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**AN ASSESSMENT OF PREGNANT WOMEN'S VALUE
AND UTILIZATION OF ORAL HEALTH
CARE DURING PREGNANCY**

by

ANGELICA M. SANCHEZ

**BACHELOR OF SCIENCE
DENTAL HYGIENE**

THE UNIVERSITY OF NEW MEXICO, 2020

THESIS

Submitted in Partial Fulfillment of the
Requirements for the Degree of

**Master of Science
Dental Hygiene**

The University of New Mexico
Albuquerque, New Mexico

July 2022

DEDICATION

I am dedicating my thesis to my daughter, Tsenre. She was the whole reason and inspiration behind my work. Every day is a new day to learn something new. I wish for you to have a life full of happiness and growth. You have made me a stronger and wiser person. I love you more than words can express.

Also, to my partner Ernest, who has been a constant source of encouragement and support during all the challenges of graduate school and life itself. Your reassurance kept me going to finish strong, we did it together! I am truly thankful for your support and always believing in me.

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**AN ASSESSMENT OF PREGNANT WOMEN'S VALUE
AND UTILIZATION OF ORAL HEALTH
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**B.S., Dental Hygiene, University of New Mexico, 2020
M.S., Dental Hygiene, University of New Mexico, 2022**

ABSTRACT

The intention of this survey was to examine the value and utilization of dental services during pregnancy, to identify the value being placed on oral health and dental services during pregnancy. Also, to assess if the women received oral health education from obstetric providers. Pregnancy temporarily increases the risk of periodontal diseases, the prevalence of periodontal diseases is very high during pregnancy, 60-75% of women can be affected. Previous literature suggests that poor oral health is linked to adverse pregnancy outcomes such as pre-term births, low birth weights, and pre-eclampsia. Data was obtained and collected using REDCap. Utilizing the collected data, the information provides a descriptive analysis. Across the data, trends can be identified and compared. In conclusion, there is a great value placed on dental services, but the utilization decreases during pregnancy. Not nearly enough women are receiving any oral health education during their prenatal care visits.

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CHAPTER 1

Introduction

Periodontal disease is an oral infection which includes inflammation of the alveolar bone and other surrounding tissues that support the teeth. There are many research studies that have described the negative effects of periodontal pathogens during pregnancy, such as having an increased risk of preterm birth, fetal growth restriction, low birth weight, pre-eclampsia, and gestational diabetes^{1,2}. The purpose of this survey is to determine the value and utilization of dental care services during pregnancy.

Statement of the problem:

What value is placed on oral health care during pregnancy? How many women receive routine preventive dental care during their pregnancy? Are women receiving adequate or any oral health education from their obstetric providers?

Significance of the problem:

Periodontal diseases are prevalent and common diseases that many people will encounter in their lifetime. There are different stages, classifications, and severities of periodontal disease. Certain risk factors can increase a person's susceptibility for periodontal disease that can include smoking, diabetes, poor oral hygiene, underlying immunodeficiencies such as AIDS, medications, stress, and female hormonal changes such as with pregnancy or the use of oral contraceptives. Pregnancy can temporarily increase the risk for periodontal disease due to the fluctuations of hormones. It is estimated that nearly 60-75% of pregnant women

have gingivitis, an early form of periodontal disease². Gingivitis is so prevalent during pregnancy that it has been termed “pregnancy gingivitis”. Many health professionals are aware of the importance of oral health, but often they do not address it as part of their provision of preconception, prenatal, or well woman care. It would be beneficial for pregnant women and their babies if dental hygienists worked alongside obstetricians and midwives to place value and educate pregnant women on the importance of oral care throughout their pregnancy^{3,4}.

Dental hygienists are rigorously trained and educated in not only oral health but overall health and the systemic connections between the two. Dental hygienists play a significant role in educating patients on oral diseases and relating it specifically to their health. Although it seems rather obvious, many individuals do not make the connection of their oral health conditions to their overall health. There are many studies to provide an overview on the misunderstood oral-systemic connection for many medical conditions including pregnancy. Many studies have shown an association between periodontitis and the negative consequences during pregnancy; however, a direct correlation lacks evidence and research on how the two share a direct connection^{1,5,6}.

When women become pregnant, they are aware of the importance of their health in connection to their baby’s health and make efforts to have a healthier lifestyle. Many women seek prenatal care from obstetricians during their pregnancy. Oral health is a vital component to their overall health but often lack the oral care they need and the education and reasoning behind its importance. The perinatal

period is a critical time when health and oral health determinants set in and thus an important time for intervention⁷.

Periodontal diseases are very common and prevalent among the general population and have a systemic link to other health conditions. These oral diseases are multifactorial and are often preventable and treatable. Several studies have suggested that women with poor oral health conditions, such as gingivitis and periodontal diseases, are at greater risk for adverse pregnancy outcomes like preterm birth, low birth weights and other pregnancy related conditions. Some shocking and significant statistics show that 1 in 10 babies are born prematurely and roughly 9% of babies are born with a low birthweight of less than 5lbs 8oz. The CDC outlines that 1 in 25 pregnant women will develop pre-eclampsia and nearly 10% will suffer from gestational diabetes².

Women and medical health care providers are often misled on the misconceptions of the safety of dentistry during pregnancy. Dental care during pregnancy is safe, and there are appropriate guidelines for the treatment of pregnant patients^{8,9}; dental treatment can be provided to pregnant patients in any trimester and special precautions are taken for treatment.

[Operational Definitions:](#)

Periodontal Pathogens: Specialized groups of bacteria that contributes to periodontitis.

Periodontal Diseases: Infection and inflammation of the periodontium.

Pregnancy Gingivitis: Hormonal fluctuations increase the susceptibility and inflammatory response of bacterial plaque on gingival tissues causing infection.

Oral Health Education: Efforts used to improve the knowledge and value placed on oral care and how to prevent common oral diseases by reducing disease causing bacteria in the oral cavity.

Obstetrics: A medical specialty focused on providing care to women during pregnancy and childbirth.

CHAPTER 2: REVIEW OF RELATED LITERATURE

Introduction

The purpose of this literature review is to assess evidence on periodontal diseases during pregnancy. This literature review will highlight previous studies, systematic reviews and research conducted on the subject. The focus of the literature review will be to understand how periodontal pathogens harbor negative effects on pregnancy outcomes, how prevalent periodontal diseases are amongst pregnant women, and to understand the access and utilization to oral healthcare services during pregnancy. It is essential to assess if women are receiving any recommendations from their prenatal health care providers to seek dental treatment or are given any type of oral health education during the duration of their pregnancy.

Information was obtained through PubMed to access Medline databases to explore the most current references. MeSH terms that were used in the database search engine included periodontal diseases, pregnancy, systemic connection, and oral health along with several other terms associated to the topic being reviewed. Search results were filtered by publication year to provide results from the past 10 years (2010-2020). Basic concepts and principles will be reviewed and explained for a clearer understanding of periodontal disease and adverse pregnancy outcomes.

Periodontal Disease (PD)

Periodontal disease, PD, is a chronic multifactorial inflammatory disease of the periodontium, the structure that provides support for teeth, caused by periodontal pathogens with an adverse impact to systemic health. There are approximately 800

species of bacteria identified in the oral cavity¹⁰. Periodontal disease can range from a mild, reversible form to a more severe destructive irreversible form. In its reversible stage, gingivitis, can present as inflamed, erythemic, and bulbous gingival tissues and if left untreated it can progress to more advanced stages. In its advanced and most severe form, periodontal disease is characterized by the destruction of alveolar bone and the eradication of periodontal ligaments resulting in tooth loss. Periodontal disease is the most prevalent and common oral disease that affects majority of the United States population. Periodontal disease is a treatable and completely preventable disease.

Periodontal disease is evidently caused by bacteria, but the progression and worsening are due to a host immune response. The inflammation caused by PD is not limited to the oral cavity⁷. There are many risk factors that increase the risk of periodontal disease and are either classified as modifiable or non-modifiable and there are many associations between periodontal disease with medical conditions. Periodontitis has a complex etiology acting at multiple levels: at the microbial level, based on the presence of dysbiotic microbial communities with potential for destructive inflammation; at the host level, based on genetic factors that may predispose to or protect from disease; and at the level of environmental factors and systemic health status that modify the host response in either protective or destructive direction¹¹. Periodontal diseases are prevalent among the general population affecting about 50%-90%¹ worldwide for both sexes, pregnancy increases the risk of periodontitis and is seen in 30%-100%^{12,13,24} of expecting women.

For the purpose of this literature review, the focus will be held on modifiable risk factors and pregnancy.

Periodontal Pathogens and Oral Bacteria

There have been many research studies to identify the connection between periodontal disease in association to adverse pregnancy related outcomes. Periodontal pathogens are categorized by color into different complexes based on their virulence. The less virulent, gram-positive, pathogens fall into either the blue, purple, or yellow complexes and the more virulent, gram-negative, anaerobic pathogens are categorized into either red, orange, or green complexes. (The identification of some specialized bacteria which have been linked to adverse pregnancy related outcomes include *Fusobacterium nucleatum* (orange complex), *Porphyromonas gingivalis* (red complex), *Parvimonas mica*, *Aggregatibacter actinomycetemcomitans* (green complex), *Prevotella intermedia* (orange complex), *Tannerella forsythensis* (red complex), and *Treponema denticola* (red complex)^{5,6,10,11,14} that have been linked in connection to adverse pregnancy outcomes.) Of the listed microorganisms, *F. nucleatum* and *P. gingivalis* are the most commonly identified and associated with adverse pregnancy related outcomes.

Prevotella intermedia, and *Treponema denticola* are other periodontal pathogens that are present in pregnant women who experience gingival inflammation. Disruption of host immune homeostasis by periodontal pathogens might be the direct and major reason of exacerbated periodontal disease during pregnancy¹⁴. *Prevotella intermedia* with high levels of estrogen is found to be the

cause of what is known as pregnancy gingivitis, not to be confused with periodontitis^{11,15}.

P. gingivalis is the most investigated oral pathogen in relation to pregnancy. A clinical study on mice and rats was conducted to test the outcomes of these bacteria on pregnancy. Experiments in pregnant mice have provided insights into how *F. nucleatum* can cause intra-uterine infection and inflammation. *P. gingivalis*, were also shown to colonize the placenta and fetal tissues of mice or rats and thereby causing inflammation and pregnancy complications¹¹. Furthermore, *Fusobacterium nucleatum* has been studied and shows a link between adverse pregnancy outcomes, neonatal sepsis, stillbirth, and hypertensive disorders of pregnancy⁵.

Fusobacterium sp. have been identified in different sites throughout the body including oral and vaginal origin. *Fusobacterium nucleatum* is an invasive microorganism that has the ability to bind and invade host tissues and cells whereas the vaginal form, *Fusobacterium gonidiaformans*, cannot invade and bind to epithelial and endothelial cells. Samples have been collected, examined, and identified as originating from oral or subgingival sites rather than the lower GI tract when examining the different strains that are connected with adverse pregnancy outcomes, demonstrating that the oral bacteria are capable of translocation to the fetal-placental unit⁵.

There are numerous types and varying species of bacteria that are found within the oral cavity. Not all bacteria found in the oral cavity are disease causing. Low levels of *Lactobacilli* in saliva were associated with preterm birth. An earlier

study also reported that salivary *Actinomyces naeslundii* genospecies 2 and *Lactobacillus casei* levels could be used to predict birth outcomes¹⁵.

Although any of these microorganisms can be present in the oral cavity, it does not necessarily mean that the expecting mother will experience adverse pregnancy related issues. These microorganisms can be found in individuals who are periodontally healthy but are more numerous in quantity in individuals who are in an active state of periodontitis. The measure to determine the association between periodontal pathogens in the placenta and adverse pregnancy outcomes should be the amount and prevalence, not the mere presence of such microorganisms⁶.

Adverse Pregnancy Outcomes

Several studies, reports, and systematic reviews have been conducted to assess and clarify the effects of periodontitis in association to adverse pregnancy outcomes. It was first reported in 1996 that periodontal disease was a potential risk factor for preterm birth. The potential correlation has been expanded from periodontitis and preterm birth to various forms of periodontal infections and adverse pregnancy outcomes, including preterm birth, low birthweight, stillbirth, miscarriage, intrauterine growth retardation, and pre-eclampsia¹⁵. Maternal and fetal mortality have also been associated as adverse pregnancy related outcomes. The most researched and published studies focus on preterm births and low birth weights in connection to periodontitis.

Since the discovery of the link between periodontitis and adverse pregnancy outcomes, the exact theory of how the two are connected have been studied and examined to determine the exact cause. It is still unclear exactly how periodontal

disease causes adverse pregnancy related outcomes, but it is still being studied and many correlations have been discovered. Two major plausible biological mechanisms have been proposed: firstly, periodontal pathogens that disseminate systemically may cross the placenta into the fetal circulation and amniotic fluid, and secondly, inflammatory mediators produced locally in the periodontium could enter the systemic circulation and stimulate an acute-phase response and thereby adversely affect the placenta and fetus¹¹.

These adverse pregnancy outcomes can be successfully prevented with the proper education and value placed on oral health as well with maintaining proper oral hygiene. More value and awareness need to be placed on oral health and how it plays a key role in the health of pregnant women.

Hormonal Influences

During pregnancy, hormone levels fluctuate incredibly, specifically estrogen and progesterone. These hormones have been associated with significant oral changes and are remarkably elevated during the physical transformations. High hormone levels during this period [pregnancy] are known to increase the incidence of diseases, such as gestational diabetes, hypertension, pre-eclampsia, and periodontitis^{12,24,25}. The fluctuations of these hormones exacerbate gingival permeability, gingival manifestations and conditions and lowers the host immunity response making pregnant women more vulnerable to oral infections. These gingival changes mostly occur during the second and third month of pregnancy although periodontal conditions can be experienced at any stage during pregnancy. There is also an increased incidence of pyogenic granulomas during pregnancy at a

prevalence of 0.2 to 9.6%¹³. Both reversible and irreversible changes take place in oral cavities of women during pregnancy. High levels of estrogen have been found to be associated with occurrence of gingival hyperplasia, gingivitis, pyogenic granulomas, dental caries, and alterations in salivary flow¹⁶. Pregnancy gingivitis is a common and reversible gingival condition that will usually resolve on its own within 2 months of delivery.

Effects of estrogen on the periodontal tissues include increased cellular proliferation in blood vessels, reduces T-cell mediated inflammation, and increases the amount of gingival inflammation with no increase of plaque just to list a few. Some effects of progesterone on the periodontal tissues include increasing vascular dilation, thus increasing permeability, reduces repair and maintenance potential, and increases the production of prostaglandins. The levels of sex steroid hormones in saliva increase during pregnancy resulting in alterations in the microbial populations which may contribute to these pathologic changes¹⁷.

Dental Care During Pregnancy

Dental care is an important aspect to overall health and well-being but utilization and access to dental care is a worldwide challenge that is faced every day among the general population. Oral health becomes of greater importance during pregnancy because it now pertains to both the mother and baby. Pregnant women are more susceptible to dental disease and often lack or defer the dental care services they need during pregnancy for several concerns and reasons. The CDC and Pregnancy Risk Assessment Monitoring System (PRAMS) reported that 23% to 35%¹⁸ received dental care during their pregnancy. Factors that act as determinants

of dental care during pregnancy include demographic, socioeconomic, psychological, behavioral factors, and perceived need. Oral health care during pregnancy still reaches few women, and socioeconomic status remains one of the most important determinants for access to health services⁸.

Controversy exists whether it is safe for pregnant women to receive dental treatments during pregnancy. These myths have a great influence and impact on pregnant women, and they tend to dismiss the need and value of dental care and their oral health. Although some pregnant women hesitate to receive prenatal oral care, recent publications indicated that many dental treatments can be performed safely during pregnancy, such as extractions, local anesthetic, root canal treatment, scaling, and root planning^{9,17}. Special accommodations and precautions are made when treating pregnant women in the dental setting. Previously, recommendations were made for pregnant women with active periodontitis to receive therapy during the second trimester. Research has shown that even though scaling and root planning is effective in reducing the number of periodontal pathogens, it is not effective in reducing the microorganisms that interact with the placental microbe^{7,8,17}. Treatment is more effective prior to pregnancy or during the first trimester before the microorganisms enter circulation and reach the placenta. Therefore, this makes establishing routine dental care especially important.

Dental treatment has been shown and is proven to be safe during pregnancy and some procedures are recommended to be performed during certain trimesters. Dental check-ups can be performed during any trimester. Some procedures should not be postponed until after delivery and need to seek appropriate or even emergent

treatment before they worsen. There are many theories and concerns about radiation and potential harm to the fetus, but radiographs are safe to take during pregnancy and dental professionals follow the “As Low As Reasonably Achievable” (ALARA) concept to reduce the amount of radiation exposure and are only taken if necessary. Local anesthetics can also be administered during pregnancy but are limited to lidocaine and prilocaine which are classified by the FDA as category B. However, the use of Nitrous oxide is contraindicated during pregnancy because it is shown to cause harm, result in abortion and cause congenital anomalies to the unborn fetus⁹.

Oral Health Education

Pregnancy is the ideal time to instill and promote the value of primary oral health in relation to their children and discuss how to reduce early childhood caries (ECC), another prevalent oral disease. Education can also be placed on the link between periodontitis and adverse pregnancy outcomes and just how important routine dental care is to overall health. The general population often lacks the knowledge about the connection between the oral systemic link.

Dental hygienists are highly educated dental professionals and should be more involved with prenatal care to either provide education or dental services. Less than half of women reported that they have received referrals and recommendations to seek dental care during their pregnancy¹⁸. There seems to be a lack of interprofessional communication between prenatal providers and dental providers. Dental hygienists can focus on promoting preventive strategies, proper oral care, nutrition, and oral problems that are specifically related to pregnancy. **Greater**

awareness of the importance of oral health in pregnancy among clinicians, women, and dental care specialists, can have a significant impact on improving overall health of women and their families¹⁸.

More involvement from gynecologists in the promotion and awareness of perinatal oral health is essential for the reduction and prevention of adverse pregnancy outcomes. Gynecologists can lend a helping hand and become more involved in the interdisciplinary approach in oral medicine to overcome the barriers and lack of access to dental care by promoting the utilization of dental services and bring awareness to its benefits. Women tend to visit gynecologists more frequently than other medical professionals; hence, they play a crucial role in the health of women and more so for the pregnant woman¹⁹.

Oral Health Education of Obstetricians and Midwives

The knowledge and attitudes of prenatal care providers regarding oral health can have a direct impact to their patient's. Barriers that impact referrals of oral care include lack of knowledge on prenatal oral health, time for counseling, and a demand for service. Although gynecologists agreed that oral screening should be part of prenatal care, they rarely refer pregnant patients to dental care²⁰. Myths and a lack of practice standards regarding oral health also create a barrier to dental care during pregnancy. Several surveys have shown that even though obstetricians and midwives have general knowledge about dental care and treatment during pregnancy, as well as the relationship between oral health and pregnancy outcomes, they do not apply the knowledge to their own practices. When it came to putting their knowledge into practice, only 40% of this study's obstetricians advised routine dental

visits during pregnancy, and only 47% advised their patients about oral hygiene during prenatal period⁴. During a routine checkup, 85.7% of gynecologist never examined the oral cavity of the patient. Findings suggest that attitudes are a significant determinant of accurate knowledge and current practice²⁰.

Summary

A high percentage of pregnant women are affected by some form of periodontal disease throughout some point during their pregnancy²⁴. Many studies have been conducted and published to have insight on the connection between periodontal disease and its effects during pregnancy. Periodontal disease is a multifactorial disease; periodontal pathogens and oral bacteria have different manifestations on the disease. Additionally, pregnancy and hormonal fluctuations can have effects on and contribute to the disease. It is essential to incorporate oral health care and oral health education prior to and during pregnancy to reduce the negative effects that periodontal disease can have on mothers and their unborn children.

CHAPTER 3: METHODOLOGY

Introduction:

This descriptive research approach focused on studying the value and utilization of oral health care services during pregnancy using a survey method to obtain information. Subjects for the survey were chosen based on judgmental/purposive sampling, querying women who are currently pregnant or have been pregnant within the last 24 months. Surveying methods were distributed to a Facebook group for pregnant women and mothers in New Mexico. The Facebook group is named “Moms Who Wine Together NM (MWWTNM).” The survey link was shared and accessed by other women who wanted to participate. The survey questions focused on the oral health literacy of pregnant women and utilization of dental services during pregnancy. Past studies have shown the correlation between periodontal disease and pregnancy related outcomes.

Sample description:

The sample population for this study targeted pregnant women and women who have given birth within the last 24 months to evaluate their value and understanding of the importance of dental services during pregnancy and oral health literacy. The survey was distributed to the specified population through methods of social media and convenience sampling. The focus group is a Facebook group geared towards mothers of New Mexico which currently has over 1,700 members.

Research design:

This was a descriptive analysis study using a survey approach to obtain data to help determine the value, utilization, and oral health literacy of women during pregnancy and postpartum. The survey questionnaire included demographic information such as age, education level and number of pregnancies. Survey questions also assessed if women noticed any changes in their gingiva during pregnancy. Other questions asked women of their participation, if any, in routine dental care, home care routine, and assessed their oral health literacy. Education is key to creating awareness and improving oral health. Participants were asked to truthfully answer all survey questions as information was kept confidential and remained anonymous.

The research design included survey methodology to obtain data, so a written informed consent was not required. Instead, the participants completion of the survey served as informed consent. The participants were able to choose to participate or decline as well as not answer any questions. Participants were encouraged to fully complete the survey; this helped to obtain the most accurate data. Prior to and during the administration of the survey, the University's Human Research Review Committee (HHRC), which acts as the UNM Health Science Center Institutional Review Board (IRB), reviewed, and approved this study to ensure ethical standards were upheld.

The survey was created using an online survey program. The survey contained questions regarding oral health and if any changes have been noted or

occurred during pregnancy, if dental services were utilized during pregnancy, and if any oral health education or referrals were given by obstetrics providers regarding oral health. The intention of this survey was to obtain information from the participants and will not serve as any diagnostic measurements.

The survey was available and open to participants for two (2) weeks. The survey duration was about 10 minutes to complete and consisted of about 20 questions. The survey does not allow for any open-ended responses. The participants were asked to answer the questions with provided rankings that will best fit their responses.

Data Collection and Analysis:

Collection of data utilized an online platform, REDCap, to obtain and manage survey information. The utilization of REDCap is free of charge so there was not a budget allowance for this research survey. Study data were collected and managed using REDCap electronic data capture tools hosted at the University of New Mexico. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources.²⁰

CHAPTER 4: RESULTS, DISCUSSION AND CONCLUSION

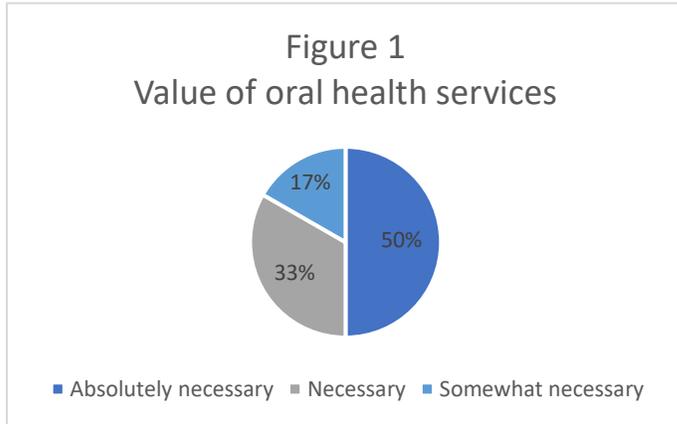
Summary:

Forty-one participants consented and agreed to the terms of the survey. The responses are skewed as some questions were not completed by the 41 participants that consented to the survey leaving the data disproportioned.

Demographics show that most of the participants, 62.2%, were between the ages 25-30, and there were no participants that were under the age of 18 years. Of the participants that took the survey, 42.1% were currently pregnant. Of those pregnant women, 37.5% were in the third trimester while the remaining participants were either in the first or second trimester equally (31% for each trimester). One of the major qualifying criteria for the participants was having a recent pregnancy within the last 24 months, 94.7% reported that their most recent pregnancy was within 24 months, or they were currently pregnant. The current pregnancy was their first pregnancy for about half of the women and the other half answering that they have had two or more pregnancies. The educational level of the respondents shows fewer holding a master's degree, about 10%, and near amounts with high school diplomas/GED/equivalent at 29.7%, 2 years of college/associate degree at 24.3%, and bachelor's degree at 35.1%. None of the participants have obtained a doctoral degree.

Out of the 41 participants, there were 36 responses and only 1 person reported that she did not have access to any dental care. Many of the women, 77.8%, have had a recent dental/dental hygiene visit within the last 12 months. Fifty percent of the participants value oral health services as 'absolutely necessary' while

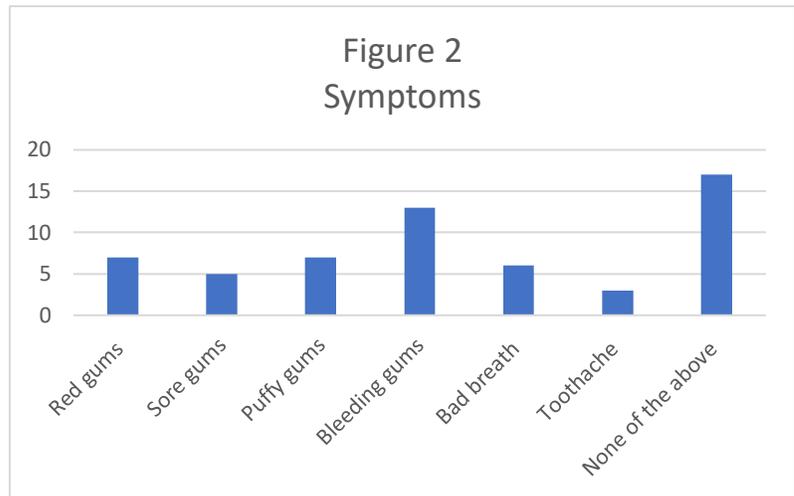
the other combined 50% rated between the values of oral health as 'necessary' and



'somewhat necessary' shown in Figure 1. Prior to their pregnancy or most recent pregnancy, 83% of women sought out routine dental services. The women were also asked to rate their current oral

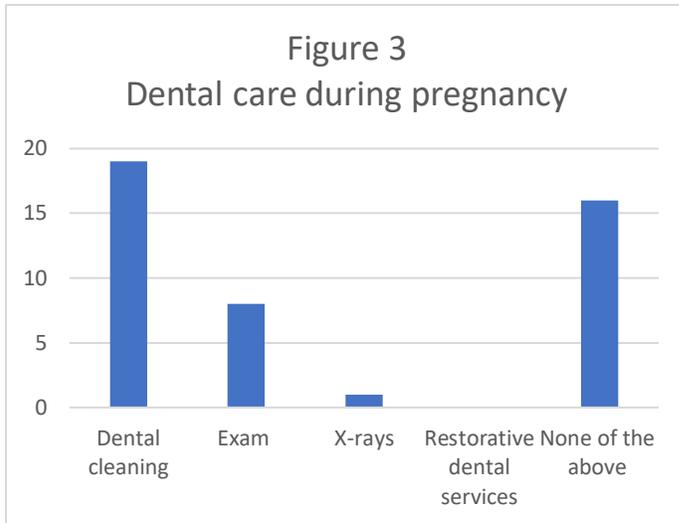
health. The results showed that 66.6% rated themselves to have either 'Great' or 'Good' oral health while 19.4% rated 'Excellent', 8.3% 'Fair' and 5.6% 'Poor' oral health. Based off the

answers to the home care questions, majority brush their teeth 1-2 times a day (94.3%), floss occasionally 1-3 times a week (62.9%), and brush their tongue once



to twice a day (88.6%). Mouth rinse is utilized the least, used by only 13 respondents once a day equaling 37.1%.

The symptoms plot shown in Figure 2 represents a scattered range of symptoms that are being experienced, though majority of women answered that they are not experiencing any of the above. Eighty-five percent responded that they had not been diagnosed with either gingivitis, bone loss or active periodontal disease by a dental professional.



The majority, 94.3%, of women sought out prenatal care during their pregnancy. The most sought out prenatal care provider was an OB/GYN at 87.9% followed by the midwife provider at 36.4%. Only 4 women recalled that their prenatal care provider discussed

oral hygiene/education or oral health during their pregnancy. Of those 4 women, the advice that was given to them was a referral or recommendation to seek dental care. As far as rating if women believe that receiving dental care during pregnancy is safe, 77.1% highly agreed. As expressed in Figure 3, nearly equal amounts of women answered that they had a dental cleaning during their pregnancy or no services at all. To end the survey, women were asked if they were aware that poor oral health can negatively affect pregnancy and the unborn child, the responses showed that 71.4% were aware.

Discussion of Results:

The survey did not gather nearly enough data to answer the initial study questions on the value placed on oral health care, the utilization of preventive care during pregnancy and whether pregnant women are receiving adequate oral health education from their obstetric providers, although there were trends seen across the data obtained.

Trends that are noticed from the data show that majority of the women have a higher value placed on oral health services being that 'absolutely necessary' and 'necessary' were the highest ranked totaling 83% of the responses. All but one of the participants have access to dental care and when compared to their recent dental visit about 64% seek out dental services on a routine basis. Prior to pregnancy, 83.3% of women received routine dental services, but during their pregnancy 54% reported that they received dental services. This shows a decrease of dental services being provided to women during their pregnancy. Most of the women agreed that receiving dental services during pregnancy is safe, yet only a little over half received any type of dental services during their pregnancy. A trend displayed that there were nearly equal amounts of women that did not seek or receive dental services during pregnancy, while the other half that received services during their pregnancy at least received a dental cleaning during that time.

Based off the responses, there is not nearly enough oral health education or a system in place to offer pregnant women oral health education during their pregnancy. There were only four participants that recalled their obstetric provider discussing any type of oral health with them and the information that was shared with them was a referral or recommendation to seek dental care. This shows a lack in oral hygiene education from obstetric providers to their pregnant patients.

The participants were asked about their current oral health status and home care routine. All but five selected that their current oral health status is 'Good', 'Great', or 'Excellent'. When the participants were asked about a diagnosis of gingivitis, bone loss, or active periodontal disease, most of the women selected 'No'.

When this data was compared to the question that asked the participants about any of the following symptoms: red, sore, puffy and/or bleeding gums, bad breath, or toothache more than half selected that they were currently experiencing one or more of the listed symptoms. This correlation shows that there is a lack of education and awareness on the symptoms and signs of gingivitis and periodontal disease. As literature shows, periodontal disease is a common disease and can be easily developed during pregnancy due to many factors including the fluctuation of hormones, the survey showed that about half of the women displayed one or more sign or symptom during their most recent pregnancy. As the participants answered questions regarding their home care routine, the data showed that the participants lack a stable home care routine that is optimal for their oral health as correlated to the number of symptoms that are being experienced. There is a known link that poor oral health can negatively affect a pregnancy and unborn baby, 71.4% of the participants selected that they were aware of this correlation. An extraneous variable that could have skewed results is if participants have a background knowledge of the oral systemic link regarding the adverse pregnancy outcomes linked to periodontal disease which will produce inaccurate conclusions. Prior literature suggests that oral and dental care require special attention, Oral health is a part of general health, and it is of even greater importance during this period because it concerns both the mother and fetus¹⁷. As suggested, neglect of oral health during pregnancy can lead to adverse pregnancy outcomes.

The data from the survey shows a higher response rate of dental services received during pregnancy when compared to statistics from the CDC and the

Pregnancy Risk Assessment Monitoring System (PRAMS) that reported 23% to 35% received dental care during their pregnancy⁸. Obstetric providers have a direct impact to their patients care and overall wellbeing, based off this survey not nearly enough are giving full comprehensive care due to the lack of dental referrals and lack of oral health education not being discussed. A greater involvement from obstetric providers in the promotion and education of oral health during pregnancy is essential in the reduction and prevention of related adverse pregnancy outcomes. pregnancy is essential in the reduction and prevention of related adverse pregnancy outcomes. Pregnancy is not a time where dental care should be postponed or neglected. Literature suggests that women visit gynecologists more frequently than any other medical professionals, yet they lack including any oral health education into their own practices^{4,21}. This survey revealed that less than 12% of women had discussed oral health during their visits with their obstetric providers. Literature has also suggested that gynecologists with lack of knowledge and time regarding outcomes of poor oral health respectively were less likely to refer for comprehensive oral care services for pregnant patients^{4,19}. This survey did not examine the level of oral health knowledge of obstetric providers, but the data does show that there were very few providers that discussed oral health or referred out for dental services.

Conclusions:

The purpose of this study was to examine the value and utilization of oral health care during pregnancy and if women are receiving adequate oral health education from obstetric providers. Women should be receiving complete comprehensive care to ensure overall health and the best pregnancy outcomes, and

this can be achieved by incorporating dental care with prenatal care. Although obstetricians specialize in care during pregnancy, periodontal disease education, prevention and treatment should be provided by licensed dental hygienists as this is the treatment, they specialize in. There is a need for and development of universal guidelines in the medical field to help reduce the number of pregnant women who experience periodontal diseases and implement the need for routine dental care.

One way to reduce the risk for periodontal disease would be through education. Education can be accomplished by having a dental hygienist work outside of the common dental clinical setting and be employed in the obstetrics department in either hospital settings, private practices and/or community clinics. The collaboration of medical and dental providers working together to treat patients will result in the best comprehensive health care for expectant mothers and their babies. If dental hygienists worked in these settings, they could have the opportunity to provide education and limited oral evaluations during visits and help bridge the gap and disparities by creating a pathway to receive the proper oral care.

There were limitations to this survey and one being that REDCap continued to allow the participants to continue with survey although there was an action tag to stop/end survey if participants selected specific answers that would no longer qualify them to be eligible to participate. Another limitation being that the survey link could be shared with anyone and was not limited to women living in New Mexico as the targeted population was intended.

Due to the low response rate, statistical analysis could not be performed. Therefore, descriptive analysis was performed on the data provided. A future study

may look at disseminating the survey at the clinics in which prenatal care is provided. This would allow for more accurate data and an increase in the response rate. Suggestions for future studies would be asking more in-depth questions related to the adverse pregnancy outcomes linked to periodontal disease such as asking if the women had any complications during their pregnancy such as high or low blood pressure, diagnosed with gestational diabetes, and at birth if their baby was born premature and/or with a low birth weight or other complications. Previous literature also suggests that socioeconomic status is significant to the prevalence of periodontal diseases. Defining the socioeconomic status can be included into the demographic section of the survey.

CHAPTER 5: ARTICLE FOR SUBMISSION

Abstract

Purpose

The purpose of this study was to examine if there is a value being placed on oral health education and services during pregnancy. The study aims to assess how many women receive preventive dental care during their pregnancy and if they receive oral health education from the obstetric providers.

Methods

Obtaining information and data from the selected population was completed by survey methodology using REDCap electronic data capture tools hosted at the University of New Mexico. The targeted population included pregnant women and women within 24 months postpartum.

Results

A descriptive analysis of the data showed a decrease in the number of dental services during pregnancy when compared to before pregnancy; the utilization of services dropped to roughly half during pregnancy. Although, most women responded that they have a high value placed on oral health services and report that dental services during pregnancy is safe, the utilization of those services appear to be lacking. All but one participant answered that they have access to dental care. About half of the participants were experiencing one or more signs or symptoms of gingival inflammation at the time of the survey. Eighty-five percent of women reported that they had not been diagnosed with gingivitis, bone loss or active periodontal disease by a dental professional. Based off the responses, oral health

education is lacking from prenatal providers and programs need to be implemented to educate pregnant women on the importance of good oral health.

Conclusion

Expanding oral health literacy can help increase the overall health and well-being of individuals. Oral health education can be impactful to pregnant women when discussed and integrated with prenatal care. The incorporation of dental hygienists along with prenatal care providers can help bridge the gap and disparities in this population.

Keywords: Pregnancy, Education, Oral Health, Value, Utilization

Introduction

Periodontal disease is an oral infection which includes inflammation of the alveolar bone and other surrounding tissues that support the teeth. There are many research studies that have described the negative effects of periodontal pathogens during pregnancy, such as having an increased risk of preterm birth, fetal growth restriction, low birth weight, pre-eclampsia, and gestational diabetes.^{1,4} The purpose of this study is to determine the value of oral health education and utilization of dental care services during pregnancy. The study will help to determine the value placed on oral health care during pregnancy and how many women receive routine preventive dental care during their pregnancy. The study will also determine if women are receiving adequate or any oral health education from their obstetric providers.

Periodontal diseases are prevalent and common diseases that many people will encounter in their lifetime. There are different stages, classifications, and severities of periodontal disease. Certain risk factors can increase a person's susceptibility for periodontal disease that can include smoking, diabetes, poor oral hygiene, underlying immunodeficiencies such as AIDS, medications, stress, and female hormonal changes such as with pregnancy or the use of oral contraceptives.¹ Pregnancy can temporarily increase the risk for periodontal disease due to the fluctuations of hormones. It is estimated that nearly 60-75% of pregnant women have gingivitis, an early form of periodontal disease.¹ Gingivitis is so prevalent during pregnancy that it has been termed "pregnancy gingivitis". Many health professionals are aware of the importance of oral health, but often they do not

address it as part of their provision of preconception, prenatal, or well woman care. It would be beneficial for pregnant women and their babies if dental hygienists worked alongside obstetricians and midwives to place value and educate pregnant women on the importance of oral care throughout their pregnancy.^{2,3}

Dental hygienists are rigorously trained and educated in not only oral health but overall health and the systemic connections between the two. Dental hygienists play a significant role in educating patients on oral diseases and relating it specifically to their health. Although it seems rather obvious, many individuals do not make the connection of their oral health conditions to their overall health. There are many studies to provide an overview on the misunderstood oral-systemic connection for many medical conditions including pregnancy. Many studies have shown an association between periodontitis and the negative consequences during pregnancy but a direct correlation lacks evidence from research.^{4,5,6}

When women become pregnant, they are aware of the importance of their health in connection to their baby's health and make efforts to have a healthier lifestyle. Many women seek prenatal care from obstetricians during their pregnancy. Oral health is a vital component to their overall health but often lack the oral care they need and the education and reasoning behind its importance. The perinatal period is a critical time when health and oral health determinants set in and thus an important time for intervention⁷.

Periodontal diseases are very common and prevalent among the general population and have a systemic link to other health conditions. These oral diseases are multifactorial and are often preventable and treatable. Several studies have

suggested that women with poor oral health conditions, such as gingivitis and periodontal diseases, are at greater risk for adverse pregnancy outcomes like preterm birth, low birth weights and other pregnancy related conditions. Some shocking and significant statistics show that 1 in 10 babies are born prematurely and roughly 9% of babies are born with a low birthweight of less than 5lbs 8oz. The CDC outlines that 1 in 25 pregnant women will develop pre-eclampsia and nearly 10% will suffer from gestational diabetes¹.

Women and medical health care providers are often misled on the misconceptions of the safety of dentistry during pregnancy. Dental care during pregnancy is safe, and there are appropriate guidelines for the treatment of pregnant patients;^{8,9} dental treatment can be provided to pregnant patients in any trimester and special precautions are taken for treatment.

Methods

This descriptive research approach focused on studying the value and utilization of oral health care services during pregnancy using a survey method to obtain information. Collection of data utilized an online platform, REDCap, to obtain and manage survey information. REDCap is an electronic data capture tool hosted at the University of New Mexico. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources.¹⁰

Subjects for the survey were chosen based on judgmental/purposive sampling, querying women who are currently pregnant or have been pregnant within the last 24 months. Surveying methods were distributed to a Facebook group for pregnant women and mothers in New Mexico. The Facebook group is named “Moms Who Wine Together NM (MWWTNNM).” The survey link could have been shared and accessed by other women who wanted to participate. The survey questions focused on the oral health literacy of pregnant women and utilization of dental services during pregnancy. Past studies have shown the correlation between periodontal disease and pregnancy related outcomes.

The survey questionnaire included demographic information such as age, education level and number of pregnancies. Survey questions also assessed if women noticed any changes in their gingiva during pregnancy. Other questions asked women of their participation, if any, in routine dental care, home care routine, and assessed their oral health literacy. Education is key to creating awareness and improving oral health. Participants were asked to truthfully answer all survey questions as information was kept confidential and remained anonymous. The participants were able to choose to participate or decline as well as not answer any questions but were encouraged to fully complete the survey; this helped to obtain the most accurate data. Prior to and during the administration of the survey, the University’s Human Research Review Committee (HHRC), which acts as the UNM Health Sciences Center Institutional Review Board (IRB), reviewed, and approved this study to ensure ethical standards were upheld.

Results

Forty-one participants consented and agreed to the terms of the survey. The responses are skewed as some questions were not completed by the 41 participants that consented to the survey leaving the data disproportioned.

Demographics show that most of the participants, 62.2%, were between the ages 25-30, and there were no participants that were under the age of 18 years. Of the participants that took the survey, 42.1% were currently pregnant. Of those pregnant women, 37.5% were in the third trimester while the remaining participants were either in the first or second trimester equally (31% for each trimester). One of the major qualifying criteria for the participants was having a recent pregnancy within the last 24 months, 94.7% reported that their most recent pregnancy was within 24 months, or they were currently pregnant. The current pregnancy was their first pregnancy for about half of the women and the other half answering that they have had two or more pregnancies. The educational level of the respondents shows fewer holding a master's degree, about 10%, and near amounts with high school diplomas/GED/equivalent at 29.7%, 2-years of college/associate degree at 24.3%, and bachelor's degree at 35.1%. None of the participants had obtained a doctoral degree.

Out of the 41 participants, there were 36 responses and only 1 person reported that she did not have access to any dental care. Many of the women, 77.8%, have had a recent dental/dental hygiene visit within the last 12 months. Fifty percent of the participants value oral health services as 'absolutely necessary' while the other combined 50% rated between the values of oral health as 'necessary' and 'somewhat necessary' (Figure 1). Prior to their pregnancy or most recent pregnancy,

83% of women sought out routine dental services. The women were also asked to rate their current oral health. The results showed that 66.6% rated themselves to have either 'Great' or 'Good' oral health while 19.4% rated 'Excellent', 8.3% 'Fair' and 5.6% 'Poor' oral health. Based off the answers to the home care questions, majority brush their teeth 1-2 times a day (94.3%), floss occasionally 1-3 times a week (62.9%), and brush their tongue once to twice a day (88.6%). Mouth rinse is utilized the least, used by only 13 respondents once a day equaling 37.1%.

The symptoms plot (Figure 2) shows a scattered range of symptoms that are being experienced, though majority of women answered that they are not experiencing any of the above. Eighty-five percent responded that they had not been diagnosed with either gingivitis, bone loss or active periodontal disease by a dental professional.

The majority 94.3% of women sought out prenatal care during their pregnancy. The most sought out prenatal care provider was an OB/GYN at 87.9% followed by the midwife provider at 36.4%. Only 4 women recalled that their prenatal care provider discussed oral hygiene/education or oral health during their pregnancy. Of those 4 women, the advice that was given to them was a referral or recommendation to seek dental care. As far as rating if women believe that receiving dental care during pregnancy is safe, 77.1% highly agreed. Nearly equal amounts of women answered that they had a dental cleaning during their pregnancy or no services at all (Figure 3). To end the survey, women were asked if they were aware that poor oral health can negatively affect pregnancy and the unborn child, the responses showed that 71.4% were aware.

Discussion of Results

The survey did not gather nearly enough data to answer the initial study questions on the value placed on oral health care, the utilization of preventive care during pregnancy and whether pregnant women are receiving adequate oral health education from their obstetric providers, although there were trends within the data obtained.

Trends that are noticed from the data show that majority of the women have a higher value placed on oral health services being that 'absolutely necessary' and 'necessary' were the highest ranked totaling 83% of the responses. All but one of the participants have access to dental care and when compared to their recent dental visit about 64% seek out dental services on a routine basis. Prior to pregnancy, 83.3% of women received routine dental services, but during their pregnancy 54% reported that they received dental services. This shows a decrease of dental services being utilized by women during their pregnancy. Most of the women agreed that receiving dental services during pregnancy is safe, yet only a little over half received any type of dental services during their pregnancy. A trend displayed that there were nearly equal amounts of women that did not seek or receive dental services during pregnancy, while the other half that received services during their pregnancy at least received a dental cleaning during that time.

Based off the responses, there is not nearly enough oral health education or a system in place to offer pregnant women oral health education during their pregnancy. There were only 4 participants that recalled their obstetric provider discussing any type of oral health with them and the information that was shared

with them was a referral or recommendation to seek dental care. This shows a lack in oral hygiene education from obstetric providers to their pregnant patients.

The participants were asked about their current oral health status and home care routine. All but five selected that their current oral health status is 'Good', 'Great', or 'Excellent'. When the participants were asked about a diagnosis of gingivitis, bone loss, or active periodontal disease, most of the women selected 'No'. When this data was compared to the question that asked the participants about any of the following symptoms: red, sore, puffy and/or bleeding gums, bad breath, or toothache more than half selected that they were currently experiencing one or more of the listed symptoms. This correlation shows that there is a lack of education and awareness on the symptoms and signs of gingivitis and periodontal disease. As literature shows, periodontal disease is a common disease and can be easily developed during pregnancy due to many factors including the fluctuation of hormones, the survey showed that about half of the women displayed one or more sign or symptom during their most recent pregnancy. As the participants answered questions regarding their home care routine, the data show that the participants lack a stable home care routine that is optimal for their oral health as correlated to the number of symptoms that are being experienced. There is a known link that poor oral health can negatively affect a pregnancy and unborn baby, 71.4% of the participants selected that they were aware of this correlation. Prior literature suggests that oral and dental care require special attention, oral health is a part of general health, and it is of even greater importance during this period because it

concerns both the mother and fetus.⁹ As suggested, neglect of oral health during pregnancy can lead to adverse pregnancy outcomes.

The data from the survey shows a higher response rate of dental services received during pregnancy when compared to statistics from the CDC and the Pregnancy Risk Assessment Monitoring System (PRAMS) that reported 23% to 35% received dental care during their pregnancy.¹¹ Obstetric providers have a direct impact to their patients care and overall well-being, based off this survey not nearly enough are giving full comprehensive care due to the lack of dental referrals and lack of oral health education being discussed. A greater involvement from obstetric providers in the promotion and education of oral health during pregnancy is essential in the reduction and prevention of related adverse pregnancy outcomes. Pregnancy is not a time where dental care should be postponed or neglected. Literature suggests that women visit gynecologists more frequently than any other medical professionals, yet they lack including any oral health education into their own practices.^{12,13} This survey revealed that less than 12% of women had discussed oral health during their visits with their obstetric providers. Literature has also suggested that gynecologists with lack of knowledge and time regarding outcomes of poor oral health respectively were less likely to refer for comprehensive oral care services for pregnant patients.¹³ This survey did not examine the level of oral health knowledge of obstetric providers, but the data does show that there were very few providers that discussed oral health or referred out for dental services.

Conclusions

The purpose of this study was to examine the value and utilization of oral health care during pregnancy and if women are receiving adequate oral health education from obstetric providers. Women should be receiving complete comprehensive care to ensure overall health and the best pregnancy outcomes, and this can be achieved by incorporating dental care with prenatal care. Although obstetricians specialize in care during pregnancy, periodontal disease education, prevention and treatment should be provided by licensed dental hygienists as this is the treatment, they specialize in. There is a need for and development of universal guidelines in the medical field to help reduce the number of pregnant women who experience periodontal diseases and implement the need for routine dental care.

One way to reduce the risk for periodontal diseases would be through education. Education can be accomplished by having a dental hygienist work outside of the common dental clinical setting and be employed in the obstetrics department in either hospital settings, private practices and/or community clinics. The collaboration of medical and dental providers working together to treat patients will result in the best comprehensive health care for expectant mothers and their babies. If dental hygienists worked in these settings, they could have the opportunity to provide education and limited oral evaluations during visits and help bridge the gap and disparities by creating a pathway to receive the proper oral health care. Pregnancy temporarily increases the risk for periodontal diseases but if

proper oral health education and examinations can be provided it can decrease the chance of women being affected.

There were limitations to this survey and one being that REDCap allowed the participants to continue with survey if participants selected specific answers that would no longer qualify them to be eligible to participate. Another limitation being that the survey link could be shared with anyone and was not limited to women living in New Mexico as the targeted population was intended.

Due to the low response rate, statistical analysis could not be performed. Therefore, descriptive analysis was performed on the data provided. A future study may look at disseminating the survey at the clinics in which prenatal care is provided. This would allow for more accurate data and an increase in the response rate. Suggestions for future studies would be related to the adverse pregnancy outcomes associated with periodontal disease, such as, any complications during their pregnancy like hyper- or hypo- tension, gestational diabetes, and preterm or low birth weight. Previous literature also suggests that socioeconomic status is significant to the prevalence of periodontal diseases. Defining the socioeconomic status could be a factor included in the demographic section of the survey.

Appendices

Appendix A

HRPO Approval Letter

Appendix B

Recruitment Letter

Appendix C

Informed Consent

Appendix D

Letter of Support

Appendix E

Survey

Appendix A: HRPO Approval Letter



Human Research Protections Program

March 15, 2022
Robin Gatlin
robing@salud.unm.edu

Dear Robin Gatlin:

On 3/15/2022, the HRRC reviewed the following submission:

Type of Review: Initial Study
Title of Study: An Assessment of Pregnant Womens' Value and Utilization of Oral Health Care During Pregnancy
Investigator: Robin Gatlin
Study ID: 22-080
Submission ID: 22-080
IND, IDE, or HDE: None

Submission Summary: Initial Study

Documents Approved:

- Final Thesis Survey Questions.pdf
- Letter of support
- Letter of support - signed PDF
- Recruitment letter.pdf
- UPDATED- HRP-507a-TEMPLATE-UNM-Consent-Survey-Research v5.23.19.pdf
- UPDATED-HRP-583 - TEMPLATE - Exempt Category 2 Protocol v03.16.2021 .pdf

Review Category: EXEMPTION: Categories (2)(i) Tests, surveys, interviews, or observation (non-identifiable)

Determinations/Waivers: Provisions for Consent are adequate.
HIPAA Authorization Addendum Not Applicable.

Submission Approval Date: 3/15/2022
Approval End Date: None
Effective Date: 3/15/2022

The HRRC approved the study from 3/15/2022 to inclusive. If modifications were required to secure approval, the effective date will be later than the approval date. The "Effective Date" 3/15/2022 is the date the HRRC approved your modifications and, in all cases, represents the date study activities may begin.

Appendix B: Recruitment Letter

Hello,

My name is Angelica M. Sanchez, I am a graduate student at the University of New Mexico in the Dental Hygiene Department. I am writing to let you know of an opportunity to participate in a survey research study about oral health literacy during pregnancy. The following survey aims to assess pregnant women and/or women that have been pregnant within the last 24 months. The survey aims to evaluate the value and utilization of oral health services during their pregnancy. The survey should take approximately 10 minutes to complete. There are no known risks involved in this research. Participation of this research study is voluntary.

If you would like additional information about this study, please contact Angelica M. Sanchez at anmsanchez@salud.unm.edu or if you have questions regarding your legal rights as a research subject, you may call the UNM Human Research Protections Office at (505) 272-1129.

Thank you for considering this research opportunity, your participation is greatly appreciated.

Robin Gatlin, RDH, MS, Principle Investigator

Angelica M. Sanchez, RDH, MS Candidate

HRRC ID 22-080

Appendix C: Informed Consent

Template v5/23/2019

The University of New Mexico Health Sciences Center Consent and Authorization to Participate in a Research Study

Dear Prospective Participant,

Researchers at the University of New Mexico are inviting you to take part in a survey/questionnaire about the value and utilization of oral health care services during pregnancy.

Although you may not get personal benefit nor any type of compensation from taking part in this research study, your responses may help us understand more about the value and utilization of oral health care services during pregnancy. Your responses will also help to assess oral health literacy of the targeted population.

The survey/questionnaire will take about 10 minutes to complete.

There are no known risks to participating in this study. Although we have tried to minimize this, some questions may make you upset or feel uncomfortable and you may choose not to answer them. Questions of a personal or sensitive nature are included in the survey.

Your response to the survey is anonymous which means no names will appear or be used on research documents, or be used in presentations or publications. The research team will not know that any information you provided came from you, nor even whether you participated in the study.

We hope to receive completed questionnaires from about 200 people, so your answers are important to us. Of course, you have a choice about whether or not to complete the survey/questionnaire, but if you do participate, you are free to skip any questions or discontinue at any time.

Please be aware, while we make every effort to safeguard your data once received on our servers via REDCap, given the nature of online surveys, as with anything involving the Internet, we can never guarantee the confidentiality of the data while being transmitted to us.

If you have questions about the study, please feel free to ask; my contact information is given below. If you have questions regarding your legal rights as a research subject, you may call the UNM Human Research Protections Office at (505) 272-1129.

Thank you in advance for your assistance with this important project. To ensure your responses/opinions will be included, please submit your completed survey/questionnaire 2 weeks from the original start/opening date. By clicking on the link below, you will be agreeing to participate in the above described research study.

Sincerely,

Robin Gatlin, Assistant Professor, RDH, M.S
Division of Dental Hygiene, University of New Mexico Health Sciences
PHONE: 505-272-0838
E-MAIL: robging@salud.unm.edu

Appendix D: Letter of Support

March 13, 2022

Dear UNM HRPO:

My name is Christiann Orozco, I am one the founders and admins for our Facebook Group page "Moms Who Wine Together, New Mexico". The Facebook Group is managed by myself and Sher Webb who is also a founder and admin. Angelica has requested permission, to use our group as a platform to distribute her survey to participants. We appreciate we appreciate her request and are happy to support her in her research study in, Value and Utilization of Oral Health Services during pregnancy.

If you have any questions, please feel free to contact me at 505.259.5435

Sincerely,



Christiann Orozco
Founder & Admin of
Moms Who Wine Together NM

Appendix E: Survey

What is your age range?

- <18
- 19-24
- 25-30
- 31-35
- 36+

What is your highest level of education?

- High school diploma/GED/Equivalent
- 2 years of college/Associate degree
- Bachelor
- Masters
- Doctoral

Are you currently pregnant?

- Yes
 - Which term are you currently in:
 - 1st trimester
 - 2nd trimester
 - 3rd trimester

- No

Was your most recent pregnancy within the last 24 months?

- Yes
- No

→ End of survey

How many pregnancies have you had?

- 1st
- 2nd
- 3rd
- 4th+

How would you rate your value of oral health services?

- Absolutely necessary
- Necessary
- Somewhat necessary
- Not at all necessary

Do you have access to dental care?

- Yes
- No

When was your last dental/hygiene visit?

- Less than 1 month
- 2-5 months ago
- 6-11 months ago

- 1 year ago (12 months)
- More than 1 year

Prior to pregnancy did you seek routine dental services (Preventive, or restorative?)

- Yes
- No

How would you rate your current oral health?

- Excellent
- Great
- Good
- Fair
- Poor

How often do you perform the following:

Never Occasionally 1xday 2xday after every meal

- Brush your teeth
- Use dental floss/similar
- Clean/brush your tongue
- Use a mouth rinse

Do you currently have any of the following: (Select all that apply)

- Red gums
- Sore gums
- Puffy gums
- Bleeding gums
- Bad breath
- Toothache
- None of the above

Have you been told by a dental professional that you have bone loss or active periodontal disease?

- Yes
- No

During your pregnancy did you seek prenatal care?

- Yes

→ Which type of provider do/did you see for prenatal care

No care from prenatal providers

Midwife

OB/GYN

Perinatologist

Family Physician

Nurse Practitioners

- No

Has your midwife, OB/GYN or any other prenatal care providers discussed oral hygiene or oral health with you?

- Yes
- No
- Unsure

→ If yes, what information did you receive:

Pamphlet or brochure

Internet website/resources

Recommendations to seek oral care

Rate your level of agreement with the statement “receiving dental services during pregnancy is safe”

- Highly agree
- Agree
- Neither agree nor disagree
- Skeptical
- disagree
- strongly disagree

DURING your pregnancy, did you receive any dental health services? (Select all that apply)

- Dental Cleaning
- Exam
- X-rays
- Restorative dental services
- None of the above

Are you aware that poor oral health can negatively affect your pregnancy?

- Yes
- No

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