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Leah Salmans

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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

ORAL HEALTH DURING PREGNANCY: PROMOTING AWARENESS OF
GUIDELINES AND EDUCATION RESOURCES IN THE EVALUATION
OF SELF-PERCEIVED EFFICACY TO EDUCATE, SCREEN, AND
REFER WOMEN DURING PREGNANCY FOR THE
NURSE PRACTITIONER STUDENT

A Scholarly Project Research Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

Leah Salmans

College of Natural and Health Sciences
School of Nursing
Nursing Practice

December 2019

This Scholarly Project by: Leah Salmans

Entitled: *Oral Health During Pregnancy: Promoting Awareness of Guidelines and Education Resources in the Evaluation of Self-Perceived Efficacy to Educate, Screen, and Refer Women During Pregnancy for the Nurse Practitioner Student*

has been approved as meeting the requirement for the Degree of Doctor of Nursing Practice in College of Natural and Health Sciences in School of Nursing, Program of Nursing

Accepted by the Scholarly Project Research Committee

Jeanette McNeill, DRPH., RN, Research Advisor

Carolyn Bottone-Post, DNP., RN, Committee Member

Michaela Romero, DNP., FNP-BC, Committee Member

Accepted by the Graduate School

Cindy Wesley
Interim Associate Provost and Dean
Graduate School and International Admissions

ABSTRACT

Salmans, Leah. *Oral Health During Pregnancy: Promoting Awareness of Guidelines and Education Resources in the Evaluation of Self-Perceived Efficacy to Educate, Screen, and Refer Women During Pregnancy for the Nurse Practitioner Student*. Unpublished Doctor of Nursing Practice Scholarly Project, University of Northern Colorado, 2019

Historically, oral health (OH) care has been largely misunderstood and excluded from the realm of primary care. However, this exclusion is at odds with the fact that oral health can and does have an impact on individuals' general health and well-being. Oral disease is considered one of the most widespread chronic diseases, despite being highly preventable. For women, pregnancy can set the stage for oral disease development or exacerbation due to multiple factors. Poor maternal oral health has been associated with adverse pregnancy outcomes, contributing to early dental caries development in their children, and detrimental effects over her lifespan.

To achieve the aim of the scholarly project, a quantitative descriptive study was created to meet two objectives: (a) develop and implement an education-based intervention and (b) measure and evaluate the intervention to promote OH awareness, self-perceived efficacy, and likelihood of incorporating OH into future practice. The results from the 22 participants reported improved awareness, perceptions of confidence in the learning intervention, and likelihood to integrate OH into practice. The scholarly project successfully met the project objectives by meeting the eight essentials of doctoral education for advanced nursing practice as mandated by the American Association of

Colleges of Nursing and achieved the goals of the recommended five criteria for executing a successful Doctor of Nursing Practice (DNP) project.

ACKNOWLEDGEMENTS

I would like to express my gratitude to my scholarly project committee members: Dr. Jeanette McNeill, Dr. Carolyn Bottone-Post, and Dr. Michaela Romero. It was a pleasure to have the support and insight of these individuals, and it was with their expertise as I was able to work through and complete the scholarly project and the doctor of nursing practice degree. I am indebted to Dr. McNeill for affording me with time, patience, and guidance throughout the process. She was an invaluable resource throughout each step of the process. Dr. Bottone-Post was instrumental in the launch and data portion for my project. Through her support and shared vision, the project was able to have a broader audience. Dr. Michaela Romero's contribution to professional standards and expectations provided motivation. I am sincerely appreciative of Dr. Kathleen Dunem's unwavering support throughout this process when I encountered conflicts with project timelines. I am thankful to Dr. Martha Levine, who helped to guide me in the very beginning stages, through her expertise, I was able to see the forest through the trees.

Last but not least, I would like to express my sincerest gratitude to my family, friends, co-workers, peers, and classmates. These individuals provided genuine interest and encouragement in completing this project. It is my hope that future NP students and providers will have greater exposure to the fundamental importance of oral health through education resources that incorporate, promote, and collaborate with dental providers in their future practice.

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LIST OF ABBREVIATIONS

ACA	Affordable Care Act
APN	Advanced Practice Nurse
APRN	Advanced Practice Registered Nurse
CNM	Certified Nurse Midwife
DNP	Doctor of Nursing Practice
EBP	Evidence Based Practice
EBG	Evidence Based Guidelines
FNP	Family Nurse Practitioner
HCP	Health Care Provider
IOM	Institutes of Medicine
PCP	Primary Care Provider
NP	Nurse Practitioner
OH	Oral Health

CHAPTER I

INTRODUCTION

Background

Historically, the concept of oral health (OH), in general, has existed as an unrecognized element of systemic health in primary care. Dental and health care providers have traditionally practiced within professional silos, preparing students to practice within their respective disciplines. However, patients and specifically those that are pregnant are managed mainly by primary care and seek advice on areas of health that cross these boundaries (Haber, Spielman, Wolf, & Shelley, 2014). The existence of boundaries in the delivery of healthcare is of particular importance when the quality and safety of patient care carry a more significant impact on both maternal and infant outcomes.

Despite OH being mostly absent in primary care practice, it is contradictory to the principles of a whole-person approach to health care. Research has shown that the impact of oral disease, specifically periodontal disease, is not localized to the oral cavity and can trigger damaging systemic inflammatory responses. These systemic inflammatory responses have been linked to heart disease, strokes, kidney disease, cancer, diabetes, and adverse pregnancy outcomes (Institute of Medicine [IOM], 2011).

An extensive body of research exists correlating poor OH to adverse pregnancy outcomes. The California Dental Association in collaboration with the American College

of Obstetrics and Gynecology stated, “good oral health and control of oral disease protects a woman’s health and quality of life before and during pregnancy, and has the potential to reduce the transmission of pathogenic bacteria from mothers to their children” California Dental Association Foundation; American College of Obstetricians and Gynecologists, District IX [CDA], 2010). During pregnancy, women are at a higher risk of developing or exacerbating oral disease due to the complex physiologic and hormonal changes; women can experience tooth mobility, salivary changes, and gingival hyperplasia (Azofeifa, Yeung, Alverson, & Beltran-Aguilar, 2014). While these are considered normal fluctuations, they can evolve quickly during the pregnancy and become compounded by factors such as increased episodes of emesis and gastric reflux leading to dental erosion, gingivitis, and dental caries. The more advanced OH conditions are associated with; low birth weight, pre-term birth, preeclampsia, and a systemic health impact over a woman’s lifespan (U.S. Department of Health and Human Services Oral Health Coordinating Committee, 2016).

The systemic impact of oral disease has been traditionally avoided and misunderstood by physicians, dentists, and pregnant women alike due to a lack of information about the importance and safety of dental treatments during pregnancy (California Dental Association Foundation; American College of Obstetricians and Gynecologists, District IX [CDA], 2010). Research and practice communication in scientific journals between professions continue to cite and promote inside sourced data with little cross-reference or inclusion (Skvoretz et al., 2016). These misconceptions and barriers in care delivery systems have placed women, dental, and primary providers at opposing ends in the provision of care.

Nearly two decades ago, the notable disconnect between OH and our nation's health care system came into the spotlight and was systematically examined in a report by the U.S. Surgeon General. The report called for a paradigm shift in the education and training of all health care professionals to begin the process of implementing OH into the systemic health equation and the development of interprofessional based collaborative programs (U.S. Department of Health and Human Services [HHS], 2000). Since, that time efforts from policymakers, agencies, and professional organizations have attempted with limited success to address this gap.

With the introduction of the Affordable Care Act (ACA) in 2010, changes to the health system established new avenues in the delivery of care. These avenues emphasize and mirror elements of nursing care models of health care strategies that focus on prevention and care coordination. Access and prevention efforts require more workforce capacity than the dental community alone can provide (IOM, 2011). Key stakeholders have identified the increasing role of Nurse Practitioners (NPs) in the primary care setting as pivotal contributors to disparity reduction efforts by providing quality, patient-centered, accessible, and affordable care (IOM, 2010). Furthermore, OH disease prevention efforts focused on women during pregnancy have the potential to reduce adverse pregnancy outcomes, protect maternal health over her lifespan, and reduce the risk in the transmission of maternal oral bacteria that can lead to early-onset dental caries in children.

Problem Statement

Awareness of EBP guidelines, access to educational resources, and learning tools for the preparation of health profession students on OH during pregnancy have been

identified as lacking or absent from the nation's academic institutions. Guidelines do exist for OH during pregnancy. However, reliance on the guidelines alone does not address the translation of the evidence into the practice setting or provide skills in patient engagement (Politi, Wolin, & Legare, 2013). Current research points to a multi-modal approach in the education of health professionals through the inclusion of OH in curricula, clinical experience, and competency skills (Haber et al., 2015).

Currently, the Bachelor of Science in Nursing to Doctor of Nursing Practice (BSN-DNP) Obstetrics and Gynecology (OB/GYN) Summer 2019 course for Family Nurse Practitioners (FNP) students at the University of Northern Colorado (UNC) does not contain the EBP guidelines. The benefits of providing students with the OH guidelines and the how-to's of this practice change may lead to improved patient outcomes and provider self-efficacy.

Purpose of the Project

A defining aspect of the doctor of nursing practice (DNP) degree is to prepare clinicians for leadership roles in the translation “of research evidence into clinical practice and health policy to improve the quality and safety of care as well as reduce health care costs through expertise in EBP change projects, outcomes management, and quality improvement projects” (Anderson, Knestruck, & Borroso, 2015, p. xi). The DNP provider can, therefore, transcend barriers and positively impact the state of health care by applying research and theory to a practice gap (Moran, Burson, & Conrad, 2017).

The purpose of this DNP scholarly project was to uphold the eight DNP Essentials of Doctoral Education through: the use of research and theory to support the scientific underpinnings for practice, leadership for quality improvement, clinical

scholarship of EBP, utilization of information technology, advocacy for health care policy, promotion of interprofessional collaboration, and advancement of nursing practice through a population health-based prevention project (American Association of Colleges of Nursing [AACN], 2006).

The project provided insight into the promotion of OH in nursing, EBP, and learning methods to bridge this gap in the delivery of health care. The generation of new nursing knowledge facilitated by the foundations of research and theory has provided insight into the process student NPs face when reviewing guidelines, participating in learning modules that mimic competency skills. It may afford supportive data to promote OH in nursing organizations, curricula in nursing programs, and multi-discipline collaborative practices.

This DNP scholarly project aimed to evaluate BSN-DNP students' (a) awareness of the EBP guidelines on OH during pregnancy, (b) perceived self-efficacy on how to perform an OH screening after review of the EBP guidelines and completion of a learning module, and (c) likelihood of implementing the OH guidelines into future practice. The project served to promote OH through the use of existing resources aimed to connect the evidence to the NP in practice.

Population, Intervention, Comparison, and Outcomes (PICO Question)

In the beginning stages of this DNP scholarly project, the research question method Population, Intervention, Comparison, and Outcomes (PICO) served as a guide to facilitate the criteria for the literature search strategy. The PICO for this project: In the assessment of women during pregnancy (P) what is the NP students' current awareness of the evidence-based guidelines and education resources for oral health during pregnancy

and perceived self-efficacy (C) compared to after intervention of a self-guided oral health education module and evidence-based guidelines (I) in their likelihood to incorporate into future practice; oral health screening, anticipatory guidance, and referral to dentist (O).

Project Objectives

The objectives for DNP scholarly project was to develop an education-based intervention to increase awareness of the OH guidelines for women during pregnancy, perceived competence in screening and performing an oral exam, providing anticipatory guidance during pregnancy, and when to refer women during pregnancy for oral disease prevention and management (Mitchell, May, & Arce, 2017). The project was implemented through the use a web-based platform to launch interventional education, learning tools, and shared resources to allow the student NP the ability integrate oral health screenings into practice with consistency and confidence. The outcomes of this project were measured and evaluated to assess for increased awareness of oral health as a component of systemic health, additional knowledge and skill set, increased collaboration between health and dental care providers, and improved maternal and child health outcomes (Clark et al., 2010).

Definition of Terms

The literature uses the terms health, medical, and primary care synonymously for all non-dental prepared providers to include: physicians, physicians assistants, general practitioners, medical doctors, pediatricians, certified nurse-midwives (CNM), nurse practitioner (NP), and family nurse practitioner (FNP). Dental prepared providers are delineated within the literature as oral health professionals, dentists, and periodontists. However, terms for oral health professionals are not synonymous and define dentists as

general dental health providers and periodontists as dental specialists in the treatment of severe gum disease and oral inflammation (American Academy of Periodontology, 2019). Lastly, periodontists were found often in the literature regarding the oral disease condition of periodontitis and its impacts on and management of women during pregnancy. However, they as a group for the sake of this project will not be discussed further.

CHAPTER II

REVIEW OF THE LITERATURE

Historical Background

At the beginning of this century, the Department of Health and Human Services (HHS) released the Surgeon General's landmark report titled *Oral Health in America*. The report was a declaration of the need for practice change in primary care to establish the connection between OH and its reflection of an individual's state of general health and well-being (U.S. Department of Health and Human Services [HHS], 2000). The findings of the report identified vulnerable populations to include women and children. The report provided details on the multiple barriers and gaps in the current infrastructure on how our healthcare system and policies are lacking in the inclusion of oral care. The findings in the report highlighted the divisions that exist and permeate every facet between medical and dental professionals, including education, training, location, and reimbursement (U.S. Department of Health and Human Services [HHS], 2000). Also notable was the call for all health care organizations and providers to initiate policies and strategies to integrate OH into practice.

During the nearly two decades following the Surgeon Generals report in 2000, the integration of OH into primary care has been slow to gain recognition from policymakers, agencies, providers, and academic institutions (Silk, 2017). The following timeline highlights the pace of action from key stakeholders. Education-based efforts began in

2003, and an oral health curriculum was developed by the Society of Teachers of Family Medicine titled “Smiles for Life.” The initial goal was to create a curriculum focused on educating primary care providers. Since its inception, it has grown into an interprofessional collaborative education-based resource inclusive to medical and dental professionals (Clark et al., 2010). In 2008, the American Academy of Family Physicians (AAFP) published a succinct report discussing the lack of evidence-based practice (EBP) guidelines, misinformation between physicians, dentists, and patients, adverse pregnancy/health outcomes, and prevention of dental caries from mother to infant. Subsequently, in 2010, the California Dental Association released evidence-based practice (EBP) guidelines on *Oral Health During Pregnancy for Health Professionals*. These guidelines provided a quick-to-read format with supporting evidence and references aimed at health care professionals delivering OH services to pregnant women and their children (California Dental Association Foundation; American College of Obstetricians and Gynecologists, District IX [CDA], 2010).

The issue of OH had not advanced substantially since the U.S. Surgeon General’s report over a decade previously, and efforts in public health saw renewed momentum. In April of 2011, The Committee on an Oral Health Initiative released *Advancing Oral Health in America*. This report echoed a call for the promotion and support of education and training for all health care professionals via an interdisciplinary and team-based approach (IOM, 2011). The report discussed NPs as being instrumental to the promotion of OH since these providers statistically practice in rural settings caring for underserved and often uninsured populations (IOM, 2011). In 2014, the Health Resources and Services Administration (HRSA) published the *Integration of Oral Health and Primary*

Care Practice. This HRSA report was intended to facilitate efforts for a fundamental system change by incorporating OH core clinical competencies into the existing scope of practice by focusing on frontline primary care health professionals including nurse practitioners, nurse midwives, physicians and physician assistants (Health Resources and Services Administration [HRSA], 2014).

In response to the calls for action, the New York University College of Nursing's (NYUCN) Oral Health Nursing Education and Practice (OHNEP) program launched the *Interprofessional Oral Health Faculty Toolkit* in 2015. This web-based, open-source toolkit was developed to promote the integration of evidence-based oral-systemic health content and clinical competencies into the curricula of certified nurse-midwifery (CNM) and nurse practitioner (NP) programs nationwide (Oral Health Nursing Education and Practice [OHNEP], 2015). In 2017, the Harvard School of Dental Medicine was awarded a grant from HRSA to support the Center for Integration of Primary Care and Oral Health (CIPCOH). The efforts of CIPCOH are aimed at the gaps in primary care by developing education and clinical practice models for students and practicing providers.

Synthesis of the Literature

A literature review was conducted using the keywords *oral health in pregnancy*, *oral health guidelines during pregnancy*, *oral health in primary care*, *maternal oral care*, *perinatal oral health*, *nurse practitioner knowledge of oral health*, *nurse practitioner role in oral health*, *nurse practitioner competencies in oral health*, and *interprofessional oral health practices* were used to search in the following databases; CINAHL, Cochrane, EBSCO, Google Scholar, MEDLINE, PubMed, and Wiley. Additional resources used to

expand the literature search included citations found in the review of articles referring to reports from government agencies and public health organization websites.

A review of the available research revealed a series of interconnected themes, with common parallels between the dental and medical communities. These included research on oral disease in women during pregnancy, barriers to utilization of dental care services during pregnancy, provider-based barriers, and education-based barriers.

Summary of the Literature

Oral Disease and Pregnancy

Fundamental to the provision of OH for the NP is understanding dental terms and conditions. The main clinical conditions that result from oral infections consist of gingivitis, periodontitis, and dental caries (Lachat, Solnik, Nana, & Citron, 2011, p. 312). Respectively, the most common bacteria associated with these conditions are *Porphyromonas gingivalis*, *Actinobacillus actinomycetemcomitans*, and *Streptococcus mutans* (Xiaojing, Kolltveit, Tronstad, & Olsen, 2000). The Fédération Dentaire Internationale (FDI) World Dental Federation (2016) reports, the high-cost burden of oral diseases can be prevented or their impact reduced by implementing the following simple inexpensive measures; education on oral hygiene practices, routine screenings, and interventional procedures (FDI World Dental Federation, 2016, para. 1).

The term periodontal disease refers to a group of inflammatory conditions affecting the soft and hard structures that support teeth (American Academy of Periodontology, n.d.). Gingivitis and periodontitis are the most common forms of periodontal disease development associated with pregnancy (Wu, Chen, & Jiang, 2014). The American Academy of Periodontology defined gingivitis as the early stage of

periodontal disease when “the gums become swollen and red due to inflammation,” occurring in response to the presence of harmful bacteria, and periodontitis, the later stage when the “gums pull away from the tooth and supporting gum tissues are destroyed” (American Academy of Periodontology, n.d., para. 2).

Gingivitis

Gingivitis occurs when harmful bacteria harbored within the sticky film of plaque build up between the teeth and gums, the bacterial growth produces toxins triggering swelling, redness, and bleeding of the gum tissue (Xiaojing et al., 2000). The relationship between pregnancy and gingivitis development has been well documented since the 1960s (Wu et al., 2014, para. 1). According to Wu et al. (2014), hormonal fluctuations that occur during pregnancy affect the existing oral flora and lead to inflammatory responses in the gum tissue, resulting in gingival inflammation (para. 30). To further support this relationship Figuro, Carrillo-de-Albornoz, Mart'in, Tob'ias, and Herrera, (2013) reported in their systematic review of 33 studies comparing pregnant versus postpartum or non-pregnant women that the results confirmed, “gingival inflammation is significantly increased throughout pregnancy” (Figuro et al., 2013, p. 471). The increased risk during this time in a woman's life leads to a greater chance for systemic impacts on the overall health of the mother and the possibility for adverse pregnancy outcomes (Lachat et al., 2011). The findings of these studies substantiate the health concern with gingivitis development and progression in pregnancy.

Periodontitis

Periodontitis is the advanced form of gum disease where untreated plaque build up calcifies, and bacterial infection destroys the structures supporting the teeth leading to

eventual tooth loss (Lachat et al., 2011). Like gingivitis, a number of recent studies have been published describing the correlation between periodontitis and adverse pregnancy outcomes. In one study to evaluate this association Guimarães et al. (2012) concluded in their cross-sectional study of 1,206 women at post-partum follow-up that maternal periodontitis was associated with a decrease in mean weight, as well as with low birth weight, and very low birth weight. Corbella et al. (2016) performed a meta-analysis of 22 studies, including 17,053 subjects to explore periodontitis as a risk factor for pre-term and low birth weight; they reported a low but existing association for negative pregnancy outcomes.

In addition to these studies association of periodontitis was the most commonly screened for health issues seen in pregnancy, including diabetes and hypertension. Gestational diabetes mellitus (GDM) is a systemic health issue and is associated with maternal and fetal pregnancy complications. In a meta-analysis of 10 studies including 5,724 subjects, Abariga and Whitcomb (2016) concluded strong evidence to support the association with periodontitis in the development of GDM; furthermore, the authors state these findings have significant implications for public health and should prompt health care professionals to develop intervention strategies (Abariga & Whitcomb, 2016, p. 12). Another adverse pregnancy outcome associated with periodontitis is preeclampsia. In a prospective cohort study of 283 pregnant women who never smoked, 67 subjects met the criteria for periodontitis and of those subjects 13 were diagnosed with preeclampsia; revealing that periodontitis increases the risk for preeclampsia in never-smokers (Ha, Jun, Ko, Palk, & Bae, 2014).

Dental Caries in Children and the Maternal Oral Health Connection

Dental caries and the acid-producing bacteria *Streptococcus mutans* that colonize and cause damage to hard tooth structures are among the most common diseases found worldwide (Forssten, Björklund, & Ouwehand, 2010). Research on dental caries has traditionally focused on individual factors such as genetics, diet, OH behaviors, and dental utilization (Weintraub, Prakash, Shain, Laccabue, & Gansky, 2010). However, maternal oral health status is one of the most significant predictors in the development of dental caries in childhood (Boggess, 2008). The Surgeon Generals Report on *Oral Health in America* used the term “silent epidemic” to describe dental caries as the most prevalent and preventable disease in childhood (U.S. Department of Health and Human Services [HHS], 2000).

A systematic review was conducted to assess the literature for risk factors contributing to early childhood caries affecting children ages 0-12 months. In this review, Leong, Gussy, Barrow, Silva-Sanigorski, and Waters (2012) reported,

Infants can be colonized with cariogenic bacteria during the pre-dentate stage, with some children colonized as early as 3 months of age. Further, the studies showed an association between bacterial acquisition and maternal bacterial levels; hence, a vertical pathway for transmission of these bacteria occurs. Notably, in studies where bacterial transmission was investigated, the timing of reducing maternal bacterial levels to achieve a delayed or reduced level of infant bacterial colonization was important. (p. 246)

These findings highlight that (a) pregnancy and the neonatal period are times to identify children for risk and (b) early maternal OH interventions have the potential to reduce the likelihood of early-onset dental caries in children (Leong et al., 2012).

A population-based study of untreated dental caries in 179 mothers and 387 children was conducted in a rural California community using a Generalized Estimation

Equation logit model. The researchers reported a positive correlation between maternal and child untreated dental caries, this degree of correlation did not change when OH behavior and dental use factors were added to the model (Weintraub et al., 2010). These studies support the need for prevention-based strategies in primary care aimed at women of childbearing age.

Utilization of Dental Services During Pregnancy

The research supports evidence that a high percentage of women do not see a dentist during pregnancy. Many studies have attempted to summarize the reasons for low dental attendance in an attempt to identify the barriers. However, the issue of utilization is multifactorial, and the literature that cites the main factors broadly include race/ethnicity, socio-demographics, financial barriers, and perceptions (Azofeifa et al., 2014).

Race, Ethnicity, and Socio-Demographics

Significant disparities in the OH experience of women during pregnancy were found to exist in the data based on race and ethnicity. Hwang, Smith, McCormick and Barfield (2011) analyzed data from the Centers for Disease Control (CDC) Pregnancy Risk Assessment Monitoring System (PRAMS) from 2004-06; this included: 35,267 white non-Hispanic (WNH), black non-Hispanic (BNH), and Hispanic women. Of the 35,267 women included in the analysis, only 41% reported receiving OH counseling or referral to a dental provider. Furthermore, Hwang et al. (2011) reported that BNH and Hispanic as compared to WNH women were significantly less likely to receive dental care before or during pregnancy.

The impact of socio-demographics on OH and dental service access was captured in the National Health and Nutrition Survey. Azofeifa et al. (2014) reported in an analysis of the data from 1999 through 2004 the survey's findings revealed, "significant socio-demographic disparities in dental service use among U.S. women in general and between pregnant and non-pregnant women" (p. 100). The survey data also supported the probability of dental service use significantly increased as the pregnant woman's age, education, and income increased (Hartnett et al., 2016).

Insurance

Many women report not having a dental benefit through their public or private health plans. This lack of insurance coverage may be due to the fact that the Patient Protection and Affordable Care Act (ACA) did not mandate dental health as an essential benefit for adults (Vujcic, Buchmueller, & Klein, 2016). The Cigna Corporation conducted a nationwide survey in 2015 of 801 pregnant and new mothers of whom half reported having dental insurance. The survey's findings discovered that while 76% of women reported an OH problem during pregnancy, 43% did not go to a dentist because they did not have a dental insurance benefit and 33% reported avoidance a dental visit related to cost regardless of coverage status (Cigna Corporation, 2015).

For some, pregnancy may be the only time a woman has dental benefits, and for adults receiving Medicaid, the level of benefits can vary widely from state to state (Centers for Medicare & Medicaid [CMS], n.d.). As of 2015, only 18 states offered at the very least emergency dental services, 28 states offered preventative services, and only 26 offer basic restoration services (Medicaid and CHIP Payment and Access Commission [MACPAC], 2015). The issue is compounded further by a shortage of dentists available

or willing to treat patients with Medicaid. As of 2015, the American Dental Association (ADA) reported approximately 38% of dentists nationwide accept Medicaid patients. Additionally, Medicaid provided dental benefits often end when a woman gives birth or shortly after, making oral health assessments and timely facilitation to a dental provider all the more pertinent.

Perceptions

The broader and more complex reasons for women to defer dental care services during pregnancy relate to perceived need and misconceptions. In a population-based survey of over 21,732 postpartum women in California from 2002-2007, the primary reason women reported not using dental care during pregnancy was a lack of perceived need followed secondarily by financial barriers (Marchi, Fisher-Owen, Weintraub, YU, & Braveman, 2010). Of the 21,732 postpartum women, >50% reported some form of a dental problem before or during pregnancy, 38% reported a lack of perceived need, 14% reported considering care unsafe, and 8% reported a provider had advised them against care (Marchi et al., 2010). Similar research was conducted in a cross-sectional study of 423 Canadian mothers, of whom 79% reported having dental insurance. Of the 423 mothers, 56% reported awareness of the association between OH and pregnancy, 45% reported not visiting the dentist due to perceived need, and 15% reported fears about the safety of treatments and harm to a child (Amin & ElSalhy, 2014).

Provider-Based Barriers

Provider-based barriers are equally pervasive as those that influence women during pregnancy. The research affirms that barriers persist in the realms of awareness, knowledge, attitudes, and behaviors of dental and healthcare providers. Healthcare

provider education, competency, and the subsequent clinical integration for the advancement of OH in primary care, is the ultimate goal.

Awareness

While the literature highlights differences between oral health professionals and non-oral health professionals, both respectively report awareness of the importance of OH. However, many do not address it or do so inconsistently during routine visits with women of childbearing age (Hashim & Akbar, 2014). Morgan, Crall, Goldenberg, and Schulkin (2009) provided 351 obstetricians and gynecologists with a survey to assess how they address OH during pregnancy. The authors found 84% reported awareness of the importance of OH in pregnancy but that 73% did not discuss if the patient had seen a dentist, 54% did not ask about current oral health, 69% reported not providing information about oral care, and only 62% recommended their patient visit a dentist (Morgan et al., 2009).

An exploratory study was launched in 2013 to assess 22 medical and dental providers for awareness of the OH guidelines during pregnancy. Vamos, Walsh, et al. (2015) found almost all medical providers from the study reported, “they were not aware of any guidelines that focused on oral health during the pregnancy period” (p. 1266). Reasons for the lack of awareness of the OH guidelines may be in part due to its absence from the literature. In a systematic review of OH prevention interventions during pregnancy, the researchers concluded both medical and dental professional organizations have existing discipline-specific guidelines but that few studies specifically address the OH guidelines during pregnancy (Vamos, Thompson, et al., 2015). Additionally, the

researchers stated that it is unknown if interventions currently exist that translate the guidelines into practice for either profession (Vamos, Thompson, et al., 2015).

Knowledge, Attitude, and Behaviors of Dental and Healthcare Providers

Regardless of the provider type and reported awareness of OH in general or the guidelines, misconceptions on multiple levels highlight the gaps that persist. In a systematic review of knowledge and attitudes of dental providers, Pontes Vieira, Figueiredo de Oliveira, Ferreira Lopes, & de Figueiredo Lopes e Maia (2015) found in studies spanning from 2003 to 2013 dentists reported the main reasons for not treating women during pregnancy was related to concerns about the safety of x-rays, medications, and the ideal trimester for treatments. Hashim and Akbar (2014) surveyed 108 gynecologists regarding the safety of dental treatments during pregnancy. Their findings concluded that 73% considered dental x-ray imaging as unsafe, and 59.3% regarded the administration of local anesthesia during pregnancy to be unsafe as well.

In a similar study, George et al. (2012) performed a systematic review to explore knowledge, attitudes, behaviors, and barriers perceived by midwives, dental, general practitioners (GPs), and OB/GYNs professionals. The review found that when caring for pregnant patients: dentists acknowledged the importance of OH but reported uncertainty about the safety of dental treatments and were therefore hesitant or refused treatments, GPs and midwives lacked understanding about the systemic impacts of oral diseases and therefore rarely discussed OH during prenatal visits, GPs believed dental procedures were unsafe and advised patients to wait until after pregnancy, and that OB/GYNs were generally supportive and well informed about the importance of OH, and dental

treatments but due to lack of training did not address it during visits (George et al., 2012). The research suggests no clear consensus exists on prenatal OH, and providers are missing critical components between evidence and practice.

Dental care at any time during pregnancy is considered safe (Oral Health Care During Pregnancy Expert Workgroup, 2012). Medical and dental communities have published consensus statements based on extensive research concerning the use of x-rays and the use of medications and anesthetics at dental visits. The CDA 2010 reported, dental radiographs produced very low levels of radiation and, with the use of lead aprons to cover the pregnant woman's abdomen and neck, made the potential risk for harmful effects extremely small. The American College of Obstetricians and Gynecologists Women's Health Care Physicians Committee on Health Care for Underserved Women (2013) reported common medications and anesthetics used in dental practices fell under the Food and Drug Administration (FDA) pregnancy Category B, and these have not been found to be a risk to the fetus.

Education-Based Barriers

At the crux of the OH gap is the absence or limited resources for education and preparation of healthcare providers. Practice guidelines are only part of the equation and often do not offer supplementary guidance on their application to the clinical setting. Supplemental learning modules offer visuals, case scenarios, tests to review knowledge, and options for continuing education credits. However, they may be limited through available technology platforms, falling short of providing a skill set or competency in the performance of the skill. Endeavors for the integration of OH in academic institutions involve collaboration between dental and medical professions. The culmination of the

guidelines, learning modules, and collaborative practice facilitates provider's perceived self-efficacy.

Practice Guidelines

Shortly after the *Oral Health in America* report in 2000, multiple organizations across the nation released OH practice guidelines covering women and children aimed at prenatal, dental and pediatric professionals. Exemplars of the guidelines published by the New York Department of Health in 2006 and the CDA in 2010 outlined roles by provider type and key points for each regarding screening, education, management, and example referral forms. The executive summaries within these guidelines acknowledged limitations related to a limited number of available studies, relying alternatively on expert consensus and collaboration between dental and medical professionals (New York State Department of Health, 2006).

Given the existence of these guidelines and the wealth of information within them, research indicates that they are often not applied. In a scoping review of barriers and strategies to guideline implementation, researchers analyzed 69 articles to identify common themes. Fischer, Lange, Klose, Greiner, and Kraemer (2016) reported that barriers to implementation consisted of personal, guideline-related, and external factors. Successful guideline implementation elements comprised of education and training, social interaction, and support systems. Fischer et al. (2016) concluded that the publication of guidelines alone does not instinctively result in their use; instead, guidelines require the addition of structured strategies to improve implementation and adherence. The themes found within this study support the need for a multi-modal approach in order to successfully connect the guideline to the practice setting.

Education, Curriculum, and Interprofessional Collaboration

The Society of Teachers of Family Medicine developed the *Smiles for Life: A National Oral Health Curriculum*. This curriculum is available to all health professionals and can be reviewed in learning modules by the population of focus. The modules are free and accessible via an open sourced web-based platform due to support of the National Interprofessional Initiative on Oral Health (NIIOH). In a study to determine the effectiveness of the *Smiles for Life* curriculum, 72 physician assistant (PA) students were surveyed to assess for knowledge and attitudes regarding OH. The authors of this study concluded that statistically significant improvements in knowledge and attitudes towards OH were observed after completion of the curriculum (Forbes, Sierra, & Papa, 2018). Additionally, the findings support the effectiveness of the curriculum as an interprofessional educational experience.

Another OH resource, geared towards educators is the Oral Health Nursing Education and Practice (OHNEP) Interprofessional Oral Health Faculty Tool Kit. This web-based, open source toolkit was developed to promote the integration of EBP oral-systemic health content and clinical competencies specific to nurse practitioner (NP) curricula (Oral Health Nursing Education and Practice [OHNEP], 2015). This resource addresses the issue of faculty knowledge and expertise. This issue is often noted in the literature as a barrier in the education setting. The OH curriculums listed above are free, and review of the information does not require registration, it also allows participants the opportunity to earn continuing education credits

Despite the fact that the *Smiles for Life* and OHNEP promote interprofessional collaboration for the integration of OH into primary care, it is not reflected within the

nation's health care curriculums. In a study to discover the number of academic institutions incorporating OH into the curriculum, Ferullo, Silk, and Savageau (2011) discovered OH is not required by some schools while others report receiving fewer than 5 hours of content. However, a cross-sectional national survey of 230 NP graduate programs reported that 57% covered pregnancy related OH issues in the curriculum (Dolce, Haber, Savageau, Hartnett, & Riedy, 2018). Newer studies suggested OH was gaining recognition in the education setting.

One novel solution to the integration of OH has involved revisiting the traditional head, ears, eyes, nose, and throat (HEENT) exam. The solution devised by collaboration between the New York University (NYU) College of Nursing and NYU College of Dentistry introduced the letter "O" for oral cavity assessment. The authors proposed changing the traditional HEENT assessment to HEENOT, to remind educators and clinicians to "NOT" omit oral health from the exam (Haber et al., 2015).

In recognition of the continued exclusion of the oral cavity assessment from curriculums for NP students, Estes et al. (2018) capitalized on the NYU HEENOT exam. The study aimed to assess NP students' perceptions of an interprofessional education (IPE) activity taught by dental faculty in conducting an oral exam and recognizing oral health pathologies. The study spanned over four semesters from 2014-2017, Estes et al. (2018) reported, "in all semesters NP students reported feeling more confident conducting oral health exams after completion of the IPE activity" (p. 1084).

Self-Perceived Efficacy

A finite number of studies exist addressing the provider's perceptions of self-efficacy in the application of guidelines and other prevention-based strategies to their

practice. None of the discoverable studies address OH or NPs specifically. However, data from similar EBP interventions address self-efficacy and the likelihood of use in future practice.

A study of 24 PCPs measured self-efficacy after participation in a 6-session learning series on pediatric behavioral conditions in collaboration with pediatric PCPs. The self-efficacy indicators included ratings for assessing, diagnosing, treating, and managing, as well as participant satisfaction, and intentions to make practice changes. Of the list of indicators, the reported overall self-efficacy increased by 18.6% (Shimasaki, Lippolis, Brilliant, Bishop, & Thomas, 2018). Shimasaki et al. (2018) concluded that training and collaboration could equip PCPs with the skills and knowledge to successfully deliver pediatric behavioral health services.

A study to assess 34 PCP's perceptions of self-efficacy and practice behaviors were measured before and after receiving interventional training in the screening and counseling of childhood obesity. The results revealed improvements in PCPs reported self-efficacy and practice behaviors to confidently identify and provide patient centered counseling (Barlow, Salahuddin, Butte, Hoelscher, & Pont, 2018). The authors concluded through the combination of training and supportive materials; these interventions improve self-efficacy and implementation of prevention-based strategies (Barlow et al., 2018).

The lack of studies addressing provider-based perceptions of self-efficacy, suggests the need for education strategies focused on competency skills. As stated previously, data supports the use of multiple modalities for the integration of EBP of OH into practice. The implications for practice are revealed in the data, combined with an increased presence of the NP in the primary care setting allows the opportunity for

meaningful contributions to the nations' health outcomes Through proficiencies in OH education, NPs are ideally positioned to integrate and improve access to OH (Dolce et al., 2018).

Theoretical Framework

Strong theoretical underpinnings support the how and why for successful implementation efforts. This project utilized the Stetler model to provide the framework for the projects structure and phases. Albert Bandura's Self-efficacy theory (Bandura, 1994) was employed to evaluate and measure data.

Stetler Model

The Stetler (2001) model was developed in 1976 by Stetler and Marram and has been updated over time to reflect changes in nursing practice research. The newer update of the Stetler model of EBP is considered a planned action theory consisting of a prescriptive critical thinking approach to assist practitioners in the assessment of evidence and its application to their practice (Rycroft-Malone & Bucknall, 2010).

According to the National Collaborating Centre for Methods and Tools (2011),

The Stetler model of evidence-based practice outlines criteria to determine the desirability and feasibility of applying a study or studies to address an issue.

These criteria are:

- substantiating evidence;
- current practice (relates to the extent of need for change);
- fit of the substantiated evidence for the user group and settings; and
- feasibility of implementing the research findings (risk/benefit assessment, availability of resources, stakeholder readiness). (para. 6)

Each of these criteria were considered throughout the project's initial stages of development and implementation. The following five phases facilitated critical thinking to guide this scholarly project:

- Phase I: Preparation. In this preparatory phase identification of the practice gap, doctoral committee formation, proposal of an intervention, and consent for approval was sought by the Graduate Leadership Team (GLT) of the School of Nursing at UNC (see Appendix A) and the Institutional Review Board (IRB; see Appendix B).
- Phase II: Validation. Included in this phase was appraisal of the evidence related to oral health. A critique of the available guidelines and associated research supported the need for the integration of oral health for women during pregnancy into the curriculum. Evidence showed that education-based interventions utilizing EBP and supportive learning methods may lead to successful adoption of OH guidelines into practice.
- Phase III: Comparative Evaluation/Decision Making. Determination is made whether it is feasible to apply the proposed project to the setting and application to current practice. Collaboration with the instructor for the BSN-DNP student NP's OB/GYN course facilitated a path and plan to launch a mixed methods EBP education-based intervention.
- Phase IV: Translation/Application. In this phase the practice improvement project used the EBP OH guidelines and collaborative practice-based learning module. These methods provided the students with the operational or "how-to's" of implementation into clinical practice.
- Phase V: Evaluation. After review of the OH guidelines and self-guided learning module the student NPs were prompted to participate in three-part questionnaire. The survey aimed to evaluate awareness of the guidelines and education resources, self-efficacy in learning, and use of the OH guidelines in future practice. (Stetler, 2010)

These phases guided the practical application of research and other sources of evidence to the project. Each phase provided decision-making steps that afforded critical assessment of the evidence, the implications to practice, the how-to's of implementation, and subsequent evaluation of the proposed intervention (Stetler, 2010). Figure 1 represents a diagram of the Stetler Model (Rycroft-Malone & Bucknall, 2010) and illustrates the steps for the evaluation and implementation of EBP.

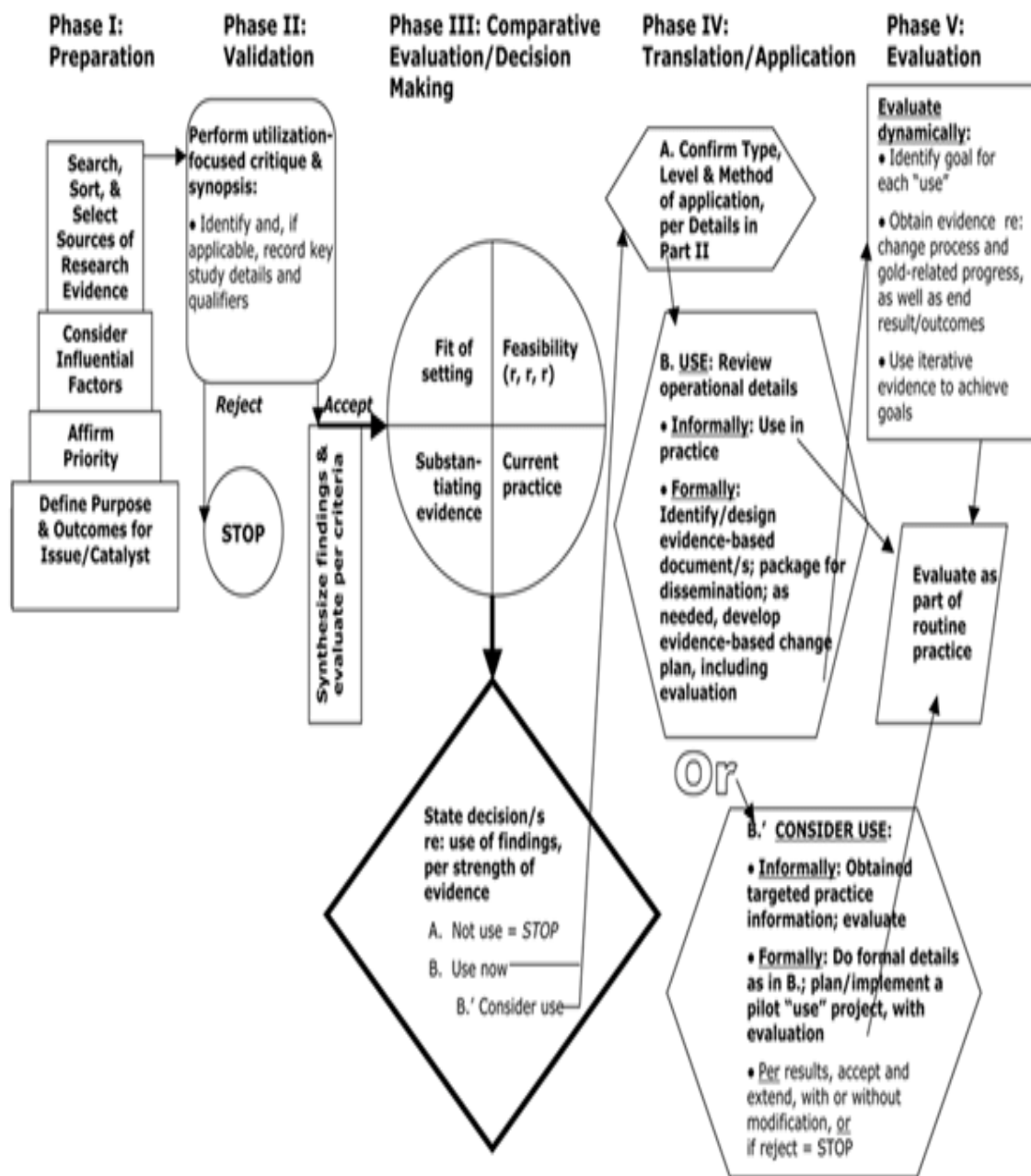


Figure 1. Stetler Model, Part I: Stetler Model of evidence-based practice (Rycroft-Malone & Bucknall, 2010, p. 53).

The Stetler model part II is a list of additional phase details and offered clarifying options for each of the five phases. This detailed portion of part II helped support decisions in the identification of obstacles and facilitators in the implementation of the OH EBP guidelines and other resources for use in this project.

Self-Efficacy Theory

The main theme of interest for this project focused on evaluating provider-based perceptions of self-efficacy after review of OH guidelines and completion of a self-guided learning module. Self-efficacy refers to an individual's belief about his or her capabilities, reflecting the confidence necessary to execute levels of performance to manage prospective situations (Bandura, 1994). Sources of self-efficacy beliefs fall into four categories:

- Mastery of experiences results from a positive or negative learning experience in the performance of a task
- Vicarious experiences come from the observation of capabilities often modeled by those considered to be educated or experts of a particular skill
- Verbal persuasion from influential people in our lives such as peers, teachers, and coaches that encourage and share knowledge and skills
- Physiological arousal states such as tension or mood influence perceptions of self-efficacy and performance (Bandura, 1994).

The relationship between self-efficacy and performance is shown in Figure 2 (Gist & Mitchell, 1992). This model illustrates elements of Albert Bandura's Self-efficacy theory combined with analysis, action and assessment in the performance of a task.

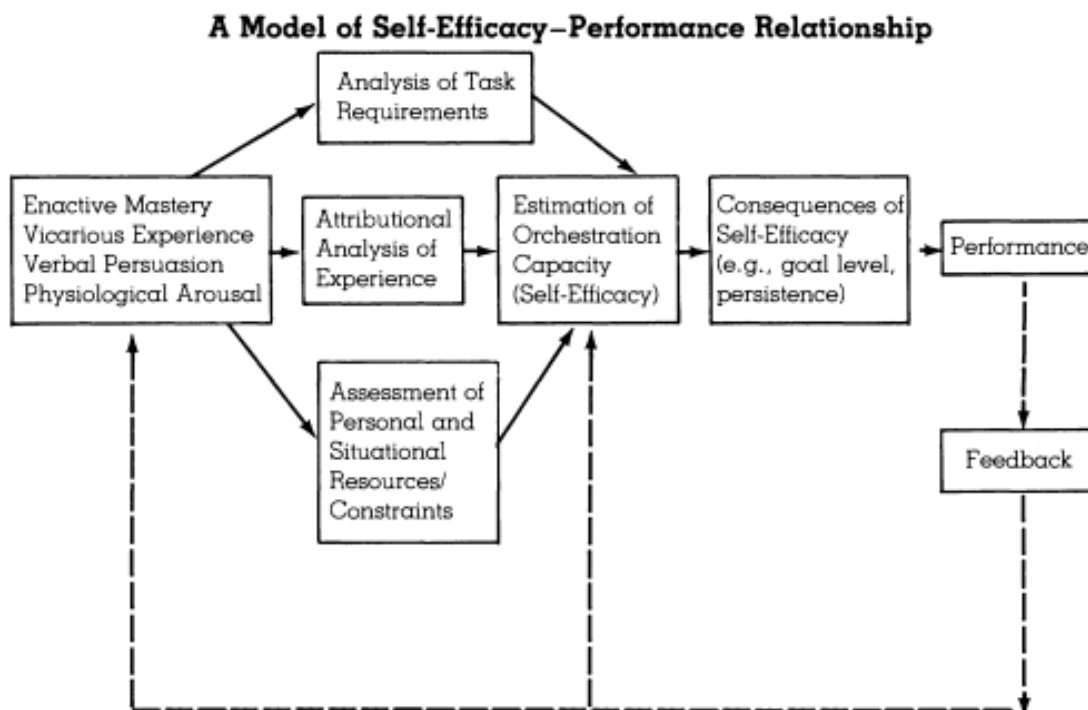


Figure 2. Self-efficacy and performance relationship (Gist & Mitchell, 1992).

The self-efficacy theory influences the domains of research, education, and clinical practice. Nurse practitioners are encouraged to pursue competencies of health care guidelines. The National Organization of Nurse Practitioner Faculties (NONPF) included oral health as part of independent practice competency in 2014 (The National Organization of Nurse Practitioner Faculties [NONPF], 2017). The connection between an individual's perceived self-efficacy is key to successful adoption of practice change. This is particularly daunting due to the almost complete absence of oral health curriculum in the traditional nurse education setting.

CHAPTER III

METHODOLOGY

Design

The DNP Scholarly project evaluated survey data in a quantitative descriptive study regarding student NPs awareness of the OH guidelines, self-perceived efficacy in learning, and applying new knowledge into future practice. Since the study involved student NPs at the UNC, the Graduate Leadership Team (GLT) was consulted prior to the launch of the project to establish a Statement of Mutual Agreement (see Appendix A). This agreement stated participants have been identified as a vulnerable population and procedures were developed to ensure no confidential information was recorded, discussed or published in any manner that would be a violation of student rights.

Next steps required approval from the Institutional Review Board (IRB). This approval was obtained from the University of Northern Colorado (UNC) prior to initiation of the DNP Scholarly project (see Appendix B). The IRB application for the project was considered to fall under the designation of exempt. The exempt category was chosen due to fact that the project did not propose to disrupt the participants' normal life experiences and the research was focused on the effectiveness of instructional techniques and curricula. Additionally, the student researcher was classified as "not an instructor" for the course and no identifiers were recorded. Consent was obtained from the volunteer participant student NPs involved in the survey study. No incentives were given or implied.

The literature supported the need for a combination of knowledge building and skill development to ensure successful implementation of this practice change into the clinical setting. Successful implementation was identified as learning activities that aim to incorporate the OH guidelines, build skills in performance of an OH assessment, and the promotion of interprofessional collaborative efforts. As NPs expand into larger roles in the primary care setting, the expectations to engage in efforts that facilitate EBP continue to grow. A quantitative descriptive study was performed. The DNP scholarly project consisted of a survey method that evaluated the student NPs perceptions and effectiveness of the project's interventions aim of addressing the OH practice gap.

The participants for the project included NP students in their OB/GYN course at UNC during the Summer 2019 semester. The OB/GYN course roster contained 26 students; of this number, 22 students consented and participated in the survey.

The OB/GYN course is considered a hybrid, consisting of a combination of face-to-face and online-based learning activities. The online-based learning environment is accessible within cloud-based learning management system through UNC. The project materials were made available by the instructor during the third week of the summer OB/GYN 2019 course.

Project Objectives

1. Implement a multi-resource education-based intervention to increase student NPs awareness of OH during pregnancy EBP guidelines and education resources. This intervention strategy was developed to provide students during their OB/GYN course with the necessary knowledge and skills for implementation of OH based

prevention efforts during their required clinical rotation. Promotion of continuing education credits was also introduced to facilitate the benefits of OH in primary care.

2. Measure and evaluate the effect of the intervention to facilitate students' perceptions of self-efficacy in learning and skill development in educating patients, performance of an OH assessment, and promotion of interprofessional collaboration.

Project Plan

A presentation and self-guided mixed resources education plan were created to introduce the OH guidelines and supplemental learning resources. The project was made accessible via UNC's cloud-based learning management system during the third week of the summer course. During the third week of the summer course, the student researcher provided an introduction to the project and contact information via recruitment email (see Appendix C). Also included were a set of instructions to introduce the material, order of steps to complete, navigation to internet-based links, and expected time commitment.

The students were asked to review two evidence-based guidelines. The first document, Oral Health During Pregnancy and Early Childhood published by the California Dental Association in collaboration with the American College of Obstetricians and Gynecologists, District IX (2010) was a lengthy 75-page document. The second shorter 12-page Oral Health During Pregnancy: A National Consensus Statement released by the Oral Health Care During Pregnancy Expert Workgroup (2012) mirrors the first document. After review of these two documents the students were instructed to access the internet and navigate to a link provided to the learning module titled Smiles for Life Module 5. Once students had accessed Module 5 titled Oral Health for Women: Pregnancy and Across the Lifespan, further instruction was provided to the

students concerning choices to register for continuing education credits or skip registration after completion of the learning module (see Appendix D). The final set of instructions prompted the students to access the internet again and navigate to a the Qualtrics software platform, respond to the 26-question survey and submit.

Instrumentation and Data Analysis Procedures

A quantitative descriptive data analysis was conducted on the responses from the questionnaire (see Appendix E). Once the data was collected, it was then evaluated by question section and type. It was then analyzed to address the projects objectives

- The first set of questions (1-7) were used to assess students' awareness of OH guidelines during pregnancy and learning resources in a dichotomous yes/no format.
- The second set of questions (8-20) were modified with permission from the National League for Nursing (NLN). This set of modified questions titled *Student Satisfaction and Self-Confidence in Learning* consisted of a 13-item instrument designed to measure student satisfaction and self-confidence in learning. A 5-point Likert scale assessed how much the student agreed or disagreed with each statement. Reliability of the modified instrument was tested and compared to the original NLN instrument using Cronbach's alpha (see Appendix F).
- The third set of questions assessed the likelihood for applying the information provided in the education intervention to the clinical setting. This set of questions used a 3-point Likert scale.

Data Handling Procedures

Consent forms were physically distributed to students during a face-to-face classroom meeting time (see Appendix G). These forms were then collected by the course instructor and stored in the office of the course instructor's locked filing cabinet. The student researcher collected the consent forms from the course instructor. The consent forms are accessible only to the researcher and stored in a combination code locked filing cabinet within the researcher's home.

Data collected from the survey was housed in the Qualtrics online platform. No personal identifiers were included, and all data was reported in aggregate form. Furthermore, all student records remained confidential per school protocol. No confidential information was recorded, discussed or published in any manner that would be a violation to student rights.

Duration of the Project

The DNP scholarly project was planned using the following timeline

- Pre-development
 - Development of scholarly project idea- August 2018
 - Needs Assessment -January 2019
 - Protocol and Literature Review completion – February 2019
 - Defense of Scholarly Project Proposal -March 2019
 - Obtain approval from Institutional Review Board (IRB) -April 2019
- Project Development
 - Recruit participants and introduction to project and timeline-May 2019
 - Distribute intervention materials and survey via web platform-May 2019

- Gather quant data via survey--May
- Summarize findings-July 2019
- Completion of Project
 - Conclusion and finalization of scholarly project. October 2019.
 - Final Defense November 2019.

Ethical Consideration

The risks inherent in this study were no greater than those normally encountered during regular classroom participation. There were no anticipated risks for students reviewing evidence-based guidelines, accessing, navigating and registering (if the participant chose to register) for the online-based education resource, or participation in the survey. All student records remained confidential per the school protocol. No confidential information would be recorded, discussed, or published in any manner that would be a violation of student rights. Student participation is voluntary and would not affect the students' grades. No costs or compensation had been identified. The consent form states that participation would not count towards a grade in the course.

No discomforts to the students were identified by the principal investigator or Graduate Leadership Team (GLT) who has reviewed and agreed to the proposed project. The student may benefit directly from gaining knowledge and skills on performing oral health assessments, education for pregnant patients, and how/when to refer a patient to a dentist. Indirect benefits include awareness and promotion of materials and resources presented in this project that may result in a benefit to the discipline of nursing.

**Congruence of Organizations’
Strategic Plan**

Congruence of the project aligned with the mission and goals of the UNC School of Nursing (SON). The mission statement includes “a commitment to quality professional practice outcomes within all healthcare settings” (University of Northern Colorado School of Nursing, 2016, p. 6). This DNP project is in agreement with the goals for students to “engage in scholarly activity, research and creative projects conducive to advanced professional nursing roles and advanced nursing practice” (University of Northern Colorado School of Nursing, 2016, p. 6).

**Resources: Personnel, Technology, and
Budget**

Resources for personnel for this project were provided by the DNP student, this includes; research development, organization and completion. The DNP student provided technology resources including; workspace, computer, printer, and printing supplies. No budget expenses were identified in association with the project.

CHAPTER IV

DATA ANALYSIS AND RESULTS

It is a well-established fact that OH manifestations can have an impact on systemic health and quality of life. For women, during pregnancy, this relationship and potential for adverse child and maternal health outcomes underscore the need for strategies that integrate OH into primary care. The literature review revealed that the most commonly cited barrier to the successful integration of OH exists between the realms of education and practice. Efforts to discover strategies that aim to remove these barriers were found to combine education-based resources, EBP, and competency skills. A survey was provided to the students after review and completion of the educational intervention to assess for student reported effectiveness. Object two for this project was partially met by the survey and student response data.

Data Collection Description

The web-based survey software tool Qualtrics was used to develop and format a 26-item questionnaire for use in this project (see Appendix E). Data were collected between May and July of 2019 via a link to the Qualtrics questionnaire provided within UNC's cloud-based education software platform of the students' OB/GYN course. Data from the questionnaire was extracted from the 22 participant responses.

Data from the first set of questions (1-7) was tabulated and evaluated by percentages. Questions 8-22 consisted of thirteen 5-item Likert scaled questions modified from the NLN instrument to measure student satisfaction and self-confidence in learning.

The data from these questions were entered into a Statistical Package for the Social Sciences (SPSS) software platform and used to compute the results using Cronbach's alpha. They were also graphed in excel to illustrate the participant responses. The third set of questions (21-26) was graphed in excel and evaluated in a 3-item Likert based format.

Survey Questions 1-7

The first set of yes/no type questions established the students' prior experience with the OB/GYN patient population and OH education. A total of 22 responses were recorded for each of the questions and consistent with the number of participants (see Figure 3). Greater than half of all respondents reported no prior experience with the OB/GYN population, and awareness of the OH guidelines, or education resources.

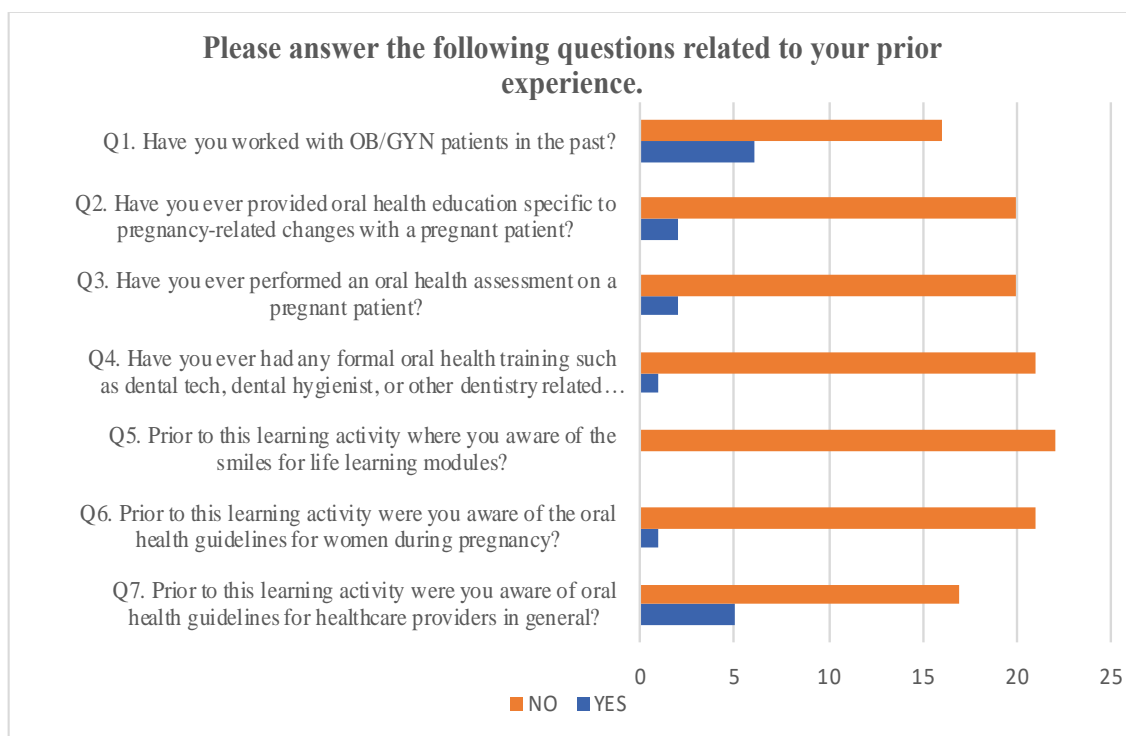


Figure 3. Student prior experience.

Results and Analysis

Data analysis for survey questions 1-7 were reported in percentages of previous experience or awareness prior to participation in the learning activity (see Figure 3).

- Q1 - 27% reported prior history of working with OB/GYN patients in the past
- Q2 - 9% reported providing OH education to specific to pregnancy-related changes with a pregnant patient
- Q3 - 9% reported performed an oral health assessment on a pregnant patient?
- Q4 - 4% reported having had formal oral health training such as dental tech, dental hygienist, or other dentistry related training
- Q5 - 0% reported being aware of the Smiles for Life learning Modules
- Q6 - 9% reported being aware of the oral health guidelines for women during pregnancy
- Q7 - 22% reported being aware of oral health guidelines for healthcare providers in general

Survey Questions 8-20

The second set of questions (8-20) were adopted and modified from the NLN *Student Satisfaction and Self-Confidence in Learning* instrument (see Appendix F). This set of questions was presented in order to address two areas of learning. The first set of questions 8-13 represented the students' level of satisfaction with the learning material. The second set of questions 14-20 represented the students' report of self-confidence in learning. The data from both sets of questions were combined and represented via the use

of Cronbach's Alpha (see Figure 4) to address reliability of the NLN Student Satisfaction and Self-Confidence in Learning instrument to the modified version used in this project.

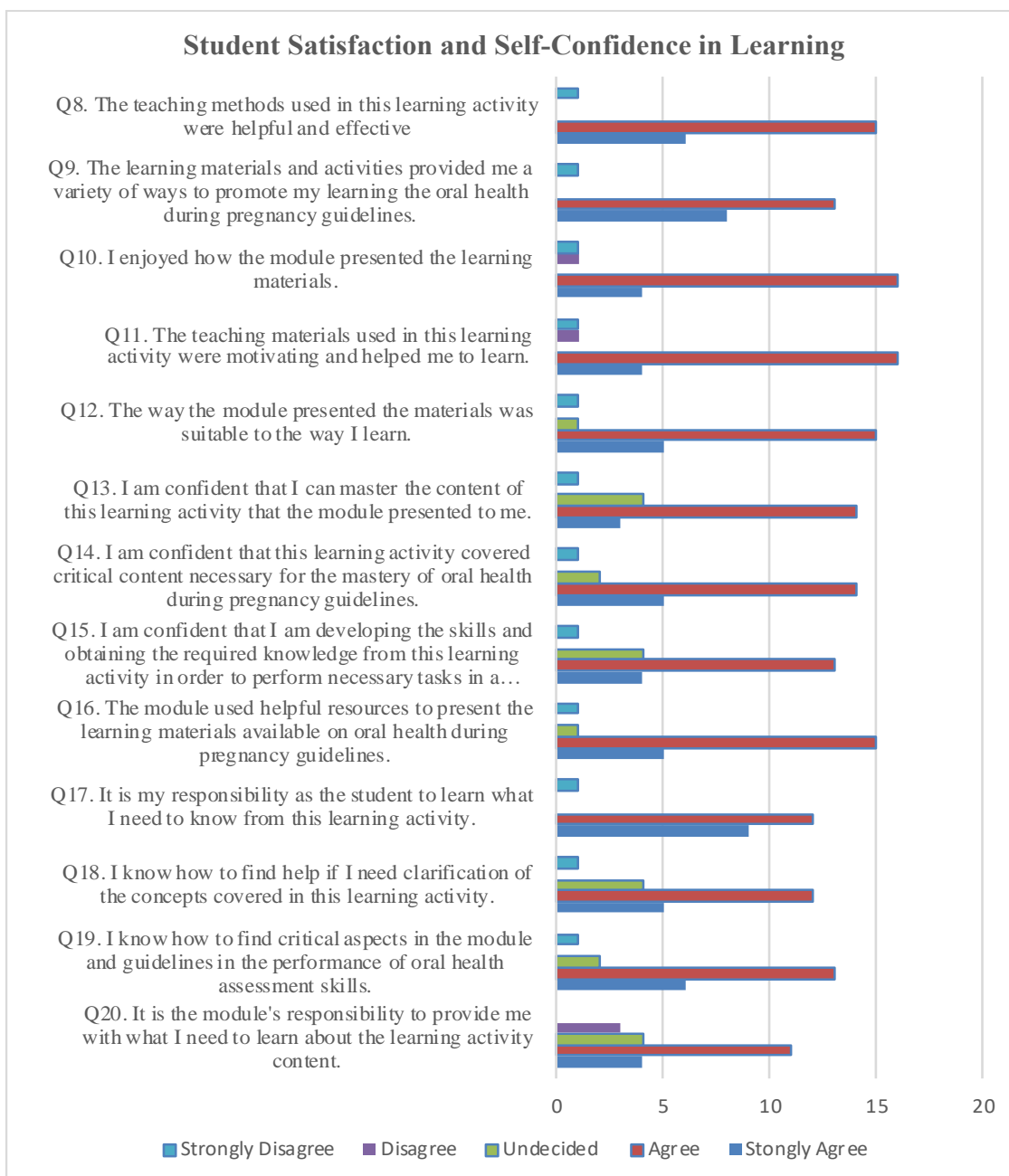


Figure 4. Questions 8-12 Student Satisfaction and Questions 13-20 Self-Confidence in Learning.

Results and Analysis

The project's second objective was met by evaluating the student's perceptions of self-efficacy. The majority of the students in both the areas of satisfaction and self-confidence in learning reported being in "agreement" with the statements. Student Satisfaction responses (see Figure 4) addressed teaching methods, learning materials, and the learning module. The majority of students also reported being in "agreement with statements of Self Confidence in learning regarding confidence in learning the material and in the performance of the skill competencies. Responses in both areas met the project's second objective of self-efficacy in learning and performing a skill.

Cronbach's Alpha Results

Cronbach's Alpha is a measure used to assess the reliability, or internal consistency, of a set of scale or test items (UCLA: Statistical Consulting Group, n.d.). It is a function of the number of test items and the average inter-correlation among them and can determine if multiple-question Likert-Scaled surveys are reliable (Tavakol & Dennick, 2011). Cronbach's alpha can help the researcher determine if the test design is accurately measuring the variable of interest (UCLA: Statistical Consulting Group, n.d.).

In the second set of questions modified from the NLN Student Satisfaction and Self-Confidence in Learning instrument the word "simulation" in each question was replaced with "learning module." The modification of "learning module" referred to the Smiles for Life: Module 5, Oral Health for Women: Pregnancy and Across the Lifespan. In the original version of the NLN Student Satisfaction and Self-Confidence in Learning instrument (see Appendix F) the reliability was tested using Cronbach's alpha: satisfaction = 0.94; self-confidence = 0.87 (National League for Nursing, n.d.). Due to the

wording modifications, the responses from the participants for the project were measured and compared to those reported by the NLN instrument.

The case processing summary (see Table 1; $N = 22$) corresponded to the number of participants. Reliability statistics listed below the case processing summary were calculated using the 5-point Likert-scaled responses in questions 8-12 relating to Student Satisfaction. This is mirrored for questions 13-20 relating to Self-Confidence in Learning. The Cronbach's alpha for these modified questions resulted in satisfaction = 0.96; self-confidence = 0.94. The importance of comparing the original NLN instrument to the modified version by using Cronbach's Alpha was to demonstrate equivalence. These higher results did not mean that the modification of wording to this instrument was more reliable than the original. The purpose of this comparison was to illustrate the level of internal consistency or reliability of the questions to measure similar constructs. The modification of the wording in the instrument did not alter the reliability of what the survey was intended to measure.

Table 1

Cronbach's Alpha Reliability Statistics for Modified Student Satisfaction and Self-Confidence in Learning Instrument

Case	Student Satisfaction		Self-Confidence in Learning	
	<i>N</i>	%	<i>N</i>	%
Valid	22	100.0	22	100.0
Excluded ^a	0	0.0	0	0.0
Total	22	100.0	22	100.0
Reliability Statistics				
Cronbach's Alpha	.968		.949	
Cronbach's Alpha based on Standardized Items	.968		.950	
<i>N</i> of items	5		8	

^a Listwise deletion based on all variables in the procedure.

Survey Questions 21-26

The third set of questions was developed by the student researcher to address the second project objective concerning likelihood of use in the clinic setting (see Figure 5). Questions related to the likelihood of students screening patients, educating, referring patients to a dentist, and the promotion of the OH guidelines. Only 21 of the 22 participants responded to questions 21-26.

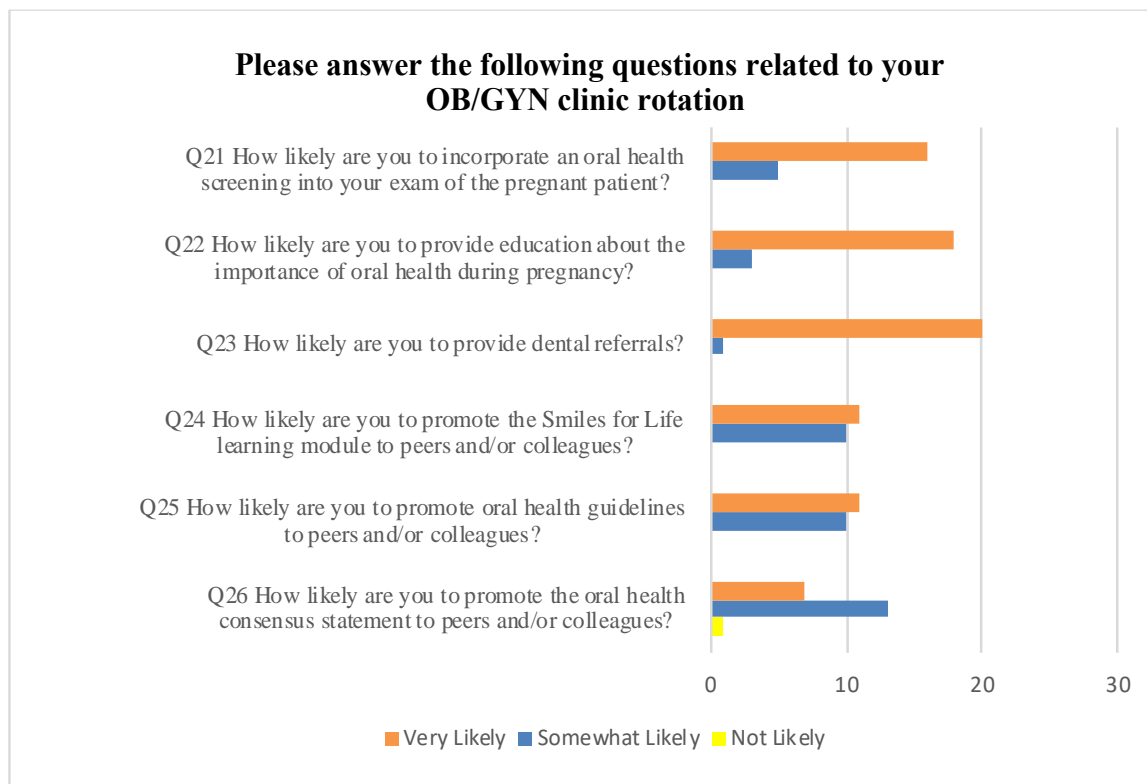


Figure 5. Likelihood to screen, educate, refer, and promote oral health.

Results and Analysis

In the last set of questions the project’s second objective was met by measuring and evaluating the likelihood to promote OH in the practice setting. In questions 21-23 the majority of students responded “very likely” to incorporating OH into practice. These questions reflected the likelihood of students to integrate OH screenings, provide education, and refer patients to a dental provider. In questions 24-26 responses concerning the likelihood of promoting the provided OH guidelines in the long or short format and the Smiles for Life learning module, were nearly evenly distributed between “very likely” and “somewhat likely.”

Summary

The second objective of this project was intended to measure and evaluate the results of the survey developed from the project's first objective to implement an education-based intervention. Analysis of the data from the survey revealed that, through the use of mixed education resources, student responses supported that the intervention helped to meet the second objective of this project. The results of the survey revealed improved awareness of the OH guidelines, perceptions of satisfaction and self-efficacy in the learning intervention, and likelihood to integrate OH into practice.

CHAPTER V

DISCUSSION

Conclusions

The purpose of this DNP Scholarly project was to represent the culmination of the student researcher's doctoral studies. This culmination of education was translated into a project that aimed to improve nursing practice. For this project, the issue of OH was determined to be a missing element in the provision of wholistic-based care to women during pregnancy.

Integration of OH into primary care was essential in the provision of a wholistic approach to general health and wellbeing. The role of the NP as a champion of prevention was well-positioned to provide leadership in health promotive endeavors. The trichotomous impact of OH in women during pregnancy was all the more reason to develop and support integrative strategies in healthcare. Expanding roles of the NP in primary care and the absence of OH in the curriculum offered the opportunity to assess NP students during their OB/GYN course.

The two objectives for this DNP scholarly project were met and were reflected in the development, execution, and evaluation of the project's education-based intervention. The data from study supported the goals of the project. The goals of the project aimed to (a) evaluate the evidence surrounding OH during pregnancy, (b) identify the barriers of

integration into primary care, (c) employ a nursing based practice theory for assessing the evidence, (d) assess EBP guidelines in their application to the role of nurse practitioner as a promoter of OH, and (e) the evaluation of student nurse practitioners perceptions of knowledge and competency after an education-based intervention.

Theory provided the means to identify and maximize understanding of the issue of OH. The use of theory in the DNP Scholarly project provided the means to translate the issue of OH among members of the nursing profession with a common language and frame of reference. Theory acts as a guide to inform, guide, and improve professional practice.

The theoretical frameworks of the Stetler Model (Stetler, 2010) and Bandura's Self-efficacy (Bandura, 1994) helped to provide purpose and direction to the project and its outcomes. The framework of Stetler's model strengthened the project by providing the phases to critically evaluate the literature and its relevance to the project's goals and objectives. The use of Bandura's Self-Efficacy theory provided the connection between the intervention and the project's objectives.

Evaluation of the data from the survey showed promise in the utilization of existing learning resources to increase awareness of OH, satisfaction in the learning modalities to provide necessary content, and the likelihood to promote and implement OH into future practice. The results of this study support efforts to integrate OH during pregnancy into the curriculum and the realm of primary care. The data also supported education-based interventions focusing on providers and their perceptions of confidence and competency.

As mandated by the American Association of Colleges of Nursing, This DNP Scholarly project successfully met the expected outcomes of the eight essentials of doctoral education for advanced nursing practice and achieved the goals of the recommended five criteria in EC as PIE. The outcomes were evidenced by the phases of the project, the application of the intervention, and evaluation of the data. It was determined that the project successfully met the expected outcomes of the eight essentials of doctoral education for advanced nursing practice and achieved the goals of the recommended five criteria in EC as PIE.

Limitations

Limitations to the study include the small number of participants and lack of a control group to compare intervention and assessment of learner gains. The target group consisted of 26 NP students, of which 6 were BSN-DNP and the remaining 20 were masters in nursing students. It is unknown how many students in each group participated in the study. A pre and post-test of knowledge, attitudes, and skills would have added credibility that the intervention was associated with a gain in knowledge and skills. Further testing is needed to discover the effects of this project in other NP groups.

The research places a great deal of weight on the importance of EBP. However, EBP falls short in the ability to transition into practice settings. The literature discusses at great length the role of the DNP in translating the overabundance of research and efforts to improve health outcomes. Use of the EBP alone for OH integration was deemed to be ineffective. This was in part due to the age of the guidelines, intended audience, and conflicting out of date information found within them. Additionally, limited and limitations of the resources such as the Smiles for Life modules and OHNEP (curriculum

for NP faculty) utilizing older software programs that had out of date or broken links. Overall, there was a lack of usable resources for educating the NP population. These factors placed concerns about the effectiveness of the intervention in the access and usability by the students.

Other limitations to the project were identified in later stages of executing of the projected intervention. Technology, time and access were the greatest limiters to assessing the student participants. Initial permission to study the student population was a timely process, given the time restraints of the summer semester. Design of the project needed to be constructed in manner that took into consideration participant technology resources, time to complete, and value of the intervention.

Recommendations for Future Education

Recommendations for future research should focus on collaborative OH education practices. The literature in the professions of dentistry and medicine echo the need for greater buy in from stake holders on the benefits of interprofessional collaborative practice. However, these voices fall silent given the exclusionary circles of education, location of practice, and insurance reimbursement. This is reflected in the barriers academic institutions face as evidenced by the lack of faculty, resources, and time to effectively develop programs that support integrative teaching methods. Efforts to support OH education and the promotion of professional practice aimed at the inclusion of all professions may improve OH outcomes. Conversely, improved OH outcomes may lead to improved general health and well-being. The hope of this recommendation for future research is to combine and share knowledge, resources, to benefit better patient outcomes.

The Essentials of Doctoral Education for Advanced Nursing Practice

In response to the increasingly complex demands of modern healthcare, the American Association of Colleges of Nursing (AACN) released the following eight essentials of doctoral education for the advance practice nurse:

- Essential I: Scientific underpinnings for practice
- Essential II: Organizational and systems leadership for quality improvement and systems thinking
- Essential III: Clinical scholarship and analytic methods for evidence-based practice
- Essential IV: Information systems/technology and patient care technology
- Essential V: Healthcare policy for advocacy in health care
- Essential VI: Interprofessional collaboration for improving patient and population health outcomes
- Essential VII: Clinical prevention and population health for improving the nation's health
- Essential VIII: Advanced nursing practice. (American Association of Colleges of Nursing, 2006)

The eight essentials were met, spanning the development stage to the completion of this scholarly project. Essential I utilized nursing theory and science to evaluate and address an identified gap in health care delivery. Essential II was met through modeling organizational and systems leadership by evaluating, translating, and disseminating the guidelines and learning module to DNP students during their OB/GYN course and clinical rotation. Essential III was met by promoting clinical scholarship of the OH

healthcare disparity by providing DNP students with learning materials. Analytical methods for EBP employed the development of a survey to gauge provider awareness, perceptions, and the likelihood of using the OH guidelines in future practice. The use of information systems and technology via the University of Northern Colorado's learning management platform was essential to the project. It afforded flexibility and accessibility to the student volunteers. This platform provided the DNP students a centralized hub of information with additional materials, including a portable document format (PDF) of the guidelines and consensus statement. Web-based links for the learning module and the OH Qualtrics survey was provided within the platform, which was consistent with Essential IV. Essential V was met by critically focusing on health care policy and advocacy for NPs in primary care as providers of high quality, low cost, and equitable care. Essential VI was met through the promotion of interprofessional collaboration education efforts between NPs and dental communities and communication between providers when referring patients for dental care. Essential VII was met by helping the DNP student apply the knowledge and skills gained from the learning material provided by this project. The knowledge and skill set could be applied in future practice for clinical prevention strategies in efforts to improve the health of the nation. Essential VIII was met through the culmination of education, research, project creation, and project completion. The goal, to comprehensively address a complex health disparity through the use of available tools and resources focused on NP students.

Criteria for Executing a Successful Doctor of Nursing Practice Final Project

In 2006, the AACN released the Essentials of Doctoral Education for Advanced Nursing Practice as outlined previously. Shortly after its release, the number of DNP programs across the nation increased substantially. This increase elicited concerns regarding the variability of DNP programs and the quality of the final project requirements. With this in mind Waldrop, Caruso, Fuchs, and Hypes (2014) published an article outlining a set of five criteria for uniformly evaluating the DNP final project with the acronym EC as PIE (E = Enhances; C = Culmination; P = Partnerships; I = Implements; E = Evaluates; Waldrop et al., 2014).

- E = *Enhance* health and practice outcomes. This scholarly project validated the evidence supporting the need for OH integration in the practice setting and the opportunity to improve the health outcomes of women and children. The NP was identified as a key stakeholder in the promotion of EBP. Strategies focused on increasing awareness of the guidelines in the education and preparation of healthcare providers affords a path in the effort to bridge the OH practice gap. While simultaneously meeting the needs of patients in the provision of high quality, low cost, equitable health care.
- C = *Culmination* of practice inquiry. The DNP student employed a depth and breadth of expert knowledge in the identification, development, and assessment of a current gap in practice. This inquiry was developed into an intervention aimed at NP students for use during their OB/GYN course and clinical rotation. The researcher presented the combination of guidelines and

learning modules to assist DNP students with the knowledge and competencies to incorporate a practice change.

- P = *Partnership* engagement. A partnership was established within the school of nursing prior to the launch of the project. The researcher worked in collaboration with the project committee members, GLT, and the instructor for the OB/GYN course to successfully present and launch the education intervention to the student NPs.
- I = *Implement/apply/translate* evidence into practice. Translation of the evidence from the literature was applied to the development and application of an education-based intervention focused on student NPs during their OB/GYN course clinical rotation. The intervention was intended to provide students with knowledge and skills to apply to the OB/GYN patient population. The effectiveness of the intervention was evaluated through a survey. The DNP student intends to use the data from the survey to promote oral health into the curriculum of the nurse practitioner program at UNC.
- E = *Evaluate* health care or health care practice. Integrating OH into the primary care setting by APNs was determined by the literature to meet the standards of practice in health prevention strategies. The role of the APN benefits vulnerable populations such as women during pregnancy by providing care that includes a whole person approach to assessing an individual's general health and wellbeing. This care includes collaboration with other care teams by communicating to meet the needs of the patient. The Stetler model helped guide the steps of the scholarly project from the

development phase to its completion. Bandura's self-efficacy theory helped to interpret the effect of the project intervention and the student NP's application of OH care into the practice setting. From the results of the OH during pregnancy questionnaire, the DNP student will use the findings to help develop a curriculum that integrates this essential element of systemic health.

Summary

The DNP Scholarly project afforded the student researcher an opportunity to explore and develop a plan of action to address an identified gap in practice. This project aimed to develop, implement, measure, and evaluate a plan of action to address the OH disparity for women during pregnancy. The project identified that the current education resources provide the EBP guidelines but lack adequate representation to fully translate OH into the practice setting.

The findings of this project held promise for addressing the OH gap in primary care. Nurse Practitioners have often been the first healthcare providers to evaluate a patients' oral health status. The role of the NP has been pivotal to health prevention based advocacy.

The implications for current and future integration of OH for women during pregnancy into UNC's curriculum were gathered from this scholarly project. This project revealed the need for additional research focused on methods to translate EBP to the practice setting. Additionally, the need for more research regarding OH integration as it relates to inter-professional collaboration in the education setting for health care providers.

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APPENDIX A
GRADUATE LEADERSHIP TEAM (GLT) STATEMENT
OF MUTUAL AGREEMENT

UNIVERSITY of
NORTHERN COLORADO
School of Nursing

April 19, 2019

Leah Salmans, RN, MSN
Doctorate of Nursing Practice Student
University of Northern Colorado
Greeley, Colorado

Dear Ms. Salmans,

The purpose of the "Statement of Mutual Agreement" is to describe the shared view between the University of Northern Colorado, Graduate Program and Leah Salmans, DNP Candidate from University of Northern Colorado, concerning her proposed capstone project.

Proposed Project Title: Oral Health During Pregnancy: Promoting Awareness of Guidelines and Education Resources in the Evaluation of Self-Perceived Efficacy to Educate, Screen and Refer Women During Pregnancy for the Nurse Practitioner Student.

Brief Description of Proposed Project: The project will evaluate the outcome of participation in a learning module on evidence based guidelines for oral health during pregnancy. During pregnancy women are at a greater risk of developing oral diseases and this has been linked to low birth weight, pre-term birth, preeclampsia, transmission of harmful bacteria from maternal to infant mouth, early onset dental caries in children, and a systemic health impact over a woman's lifespan. The benefits of providing students with education using evidence based guidelines and the how-to's of this practice change may lead to improved patient outcomes and provider self-efficacy in the performance of the guidelines in the practice setting.

Goals of Capstone Project: The project aims to 1) increase students' awareness of primary care based oral health guidelines for women during pregnancy, 2) increase students' awareness of available oral health education resources, 3) increase students' perceived self-efficacy for providing anticipatory guidance on oral care to pregnant women, performing an oral health assessment and referral to a dental provider, 4) finally, the project aims to increase the likelihood of students to incorporate oral health guidelines into practice during OB/GYN clinical rotation and collaborate with preceptors to provide referrals to dental care providers.

Proposed On-Site Activities: Students will participate in a learning module including two evidence based practice guidelines. The module is entitled, *Smiles for Life*, which is currently the only web based free open sourced course for oral health education. After completion of the module the students will fill out a Qualtrics survey to evaluate awareness, perceived self-efficacy in learning, and likelihood of employing the guidelines during the students OB/GYN clinical rotation.

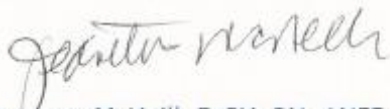
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Confidentiality of Student Records: All student records will remain confidential as per school protocol. No confidential information will be recorded, discussed or published in any manner that would be a violation of student rights. The participation in the project will be voluntary, and participation or refusal of participation will not affect students' grades in the program.

The designated Capstone Community/ Agency member, Dr. Jeanette McNeill, will agree to participate in the review and approval of the proposal and presentation of the final version of the project.

The DNP Scholarly project will include a final report, an abstract, and oral presentation of the report to the faculty and committee members. No personal identifiers will be included and all data will be reported in aggregate form.

The Graduate Leadership Team approves the conduct of this project with Family Nurse Practitioner students at the University of Northern Colorado, School of Nursing. The DNP student, Leah Salmans, will coordinate the conduct of her project with FNP faculty, in order to recruit the students, obtain their consent to participate, provide the educational program, and evaluate the outcomes of the project.



Jeanette McNeill, DrPH, RN, ANEF, CNE
Professor
Assistant Director of Graduate Programs
University of Northern Colorado
School of Nursing
Greeley, CO
Jeanette.mcneill@unco.edu

APPENDIX B
INSTITUTIONAL REVIEW BOARD APPROVAL



Institutional Review Board

DATE: May 22, 2019

TO: Leah Salmans, BS, BSN
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1431095-3] Oral Health During Pregnancy: Promoting Awareness of Guidelines and Education Resources in the Evaluation of Self-Perceived Efficacy to Educate, Screen and Refer Women During Pregnancy for the Nurse Practitioner Student.

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE: May 22, 2019
EXPIRATION DATE: May 22, 2023

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

Thank you for addressing all the requested revisions! Best of luck with your research!

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

APPENDIX C
INITIAL SURVEY RECRUITMENT EMAIL

Greetings,

I am completing my fourth year of the DNP program at the University of Northern Colorado. I am recruiting participants for my scholarly project entitled, *Oral Health During Pregnancy: Promoting Awareness of Guidelines and Education Resources in the Evaluation of Self-Perceived Efficacy to Educate, Screen and Refer Women During Pregnancy for the Nurse Practitioner Student*.

There is an abundance of evidence linking the development of oral disease during pregnancy to poor health outcomes. These include; low birth weight, pre-term birth, preeclampsia, transmission of harmful bacteria from maternal to infant's mouth, early onset dental caries in children, and a systemic health impact over a woman's lifespan. Despite the evidence, providers and patients report confusion and fear about the safety of dental care during pregnancy. In an effort to bridge this evidence-based practice gap, I invite you to volunteer for my project.

In this project, you will be asked to follow these steps:

1. Sign a consent form
2. Review two evidence-based guideline documents
 - a. *Oral Health During Pregnancy & Early Childhood*
 - b. *Oral Health Care During Pregnancy: A National Consensus Statement*
3. Follow the link provided and complete the *Smiles for Life Course 5: Oral Health for Women: Pregnancy and Across the Life Span*.
4. Complete a survey

If you have questions, please contact me at Salm9011@bears.unco.edu.

Thank you,

Leah Salmans

APPENDIX D
SMILES FOR LIFE MODULE 5



Smiles for Life
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Oral to Systemic Child Adult Acute Dental Problems **Pregnancy & Women** Fluoride Varnish Oral Exam Geriatric

Course 5: Oral Health for Women: Pregnancy and Across the Life Span

Description

This course addresses the importance of oral health before, during, and after pregnancy. Clinicians will explore the prevalence of oral disease during pregnancy and its consequences for both mothers and children, as well as review dental treatment guidelines for pregnant women.



This course takes approximately one hour to complete.
Each Clinical Case takes about 10 minutes.

Course Steering Committee Authors

▶ Hugh Silk, M.D.

Dental Consultant

▶ Rocio Quinonez, D.M.D., M.P.H.

Smiles for Life Editor

▶ Melinda Clark, M.D.

OB/GYN Consultant

▶ Lucy Chie, M.D., M.P.H.



LAUNCH COURSE

Course 5:

Oral Health and the Pregnant Patient



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Image: Ken Hurst/Photos.com

A Product of:

Endorsed by:

Oral Health for Women: Pregnancy and Across the Life Span

This course addresses the importance of oral health before, during, and after pregnancy. Clinicians will explore the prevalence of oral disease during pregnancy and its consequences for both mothers and children, as well as review dental treatment guidelines for pregnant women.

Acknowledgements

Course Steering Committee Authors

▶ Hugh Silk, M.D.

Consultants

▶ OB/GYN – Lucy Chie, M.D., M.P.H.

▶ Dentistry - Rocio Quinonez, D.M.S, M.P.H.

Smiles for Life Editor

▶ Melinda Clark, M.D.

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Last Modified:
January, 2018

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Course 5: Oral Health and the Pregnant Patient



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Register

Please complete the training registration. You must enter all fields in the Registration window to start the training.

Registration Information: New users	
First Name:	<input type="text"/>
Last Name:	<input type="text"/>
Email Address:	<input type="text"/>
Password:	<input type="password"/>
State:	Please Select... <input type="button" value="v"/>
Organization/Institution:	<input type="text"/> <i>Please enter the full name of your organization (e.g. University of Alabama, not UA).</i>
Primary Role:	Please Select... <input type="button" value="v"/>
Profession:	Please Select... <input type="button" value="v"/>
Field of Study or Practice:	Please Select... <input type="button" value="v"/>
7 digit AAFP ID number (optional):	<input type="text"/>
<input checked="" type="checkbox"/> By registering on this website, I agree to the following terms and conditions .	
<input type="button" value="SUBMIT"/>	

Returning user
Registered previously? Click here to login
View without registering*
Don't want to register? Click here to begin
*If you choose to view without registering you will not be able to take the end of course assessment, receive a certificate of completion or receive continuing education credit .

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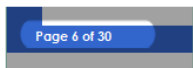
Instructions

Navigation

Back and Next: Click the Back and Next buttons at the top and bottom of each screen to navigate linearly through the course.



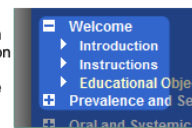
Page Counter: In the lower left hand corner of each page, a page counter indicates how far you have progressed through the course.



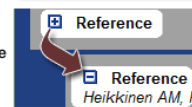
Save & Close: This action will bookmark your progress and close this browser window. Smiles for Life home site is still open in another window.



Page List Navigation: Use the chapter and page lists on the left of each screen to navigate to a specific topic. Clicking on a chapter title opens the chapter's page list. Clicking on a page title will open the page.



More information: Clicking the bold links with a small "+" sign will open additional text. To close this text click the "-" sign.



Optional Clinical Cases



We recommend you complete the optional clinical cases. Launch buttons for each are located at the start of the chapter that corresponds with that case. You can also open these cases at any time by clicking the links that will appear at the top of each page. Each clinical case opens in its own window.

Post Assessment



A required assessment will be given at the end of the course. **If you score less than 80% correct, you will need to go back and retake it before receiving credit.**

Course Evaluation



An evaluation form will appear after you've passed the assessment. We welcome your recommendations for improving the training.

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- Summary & Assessment

Educational Objectives

The educational objectives for the Oral Health and the Pregnant Patient course are:

- Elicit risk factors for periodontal disease and dental caries
- Perform an oral examination using proper anatomical terms and terminology
- Reduce the risk of caries transmission from mother to child
- Apply the evidence for periodontitis affecting perinatal outcomes
- Manage common oral conditions in pregnancy
- Counsel pregnant patients about the safety of dental care
- Improve dental access for pregnant women through interprofessional collaboration
- Promote and address oral health issues across the lifespan for women



Image: Jupiterimages/Photos.com



This course takes approximately one hour to complete.
Each clinical case takes about 10 minutes.

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Oral Anatomy, Terminology, and Examination

Learning objectives targeted in this chapter:

- Elicit risk factors for periodontal disease and dental caries
- Perform an oral examination using proper anatomical terms and terminology



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Oral Disease Risk Factors

When taking an oral history, providers should focus on these risk factors for caries and periodontal disease.

Individual

- Personal history of caries or periodontal disease
- Low socioeconomic status
- Medications that contain sugar or cause xerostomia
- Chronic disease such as diabetes
- Emotional or physical disabilities

Behavioral

- Poor oral hygiene habits
- High sugar-containing diet
- Lack of routine dental visits
- Alcohol and tobacco use

Environmental/Societal

- Non-fluoridated community water
- Poor access to dental and/or medical care

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Adult Oral Examination

A systematic approach to examination is important. Any provider who cares for pregnant women should, at a minimum, examine the teeth and gums for hygiene, inflammation, and disease. A detailed description of the complete oral examination is available in Smiles for Life Course 7: The Oral Examination.


A proper exam requires:

- Adequate lighting
- Tongue depressor
- Gloves

Use Systematic Approach:

- Internal structures
 - Teeth and gingiva
 - Soft and hard tissues
 - Lateral borders and undersurface of tongue
 - Posterior pharynx
- External structures
 - Lips
 - Palpate floor of mouth and neck

Photos show use of gloves to depress the lower lip to examine gums completely and perform palpation



Ellen Eisenberg, DMD

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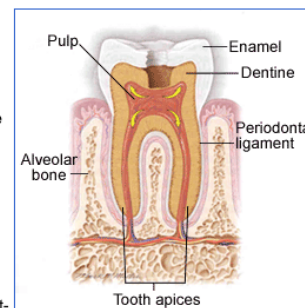
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Tooth Terminology

Anatomy of the Tooth

- The outer protective layer of the tooth is enamel, which is extremely hard.
- The middle layer is dentin.
- The pulp is composed of nerves and blood vessels that exit the tooth via the apices.
- The root connects to alveolar bone via the periodontal ligament.



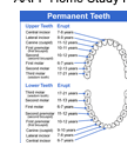
Adult Dentition

Permanent teeth begin to erupt around age 6 years and are all present by 21 years of age. Some adults had their third molars (wisdom teeth) or premolars extracted to relieve crowding, or they may not have erupted, so there may be only 24 to 28 teeth in intact-appearing dentition.

However, most adults have 32 teeth, which include:

- 8 incisors
- 4 canines
- 8 premolars
- 12 molars

AAFP Home Study Program—with permission



[Download a Permanent Dentition Diagram \(PDF\)](#)

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Gingivitis

Gingivitis is superficial inflammation of the gingiva without destruction of the periodontal ligament or bone, which distinguishes it from periodontitis. Pregnancy-related gingivitis affects 25-75% of pregnant women. It likely occurs because immunosuppression and hormonal changes cause an altered response to bacterial plaque.

Symptoms

- Mild gum swelling
- Tenderness
- Erythema
- Bleeding gums when brushing
- Typically identified in the second month and peaks in the eighth month

Mild gingivitis



Etiology

- Plaque buildup from poor oral hygiene triggers gingival inflammation.
- Changes in hormone levels as a result of puberty, pregnancy, and diabetes can magnify the gingival response to plaque, resulting in increased gingivitis.
- During the second trimester, there is a shift from predominant periodontal pathogens to destructive anaerobes, which frequently results in gingival inflammation.
- Decrease in cellular immunity during pregnancy exacerbates this process.

Moderately severe gingivitis



Top: Judith Skelton, MEd, PhD; Bottom: John McDowell, DDS

Preventive Measures & Treatment

- Maintaining excellent oral hygiene through frequent brushing and flossing.
- Regular dental visits to monitor oral hygiene and to reinforce appropriate home care.

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Periodontitis

Periodontitis is deep inflammation of the periodontium which occurs in response to bacterial plaque on teeth. Progression of the disease results in destruction of the supporting bone, increasing tooth mobility and eventually causes tooth loss. It is a relatively common oral disease affecting 15% of pregnant women.

Symptoms

- Periodontitis in its earliest stages may have no obvious symptoms.
- Dentists can detect early disease through clinical probing of the gingiva and radiographs.
- Patients with advanced disease have loose teeth.

Moderately severe periodontal disease



Efthimia Ioannidou, DDS, MDS

Etiology

- Chronic exposure of the periodontal tissues to bacterial plaque cause a chronic inflammation.
- The body's host response to the bacteria, magnifying or suppressing the inflammatory response, helps determine the manifestation and progression of the disease.
- Chronic inflammation leads to destruction of the periodontal ligament, loss of supporting bone, tooth loosening, and eventual tooth loss.
- Smoking, diabetes, HIV, pregnancy, and poor oral hygiene can all contribute to the development of periodontitis.

Preventive Measures & Treatment

- Good oral hygiene and regular dental visits to monitor hygiene and remove subgingival plaque helps to prevent or control inflammation.
- Established disease may require more advanced dental treatment including deep root scaling (cleaning below the gum surface) and antibiotics.

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Dental Caries

In addition to gingivitis and periodontitis, pregnancy also increases the risk for dental caries.

Symptoms

- Caries can be symptom free in early stages
- Changes to the tooth include white spots, which become brown spots and then cavities (a hole in the tooth)
- Once a cavity forms, the root becomes exposed and pain occurs

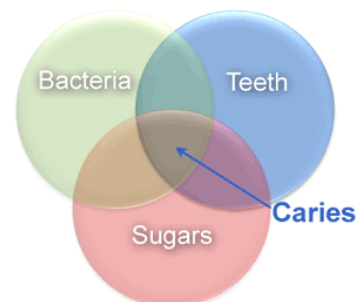
Etiology

- Bacteria (strep mutans and others) metabolize carbohydrates to create acids that erode the tooth enamel

Treatment

- Prevention is key – good oral hygiene, healthy diet, routine dental visits
- Once cavities occur, restorations (fillings), extractions, and/or root canal are needed

This process is reviewed in greater depth in Smiles for Life Module 2: Child Oral Health.



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Caries Risk Transmission from Mother to Child

Learning objective targeted in this chapter:

- Reduce the risk of caries transmission from mother to child.



Image: Jupiterimages/Photos.com

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The Maternal Child Linkage

Caries is a transmissible disease!

- Mothers are the main source of passing streptococci mutans, the bacteria responsible for causing caries, to their infants.
- Transmission occurs via saliva contact such as tasting or pre-chewing food.
- If mom's bacterial level is high, transmission is more likely.
- If colonization is delayed until after age two, then the child will have fewer caries.
- Caregivers with caries also often pass on bad habits (high sugar intake, poor oral hygiene).
- Fathers can pass on the bacteria, but studies show this is less common.
- Message to moms should be BRUSH FOR TWO!

Transfer can occur via shared utensils



Image: Annett Vauteck/Photos.com

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Reducing the Risk

Dental caries is the most common chronic disease of childhood. Untreated caries can lead to local and systemic complications, such as:

- Infections (Dental abscess, facial cellulitis, brain abscess)
- Pain
- Nutrition and growth changes
- Sleep dysfunction
- Poor self-esteem


Caregivers can decrease their own caries levels by:

- Receiving regular comprehensive dental care, including during pregnancy
- Limiting the frequency of sugar in the diet
- Maintaining excellent oral hygiene
- Using preventive agents, such as prescribed mouth rinses and Xylitol-containing gums

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Facial cellulitis



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Postpartum Interventions

At postpartum visits with the mother, focus on the following:

- **Promote breast feeding.**
 - Children who are breast fed are less likely to develop caries than those who are bottle fed, especially if there is ad lib use of bottles and sippy cups.
 - Breastfeeding has multiple other proven health benefits.
 - The American Academy of Pediatrics recommends that breastfeeding should be exclusive for the first 6 months of life and should continue to at least age 12 months or beyond, as desired by mother and child.
- Promote high dose xylitol gum or brief chlorhexidine rinse programs for mom until child is age two.
 - Xylitol can help decrease transmission of caries causing bacteria from mom to child.
 - If chlorhexidine is used, use only for brief periods of time (i.e. weeks) to reduce the risk of tooth staining.
- Ensure children are not put to bed with a bottle.
 - Teeth are at highest risk overnight when saliva levels are low.
- Gently clean infants' gums and teeth after breastfeeding, then brush twice daily with fluoride toothpaste once teeth erupt (AAP and AAPD recommendation).
- Recommend children see a dentist at 12 months of age.

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Effects of Periodontal Disease on Pregnancy

Learning objective targeted in this chapter:

- Apply the evidence for periodontitis affecting pregnancy outcomes.



Image: Ken Hurst/Photos.com

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The Relationship Between Periodontal Disease and Preterm Birth

Preterm birth is the number one cause of neonatal mortality in the U.S., with substantial cost burdens. If treatment of periodontal disease in pregnant women improved pregnancy outcomes, this would be a significant public health benefit.

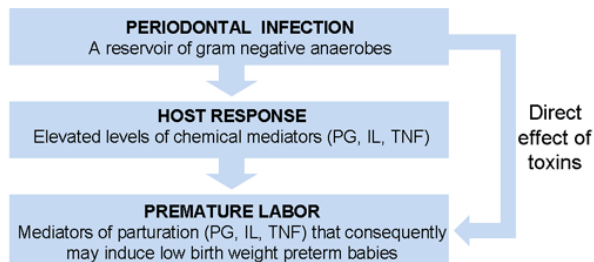
Numerous studies have documented an association between maternal periodontal disease and preterm birth and low birth weight. There are several potential explanations for this association. Periodontal disease may have direct effects on the uterus through bacteremia causing direct infection of the chorioamnion. However, it is more likely that an indirect mechanism mediated by a systemic inflammatory response occurs.

Bacteremia: Direct Mechanism

- Periodontal infection in the mouth may have direct effects on the uterus through bacteremia causing direct infection of the chorioamnion.

Systemic Inflammatory Response: Indirect Mechanism

- It is postulated that preterm birth results from a systemic inflammatory response to periodontal infection that increases prostaglandins and interleukins and affects labor initiation.
- Inflammatory response may lead to placental blood flow restrictions, placental necrosis, and consequent low birth weight.
- A similar mechanism has been proposed to explain the association seen between periodontitis and increased rates of heart disease and diabetes.



Kumar J and Samelson R. Oral Health Care During Pregnancy and Early Childhood: Practice Guidelines. Albany, NY. New York State Department of Health. 2006. P. 23.

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Does Treatment of Periodontal Disease Improve Birth Outcomes? The Bottom Line

The following table summarizes the current medical literature on this subject. At present, studies **do not** demonstrate that treatment of periodontal disease during pregnancy improves pregnancy outcomes. However, the studies **do** demonstrate that periodontitis improved with treatment and that treatment is safe during pregnancy. Studies are needed to determine if pre-pregnancy treatment would lower risk as treatment during pregnancy may be too late to avoid effects of inflammation.

Meta-analysis

- Analysis offers a very thorough review of the latest evidence.
- Inclusion criteria were rigorous with only good RCTs included.
- Women in the treatment groups received deep root scaling and planing (vigorous cleaning below and at the gum line; the standard of care for periodontitis management) before 24 weeks gestation.
- Women in the control groups received routine prenatal care but no specific dental care until after delivery when they were offered deep root scaling and planing.
- Other studies listed are more recent studies not included in the meta-analysis.

Study	Study Type	Participants	Outcomes
Polyzos et al, 2009	Metaanalysis of 7 RCTs	Case 1491 Control 1172	Tx produced: Lower PTB OR 0.55 (p=0.008) Lower LBW OR 0.48 (p=0.049)
Offenbacher et al, 2008	RTC	Case 903 Control 903	No difference in PTB, LBW
Srinivas et al, 2009	RTC	Case 311 Control 425	No difference in PTB, IUGR, Preeclampsia
Newnham et al, 2009	RTC	Case 542 Control 540	No difference in PTB

Definitions: PTB = Preterm Birth, LBW= Low Birth Weight, OR = Odds Ratio, CI=Confidence Intervals

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Other Oral Conditions in Pregnancy

Learning objective targeted in this chapter:

- Manage other common oral conditions in pregnancy.

Apply Your Knowledge

The cases in this course are an opportunity to apply concepts that have been or will be covered in the subsequent slides. Cases can help guide your learning.

CASE 1

Note: Case responses do not count toward your module score.



Image: Leah-Anne Thompson /Photos.com

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Pregnancy Granuloma

Pregnancy granuloma occurs in 5% of pregnant women. It is indistinguishable from pyogenic granuloma, and is a rapidly growing, tumor-like lesion that develops as a response to local irritation such as poor hygiene, overhanging restorations, or trauma. Increasing estrogen and progesterone levels during pregnancy exacerbate the condition.

Symptoms

- Erythematous, nonpainful, smooth, or lobulated mass
- Bleeds easily when touched
- Most frequently develops on the gingiva, but less common locations include the lip, tongue, or buccal mucosa
- May vary in size from a few millimeters to several centimeters in diameter
- Usually appears between second and eighth month of pregnancy

Photo shows a large granuloma



Brad Neville, DDS

Treatment

- Offer reassurance
- Observe unless lesions are bleeding excessively, interfere with eating, or do not resolve spontaneously after delivery
- Lesions can be treated by conservative surgical excision
- Recurrence is uncommon unless the lesion is incompletely removed or the source of irritation remains
- Lesions excised during pregnancy recur more frequently

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Dry Mouth and Hyperemesis Gravidarum

Dry mouth (xerostomia) can worsen both caries and gingivitis.

Management

- Drink water often in small amounts.
- Brush regularly.
- Use fluoride rinse.

Gastroesophageal reflux or Hyperemesis gravidarum are both common in pregnancy and can cause enamel erosions.

Management

- Rinse with water or bicarbonate to reduce acid in mouth immediately after vomiting.
- Avoid brushing too firmly or immediately following vomiting.

Photo shows erosions of the lingual sides of the lower incisors due to excessive exposure to gastric acid in a patient with severe GERD. Mandibular tori are also present.



John McDowell, DDS

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 - ▼ Preventive Agents
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Dental Treatment in Pregnancy

Learning objective targeted in this chapter:

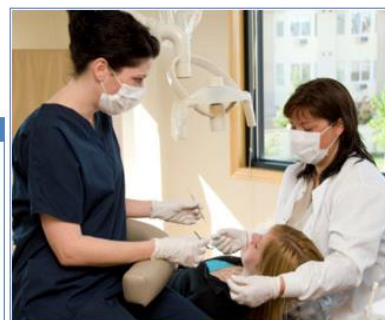
- Counsel patients regarding the safety of common dental interventions in pregnancy.

Apply Your Knowledge

The cases in this course are an opportunity to apply concepts that have been or will be covered in the subsequent slides. Cases can help guide your learning.

CASE 2

Note: Case responses do not count toward your module score.



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The Dental Disconnect

Women frequently do not see a dentist when pregnant:

- Only 26-34% of all pregnant women visit the dentist
- Percentage is even lower for Hispanic women, low SES, and those not aware of oral-systemic linkages
- Only 50% of pregnant woman with a dental problem actually visit a dentist
- Even among women with dental insurance, dental care declines during pregnancy



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Barriers to Dental Care During Pregnancy

All health care providers and patients need to be aware of the importance of oral health and the safety of treatment during pregnancy. Clinicians need to take time during first prenatal visits to ask about oral health, examine the mouth, and refer. Studies show that few primary care clinicians advise pregnant patients to see the dentist.

Why Don't Pregnant Women Obtain Dental Care?

- Obstetrical and primary care providers do not routinely refer patients for dental care
 - Unsure about safety of dental interventions
 - Lack of practical training
 - Competing health demands limits focus on oral health
- Dentists may be unsure of how to manage the pregnant patient
 - Lack of practical training
 - May fear malpractice repercussions
- Patients have competing health demands and may receive conflicting or unclear information about the importance of having a dental visit during pregnancy

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Treatment Guidelines

There is clear national consensus on the importance of oral health during pregnancy, an approach to prenatal oral health, and the safety of dental procedures during pregnancy. These are addressed in two key documents:

- 2012 Oral Health Care During Pregnancy Expert Workgroup. Oral Health Care During Pregnancy: A National Consensus Statement—Summary of an Expert Workgroup which was endorsed by both the American Dental Association (ADA) and the American College of Obstetrics and Gynecology (ACOG).
- The 2013 American College of Obstetrics and Gynecologists (ACOG) Committee Opinion Oral Health Care During Pregnancy and Through the Life Span. This Committee Opinion recommends practitioners:
 - Discuss oral health with all pregnant and post-partum patients.
 - Conduct an oral health assessment during the first prenatal visit. Reassure patients that oral care is safe during pregnancy and should not be delayed.
- American Congress of Obstetricians and Gynecologists states "A dental checkup early in pregnancy will help ensure that your mouth stays healthy. Pregnant women are at an increased risk for cavities and gum disease".

References

Click the thumbnail images below to access each guideline document



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Take Home Messages

Key messages to take away from this course.

- Periodontal disease is associated with preterm birth and low birth weight.
- Periodontal therapy has not been shown to improve pregnancy outcomes, but is safe in pregnancy.
- Decreased levels of cariogenic bacteria in mothers is associated with improved child oral health.
- Routine dental interventions are safe during pregnancy.
- Health professionals should promote oral health throughout the life cycle for all women as mouth health affects overall health.

Time to Take the Assessment



User competencies are assessed at course completion.

To receive a certificate, you must answer all 10 questions and press Submit to see your score. You will then be directed to complete a brief survey and press **Submit** again to view a link to download your certificate. You must score 80% or higher to receive CME credit. Click **NEXT** to take this Assessment.

Need More Information?

The Smiles for Life website contains a listing of recommended websites. These sites are excellent sources of information on oral health for primary care clinicians.

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APPENDIX E
QUALTRICS SURVEY

QUALTRICS SURVEY

Please answer the following questions related to your prior experience.

Q1 Have you worked with OB/GYN patients in the past?

- Yes
- No

Q2 Have you ever provided oral health education specific to pregnancy-related changes with a pregnant patient?

- Yes
- No

Q3 Have you ever performed an oral health assessment on a pregnant patient?

- Yes
- No

Q4 Have you ever had any formal oral health training such as dental tech, dental hygienist, or other dentistry related training?

- Yes
- No

Q5 Prior to this learning activity were you aware of the smiles for life learning modules?

- Yes
- No

Q6 Prior to this learning activity were you aware of the oral health guidelines for women during pregnancy?

- Yes
- No

Q7 Prior to this learning activity were you aware of oral health guidelines for healthcare providers in general?

- Yes
- No

The following questions are adapted from the Student Satisfaction and Self-Confidence in Learning Survey.

Instructions: This questionnaire is a series of statements about your personal attitudes about the **documents** and **learning module**. Each item represents a statement about your attitude toward your satisfaction with learning and self-confidence. There are no right or wrong answers. Please indicate your own personal feelings about each statement below by marking the numbers that best describe your attitude or beliefs.

STRONGLY DISAGREE - with the statement

DISAGREE - with the statement

UNDECIDED - you neither agree or disagree with the statement

AGREE - with the statement

STRONGLY AGREE - with the statement

Please answer the following questions related to your satisfaction with the learning activity

Q8 The teaching methods used in this learning activity were helpful and effective

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q9 The learning materials and activities provided me a variety of ways to promote my learning the oral health during pregnancy guidelines.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q10 I enjoyed how the module presented the learning materials.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q11 The teaching materials used in this learning activity were motivating and helped me to learn.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q12 The way the module presented the materials was suitable to the way I learn.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Please answer the following questions related to your self-confidence in learning

Q13 I am confident that I can master the content of this learning activity that the module presented to me.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q14 I am confident that this learning activity covered critical content necessary for the mastery of oral health during pregnancy guidelines.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q15 I am confident that I am developing the skills and obtaining the required knowledge from this learning activity in order to perform necessary tasks in a clinical setting.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q16 The module used helpful resources to present the learning materials available on oral health during pregnancy guidelines.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q17 It is my responsibility as the student to learn what I need to know from this learning activity.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q18 I know how to find help if I need clarification of the concepts covered in this learning activity.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q19 I know how to find critical aspects in the module and guidelines in the performance of oral health assessment skills.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Q20 It is the module's responsibility to provide me with what I need to learn about the learning activity content.

- Strongly Disagree
- Disagree
- Undecided
- Agree
- Strongly Agree

Please answer the following questions related to your OB/GYN clinic rotation.

Q21 How likely are you to incorporate an oral health screening into your exam of the pregnant patient?

- Not likely
- Somewhat likely
- Very likely

- Q22 How likely are you to provide education about the importance of oral health during pregnancy?
- Not likely
 - Somewhat likely
 - Very likely
- Q23 How likely are you to provide dental referrals?
- Not likely
 - Somewhat likely
 - Very likely
- Q24 How likely are you to promote the Smiles for Life learning module to peers and/or colleagues?
- Not likely
 - Somewhat likely
 - Very likely
- Q25 How likely are you to promote oral health guidelines to peers and/or colleagues?
- Not likely
 - Somewhat likely
 - Very likely
- Q26 How likely are you to promote the oral health consensus statement to peers and/or colleagues?
- Not likely
 - Somewhat likely
 - Very likely

APPENDIX F

**NATIONAL LEAGUE FOR NURSING (NLN) STUDENT
SATISFACTION AND SELF-CONFIDENCE
IN LEARNING**

Student Satisfaction and Self-Confidence in Learning

Instructions: This questionnaire is a series of statements about your personal attitudes about the instruction you receive during your simulation activity. Each item represents a statement about your attitude toward your satisfaction with learning and self-confidence in obtaining the instruction you need. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the numbers that best describe your attitude or beliefs. Please be truthful and describe your attitude as it really is, not what you would like for it to be. This is anonymous with the results being compiled as a group, not individually.

Mark:

- 1 = STRONGLY DISAGREE with the statement
- 2 = DISAGREE with the statement
- 3 = UNDECIDED - you neither agree or disagree with the statement
- 4 = AGREE with the statement
- 5 = STRONGLY AGREE with the statement

Satisfaction with Current Learning	SD	D	UN	A	SA
1. The teaching methods used in this simulation were helpful and effective.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. The simulation provided me with a variety of learning materials and activities to promote my learning the medical surgical curriculum.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
3. I enjoyed how my instructor taught the simulation.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
4. The teaching materials used in this simulation were motivating and helped me to learn.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
5. The way my instructor(s) taught the simulation was suitable to the way I learn.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Self-confidence in Learning	SD	D	UN	A	SA
6. I am confident that I am mastering the content of the simulation activity that my instructors presented to me.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
7. I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
8. I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical setting	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
9. My instructors used helpful resources to teach the simulation.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
10. It is my responsibility as the student to learn what I need to know from this simulation activity.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
11. I know how to get help when I do not understand the concepts covered in the simulation.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
12. I know how to use simulation activities to learn critical aspects of these skills.	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
13. It is the instructor's responsibility to tell me what I need to learn of the simulation activity content during class time..	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

APPENDIX G
CONSENT INFORMATION FORM



**CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH UNIVERSITY OF
NORTHERN COLORADO**

Project Title: Oral Health During Pregnancy: Promoting Awareness of Guidelines and Education Resources in the Evaluation of Self-Perceived Efficacy to Educate, Screen and Refer Women During Pregnancy for the Nurse Practitioner Student

Student Researcher: Leah Salmans, BSN, RN, ~~DNP-S~~

Research Advisor: Jeanette McNeill, ~~DrPH~~, RN, MSN, CNE, ~~ANEF~~

Contact Information:

Student Researcher: Leah Salmans, BSN, RN, ~~DNP-S~~

E-mail: Salm9011@bears.unco.edu

Phone: (970) 430-0506

Research Advisor: Jeanette McNeill, ~~DrPH~~, RN, MSN, CNE, ~~ANEF~~

E-mail: Jeanette.mcneill@unco.edu

Phone: (970) 351-1704

Project Purpose: You are invited to participate in a ~~study which~~ will evaluate the outcome of an introduction and participation in a learning module on the evidence-based guidelines for oral health during pregnancy. This study is the DNP Scholarly project for the student researcher.

The outcomes assessed will be:

- Increase students' awareness of primary care-based oral health guidelines for women during pregnancy.
- Increase students' awareness of available oral health education resources and earn continuing education credits.
- Increase students' perceived self-efficacy for:
 - Providing anticipatory guidance on oral care to pregnant women
 - Performing an oral health assessment
 - When to refer a patient to a dental provider; and
- Increase the likelihood of students to:
 - Incorporate oral health guidelines into practice during OB/GYN clinical rotation.
 - Collaborate with preceptors to provide referrals to dental care providers.

Project Description: As a participant in this research, you will be asked to review two evidence-based guideline documents. After review of the documents you will then be provided with access to a web-based online learning module. There is opportunity, if you desire, to earn continuing education credit (CE) through the learning module. A survey will follow after review of the documents and completion of module. Participation or non-participation in the research study will not affect your grade in the class. The introduction, documents, learning module, and survey will be provided during the first weeks of your summer 2019 course and accessible via the Canvas platform

The documents consist of the comprehensive oral health guidelines during pregnancy for healthcare providers and a shorter condensed consensus statement for you to review. The learning module is a web-based free educational resource provided by the Smiles for Life national oral health curriculum for the integration of oral health into primary care. You are not required to register for this module to access the information. However, you may choose to register and will have the opportunity to earn 1 CE credit after successful completion of the module. Your personal registration information through the Smiles for Life website will not be shared or accessible to the student researcher. For the final step, you will be prompted to complete a short survey (no personal identifiers will be collected in the survey portion).

The time commitment is not anticipated to exceed more than 2 hours. This includes a review of the evidence-based guidelines, completion of the module, and filling out the survey. This is self-paced, and you will be given one week to complete the steps listed above. Results of the study will be accessible via the e-mail listed above to the student researcher after the completion of the Summer 2019 semester.

Risks and Benefits of Participation: There are no anticipated risks to you outside of what naturally occurs when accessing and navigating a new online-based education resource. The benefits include gaining practice on performing oral health assessments, providing education to patients, and when to refer patients to a dentist. Additionally, the materials and resources presented may help you learn and promote the guidelines and therefore, make you better prepared for patient encounters during clinical rotation and future practice.

Participation is voluntary: You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Research, Kepper Hall, University of Northern Colorado Greeley, CO 80639, 970-351-1910.

Subject's Signature _____ Date _____

Researcher's Signature _____ Date _____