) Tests and studies of the safety, tolerability, and consumer acceptance studies, if: (i) if wholesome foods without additives are consumed, or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant or at or below the levels found to be safe, by the FDA, or approved by the FDA or the Food Safety and Inspection Service of the USDA.

A thorough review by the Institutional Review Board is not required for the above research. The Committee will be glad to review it. If you wish a review and committee approval, please submit 2 copies of the usual application form and it will be processed by expedited review.
APPENDIX C

PRE-ORAL HEALTH EDUCATION CLASS SURVEY
Pre-Oral Health Education Class Survey

Participants are being asked to participate in a project regarding oral health assessment. Information obtained will serve as the foundation for integration of oral health in a graduate nursing curriculum. Participants consist of graduate nursing students enrolled in the NRSG 601, Advanced Health Assessment course, Fall, 2016.

Completion of this questionnaire is voluntary and you can choose to not answer any questions you do not want to answer and you may stop at any time. Participation or non-participation will not affect your grade or class standing. Completion of the questionnaire is considered consent to participate.

1. **Current employment (please circle):**
   - Acute care
   - Public health
   - Clinic
   - Currently not employed

   Other (please describe):

2. **Years of practice as a nurse: _____**

3. **Which of the following applies to you? (please circle)**
   - CNL student
   - DNP student
   - Other

4. **Do you believe that the patient’s seen in your health care agency have unmet dental needs?**
   - Yes____
   - No____
   - Uncertain____

   Please explain:
5. **How do the majority of patients seen in your health care agency pay for their services?**

Medicare____ Medicaid____ Insurance____ Uninsured____ Self-pay____

Uncertain____

6. **Do you believe that oral health should be included in the overall health assessment of patients?**

Yes____ No____ Uncertain____

7. **Do you believe that oral health screening should be provided by non-dental providers?**

Yes____ No____ Uncertain____

8. **Is completing an oral health assessment currently part of your practice?**

Yes____ No____

If oral health assessment is part of your practice, please describe:

9. **Do you believe that oral health is an important component of overall health?**

Yes____ No____ Uncertain____

10. **Do you believe that it is important to include education regarding oral health in non-dental curricula such as nursing?**

Yes____ No____ Uncertain____

11. **Do you feel that you have an understanding of oral health and its relationship to other diseases?**

Yes____ No____ Uncertain____
12. What three things come to mind when you think about oral health?

13. Have you received any training or education regarding oral health from someone other than your dental provider?
   Yes____  No____  Uncertain____
   If yes, where and from whom did you receive this education?

14. Does your non-dentist health care provider include oral health as a part of your care?
   Yes____  No____  Uncertain____

15. Do you have any additional thoughts or comments regarding oral health?

Thank you for your time in completing this survey.
APPENDIX D

POST-ORAL HEALTH EDUCATION CLASS SURVEY
Post-Oral Health Assessment Class Survey

Participants are being asked to participate in a project regarding oral health assessment. Information obtained will serve as the foundation for integration of oral health in a graduate nursing curriculum. Participants consist of graduate nursing students enrolled in the NRSG 601, Advanced Health Assessment course, Fall, 2016.

Completion of this questionnaire is voluntary and you can choose to not answer any questions you do not want to answer and you may stop at any time. Participation or non-participation will not affect your grade or class standing. Completion of the questionnaire is considered consent to participate.

1. **Do you believe that oral health should be included in the overall health assessment of patients?**
   - Yes____
   - No____
   - Uncertain____

2. **Do you believe that oral health screening should be provided by non-dental providers?**
   - Yes____
   - No____
   - Uncertain____

3. **Do you anticipate integrating oral health into your practice?**
   - Yes____
   - No____
   - Uncertain____
   
   Please explain:

4. **Please circle a number that represents the likelihood that you will integrate oral health assessment into your practice.**

   5  4  3  2  1

   High  Low

5. **Do you anticipate any barriers to integrating oral health into your practice?**
   - Yes____
   - No____
   - Uncertain____

   If yes, please describe:
6. Do you believe that it is important to include education regarding oral health in non-dental curricula such as nursing?
   Yes____   No____   Uncertain____

7. Do you feel that you have an understanding of oral health and its relationship to other diseases? Yes_____ No_____ Uncertain____

8. Did you learn new information from this class?
   Yes____   No____   Uncertain____

9. What additional information would be helpful to you regarding oral health?

   Thank you for your time in completing this survey.
APPENDIX E

ORAL HEALTH OVERVIEW CLASS
Oral Health Assessment
Janice Hausauer, MS, FNP-BC
MSU DNP Student

Prevalence
- Dental caries is the most common chronic disease of childhood
  - 50% of preschool children
- Severe gum disease affects 47% of U.S. Adults
- 70,000 oral cancers diagnosed annually
  - One cancer causes 14,000 deaths a year
  - Diagnosis is variable

Objectives
- Discuss the prevalence and sequelae of oral disease.
- Recognize the interrelationships between oral and systemic disease.
- Discuss the role of the non-dental professionals in the promotion of oral health.
- Perform an oral health assessment identifying normal findings.
- Discuss how collaborative practice can increase provision of comprehensive oral health services.

Consequences of Poor Oral Health
- Pain, infection
- Speech
- Nutrition
- Sleeping
- Quality of life
- Costly restorative treatment
- Higher risk of continued poor oral health
  - Increased hospitalizations/ED visits
  - Cost/time
  - Children: loss of school days/ability to learn
  - Adults loss of work/income
  - AAPD, 2011

The Big Picture
"You are not healthy without good oral health."
- David Satcher, MD, 18th Surgeon General

Surgeon General’s Report on Oral Health
- Detractors is the most common unmet health need
- Oral health affects overall health
- Malnutrition cannot be improved until oral health is controlled
- Problems of discomfort in oral health and access to care result in 70-83% gap
- Interdisciplinary care is necessary to achieve optimal oral and general health

National call to action
- Institute of Medicine (2003)
  - Advancing oral health in America
- Improving access to oral health care for vulnerable and underserved populations
- Oral Health 2000
- NIDCR, Integration of Oral Health and Primary Care Practice
- Lack of access to dental care in US
- Call for all in healthcare who have interactions with patients to discuss oral health
- Oral health is different than dental health

This is a population health issue, important for nursing and primary care providers, problem with access to oral health care, link between systemic and oral health (NIDCR)
The Disconnect

Consider the following:
- The average American uses more healthcare dollars for teeth than for their head and heart.
- Children are 2.5 times more likely to lack dental coverage than medical coverage.
- Cancers are often not detected at early stages or are misdiagnosed.
- Patients often are uncomfortable discussing personal issues with others.
- 52% of patients who are late for their dental visits are called in less time than one hour.
- Women and men are differently affected by oral disease.
- 30% of patients think their oral health should be addressed at the same visit as their medical visit.
- Smoking is linked to 30% of all oral cancers.

INTERRELATIONSHIPS BETWEEN ORAL AND SYSTEMIC DISEASE

Barriers to oral health care
- Patient barriers:
- Health professional barriers:
- Health system barriers:

Oral Health and General Health Relationships
- Poor oral health significantly associated with major chronic diseases.
- Poor oral health causes disability.
- Oral health problems and major disease share common risk factors.
- General health problems may cause or worsen oral health conditions and vice versa (World Oral Health Report, 2003).

Putting the Mouth Back in the Head
- HEENT to HEENT:
  - Often exclude oral examination and oral health from medical examinations and linkages to overall health.
Helicobacter Pylori

- Helicobacter pylori infection is a causative agent of gastritis and peptic ulcers and a risk factor for gastric cancer.
  - In the USA, it is found in 31% of the population.
  - Strong association between the risk of developing the oral variant with Helicobacter pylori and the risk of developing certain tumors.
  - Prolonged infection has been linked to an increased risk of GI cancers.
  - Elevations with treatment of Helicobacter pylori correspond to a significant decline in the prevalence of Metformin in the disease.
  - Patients with damage to Helicobacter pylori may experience the rapid decline in the infection.

Menopause

- Oral health is important for post-menopausal women.
  - The prevalence of periodontal disease increases after menopause.
  - Hormonal replacement therapy appears to be protective.
  - Primary care providers should counsel pre- and post-menopausal women about maintaining good oral hygiene.

Coronary Heart Disease

- Cardiovascular disease is associated with coronary artery disease and cardiovascular disease through the repair of a coronary.
  - Statins can prevent or reduce the risk of stroke and cardiovascular disease in people with high cholesterol.
  - A higher risk of cardiovascular disease is associated with the presence of high cholesterol levels.
  - Being overweight or having a family history of cardiovascular disease increases the risk of cardiovascular disease.
  - Smoking is associated with both cardiovascular and coronary heart disease.
  - Getting below a BMI of 18.5 is associated with a lower risk of cardiovascular disease.
  - Treatment for cardiovascular disease has been shown to reduce the risk of cardiovascular disease.

Dementia

- Patients with dementia have increased risk for cardiovascular disease and Alzheimer's disease.
  - Cognitive factors:
    - Depression is associated with an increased risk of dementia.
    - Diabetes is associated with an increased risk of dementia.
  - Physical factors:
    - Physical activity is associated with a decreased risk of dementia.
    - Sleep patterns are associated with an increased risk of dementia.
  - Genetic factors:
    - Apolipoprotein E epsilon 4 allele is associated with an increased risk of dementia.
    - Alzheimer's disease is associated with an increased risk of dementia.

Pregnancy

- 60-75% of pregnant women develop gingivitis.
- Periodontal disease risk factor for pre-eclampsia, pre-term labor, low birth weight.
- Endothelial damage due to inflammatory mediators is proposed etiology.
  - (Coronary Life)

Common Effects

- Malabsorption
- Fever
- Diarrhea
- Constipation
- Nausea
- Vomiting
- Abdominal pain
- Fatigue
- Headache
- Sleep disturbances
- Depression
- Anxiety
- Weight loss
- Skin rash
- Mouth ulcers
- Joint pain
- Muscle cramps
- Hair loss
- Loss of teeth
- Cognitive impairment
- Memory loss
- Changes in mood
- Changes in behavior
- Changes in sleep patterns
At Risk Elderly

- Difficulty swallowing or chewing
- Poor vision
- Poor hearing
- Poor balance
- Limited mobility
- Limited to no access to transportation
- Limited income
- Limited access to dental care
- Limited educational background

Nursing Facilities

- 1.25 million elders reside in nursing facilities
- Staff are trained in assessing oral health and providing care
- 90% of residents cannot brush their own teeth
- Most staff are not trained in dental hygiene

Growing Oral Health Needs

- Elders retain more of their teeth, yet still have high levels of decay
- 95% of elders perceive their oral health as poor or very poor
- Prevalence of oral disease in elders:
  - Caries: 70%
  - Periodontal disease: 50%
- Complete tooth loss has declined from 50% to 10% in the over 65 years age group
- Xerostomia
- Infections
- Decreased ability to carry out routine oral hygiene

Oral Health Promotion

- Snacks for Life course on oral examination, infant oral health, adult oral health, oral health in pregnancy, caries risk assessment, and gum health: oral health care in general

Topics to Be Addressed

- Preventing oral diseases
- Anticipating problems
- Tobacco control
- Oral health maintenance
- Early intervention
- Preventing disease

Limited Access to Care

- Only 43% of elders visit the dentist
- 47% lack dental insurance
- Fewer than 50% of elders receive professional dental care
- Fewer than 50% of elders receive any dental care

Caries Risk Assessment Tools

- See handouts
- Oral health assessment tool for dental screening:
  - https://www.healthcare.uiowa.edu/ige/c/tools/oralhealth/OHAT.pdf
- Oral health risk assessment tool for children:
  - http://www2.aap.org/oralhealth/docs/riskassessmenttool.pdf
Assessing Caries Risk

Moderate
- One or more minor risk factors
- Presence of decay
- Poor oral hygiene
- Family history of dental caries
- No evidence of recent decay

High
- Multiple moderate risk factors
- Extensive decay
- Presence of multiple lesions
- Poor oral hygiene
- History of recurrent caries

Exam Components

Observe
- Lips
- Cheeks
- Teeth
- Tongue and hard palate
- Palate, tongue, and oral floor
- Oral mucosa
- Floor of the mouth

Palpate
- Neck
- Temporomandibular joint
- Floor of mouth

Equipment

Use the Following to Perform an Oral Exam
- Good light source
- Mirror
- Tongue blade
- Interdental probes
- Gauze
- Extra set of gauze
- Oral speculum
- Examination light
- Mouth mirror

Risk Assessment Tool

Face and Lips
- Identify any facial asymmetry, skin lesions, or peri-oral lesions
- Gently examine sun-exposed areas
- In tobacco users, pay close attention to the lips
Face and Lips
- Facial lines visible
- Identifies any blemishes, ulcers, or lesions
- Stomatitis or candidiasis may present as an oval or ulceration that may have a white base
- Cigarette stains in the crevice between the teeth and gums that protrude passively into the angular fossa

Mucosa
- Aging results in thinning of oral mucosa and decreased elasticity
- Mucosa should appear pink and glistening
- Dry mucosa may indicate substantial thinning and increased risk of cancer
- Pay particular attention to mucosa inside dentures

Inside Lips
- Fold the upper lip up and lower lip down
- Note areas that are smooth, pink, and moist
- Any ulcerations or white patches are cause for concern

Gums
- Fold the lower lip down and upper lip up
- Use a tongue blade to retract the cheeks
- Note inflammation, plaque, or debris at the gums, or gingival recession

Buccal Mucosa
- With a palpating index finger, tongue blade, or mirror inspect the inner (buccal) aspects of the mouth
- Mucosa should be smooth, pink, and moist
- Any ulcerations or white patches are cause for concern

Common Gum Abnormalities
- Periodontal Disease is deep inflammation of the gums, ligaments, and bony structures
- Gingivitis hyperplasia is an enlargement of the gums that makes maintaining good hygiene difficult
Anterior Teeth

- Examine the anterior surfaces of the teeth for discolored spots, discoloration, caries, intracanalicular debris, and plaque.
- Inspect the teeth with the mouth open and closed noting occlusion and missing, damaged, or decayed teeth.

Gums and Teeth

- Examine the dentine for:
  - Generalized decay
  - Localized decay
  - Intracanalicular debris
  - Fracture

Lingual Upper Teeth

- Instruct patient to open wide to inspect the inner (lingual) aspect of the teeth.
- Use a mouth mirror to help view the lingual aspect of the teeth and a retractor to help view the palate.

Age-Related Changes

- Lingual recession:
  - Gingival recession
  - Gingival recession and exposure

Lingual Lower Teeth

- Instruct patient to open wide to inspect the inner (lingual) aspect of the teeth.
- Use a mouth mirror to help view the lingual aspect of the teeth and a retractor to help view the palate.

Hard and Soft Palate

- Tilt the patient's head back to examine the hard and soft palate.
- Closely inspect the soft palate for suspicious lesions as this is a high-risk area for cancer.

- Hard Palate
- Soft Palate
Common Palate Abnormalities

- Palatal tori are benign bony developmental lesions that normally appear in 20% of adults.
- Oral cancers can be life threatening and require immediate biopsy and referral for comprehensive treatment.

Lateral Tongue

- Retract the cheek with a finger, tongue blade, or mirror.
- Inspect the lateral margin of the tongue as far back as possible.
- Grasp the tip of the tongue with a gauze pad to facilitate the rest of the examination.
- Posterior lateral tongue margins are often prone to lesions.

Dorsal and Ventral Tongue

- Inspect the dorsal and ventral tongue.

Oral Cancer Screening

- Oral cancers are the 8th most common cancers in the U.S.
- 90% of oral cancers are squamous cell carcinomas.
- 50% of oral cancers are advanced at time of detection.
- All unexplained white lesions in the mouth should be referred for evaluation and biopsy.

Tongue

- Examination:
  - General inspection and tongue evaluation:
    - Color, texture, and shape
    - Presence of swelling or ulceration
  - Age-related changes:
    - 40 years and older: Look for white plaques, red areas, rough or white patches, or white lesions.
    - General health:
      - Check for factors that may increase the risk of oral cancer, such as smoking, alcohol consumption, and HPV.

Common Tongue Abnormalities

- Geographic
- Pressure & Geographic
- Tongue Cancer
Leukoplakia and Erythroplakia

**Etiology:**
- Trauma and smoking

**Symptoms:**
- White spot/patchy lesion
- Lesions are usually asymptomatic

**Treatment:**
- Lesions that display a 10% or higher risk of malignant transformation require referral to a specialist for medical treatment.

**Anticipatory Guidance/Education:**
- Nutrition
  - Snacks, fluids, bottles, cups
- Fluoride
- Tooth brushing
- Flossing
- Dental home
- Dentures
- Smoking/tobacco cessation
- Relationship of systemic disease and oral health

Posterior Pharynx

- The posterior pharynx is termed the tertiary or primary care triad.
- Observe for:
  - Size and symmetry of the tonsils and supporting structures
  - Erythema
  - Ulceration
  - Obstruction

**Prevention: Diet Counseling**

- **Infants**
  - Breast feeding
  - Infection should be treated
  - Avoid prolonged exposure to tears
  - Feeding within 2 hours after a meal

- **Older Children**
  - Limit snacking between meals
  - Use of milk to rinse
  - Avoidation of acidic foods
  - Use of water
  - Use of temperature

- **Adolescents**
  - Avoidance of acidic foods
  - Use of temperature
  - Use of water

- **Adults**
  - Avoidance of acidic foods
  - Use of temperature
  - Use of water

Neck Palpation

- Observe for atrophy or abnormal masses
- Inspect the nasolabial folds and the region below the neck

**Cariogenicity of Foods**

- **Low Risk Snacks**
  - Fruits
  - Vegetables
  - Milk
  - Cheese
  - Grains

- **High Risk Snacks**
  - Candy
  - Sweets
  - Cookies
  - Ice cream
  - Sweetened baked goods
  - Raw vegetables
  - Raw fruits
How Much Toothpaste?

- Brush teeth after meals and before bedtime.
- Use a fluoride toothpaste.
- Brush teeth for at least 2 minutes.
- Floss teeth after brushing.

How Often?

- Brush teeth twice a day.
- Floss once a day.
- Rinse with mouthwash.

Oral Health Recommendations

- Don’t assume patients are seeing a dentist on a regular basis.
- Know how to screen and assess caries risk.
- Perform oral health risk assessments on all patients beginning at age 6 months.
- Assess need for fluoride.
- Understand indications for fluoride varnish and how to provide it.
- Promote dental home.
  
  "Clark & Dayton, 2014"

Fluoride Varnish

- Strengthens enamel and prevents initiation of disease.
- Can reverse early decay.
- Slows enamel destruction.
- PCP apply FV to teeth of all infants and children through age at least every 6 months.
  
  "Jumper, 2004"

Working With Other Professions

- Oral health is the responsibility of many health professionals.
- Collaborative practice = Health care providers from different professional backgrounds work with patients, their families, other care providers, and communities to deliver comprehensive, high quality of care.
- Interprofessional education around oral health is necessary to prepare for collaborative practice.

Conclusion

- Re-conceptualize healthcare delivery practice patterns.
- Interprofessional collaboration.
- Relationship between oral health and physical health.
- Improve patient outcomes by integrating oral health into primary care.
- Nurses and PCPs can have a major impact on the oral health of individuals and communities.
  
  "Futter & Cabana, 2002"
Oral Health Education Resources

- Smiles for Life:
  http://www.smilesforliforalhealth.org/
- Oral Health Assessment Tool:
  https://www.healthcare.wisc.edu/spec/tools/oralhealth/19/OHT1.pdf
- Open Wide Oral Health Training Program
  http://oralskepticism.org/openwide/orwide.htm

References

- Oral Health Assessment Tool:
  http://www.healthcare.wisc.edu/spec/tools/oralhealth/19/OHT1.pdf
- Open Wide Oral Health Training Program
  http://oralskepticism.org/openwide/orwide.htm
  http://HealthyPeople.gov/2020/topics-objectives/topics/OralHealth

Resources for oral health integration into curricula

- Say AHH! Documentary
  http://www.sayahhheronrose.com
- One health Nursing Education and Practice (ONNEP)
  http://onep.org
- Association for prevention, training and research (APTAR)
  http://www.aptr.org
- Innovations in oral health
  http://www.cureoralhealth.org/oralhealth/today
APPENDIX F

THEMES FROM PRE- AND POST-ORAL HEALTH EDUCATION CLASS SURVEYS
Pre-Oral Health Survey Participant Themes and Comments

Pre-intervention survey question 4: “Do you believe that the patients seen in your health care agency have unmet dental needs? Please explain.”

- Participant comments from the “yes” responses (there were no comments from participants who answered “no” or “uncertain”):
  - Regarding drugs:
    - Drug users
    - Young pregnant mothers, usually history of meth use, minimal or no teeth
    - Meth mouth
  - Regarding patient finances, insurance, living situation, access to dental health:
    - Homeless with poor oral care
    - Low-income patients frequently come in, education is provided about CHP and their dental program
    - In eastern MT, there is a lack of dental providers, patients in rural communities tend not to seek oral care until there is a problem
    - A lot of patients are uninsured with no dental health
    - I work in the ED in acute care role – many patients do not have Work in the VA hospital, there are a large amount of homeless and uninsured individuals
    - I work in an ED, we see many patients with dental pain that don’t have access to dental care, we give pain meds, antibiotics, and tell patients to follow-up with a dentist – not adequate
    - Preventative care; I see a fair number of patients for dental abscesses
    - We get homeless pregnant women, poor pregnant women, etc.
  - Regarding Native American populations:
    - Native American children
    - High native population with poor oral care
    - Large Native American population with multiple oral health issues
    - Large native population
  - Regarding services offered at their health care agency:
    - Oncology patients – We treat oral mucositis but we are not very attentive to decay/infection prophylactic
    - In ICU, oral care is not performed enough
  - Regarding specific dental problems:
    - Many are missing teeth, have mouth/tooth pain, poor dentition, rotten-looking teeth, or dentures that don’t fit properly
    - Many patients come in with tooth pain, tooth infection
often broken, missing, or decayed teeth abscesses due to tooth infection

- I work in the ER where a large range of health disparities are seen, many of them arrive with “dental pain”
- I work in the ED, multiple patients are seen with dental caries, “meth mouth,” dental pain, and abscesses
- Dental caries, poor dentition leading to poor diet and nutrition

Pre-intervention survey question 8: “Is completing an oral health assessment currently part of your practice? If oral health assessment is part of your practice, please describe.

- Yes:
  - Only if related to injury or illness (sepsis)
  - I assess tongue, uvula, swallowing, lips for sores, dryness, etc.
  - Brief overview of mucosa, teeth, etc.
  - Yes, but not in depth
  - Most often by medical doctor
  - Mucous membranes are teeth clean, sores on gums, etc.
  - Brief; I review general condition of teeth, oral mucous, gums/lips
  - Dental caries prevention with fluoride, NPs examine teeth with Well Child Check
- No:
  - To a small extent
  - In Emergency Department only focused exams if warranted
  - Only if patient has oral issue
  - Only if relevant to surgical site
  - Only if it is a chief complaint
  - For long-term care

Pre-intervention survey question 12: “What three things come to mind when you think about oral health?”

- Cavities/caries/decay (5 respondents)
- Brushing/flossing teeth/self-care (7 respondents)
- Tooth abscesses (2 respondents)
- Exams every six months (2 respondents)
- Lack of oral health in young kids and how it affects their entire life (2 respondents)
- Financial
  - Not a priority for low income (2 respondents)
  - Services are limited in rural areas
• Dental insurance
  • Decrease foods that cause cavities/nutrition (3 respondents)
• Related to other systems
  • Heart/cardiac risk/endocarditis (5 respondents)
  • Ability to eat
  • Gum disease (2 respondents)
  • Lung disease
  • Indicator of health
• Important to assess daily with cancer and neutropenic patients
• Pain issues (2 respondents)
• Missing teeth
• Bacterial infection/sores (3 respondents)
• Oral Cancer
Post-Oral Health Education Class Survey Themes and Comments

Post-intervention survey question 3: “Do you anticipate integrating OH into your practice?”

Participant comments:

- Yes:
  - With my assessments, ensure patients are getting oral care
  - I will try to be more proactive
  - Tying in dental health with chronic disease
  - In primary care but not in the ER
  - Swallow evaluation, assess for sores, dentition, etc.; ask about sores, assess tongue, lips, and teeth
  - More thorough exam
  - Always have

- No:
  - Practice is provider-driven, have to get providers on board – Providers are already struggling with time constraints and time to chart

- Uncertain:
  - ER patient acuity
  - Psych/mental health usually don’t assess oral health
  - I will emphasize it more in nursing education

Post-intervention survey question 5: “Do you anticipate any barriers to integrating OH into your practice?”

Participant comments:

- Time (x6)
- Getting the referral by an MD, I am an RN/physician (2 respondents)
- Lack of sufficient education (2 respondents)
- Access to dental providers for low-income patients
- I work in ER, so our care is chief complaint driven
- Cost/low reimbursement (2 respondents)
- Hospital compliance
- Provider support (3 respondents)
- Not great tools
Post-intervention survey question 9: “What additional information would be helpful to you regarding OH?”

Participant comments:

- How floor nurses can make referrals, give resources for dentists in the area
- How to do a thorough assessment
- More information
- Resources in the community for low-income, at-risk patients
- What about the effects of bleaching teeth?
APPENDIX G

FACULTY INTERVIEW QUESTIONS
Course Name/Number:

Is an oral health topic covered in your course? (Please circle)
   Yes    No

If yes, please describe:

Are any of the following covered in your course? (Circle all that apply)
   Oral-systemic health
   Child oral health
   Adult oral health
   Geriatric oral health
   Oral health and pregnancy
   Acute dental problems
   Risk assessment
   The oral exam
   Fluoride varnish
   Dental referrals
   Other (such as TMJ, oral cancer, denture care, xerostomia, pharmacologic effects on the mouth)
APPENDIX H

ORAL HEALTH CONTENT MAP
<table>
<thead>
<tr>
<th>Course Name/Number</th>
<th>Is OH covered in this course?</th>
<th>Oral-systemic Health</th>
<th>Pediatric OH</th>
<th>Adult OH</th>
<th>Geriatric OH</th>
<th>Pregnancy OH</th>
<th>Acute Dental Problems</th>
<th>OH Risk Assessment</th>
<th>OH Exam</th>
<th>Fluoride Varnish</th>
<th>Dental Referrals</th>
<th>Oral Cancer</th>
<th>Topics Covered</th>
<th>Other</th>
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<tbody>
<tr>
<td>NRSG 601 Advanced Health Assessment</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>NRSG 602 Pathophysiology</td>
<td>Yes</td>
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<tr>
<td>NRSG 603 Advanced Pharmacology I</td>
<td>Yes</td>
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<td>NRSG 607 Diagnostic Reasoning</td>
<td>Yes</td>
<td>Yes</td>
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</table>

Lecture content: brief OH history questions.

Risk for oral cancer, salivation, swallowing; cleft lip/palate.

Brief dental abscesses, aphthous ulcers. Presentation/treatment

Unintentional weight loss r/t poor dentition
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisite</th>
<th>Curriculum Content</th>
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<tbody>
<tr>
<td>NRSG 620</td>
<td>Advanced Pharmacology II</td>
<td>No</td>
<td>Smiles for Life Module 2: Child Oral Health</td>
</tr>
<tr>
<td>NRSG 621</td>
<td>Advanced Clinical I</td>
<td>Yes</td>
<td>Smiles for Life Module 2: Child Oral Health</td>
</tr>
<tr>
<td>NRSG 622</td>
<td>Advanced Clinical II</td>
<td>Yes</td>
<td>Smiles for Life Module 8: Geriatric Oral Health</td>
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<tr>
<td>NRSG 623</td>
<td>Advanced Clinical III</td>
<td>Yes</td>
<td>Thrush, abscess</td>
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<tr>
<td>NRSG 630</td>
<td>Advanced Pharmacology II (P/MH)</td>
<td>Yes</td>
<td>Zerostomia</td>
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<td>Course</td>
<td>Yes</td>
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<tr>
<td>NRSG 631 Advanced Clinical I</td>
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APPENDIX I

REVIEW OF COURSE TEXTBOOKS AND MATERIALS
<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Name</th>
<th>Texts/Materials Reviewed</th>
<th>Oral Health Content Present</th>
<th>Oral Health Topic</th>
<th>Amount of Oral Health</th>
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<tbody>
<tr>
<td>NRSG 601</td>
<td>Advanced Health Assessment</td>
<td>Ball &amp; Dains, (2015)</td>
<td>Yes</td>
<td>Assessment of oropharynx</td>
<td>Three pages with photos</td>
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<td></td>
<td></td>
<td>PowerPoint lecture slides</td>
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<td>Cultural implications/oral cancer incidence/history questions/brief oral exam</td>
<td>Power Point slides in HEENT lecture</td>
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<tr>
<td>NRSG 602</td>
<td>Advanced Pathophysiology</td>
<td>McCance &amp; Huether (2014)</td>
<td>Yes</td>
<td>Dental amalgams</td>
<td>Half of page</td>
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<td></td>
<td></td>
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<td></td>
<td>Oral cavity: mouth, esophagus, saliva. No information on teeth.</td>
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<td>NRSG 603</td>
<td>Advanced Pharmacology I</td>
<td>Edmunds &amp; Mayhew (2013)</td>
<td>Yes</td>
<td>Mouth agents: antifungals, antiviral, antiseptic oral cleanser, Chlorhexidine oral rinse.</td>
<td>Four lines</td>
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<tr>
<td>NRSG 607</td>
<td>Diagnostic Reasoning</td>
<td>Seller &amp; Symons (2012)</td>
<td>Yes</td>
<td>Dental pathology</td>
<td>Two sentences</td>
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<td>Rhoads &amp; Jensen (2015)</td>
<td>Yes</td>
<td>Dental abscess</td>
<td>Five sentences, Case study</td>
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<td></td>
<td>Kassirer, Wong &amp; Kopelman (2009)</td>
<td>No</td>
<td>Dental malocclusion</td>
<td>Two page screening tool</td>
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<td>The Hartford Institute for Geriatric Nursing</td>
<td>Yes</td>
<td>Mouth lesions (aphthous ulcer, HSV, oral cancer)</td>
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<tr>
<td>NRSG 620</td>
<td>Advanced Pharmacology II</td>
<td>No Text Online resources</td>
<td>No</td>
<td>Oral Health</td>
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<tr>
<td>NRSG 621</td>
<td>Advanced Clinical I</td>
<td>Burns et al. (2017)</td>
<td>Yes</td>
<td>Chapter 34: Pediatric Dental or Oral Disorders. Includes oral</td>
<td>24 pages</td>
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<td>Course</td>
<td>Module/Topic</td>
<td>Text</td>
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<td>NRSG 621</td>
<td>Smiles for Life (Clark et al., 2010)</td>
<td>Yes Module 2: Child Oral Health</td>
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<td>Hacker, Gambone &amp; Hobel (2016)</td>
<td>Yes Module 5: Pregnancy &amp; Women’s Health</td>
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<td>NRSG 622</td>
<td>Advanced Clinical II</td>
<td>Yes Modules 1-8</td>
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<td>Yes Mouth Lesions</td>
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<td>Dunphy &amp; Porter (2015)</td>
<td>Yes Oral health lecture/lab</td>
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<td>Yes ECC: Role of Pediatric Nurse Practitioner</td>
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<td>Mahat, Lyons &amp; Bowen (2014)</td>
<td>Eight Modules</td>
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<td>Two hours</td>
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<td>Five-page article on ECC</td>
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<tr>
<td>NRSG 623</td>
<td>Advanced Clinical III</td>
<td>Yes Chapter 7 Throat and Mouth Guidelines: dental abscess, oral cancer, stomatitis, thrush, avulsed tooth.</td>
<td></td>
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<td>Cash &amp; Glass 2014</td>
<td>Yes Medicare Annual Wellness Visits</td>
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<tr>
<td></td>
<td>Hartford Institute for Geriatric Nursing. Primary Care for Older Adults Modules</td>
<td>Yes Medicare Annual Wellness Visits Module: Slide 19 Oral Health. HEENT becomes HEENOT</td>
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<td></td>
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<td>Seven pages. Recommends that children have first dental visit at age 3 which is not consistent with national guidelines.</td>
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