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# Communicating Periodontal Disease Risk to American Indian Patients With Diabetes

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This is to certify that the doctoral dissertation by

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Abstract

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Dissertation Submitted in Partial Fulfillment
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# Abstract

Type 2 diabetes is epidemic in the American Indian population. One problem health care providers face when working with the American Indian population is communicating about secondary complications, such as periodontal disease. From a public health standpoint, periodontal disease prevention is important not only to prevent unnecessary oral pain and tooth loss, but also to prevent other more serious systemic problems from occurring such as cardiovascular disease, strokes, and bacterial pneumonia. The purpose of this qualitative study was to examine the communication efforts of health care providers and understand if and how they discuss periodontal disease with their American Indian patients with type 2 diabetes. Structured interviews were conducted with health care providers at an American Indian community clinic using questions based on the model of communication competence. Data analysis consisted of an analysis of the interview transcripts looking for concepts, themes, and events to see if discussion of periodontal disease is occurring at diabetic visits. Results of the study showed that although all the providers knew about the link between diabetes and periodontal disease risk, not all the providers were discussing the risk with their patients, and time, perceived health literacy, and other priorities all played a role in the lack of communication. This finding has the potential to influence positive social change by being an impetus for change in current diabetic patient care policies in the areas of communication and education regarding American Indian patients with diabetes about periodontal disease risk.

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Table of Contents

# List of Tables

Table 1.

# Chapter 1: Introduction to the Study

## Introduction and Background

In the American Indian population, diabetes has become epidemic. According to the Indian Health Service (IHS) Division of Diabetes Treatment and Prevention (2012), of the 2.9 million American Indian/Alaska Natives, 16.3% have been diagnosed with diabetes, compared to 7.8 % of the general population of the United States (Centers for Disease Control and Prevention [CDC], 2011). Data from the 2005 IHS user population database indicated that 14.2% of American Indians and Alaska Natives aged 20 years or older who received care from the IHS had diagnosed diabetes (CDC, 2007).

According to the National Institute of Diabetes and Digestive and Kidney Diseases (2011), diabetic patients are at risk for several complications, including heart disease and stroke, high blood pressure, blindness, kidney disease, nervous system disease, amputations, and dental disease. Not all patients with type 2 diabetes develop the diseases listed. With a healthy diet, stabilized blood glucose management, and regular visits to medical and dental health care providers, the majority of diabetic complications can be managed or prevented (American Diabetes Association, 2012; Wilson et al., 2005).

Maintaining good oral health in order to prevent gum disease is important. Researchers have found a relationship between diabetes and periodontal disease in which those persons who have poorly controlled diabetes are more susceptible to being diagnosed with periodontal disease  (Bjelland, Bray, Gupta, & Hirsch , 2002; Deshpande, Jain, Sharma, Prashar, & Jain, 2010, Saremi et al., 2005; Soskolne & Kinger, 2001). One factor that can contribute to an increase in oral infections is poor glycemic control. Several bacteria, including *Actinobacillus actinomycetemcomitans, Bacteroides forsynthus, Porphyromonas gingivalis, Preveotella intermedia, Treponema denticola,* and *Eikenella corrodens* have been found to be associated in the development and the progression of periodontal disease (Deshpande et al., 2010). These bacteria are found in dental plaque and in a person with diabetes who does not have good glycemic control, plaque build-up, infection, and possible tooth loss may occur (Deshpande et al., 2010). Emrich, Schlossman, and Genco (1991) determined in their study of Pima Indians with type 2 diabetes that people with diabetes are three times more likely to develop periodontal disease than persons who do not have diabetes. Therefore, discussing periodontal disease with patients with diabetes is important to help prevent oral infections and tooth loss (Bjelland et al., 2002; Deshpande et al., 2010; Saremi et al., 2005; Soskolne & Klinger, 2001).

According to the IHS (2011), the death rate for American Indian patients who have diabetes is 3.3 times higher than the United States general population with diabetes. Rates of kidney disease and kidney failure for American Indians are 3.5 times higher than the U.S. general population, and American Indian patients with diabetes are three to four times more likely to develop cardiovascular disease as compared to American Indians who do not have diabetes (IHS, 2011). Overall, American Indian patients who have diabetes live on average of 15 years less than the overall U.S. general population (IHS, 2011). Since diabetes can result in serious complications if left untreated, communication about the disease and its consequences between the health care provider and the patient is of the utmost importance. However, communicating this information to a lay person can be a challenge to any health care provider because the level of health literacy can vary from patient to patient.

Communication about the complications of diabetes with the American Indian population can be challenging for both Native and non-Native health professionals. Barriers to communication include control of the conversation, focusing on long-term outcomes, pessimistic behavior, and frustration regarding the patients' perception of diabetes and how that can differ from the physician's perception of the disease (Freeman & Loewe, 2000). There are also barriers to communication from the health care provider standpoint, including little or no prior experience (work or social) with the American Indian population, being overwhelmed regarding the number of patients with diabetes and diabetes related conditions in the community, not keeping up with current medical trends in diabetes care, and concentrating on the more life-threatening complications of diabetes, such as cardiovascular disease (Kinmouth, Woodcock, Griffin, Spiegal, & Campbell, 1998; Kunzel, Lalla, & Lamster, 2007; Lautenschlager, & Smith, 2006). Current communication practices between American Indian patients with type 2 diabetes and their health care providers have not been well studied.

The American Indian population should be viewed as a unique group of people. Each American Indian tribe is distinct and has its own language, customs, beliefs, and traditions (Watson, Obersteller, Rennie, & Whitbread, 2001). Non-Native health care providers need to tailor their communication to each individual American Indian population, as each population has different beliefs about their own health (Watson et al., 2001). Tailoring communication to the population being served is important, especially for all clinics that serve the American Indian population. With the diverse populations of American Indians being served at clinics around the United States, it is important that health care providers be open to listening to and learning about the health care beliefs of their patients. Communication styles that the American Indian population uses can vary from tribe to tribe, but some common styles include nonverbal messages, use of humor, indirect communication, and storytelling (Substance Abuse and Mental Health Services Administration (SAMHSA), 2010).

In addition to being effective communicators and understanding common communication styles of the American Indian population, health care providers must also acknowledge that, although each American Indian tribe is different, there are common themes in the belief systems of some American Indian groups (Davis & Reed, 1999; Penn et al., 1995; SAMHSA, 2010). An American Indian person’s definition of health and wellness can be very different from a Western medicine view of health and wellness (SAMHSA, 2010). For instance, a commonality among tribes is that there is a belief in animate and inanimate forms of life and that these spirits need to be respected so that a harmonious balance can be maintained (SAMHSA, 2010).

In addition to communication styles and cultural beliefs, health literacy is another component that may influence the level of oral health information an individual can understand in order to make an informed health decision (i.e., oral health literacy; Lee, Divaris, Baker, Rozier, & Vann, 2012). There are several behavioral factors that may play a role in oral health literacy and these include genetic (predisposition to have oral health problems), environmental (such as primary water source is well water which contains zero or small amount of naturally occurring fluoride), socio-demographic (live in an area where oral health care not readily available), and personality (does not practice good oral health behavior such as daily brushing and flossing; Lee et al., 2012). The genetic factor is the only factor that cannot be changed; the other three factors can be changed through communication with the patient about the importance of oral health care.

The overall goal of this research was to examine provider communication patterns with American Indian patients who have type 2 diabetes. The main topic examined was how providers communicated the risk of developing periodontal disease to patients with type 2 diabetes. In order to explore the main topic, three subtopics related to communication were studied. The three subtopics included time spent with the patient during office visits, health care provider knowledge about periodontal disease and its relationship to diabetes, and the perception of importance that other diabetic complications may be seen as having a greater impact on the health of the patient than periodontal disease (Preshaw et al., 2011).

The focus of this study was to learn in what way/s health care providers, both medical and dental, in an American Indian community clinic in northeastern Wisconsin, communicate the risks of periodontal disease to their American Indian patients with type 2 diabetes. This study addressed a gap in the literature about communication between American Indian patients with type 2 diabetes and their health care providers on the topic of periodontal disease and its relationship with type 2 diabetes. This study also added to the literature on the topics of provider-to-patient communication, communication with the American Indian population, provider-to-patient communication on the topic of diabetes, and provider-to-patient communication on the topic of periodontal disease. This study was important to the field of public health as it assessed how much health care providers know about the relationship between diabetes and periodontal disease and if communication on the risk of periodontal disease is taking place between health care providers and their American Indian patients with type 2 diabetes. In addition, this study was important as American Indians and Alaska Native adults are 2.3 times more likely to be diagnosed with type 2 diabetes as compared to non-Hispanic adults (CDC, 2011). Lastly, the study provided insight into the time needed to communicate with the patient and that communication about other diabetes-related conditions were taking precedence over discussion about periodontal disease. Therefore, this is a public health problem which needed to be studied because little has been researched about the risk of periodontal disease in the American Indian population with type 2 diabetes and there is little in the literature that discusses communication between health care providers and their American Indian patients with type 2 diabetes.

## Problem Statement

Research indicated that oral health issues are prevalent in the general population when oral hygiene is not maintained and oral health care is not received by the patient (Lee et al., 2012). Individuals with type 2 diabetes are at an increased risk of developing oral diseases such as periodontal disease (Bader, Shugars, Kennedy, Hayden, & Baker, 2003; Persson, Mancel, Martin, & Page, 2003). It was unknown whether or not health care providers are discussing periodontal disease risks with their American Indian patients with type 2 diabetes. Another unknown was if health care providers are prioritizing the complications of diabetes that they discuss with their patients with diabetes. An example of this would be speaking to a patient about cardiovascular disease and its link to diabetes, as cardiovascular disease has the potential to be a more life threatening condition than periodontal disease. Other variables that were involved included lack of time (Dugdale, Epstein, & Pantilat, 1999), ineffective or unclear communication between medical professionals and patients about periodontal disease prevention and risk (Andersson, Furhoff, Nordenram, & Wardh, 2007), and health care providers' lack of knowledge about the relationship between diabetes and periodontal disease (Bissett, Stone, Rapley, & Preshaw, 2013).

The focus of this study was communication between health care providers and American Indian patients with type 2 diabetes. The scientific literature on periodontal disease and American Indians included several longitudinal studies done with the Pima Indians of the Gila River Tribe in Arizona in the 1980s and 1990s (Nelson et al., 1990). These studies showed that periodontitis in its severe stage can have an impact on the person with diabetes and can also lead to other problems such as not being able to eat the correct foods in order to maintain a healthy diet, along with other diabetes-related disorders including heart disease (Nelson et al., 1990). Since American Indians are more susceptible to diabetes and its complications, it made sense to address the issue with health care providers who care for this population. In this study, I addressed a gap in the literature by looking at what communication modalities health care providers were using to communicate with their patients with diabetes about periodontal disease and if factors such as time spent with the patient, the amount of provider knowledge of periodontal disease, and greater concerns for other conditions associated with diabetes affected the communication about the risk of periodontal disease to American Indian patients with type 2 diabetes. The results of this study not only provided information on patient-to-provider communication about type 2 diabetes and its relationship to diabetes, but also added to the literature that is currently in existence on the American Indian population.

## Purpose of the Study

The purpose of this study was to explore the communication patterns of health care providers and how they communicated the relationship between diabetes and periodontal disease to their adult American Indian patients with type 2 diabetes. In this study, I looked at how other factors played into conversations between patients and providers. This includes the amount of time spent with a patient, the amount of knowledge the health care provider had about the disease, and if the health care provider had more concern about the other conditions that are associated with diabetes, based on their perceived severity to the quality of life of the patient.

## Theoretical Framework

The model of communication competence grounded this investigation and, as described by Spitzberg and Cupach (1984) and Spitzberg (2013), is “the ability to choose a communication behavior that is appropriate and effective for a given situation” (Spitzberg & Cupach, 1984, p.126). This model is composed of three components (Spitzberg & Cupach, 1984; Spitzberg, 2013). The first component, knowledge, is the ability to acquire the information necessary to have a competent conversation with another person (Hazelton & Cupach, 1986; Spitzberg & Cupach, 1984). For the purpose of this research, knowledge involved how much the health care provider knew about the topic of periodontal disease and its relationship to type 2 diabetes.

The second component, skill, involved possessing the ability to apply a behavior to a specific situation (Spitzberg & Cupach, 1984). For the purpose of this research, the skill was the process of communication between the health care providers and their American Indian patients with type 2 diabetes. The behavior is the intent to communicate with American Indian patients with type 2 diabetes about the risk of periodontal disease at the time of diagnosis and at subsequent follow up visits.

The third component is motivation. Motivation is the level of motivation an individual possesses in order to communicate with another individual in the most effective and appropriate manner for the situation at hand (Spitzberg & Cupach, 1984). For the purpose of this research, motivation involved not only possessing the knowledge and skill of communication but also being motivated to discuss the topic of periodontal disease risk and type 2 diabetes with American Indian patients.

Overall, to be an effective communicator, the health care provider needed knowledge about diabetes and its relationship to periodontal disease, skill in communicating and being competent in using different communication modalities in order to get the patient to understand the message, and motivation in which the health care provider felt that the information was valuable and were then willing to communicate the information about periodontal disease to the patient with type 2 diabetes. Additional information about communication competence is discussed in Chapter 2.

## Nature of the Study

The nature of this study was that it was a qualitative study using a phenomenological approach. The phenomenological approach uses methods, such as key informant interviews, which enable the researcher to study a topic of which little information is known (Creswell, 2007). Donalek (2004) described the phenomenological approach as an opportunity for a researcher to “recruit potential research participants who have lived the phenomenon in question and are willing and able to describe their experiences” (p. 1). I chose to use the phenomenological approach as opposed to other qualitative approaches as phenomenology is “designed to explore and understand people’s everyday lived experiences.” (Shosha, 2012, p. 31) Since I studied the lived experiences of health care providers in an American Indian community clinic and how they communicated the risk of periodontal disease to their American Indian patients with type 2 diabetes, I determined that the phenomenological approach was the best fit.

Eight semistructured interviews were conducted with key informants. Key informants included two groups of people: medical health care providers (physicians, physician’s assistants, and nurse practitioners) and dental health care providers (dentists and dental hygienists). Both groups provided direct patient care for American Indian patients with type 2 diabetes at an American Indian community clinic in northeastern Wisconsin.

The key concept investigated was if the health care provider and the American Indian patient with type 2 diabetes were having discussions about the topic of periodontal disease. Other key concepts investigated included the amount of time spent with a patient, the amount of knowledge a health care provider possessed about the relationship between periodontal disease and diabetes, and if discussions about periodontal disease are not occurring as the health care provider had greater concern with other complications of diabetes.

Data for this study were collected through semistructured interviews with the key informants. Interviews were between 30 to 45 minutes long and took place at the health care providers' clinic and at local restaurants. All interview questions were developed by me. In addition, I used questions as previously developed by Korber et al. for their 2006 study of health care providers working with the Latino community of the Greater Lawn Area of Chicago (see Appendix B). The data collected from this study were recorded, transcribed verbatim, and reviewed to identify themes. Data were coded and analyzed using constant comparison analysis with the QSR NVivo 10 qualitative software package.

## Definition of Technical Terms

*American Indian:* Indigenous peoples who live in the area now known as the United States, comprised of 566 federally recognized tribes (Bureau of Indian Affairs, 2012).

*HbA1C:* Hemoglobin A1C is a routing blood test to show how well a person is doing in controlling blood sugar. Provides an average blood sugar level for a 3 month period (Medline Plus, 2012).

*Periodontal disease:* Periodontal disease is a type of gum disease which can lead to the loss of the gum tissue that holds the teeth in place. The cause of periodontal disease is a build-up of plaque which can cause the gum tissue to pull away from the teeth, resulting in tooth loss. If left untreated, periodontal disease can cause damage to the gum tissue that supports the teeth and the bony structure of the mouth (American Dental Association, 2011).

*Type 2 diabetes:* The most common form of diabetes in which the body does not produce enough insulin or the body's cells ignore the insulin. Type 2 diabetes is more common in African Americans, Latinos, Native Americans, and Asian Americans/Pacific Islanders, as well as the aged population (American Diabetes Association, 2012).

## Research Questions

Research questions serve to narrow the purpose of the study. To better understand how health care providers communicate, the following six research questions were formed for the current study:

Research Question 1: How much do health care providers know about periodontal disease and its relationship to diabetes? How do they obtain and then maintain that knowledge?

Research Question 2: How, and by whom, are conversations on the topic of periodontal disease and its relationship to diabetes initiated when patients with diabetes are seen at clinic visits? Are conversations about periodontal disease and diabetes initiated by the health care providers (physician, nurse, dentist, dental hygienist), by the patient, or not at all?

Research Question 3: How does the patient’s level of health literacy play a role in conversations between health care providers and patients?

Research Question 4: What modalities (i.e., spoken word, providing brochures, etc.) are health care providers using to communicate information about the risks of periodontal disease to their American Indian patients with type 2 diabetes?

Research Question 5: How does the amount of time allotted for a patient’s health care visit affect a health care provider’s ability to have a conversation with the patient about the relationship between periodontal disease and diabetes?

Research Question 6: What importance do health care providers place on periodontal disease as compared to other diabetes-related conditions with regards to severity of risk to the patient with diabetes?

These research questions were developed in order to understand the process in which health care providers interact and communicate with their patients about periodontal disease.

## Assumptions

I made three assumptions regarding this study. The first assumption was that some health care providers were discussing periodontal disease with their patients. This research investigated who was initiating the conversations and when. The second assumption was that all health care providers would answer all interview questions honestly and completely. This study investigated the current communication process of the health care providers and was not critical of how the process of communication was currently being done or not done, but as a way to gather information to possibly make positive social change or a policy change in order to increase the quality of life of the American Indian patients with type 2 diabetes. The third assumption was that the study participants would see this study as important and of value to them as the health care providers being interviewed. Again, I analyzed the study participants’ responses as they reflected on their individual perspective of how they communicated with their patients, and the results of this study were based on their individual opinions. These assumptions were necessary for the context of this study as they were critical to its success and meaningfulness. All comments made by the study participants during the interview process were processed as being factual and true.

## Scope and Delimitations

The specific focus on the topic of provider-to-patient communication was chosen as there is a gap in the literature regarding specific conversations about diabetes and its relationship to periodontal disease, especially in the American Indian population. The purpose of this research was to lay a foundation for further exploration of the topic of communication between health care providers and American Indian patients that have type 2 diabetes. Other factors such as time, provider knowledge of the link between periodontal disease and type 2 diabetes, and health care providers prioritizing other conditions related to diabetes such as cardiovascular disease, were also attributed to the communication efforts of the health care provider.

This study had several boundaries. The first boundary was that the study was conducted at one specific American Indian clinic in northeastern Wisconsin. This clinic was chosen as it had both medical and dental services within one location.

The second boundary was that I only interviewed health care providers from the dental and medical areas who have direct patient contact and do patient education with American Indian patients with type 2 diabetes. This included dentists, dental hygienists, physicians, physician assistants, and nurse practitioners. All other nursing staff, along with dental assistants and optical staff, were excluded as they do not do basic oral health checks.

A third boundary involved the actual patients that were seen at the clinic. At this specific clinic, health services are open to all enrolled members or descendants of a federally recognized American Indian tribe or Alaska Native village, not just to members of the reservation. This is important to note as the information gathered pertains to a sample of American Indian patients with type 2 diabetes from multiple tribes and not one specific tribal entity. This boundary brings strength to the study as it provided a gateway for asking health care providers if they generalized their communication messages and strategies for all the American Indian patients with type 2 diabetes that they see in the clinic. A limitation to this variability was that the tribe that this clinic is associated with compromises the majority of the population of patients being seen by health care providers. Members of other tribes are the minority.

There are four biases that could potentially influence the study outcomes. The first bias was that I am an enrolled member of the tribe being researched. Although I am only one enrolled member out of 14,000, I am known within the community as I am an employee of the tribe and participate in community events such as pow wows and secular activities. A second bias was that I am a current patient of record for medical and dental services at the clinic in question. This creates a bias as I attend this clinic for all medical and dental services thus providing a limited knowledge of myself to the health care providers. For the purpose of this study, I did not interview those health care providers that I see for medical and dental care. A third bias that could influence study outcomes was that I have family working at the clinic in both of the departments where I interviewed providers, although I did not interview my relatives. A fourth bias was that my uncle is an elected official of the tribe's elected branch of government and this could have potentially swayed some interviewees to answer questions in my favor as he has some direct oversight of the facility.

Although all the biases listed cannot be controlled, some were minimized. For instance, regarding the second bias, during the time period in which I conducted the semistructured interviews, I did not schedule a personal appointment so as to not influence the health care providers who took part in the study. I minimized the third bias by not interviewing any of my relatives that worked at the clinic. The fourth bias was minimized by asking my uncle, who is an elected official of the tribe, to not discuss my research with anyone at the clinic. Unfortunately, the first bias could not be minimized or controlled by myself. A further discussion on the role of the researcher is described in Chapter 3.

This research study could be tailored to and repeated at any American Indian clinic that has both medical and dental providers present. An interesting possibility for future research would be to conduct the research at a clinic that only services the tribal members from a specific tribe to see if there are differences in how the health care providers respond to the interview questions.

## Limitations

There were a number of limitations to this study. The first limitation was the possibility for bias on behalf of the health care providers being interviewed as they may have felt that they needed to provide me with the answers that they think I would want and not answer the questions honestly. When interviewing health care providers, I reminded them that the interviews would not contain their personal information, such as name or title, and that honesty is key not only for this research but to determine if the results of this research can make a positive impact for the clinic's clients. The second limitation was my interpretation of the results of this study and how I needed to maintain a sense of neutrality with regard to the answers provided. I did this by constantly reminding myself to remain neutral and not to agree or disagree with a health care provider's personal opinions provided during an interview. The third limitation was clinic politics and how some providers were not willing to share their thoughts with me, meaning that they did not feel it was in their best interest to participate in the study. In addition, there was the risk that those health care providers that did participate may not have answered interview questions truthfully or in full faith. I respected the wishes of those clinic providers who were not willing to share their thoughts with me. In addition, I reminded the health care providers that I would not discuss individuals by any identifying characteristics.

The weaknesses involved in using a qualitative approach included study participants not answering interview questions truthfully or in full faith, the information gathered may be unique to persons in a certain setting, and the data results can be influenced by the researcher’s personal biases. I worked to minimize these limitations by keeping my personal bias out of the interviews with the health care providers. In addition, I respected the statements that each provider made in response to the interview questions, whether I personally agreed with them or not.

## Significance of the Study

The study of patient and provider communication was well researched within the literature. What is known in the literature is that communication competence on behalf of the health care provider is crucial in communicating health messages to patients (Cegala et al., 1996; Simonds et al., 2013; Wouda & van de Wiel, 2012). Not much is known about patient-to-provider communication in the American Indian population, and especially on the topic of communicating periodontal disease risk to those American Indian patients with type 2 diabetes. What made this particular study unique was that I examined how or if health care providers in an American Indian community clinic spoke with their American Indian patients with diabetes about the topic of periodontal disease risk.

From a public health standpoint, this research was significant as untreated dental diseases, such as periodontal disease, can impact the quality of life of the person with type 2 diabetes (Griffin et al., 2012). Poor oral health, which can include tooth loss and gum and mouth pain as experienced with periodontal disease, can affect a person’s food choices and decrease the pleasures of eating food in general (Griffin et al., 2012). For example, a person who has periodontal disease and has tooth loss may not be eating food that is more nutritious, such as fruits and vegetables, as they have lost the inability to chew, chewing is more difficult or painful, or the food irritates the gum tissue (Bortoluzzi et al., 2012; Griffin et al. 2012; Rosenoer & Sheiham, 1995; Sarita et al., 2003). This may lead the person to choose softer foods which may be higher in calories and fat and could lead to obesity (Griffin et al., 2012; Rosenoer & Sheiham, 1995; Sarita et al., 2003). Persons living with type 2 diabetes need to have the appropriate nutritional intake in order to maintain healthy blood sugar level (Bortoluzzi et al., 2012; Rosenoer & Sheiham, 1995; Sarita et al., 2003) (CITE). Loss of teeth may contribute to higher blood sugars and the need to adjust insulin. Partials and dentures can also make chewing painful if they do not fit correctly or are not aligned correctly (Idowu et al., 1987; Vilela et al., 2013).

Socially, a person with periodontal disease and tooth loss may not want to be around others due to their tooth loss which can affect speech, or if the patient is unable to afford partial or dentures, they may smile or talk less as they do not want others to see the missing teeth. Self-esteem may be lowered due to having few or no teeth (Eli, Bar-Tal, & Kostovetzki, 2001; Starr & Hall, 2010; Vilela et al., 2013). The appearance of the face and mouth can also change with tooth loss resulting in people having a negative feeling about their appearance and not going out in public as much as before when they had more teeth (Vilela et al., 2013).

There are several implications for positive social change that could come forth from this study. The first was that this study is the first of its kind to be conducted at this specific American Indian clinic. This could potentially open the door for more studies to be done at this clinic. The second implication was the potential to increase the quality of life of the American Indian community through better informed health care providers who have the skills to communicate and educate patients about all conditions associated with having type 2 diabetes. The data collected may be shared with other tribes to enhance communication on the topic of communicating the risks of periodontal disease to American Indian patients with type 2 diabetes.

## Summary and Transition

The main focus of this study was to examine how health care providers in an American Indian community clinic communicate the risks of periodontal disease to their American Indian patients with type 2 diabetes. There were three considerations including the amount of time spent with a patient, the amount of knowledge the health care providers has on the topic of periodontal disease and diabetes, and if the health care provider is more concerned about other complications of diabetes. In Chapter 2, I will discuss the scholarly literature in terms of the key concepts, while comparing and contrasting the articles, and discussing the basis of this research.

# Chapter 2: Literature Review

## Introduction

The purpose of this research was to lay the foundational groundwork for exploring communication efforts of health care providers at an American Indian community clinic in northeastern Wisconsin and how the clinic's health care providers discuss the topic of periodontal disease with their American Indian patients with type 2 diabetes. In Chapter 2, I present a review of the literature conducted on the topic of periodontal disease and its effects on American Indian persons who have type 2 diabetes. I also included research on the knowledge that caregivers have about periodontal disease, the amount of time spent with the patient in general at clinical visits discussing periodontal disease, which providers are communicating to patients about periodontal disease, and if caregivers are spending more time discussing other diseases/conditions that the provider feels are more significant than periodontal disease.

My search for references was conducted by using a variety of databases along with various search engines for peer-reviewed articles published from 2015 to as far back as 1991. I searched for articles from this wider date range, as there is not a lot of information on the topic of study on diabetes, American Indians, and communication to this population about periodontal disease. What I did find was older information. The databases and search engines used included Academic Search Primer, CINAHL Plus with Full Text, EBSCO Host, Google Scholar, MEDLINE, Nursing and Allied Health Source, OVID, ProQuest, PsycINFO, PubMed, SAGE Full-Text Collections, and Wiley Interscience. Internet sources included the web pages of established and recognizable organizations such as the American Diabetes Association, CDC, and the IHS. The key words used while searching for peer-reviewed articles and auxiliary data included: *diabetes, American Indian health, Native American health, periodontal disease, oral diseases, oral health, type 2 diabetes, physician-patient relationship, provider-patient relationship, physician education, cultural sensitivity, holistic beliefs, American Indian health beliefs, cultural competency, disease of the mouth, periodontics, minority health, type 2 diabetes complications, diabetes dental complications, physician knowledge, clinic visit time, provider-to-patient communication, physician to patient communication, patient communication, communication methods, health literacy, health literacy and diabetes, health literacy and American Indians, health literacy and minorities, theory of planned behavior and qualitative methods, American Indians and communication, American Indians and health care providers, communication theory, American Indians and cultural competency, American Indians and cultural awareness, medical office visit, continuity of care, information-seeking behavior, continuing education-physicians, continuing education-health care providers, continuing medical education, information-seeking behavior-physicians, tooth loss and public health, public health inequality,* and *dental office visit*.

This review begins with a description of the extent of the problem of periodontal disease in persons with Type 2 diabetes, followed by a review of the peer-reviewed articles that served as the foundation for this research. Next, is a review of the key concepts of provider-to-patient communication, knowledge, time, and prioritization of other conditions associated with diabetes. In addition, discussion on patient health literacy is included as this topic can play a role in the communication process. Included within the description of key concepts will be an analysis of the studies that are pertinent. Each analysis will include a description of the study, the methodology used, the population studied, the results of the study, and the rationale as to why it fits with the concept being discussed. My conclusion to Chapter 2 includes a discussion as to why the key concepts and their supporting articles influence the current study, the theoretical framework, and a discussion as to why this research addresses a gap in the literature.

## Periodontal Disease

Periodontal disease, also known as periodontitis, is a type of chronic inflammatory gum disease associated with the development of pathogenic biofilm on the root surface of the tooth (Jeffcoat, Jeffcoat, Gladowski, Bramson, & Blum, 2014). Persons who do not receive treatment for periodontal disease may experience destruction to the connective tissue and bone, infection, and tooth loss (Jeffcoat et al., 2014). In the overall U.S. population, it is estimated that 47.2% of adults age 30 and over and 70.1% of seniors age 65 and over have periodontal disease (CDC, 2013). In a 1999 IHS Oral Health Survey, data were collected from 12,881 American Indian dental patients ranging in age from 2 to 96 years from each of the 12 program service areas; each one of the over 500 federally recognized tribes in the United States belongs to one of the 12 service areas. Results from this survey concluded that most adults and elders have lost teeth because of dental disease or oral trauma (IHS Oral Health Survey, 1999). Seventy-eight percent of adults 35–44 years and 98% of elders 55 years or older had lost at least one tooth because of dental decay, periodontal disease, or oral trauma (IHS Oral Health Survey, 1999).

Periodontal disease is a significant health problem for both adults and elders in the American Indian community (IHS Oral Health Survey, 1999). Fifty-nine percent of American Indian adults 35–44 years and 61% of elders with at least one tooth have periodontal disease (IHS Oral Health Survey, 1999). In addition, 30% of the American Indian adults surveyed in the 35–44 age groups who had teeth also had diabetes. In the 55 and over age group, 33% of the American Indian adults with teeth had diabetes (IHS Oral Health Survey, 1999). The impact of periodontal disease among those persons 55 and over is greater as the risk for periodontal disease increases the longer a person has diabetes (IHS Oral Health Survey, 1999). In the general U.S. population, 43% of adults 65 and over have lost six or more teeth due to gum disease and 18% have lost all their teeth due to gum disease (CDC, 2008). No identifiers indicated if the participants in the 2008 Behavioral Risk Factor Surveillance System (BRFSS) reported having diabetes in addition to gum disease.

Based on this survey it was determined that periodontal disease rates have been stable since the 1991 Oral Health Survey and more American Indian elders are keeping their teeth longer (IHS Oral Health Survey, 1999). There are no recent statistics that reflect this amount of detail. Periodontal disease is a significant health problem among American Indian adolescents, adults, and elders, and the risk for periodontal disease increases if the person has diabetes (IHS Oral Health Survey, 1999). Periodontal disease is prevalent in the American Indian population for several reasons, including issues pertaining to lack of access to basic dental services, IHS clinics having a large backlog of patients that need extensive and time consuming restorative procedures, and the American Indian population experiences a higher incidence of tooth decay, diabetes, and commercial tobacco use which can contribute to periodontal disease risk (IHS Oral Health Survey, 1999). A key recommendation of the authors of this study was that dental professionals work with other health care providers such as physicians and nurses to help assess, educate, and refer their American Indian patients in need of dental care (IHS Oral Health Survey, 1999). This information provides a baseline reference as to why the problem of periodontal disease is prevalent in the American Indian population, especially in those persons who have diabetes. In their secondary analysis of periodontal disease prevalence data from the 2009 and 2010 National Health and Nutrition Examination Survey (NHANES) study, Eke, Dye, Wei, Thornton-Evans, and Genco (2012) determined that males, those persons of Mexican American heritage, persons with low educational status, persons living in poverty, and smokers were at highest risk of developing periodontal disease. Although the information presented was from 1999, no further studies on this subject have been completed by the IHS or any other entity.

## Theoretical Foundation

The theoretical foundation for this study lies within communication theory and more specifically that of the model of communication competence as described by Spitzberg and Cupach (1984). Spitzberg (2013) went on to describe the model by stating "Communication competence is defined as an impression of appropriateness and effectiveness, which is functionally related to individual motivation, knowledge, skills, and contextual facilitators and constraints" (p. 126). This model has three components. The first component is knowledge and how it is used to communicate a message most effectively to another person (Spitzberg & Cupach, 1984). The second component, skill, involves the ability of the person to communicate a message to another (Spitzberg & Cupach, 1984). The third component, motivation, involves wanting to communicate a topic in the most effective and appropriate manner so that the other person comprehends what is being said (Spitzberg & Cupach, 1984). Communication competence of health care providers is critical for helping a patient achieve successful health outcomes. Some health communication scholars such as Kasch (1984), Kreps and Query (1990), Morse and Piland (1981), and Rubens et al. (2014), suggested that the concept of patient-to-provider communication competence may serve as a useful framework for researching patient-to-provider communication. The knowledge, skill, and motivation of the health care provider are important for successful communication between the health care provider and the patient.

Other communication theories, frameworks, and models, such as the one-with-many design (Hagiwara, Kashy, & Penner, 2014) and the Pardue framework for interprofessional education (Pardue, 2014), were considered for the framework of this study but were deemed inappropriate for this particular study as they involve areas in which health care providers work in collaborative practices. At the clinic where I conducted my research, it was not clear if health care providers were using collaborative efforts to gain or disseminate information about the risk of periodontal disease.

The communication competence model was chosen as it is a general model of communication in which communication efforts in a dyad, a conversation between two people, are examined (Spitzberg & Cupach, 1984). In the case of my research, this involved looking at how health care providers communicate to their American Indian patients with type 2 diabetes about periodontal disease. Overall, to be an effective communicator, the health care provider would need knowledge about type 2 diabetes and its relationship to periodontal disease, skill in communicating the topic to another person and the ability to use different modalities in order to help the patient to understand the health message, and motivation in which the health care provider feels that the information is valuable and is willing to communicate the appropriate information to their patients.

There are several studies in which the topic of communication competence, mainly from an interpersonal communication standpoint in dyadic situations, was researched (Cegala et al., 2009; Kenny et al., 2010; Matthews, Peden, & Rowles, 2009; Parchman, Flannagan, Ferrer, & Matamoras, 2009; Perloff, Bonder, Ray, Ray, & Siminoff, 2006; Ritsema, Bingenheimer, Scholting, & Cawley, 2014; Rose, Harris, Ho, & Jayasinghe, 2009; Street Jr., Gordon, & Haidet, 2007). The model of communication competence has been researched by many, with some researchers looking at communication competence of the health care provider from their own view and the view of the patient. In the following studies reviewed, the model of communication competence was used.

When making health care decisions, some health care providers rely on evidence-based medicine. Evidence-based medicine consists of the treatment decision being made by the health care provider, based upon the current best practices for the type of treatment being recommended (Kasper, Legare, Scheibler, & Geiger, 2011). Health care providers have begun to shift to using a shared decision making model (Kasper et al., 2011). A goal of the shared decision model is that the health care provider and the patient make cooperative decisions about the patient's treatment options (Kasper et al., 2011). In order to be able to communicate all options that are available, the health care provider needs to demonstrate a high level of communication competence, not only in the area of knowledge, but in skill and motivation along with the ability to communicate in a way that the patient understands (Kasper et al., 2011; Kenny et al., 2010). Although the shared decision making model has become more popular than traditional evidence-based medicine, researchers have concluded that there are patient-provider communication barriers and that some of those barriers could be addressed though cultural competence training to improve communication (Bhattacharyya et al., 2011; Simonds et al., 2013).

Hazelton, Jr. and Cupach (1986) took another approach to using communication competence in looking at the communicator's ability to describe, predict, and explain the communication behavior when presented with a verbal dialogue between two people. This mixed methods study involved 160 students at a Midwestern university. In the study, students were asked to read a book passage about a hypothetical situation between two college students. After the reading, students then answered questions about their opinions on situational behaviors expressed in the reading, behaviors that were exhibited in the reading, and provide a prediction as to what the main character would do next. The authors of this study were looking for the student's ability to describe the reading passage, retain information, and convey understanding. The authors of this study stated that knowledge is an essential component of effective communication in order to effectively relay information to others.

Cegala, Socha McGee, and McNeillis (1996) took the topic of communication competence and patient-to-provider communication one-step further in stating that the exchange of information is important between the patient and the health care provider, but it is the patient's belief that they have the capability to obtain their own health information. Patients also feel that their health care providers are competent in providing health information to the patient (Cegala et al., 1996). The health care providers, on the other hand, do not place as much relevance on the importance of communication competence as the patients do (Cegala et al., 1996). Health care providers express concerns about patients' communication competence, which can lead the health care provider to negatively label the patient as being difficult and can thus influence a health care provider's attitude about a patient (Cegala et al., 1996). This study, done by Cegala et al., is an example of how patients and providers feel about each other's level of communication competence. My study did not address providers' attitudes towards patients, but addressed health care providers' communication efforts to get the message of periodontal disease risk across to the patient with type 2 diabetes (Cegala et al., 1996).

In addition to the three components model as earlier described, Cupach and Spitzberg (1983) and Spitzberg (1991) also explored the relationship between dispositional and situational measures in communication competence. Dispositional measures assess a person’s predisposition to behave in a certain way while situational measures assess a person’s behavior in a given situation (Cupach & Spitzberg, 1983; Spitzberg , 1991). While both measures involve a person’s behavior, I decided not to use these measures in my study as the basis of the study focuses more on the three-component model of knowledge, skill, and motivation.

Interpersonal communication and its relationship to a person’s health is essential in a social context, as communication does not only occur between two people, but within larger social networks such as e-mail and other Internet based resources (Ackerson & Viswanath, 2009; Wilkinson & Marmot, 2003). The quality of the communication between the patient and the health care provider is essential to achieving satisfaction of care by the patient as well as an understanding by the patient on what is being said to them during a visit and the patient’s ability to recall and comply with the prescribed treatment (Ackerson & Viswanath, 2009; Garroutte et al., 2006). The information provided about interpersonal communication and social disparities is important to my study as it falls into the area of patient-to-provider communication and social disparities is important to my study as it falls into the area of patient-to-provider communication. Although I did not explore communication and social disparities, it is clear that this information needs to be discussed in brief as social and health disparities do exist between health care providers and minority populations, especially when it comes to communicating health topics.

The basis for this study involved the main topic of provider-to-patient communication. Also discussed were the topics of knowledge, time, and greater concern for other conditions associated with diabetes. Using the model of communication competence as the foundation for this study acknowledges that communication competence plays several roles in the provider-to-patient dyad, including, but not limited to the ontological knowledge of the health care provider to describing a health care messages to patients.

## Provider-to-patient Communication

The primary focus of provider-to-patient communication is how health care providers utilize different strategies or modalities to communicate with the patient in order to achieve understanding of the topic and how the amount of health related knowledge the patient can play a role in understanding of what is being communicated (Street Jr. et al., 2007; Travaline, Ruchinskas, & D'Alonzo Jr, 2005). The topic of communication as a whole is a complex one. As the cost of treating patients with type 2 diabetes who have periodontal disease can vary according to the extent of the bone loss and tissue inflammation and the treatment prescribed by the dentist, it is important for health care providers to communicate to their patients about the impact that periodontal disease can have not only on their health, but on their health care expenses (Jeffcoat et al., 2014). Treating periodontal disease can be as simple as having root planing and scaling by a dentist or dental hygienist while supplementing dental treatment with a prescription antimicrobial rinse to more complex treatment for advanced periodontal disease such as periodontal surgery (Jeffcoat et al., 2014). In the next few paragraphs, evidence will be presented about health care providers communicate with their patients, and how the level of health literacy a person has can affect how a topic is communicated and understood.

## Health Literacy of the Patient in Understanding Health Topics

Health literacy is defined by the Institute of Medicine (2004) as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (p. 2) People are relying more on others (such as a health system, meaning health care providers) rather than themselves to manage their health care  so health literacy is an outcome needed to sustain health (Gazmararian, Williams, Peel, & Baker, 2003; Kaphingst et al., 2014; Nutbeam, 2000). The more health literate the patient is, the more informed that patient will be, thus making the communication between the health care provider and the patient easier for both parties.

A review of the literature produced multiple articles on patient health literacy. A further review of health literacy and patient-to-provider communication provided a narrower set of results. Schilinger, Bindman, Wang, Stewart, and Piette (2004) determined that a functional level of health literacy can play a role in relaying a health message to patients and concluded that patients with inadequate functional health literacy were more likely to have difficulty communicating with the physician during an office visit. Paasche-Orlow and Wolf (2007) stated that health literacy should be associated not only with patients’ level of understanding, but also how the health care providers in the health care system communicate health information to the patient. They stated that patients' health literacy level is influenced by the factors of patient access and utilization of health care services, the relationship between the patient and provider, and patients' concept of self-care. Not only should a patients' ability to understand the information be examined but also the complexity of the information that is being provided to patients by providers.

In their qualitative analysis of barriers and solutions to patients with type 2 diabetes treatment, Wens, Vermeire, Van Royen, Sabbe, and Denkens (2005) determined that physicians are experiencing problems trying to help patients understand the complexities of type 2 diabetes. The patients in this study in general had little knowledge about type 2 diabetes. Some of the patients in this study tended to minimize the problem and did not think it was crucial to adhere to the physicians' advice for self-care (Wens et al., 2005).

In a similar study of health literacy in a population of new Medicare enrollees ages 65 and over, Gazmararin et al., (2003), determined that, of the 653 persons included in the study, 24% had inadequate health literacy skills and 12% had marginal health literacy skills. Inadequate health literacy skills can lead to patients misunderstanding their chronic conditions and being unsure how to correctly administer their medication. For the patient, being unsure as to the proper way to take a medication can lead to unnecessary hospitalizations.

In conclusion, the researchers in the Wens et al. (2005) and Gazamarin et al. (2003) studies found that patients and physicians have different expectations with regard to illness and health. Physicians have specific treatment protocols that they need to encourage patients to follow and physicians need to develop better ways to communicate the treatment protocols to the patients (Wens et al., 2005). If a patient has low health literacy, it may be difficult for the patient to understand what the health care provider is talking about. Low health literacy is a disadvantage for patients especially if they need to understand the technicalities of their chronic condition (Gazamarin et al., 2003). This is especially true for patients with diabetes as there is the risk of developing a secondary condition related to diabetes. In addition to the risk of developing secondary health conditions related to diabetes, patients with diabetes need to understand what their blood sugar level means and how to adjust their medication to bring blood sugar back to normal. People who have low health literacy may have difficulty understanding how to take the correct dosage of their medication in order to control blood sugar levels.

Oral health literacy is defined as “the degree to which individuals have the capacity to obtain, process and understand basic oral health information and services needed to make appropriate health decisions” (National Institute of Dental and Craniofacial Research, 2005, p. 175). In a study of WIC clients, Lee, Divaris, Baker, Rozier, and Vann (2012) looked at the specifics between oral health literacy and patients’ self-efficacy with regard to their oral health status and dental neglect. Based on interviews with clients enrolled in a WIC program, the researchers concluded that patients with better oral health literacy had better oral health status but still suffered from dental neglect (Lee et al., 2012). Most patients lacked knowledge about their condition and those patients tended to minimize the seriousness and potential consequences of their disease (Lee et al., 2012). Freeman and Loewe (2005) stated that ineffective communication between health care providers and patients is a barrier to successfully treating diabetes. This lack of health knowledge paved the way for issues in compliance with treatment plans and medication management (Freeman & Loewe, 2005; Lee et al., 2012; Wens et al., 2005).

In comparing oral health literacy levels between Indigenous Australians and American Indians, Jamieson, Divaris, Parker, and Lee (2013) sought to determine if there were differences in oral health literacy in terms of socio-demographic status, dental service utilization, self-reported oral health indicators, and oral health related quality of life factors. It was determined that the oral health literacy levels of each population is similar and each population scored at lower oral health literacy levels as compared to their White counterparts in each country (Jamieson, Divaris, Parker, & Lee, 2013). A significant limitation to this study was that the American Indian sample was taken from a WIC clinic, which restricts the study population to low-income persons who are mainly women. Utilizing this low-income population may have skewed the data to generalize that low income American Indians have a lower oral health literacy level than is actually true (Jamieson et al., 2013). The Australian Indigenous sample, on the other hand, was a convenience sample as the researchers had studied this population for some time and had developed a relationship with the study population. Per the researchers, the Australian Indigenous population cannot be considered all-inclusive to all Australian Indigenous people (Jamieson et al., 2013).

In a study of physician communication with their diabetic patients with low health literacy, Schillinger et al. (2003) found that the primary care physicians in their study rarely assessed patient recall or comprehension of new information. This study took place at two primary care clinics in California, which served ethnically diverse patients with low functional health literacy. Functional health literacy is defined as a measure of how much a person understands written and numeric health instructions. (American Medical Association (AMA), 1999). Patients with low functional health literacy may have trouble understanding patient brochures and other patient materials, difficulty with oral communication, problems reading and understanding medication labels, or, in the case of the diabetic population, understanding and interpreting blood glucose values and what dosage of insulin should be used (Kalichman, Ramachandran, & Catz, 1999; Mayeaux, Jr. et al., 1996; Williams, Parker, Baker, Coates, & Nurss, 1995). The results of this study concluded that physicians who used an interactive communication strategy such as feedback technique when communicating with their patients with type 2 diabetes found that the patients had better glycemic control despite their low functional health literacy level.

In the Native American community clinic setting, working with the local population can be tricky for a non-Native health care professional as there are social customs that the health care provider may not be familiar with thus making the communication connection with the patient a challenge (Miller, Wikoff, Keen, & Norton, 1987; Patrick et al., 2005). Kelly and Brown (2002) in their qualitative research involving Native patients and how physicians communicate with them interviewed 10 non-Native physicians who were providing care at First Nations community clinics in Canada. Three themes emerged from these interviews. The first theme involved communication, in which the physician speaks less, takes more time with the patient, and is comfortable with silence (Kelly & Brown, 2002). The second theme involved not taking patients' illnesses out of context and that there are cultural values that come into play when discussing health with the patient (Kelly & Brown, 2002). The third theme from the interviews involved physicians not taking the time to learn about the culture of the people they are serving (Kelly & Brown, 2002). In conclusion, physicians were encouraged to learn more about the culture of the people they were serving, learned to accept silence as an answer, and were trained on how to be better listeners and to take note of non-verbal cues (Kelly & Brown, 2002). The health literacy level of the patient plays an important role not only in how a patient understands the information that is communicated to them, but also to ensure that there is understanding of what is being said (Kelly & Brown, 2002).

The themes explored in the Kelly and Brown (2002) study are a general assessment of the continuing education needed by non-Native health care providers who are working with American Indian patients. It is important for all health care providers, including those who work with the American Indian population to learn these valuable skills in order to increase health care provider-to-patient communication and to increase the quality of life of the American Indian patient. The communication qualities the health care providers learned in the 2002 study conducted by Kelly and Brown, are valuable stepping-stones in patient-provider communication. It is important as a researcher to determine how health care providers are communicating to their patients to discover gaps in communication.

## How Health Care Providers Communicate with Patients

In this section, evidence will be presented about the different modalities health care providers utilize in order to communicate health messages to patients. Health care providers may use different modalities to communicate a health message to patients. Some modalities may include spoken word, use of graphs, figures, models, sign language, posters, and demonstrations (Negarandeh, Mahmoodi, Noktehdan, Heshmat, & Skhakibazadeh, 2012; Schwartzberg, Cowett, Van Geest, & Wolf, 2007). In their study of provider-to-patient communication methods, Schwartzberg, Cowett, Van Geest, and Wolf (2007) enrolled 307 health care providers who participated in answering a questionnaire on the communication modalities they used the most when discussing health information with their patients who had low health literacy. The top five common modalities used in this study were using simple language, handing out print materials to patients, speaking slowly, reading instructions out loud to the patient, and writing down instructions (Schwartzberg et al., 2007). More than 70% of the health care providers that were interviewed used five or more communication modalities the majority of the time when communicating with patients (Schwartzberg et al., 2007). Less than 40% of the health care providers in this study utilized the teach-back method, which is the recommended method for communicating with patients with low health literacy (Davis et al., 2002; Schillinger et al., 2003; Schwartzberg et al., 2007). This information is important for my study as health care providers under use their health literacy skills and less frequently use plain language and teach back skills when speaking with their patients with low health literacy (Ali, Ferguson, Mitha, & Hanlon, 2014).

Communication style can vary from profession to profession. Per the literature, physicians and nurses communicate differently to the patient. In a comparative study of the effectiveness of doctors and nurses' verbal communication with patients, Collins (2005) determined that in a clinical setting, nurses and doctors each have their own distinct communication patterns. Nurses tended to explain health topics in common language with regard to the patient being the one who needs to take responsibility for their behaviors after the conclusion of the health care visit (Collins, 2005). Physicians tended to speak to the patient in terms that are more technical and discussions were more technical as to the intervention and how it would help the patients' conditions (Collins, 2005).

In another study, physicians were asked about the communication competence of their patients. The physicians responded that it was easier to communicate with those patients who were better communicators and who expressed satisfaction with their health care provider, resulting in patients who were more likely to adhere to the prescribed treatment regimen (Street, Jr. et al., 2007). Physicians in this study stated that they favored those patients who were more involved in their health care, who were less likely to argue with the physician, and who expressed positive emotional response to treatment.

Ali, Ferguson, Mitha, and Hanlon (2014) argued that health care providers should have communication skills training during medical training. In research conducted with surgical residents, the attending surgeons stated that they did not discuss or provide feedback regarding their residents' communication skills (Ali et al., 2014; Hutul, Carpenter, Tarpley, & Lomis, 2006). Not having access to communication skills training or receiving feedback on how to improve communication skills can decrease health care providers’ confidence in talking with their patients who have low health literacy (Ali et al., 2014; Hutul et al., 2006).

Verbal communication is one way a health care provider can discuss health topics with a patient. Another way physicians can communicate with patients is through e-mail. In a 2005 pilot study conducted by Leong et al., the researchers found that communication by e-mail was a convenient form of communication for both the patients and the physicians who participated in this study. This study’s participants included eight physicians, four who agreed to communicate to their patients by e-mail and four who did not communicate with their patients by e-mail (Leong, Gingrich, Lewis, Mauger, & George, 2005). Guidelines such as separate e-mail accounts were set up for the physicians participating in the e-mail communication along with screening the patients by asking them if they used e-mail and if they would like to partake in this study (Leong et al., 2005). The 100 (67 in the e-mail group and 33 in the non-e-mail group) patients who participated in the study needed to be established patients with the participating physician and use e-mail regularly. The results of this study revealed that the level of patient satisfaction rose significantly with those in the e-mail group as compared to the non-e-mail group as they stated that they were pleased with the convenience of being able to e-mail a physician and get an electronic response rather than having to wait for a return phone call (Leong et al., 2005). At the end of this study, both the patient and physician participants were asked if patients should be able to e-mail their doctors. The response to this question by the patient participants was 100% of the e-mail group and 97% of the non-e-mail group responding yes to this question (Leong et al., 2005). Of the physician participants, the four who participated in the e-mail group responded yes. Of the non-e-mail physician group, only two of the four physicians had a yes response. There were limitations to this study which included not being a randomized study and that the physician sample size was small at eight physicians (Leong et al., 2005). Another limitation was that the patient participants in this study were from a university hospital-affiliated family practice, were educated and knew how to use e-mail and the Internet to gather information (Leong et al., 2005).

E-mail communication has the potential to improve health care delivery (Moyer, Stern, Katz, & Fendrick, 1999). Since the use of e-mail as a mode of communication has increased, more and more health care providers are using e-mail as a way to communicate with patients regarding appointment times, lab results, clinical diagnoses, refilling prescriptions, etc. (Moyer et al., 1999; White, Moyer, Sterns, & Katz, 2004; Zhou, Kanter, Wang, & Garrido, 2010). With the increased demands of health care providers' time seeing patients in the clinic, e-mail communication provides an efficient way to not only speak with the health care provider, but e-mail also provide a record of the conversation, which can be referred back to by the patient if there are any questions (White et al., 2004). These studies provide insight to another method of communication, electronic communication that is available between health care providers and patients. For some people, electronic communication can be a more comfortable way to speak with a health care provider, especially if patients have difficulty communicating medical issues (Houston, Sands, Jenckes, & Ford, 2004) or if the health care provider is of the opposite gender (Henderson & Weisman, 2001).

The gender of the health care provider can play a role in how health care providers communicate health messages to their patients and vice versa. Female health care providers tend to be better verbal communicators with their patients than their male counterparts (Arnold, Martin, & Parker, 1988; Henderson & Weisman, 2001; Jefferson, Bloor, Birks, Hewitt, & Bland, 2013; Linn, Cope, & Leake, 1984; Piette, Schillinger, Potter, & Heisler, 2003; Ramirez et al., 2009; Roter, Hall, & Aoki, 2002; Shin et al., 2014; Sprague-Jones, 1995; Zare, Sorenson, & Heeren, 1984). Female health care providers tend to provide more patient-centered-care than their male counterparts (Bertakis & Azari, 2012; Blanch-Hatigan, Hall, Roter, & Frankel, 2010; Ramirez et al., 2009). Patient-centered-care increased when female patients were under the care of female health care providers (Bertakis & Azari, 2012). In addition, more conversations occurred between patients and female health care providers than with female patients and male health care providers (Shin et al., 2014). Female physicians tended to communicate more health prevention activities than their male counterparts (Ramirez et al., 2009). This information is important especially if the population of female health care providers at a clinic is greater than the number of male health care providers. A weakness of these studies includes conducting the studies at clinics where the population of health care providers is greater for one gender than the other which could greatly vary the study results. For the purpose of my study, the information presented here is important as to determine if similar results will be seen in my study based on the role each health care provider plays in the clinic. It is important to gather demographic information on the gender of the providers at the clinic prior to beginning the interviews. Although the information provided here does not relate specifically to any of the research questions, the concept of female providers communicating more about periodontal disease risk than their male counterparts is an interesting topic to explore,

Race and ethnicity of the health care provider may also be a barrier to communication due to the health care providers' language and cultural differences as compared to the population they are treating. (Ashton et al., 2003; Ulrey & Amanson, 2001) For example, a health care provider from another country who is in the United States may not be familiar with American Indian culture and may have a different way of communicating due to the difference in language and culture (Whelan, McKinley, Boulet, Macrae, & Kamholz, 2001). Acclimating to American culture may be difficult with the variety of cultural groups that exist in the United States, especially if the person who is new to this country is in an area where there are few people of the same culture. The same can be said for a non-Native health care provider who is working with the American Indian population as that population although categorized into one group is made up of several unique cultural and linguistically different societies. Miller, Winkoff, Keen, and Norton (1987), in their study of American Indian patients with type 2 diabetes at a Midwestern American Indian clinic determined that innovative strategies should be used by the health care providers working with this population to tailor health instructions to meet the unique cultures and traditions of the American Indian tribe they are working with.

Communication between the health care provider and the patient is essential for patient adherence to a prescribed health care regimen. Non–-adherence to a health care regimen can be attributed, in part, to poor communication methods of the health care provider to the patient (Heisler et al., 2002; Matthews, Peden, & Rowles, 2009). This can lead to the patient not understanding the recommended health care regimen. On the other hand, health care providers may not understand the population they are working with. Several factors that may cause a rift between health care providers and patients include the level of training the health care providers received regarding the population they are caring for, the varied language, religious, and cultural beliefs of the population and of the health care providers, and the health literacy of the patients (Barfod, Hecht,Rubow, & Gerstoft, 2006; Freeman & Loewe, 2000; Haskard Zolnierek & DiMatteo, 2009; Wens et al., 2005).

Evidence presented in these studies helped to shape some of the research questions with regard to the type of modality used to communicate topics to patients. Health care providers may need to utilize multiple modes of communication in order to learn the best way of communicating health care messages to patients. If patient adherence to the prescribed health care regimen is the goal of the health care provider, then it is up to the health care provider to learn more about the culture of the patient and learn to become a better communicator of their health messages (Goodkind et al., 2014; Noe et al., 2014).

Communication between a patient and the health care provider can be a complicated one. From dealing with patient treatment non-adherence, low health literacy level of the patient, and patient learning styles, being a health care provider-to-patients can be a challenging task. Health care providers are left with the daunting task of learning to be better communicators and this could possibly be a challenge especially for those health care providers who are not good communicators in the first place. As discussed in this section, some of the studies (Ashton et al., 2003; Heisler et al., 2002; Matthews, Peden, & Rowles, 2009; Ulrey & Amanson, 2001) concluded that due to the diversity of the populations being diagnosed with diabetes and the fact that some of those populations have low health literacy levels change needs to be made on the part of the health care provider to ensure that their communication efforts are understood. The research discussed in this section helped influence the design of the research questions through the presentation of prior scholarly research completed on the study topic and through discussion on topics related to non-Native health care providers' challenges in working with the American Indian population. For the purpose of this study, a health care provider's perception of a patient's health literacy may affect how the provider will communicate to the patient. Now that the topic of provider–to–patient communication has been discussed, conversation can begin to the first sub-topic of health care provider knowledge of the link between diabetes and periodontal disease and how that knowledge can play a role in provider-to-patient communication.

## Health Care Providers' Knowledge of the Link between Diabetes and Periodontal Disease

The first key concept, knowledge, concerns the health care community, the medical and dental health care providers, and their knowledge about the relationship between diabetes and periodontal disease and how periodontal disease can affect the patient. Andersson et al. (2007), in their qualitative study of general medical practitioners in a health system in Sweden, described how general medical practitioners viewed the health of the elderly population that they served. The physicians in this study acknowledged that oral health was a problem with their elderly patients. A common statement made by the health care providers in this study is that patients with oral health issues should see a dentist as the health care providers' lack knowledge about oral health, have limited time to spend with patients to address all the patients' health care issues, and that in-depth examination of the mouth should be addressed by dentists (Andersson et al., 2007). The general practitioners were aware that a patient's poor oral health in connection with decayed or missing teeth can affect a person's ability to eat along with the choice of food to eat (Andersson et al., 2007). The consensus of the physicians was that oral health needs should be taken care of by a dentist. This thought process may compromise the quality of life of any patient as a simple examination of the oral cavity may provide an answer or additional information as to what is troubling the patient (Andersson et al., 2007).

Many adults who have been diagnosed with type 2 diabetes are unaware of their susceptibility to oral complications such as periodontal disease. Although oral health care education from primary health care providers is essential, it is not being carried out (Yuen, Marlow, Mahoney, Slate, Jenkins, & London, 2010). Yuen et al., (2010) studied diabetes education programs in states that had a high prevalence of diabetes; one of the states studied was Wisconsin. Representatives from each state's diabetes self-management education program (DSMEP) participated in a 13-question survey about their diabetes curriculum and if it included an oral health education component. If the representatives stated their program had an oral health education component, they were then asked 12 additional questions regarding patient education topics ranging from the importance of getting regular dental care to the effect of uncontrolled diabetes on periodontal disease to signs of dental disease and showing proper brushing and flossing techniques (Yuen et al., 2010). The results of this study concluded that of the 345 programs that were analyzed, 301 reported having an oral health component or some oral health information as part of their diabetes education curriculum (Yuen et al., 2010). Education varied from general topics such as preventing dental problems through regular brushing, flossing, and visiting the dentist to topics more specifically related to diabetes and oral health, such as periodontal disease risk. Major deficiencies including lack of education on how to manage dry mouth and demonstration of the proper technique for brushing and flossing were found in much of the diabetes curriculum of the states DSMEP’s that participated in this study. The adults with diabetes in this study who were unaware of proper oral health techniques may have been less likely to perform these tasks properly at home (Yuen et al., 2010).

For some adult patients with type 2 diabetes, the first source of diabetes-related oral health education comes from the diabetes educator especially if the patient has not seen a dentist in a reasonable amount of time (Yuen, Onicescu, Hill, and Jenkins, 2010). The purpose of this study (Yuen et al., 2010) was to determine if diabetes educators believed that their education curriculum was sufficient in teaching the patient about diabetes-related oral health information, if there were barriers to including the information in their curriculum, and to determine if an oral health module was added to the diabetes education curriculum if the educator was able to adequately cover the oral health topics. Of 130 diabetes educators surveyed, 93% felt that oral health should be part of the diabetes curriculum and 76.9% reported that their current diabetes curriculum did not cover oral health issues. Although oral health was not covered in their curriculum, eight diabetes educators reported that they briefly provided some oral health education.

Oral health care information can come from multiple health care providers (medical, dental, and auxiliary health care professionals), but as demonstrated from the studies discussed, how the information is delivered,  who delivers that information, and what resources that information comes from is important (Andersson et al., 2007; Yuen et al., 2010; Yuen et al., 2010). Having the base knowledge about health topics such as diabetes and periodontal disease can provide a patient with the basic knowledge they need in order to achieve a better quality of life. Establishing baseline knowledge about a health topic can pave the way for not only seeking more information, but being able to contribute more answers to patient questions. The information provided in this section impacts the study questions and study approach as I am searching for answers as to who in the clinical setting is discussing the risk of periodontal disease with the American Indian population with type 2 diabetes and how they get that information.

## How Health Care Providers Gain Knowledge

New technology has had an impact on how health information is accessed. In this age of new technologies such as the Internet and having access to the Internet from mobile devices such as smart phones, more and more health care providers are utilizing these technologies to gather information about their patients' medical conditions and to answer the more difficult patient questions (Bennett, Casebeer, Kristofco, & Strasser, 2004; Bennett, Casebeer, Zheng, & Kristofco, 2006; Casebeer, Bennett, Kristofco, Carillo, & Centor, 2002).

Casebeer et al., (2002) looked at how physicians use the Internet to access medical information. In this study, 2,200 physicians were faxed a 21 question survey regarding their use of the Internet in their practice (Casebeer et al., 2006). Although this study did not measure quality of care issues based on physician knowledge gained from the Internet, having access to the Internet to seek information about patient care in addition to professional development is the key to providing better patient care (Casebeer et al., 2006). The physicians in this study stated that searching for answers to patients' particular problems was the most common reason for accessing the Internet (Casebeer et al., 2006). Physicians also stated that the Internet provides credible sources, credible information, and the convenience of 24-hour access. Barriers to retrieving information included too much or too little information (Casebeer et al., 2006).

In another study about physician information-seeking behaviors, Bennett, Casebeer, Kristofco, and Strasser (2004) conducted a random sample of 3,347 physicians and asked them why they used the Internet to gather medical information. Physicians' responses included that the Internet contains the latest research on specific topics, it's an easy tool for looking for information about a new disease area (either information on diagnosis or management), and it can be used for searching for information regarding a patient problem (specifically patient education materials or guideline summaries), drug dosing information, and new therapy and product information (Bennett et al., 2004).

When looking at what prompts a physician to look for more information and how they gather that information, Bennett, Casebeer, Zheng, and Kristofco (2006) in their survey of 2,500 physicians, concluded that specific patient problems and searching for the latest medical information were key in using the Internet for answers. An interesting point in this survey was that few physicians looked up information on the Internet during patient visits (Bennett et al., 2006). This could be due to having access only to a desk top computer and/or no Internet access in the exam room. Another key point of this study was that younger physicians and female physicians were the most likely to use the Internet to seek information on a specific patient problem (Bennett et al., 2006). This is key as the younger physicians grew up with using Internet technologies for searching out information and are more likely to use it to answer their patients' questions (Bennett et al., 2006). Female physicians were more likely to utilize the Internet to search for information about a specific patient problem (Bennett et al., 2006).

In addition, a study done by Andrews, Pearce, Ireson, and Love (2005) concluded that, in their cross-sectional survey of health care providers in the Kentucky Ambulatory Network, overall 58% of the surveyed health care providers sought additional information to support patient health care, while 68% of the health care providers accessed information about patient care issues while the patients were waiting. There were also differences in information seeking behaviors between rural and urban health care providers resulting in the rural population  not using the Internet as much as the rural health care providers for informational searches (Andrews et al., 2005). The rural population’s main source of information was from print resources (Andrews et al., 2005).

Continuing medical education opportunities can provide health care providers with updates on a multitude of topics such as new patient care trends, medication updates, and allow health care providers to confer with others in their profession to share thoughts and ideas. In previous research, continuing medical education has not been effective in getting health care providers to change practice behaviors, especially when it comes to diabetes (Hagen, Griebenow, Altenhofen, Schwang & Schnelle, 2014; Jacques, Jones, Houts, Lynch, & Dwyer, 1991; Larme & Pugh, 1998). Anderson, Donnelly, and Davis (1992), Paul, et al., (2013), and Weinberger, Cohen, and Mazzuca (1984), point out that the knowledge that a health care provider has about a health topic is not what is lacking in continuing medical education but the providers attitudes and beliefs about a health topic that may interfere with care delivery according to current standards of care. Szpunar, Minnick, Dako, and Saravolatz (2014) found that there are practice gaps if no continuing medical education is offered. Baum, et al., (2014), suggest that health care providers conduct performance improvement continuing medical education in order to meet the challenge of caring for patients with type 2 diabetes. Larme and Pugh (1998) concluded in their study of the attitudes of primary care providers on the topic of diabetes that continuing medical education should address provider attitudes on the topic of diabetes in addition to updating the health care providers on the current research. This would be more effective than current continuing medical education efforts that support adhering to standards of care (Larme & Pugh, 1998).

In an ethnographic study of knowledge management by primary care providers in England, Gabbay and le Mav (2004) describe how health care providers make health care decisions. The results of this study concluded that health care providers rarely used evidence from research or other sources, but instead drew upon their own experiences and colleague's experiences (Gabbay & le Mav, 2004). Some health care providers argue that evidence-based medicine is the best method for medical practice as it incorporates knowledge based on research (Gabbay & le Mav, 2004). On the other hand the concept of knowledge in practice has come into play as it is based on what the health care providers have learned through years of practice (Gabbay & le Mav, 2004).

Staying abreast of current medical knowledge about the human body and treating conditions that affect it is essential for making correct diagnoses and creating treatment plans that have the best outcome for the patient. Through continuing education, referring questions to colleagues when questions arise (Bennett et al., 2006), and utilizing print and electronic resources (Paul et al., 2013), health care providers are more apt to increase the amount of knowledge about a health topic in addition to learning about the best practices for treating health conditions.

Health care provider attitudes and lack of concern about a topic has the potential to influence whether or not the topic is discussed during a routine visit (Larme & Pugh, 1998). This lack of concern along with health care provider attitudes has influenced the research questions and approach through the curiosity of wanting to establish as to why some topics are discussed over others. This information was uncovered during the semistructured interviews.

## Collaborations between Medicine and Dentistry

With diabetes being a global health problem, health care professionals have the opportunity to collaborate with their peers in the medical field to discuss oral health issues such as periodontal disease, which may impact a patient’s quality of life. (Bissett, Stone, Rapley, & Preshaw, 2013; Mouradian, Berg, & Somerman, 2003). In a qualitative interview study in Newcastle upon Tyne, United Kingdom, physicians, dentists, and patients were interviewed to determine their knowledge and attitudes regarding the link between periodontal disease and diabetes (Bissett et al., 2013). The results of this study concluded in three main themes. The first theme was that there was an overall lack of unfamiliarity about the link between diabetes and periodontal disease mainly on the part of the medical health care provider. (Bissett et al., 2013) Second, there are no set national guidelines for treatment of patients with diabetes in managing their oral health due to lack of limited funding and resource and that there are other medical conditions that are priority (Bissett et al., 2013). Third, medical health care providers and dental providers tend to work in their own professional silos (Bissett et al., 2013). The medical health care providers stated that their medical school education included little knowledge about oral health subjects and this had an impact on how they think about oral disease from a systemic viewpoint (Bissett et al., 2013). The medical health professionals also stated that there was a common perception that diseases and issues of oral health were to be managed by dentists. The dental providers stated that they also tended to work in their professional silos and felt that they were looked upon negatively by their medical colleagues (Bissett et al., 2013).

These studies on information seeking behavior are important as they provide a window into how health care providers seek out information. Another factor is that on some American Indian reservations, Internet access may be limited or may be available as dial up service only (IHS, 2007). Limited access to the Internet is mainly due to being rural, as the case with many tribes within the continental United States and Alaskan Native corporations.

The information provided on the sub-topic of knowledge is important due to the various ways health care providers gather knowledge about a topic. The topic of study for this research involves communication, but to be able to communicate about a subject, knowledge from credible resources and from partnerships with colleagues needs to happen in order to communicate a health topic to a patient correctly and effectively. The information in this section helped to frame the first study question which is how much do health care providers know about periodontal disease and its relationship to diabetes in addition to how health care providers gain and then maintain their clinical knowledge.

## Time Spent With the Patient

The second key concept, time, deals with health care providers and the amount of time that they are spending with patients so that the patients fully understands the risks of having diabetes. Andersson, Furhoff, Nordenram, and Wardh, (2007), confirmed in their study of general medical practitioners in Sweden that time and patient load can be a barrier to delivering quality patient care. The physician respondents in this study stated that they felt that they had such a large workload that it would be feasible to discuss only the patients' chief complaint at the time of the visit (Andersson et al., 2007).

How physicians utilize the time spent with their patients can be critical in providing the best quality of care. A large proportion of a physician’s time is spent seeing patients for two main visit types-chronic and acute care (Yawn, Goodwin, Zyanski, & Stange, 2003). Acute care visits are mainly short visits to diagnose an illness and then prescribe a medication to resolve the issue. Chronic care visits are more time consuming as the purpose of the visit is disease management. For a person who has diabetes, a chronic care visit may consist of not only seeing the physician, but also a visit to the lab, medication history, management and adjustment of medications, and discussion of the patients health status and if there are any other systemic issues that may need to be addressed (Yawn et al., 2003).

Time management research of primary care providers caring for patients with chronic disease in primary care setting conducted by Ostbye, Yarnall, Krause, Pollak, Gradison, and Michener (2005) concluded that chronic conditions such as diabetes, require more time than primary care physicians have available per patient per visit. Yarnall, Pollack, Ostbye, Krause, and Michener (2003) determined that in order to comply with the guidelines of the US Preventive Services Task Force Guide to Clinical Preventive Services, physicians would have to work 7.4 hours per day per patient in order to provide adequate preventative care. Barriers to providing adequate preventative care included the lack of time allotted for an office visit, how the physician was reimbursed by the insurance company, as the rate of reimbursement can differ from private versus public or state sponsored insurance, patient non-compliance with treatment plans, and physicians not being able to communicate in lay terms to the patient. (Yarnall et al., 2003)

With regard to how the time during an office visit is utilized, Yawn, Goodwin, Zyzanski, and Stange, 2003, identified that there were differences in the amount of time spent with the patient during acute and chronic care visits. This study involved direct observation of the patient-physician relationship during both chronic and acute care visits. The authors concluded that the amount of time spent with patients for chronic disease management was significantly higher than for acute visits as there was more involved including assessment of the current health status of the patient, providing or discussing different preventative measures or plan of care. According to this research, the amount of time spent with patients during health care visits may not be a factor for all health care providers.

Parchman, Romero, and Pugh (2006) also conducted a direct observational study of acute and chronic care visits of patients with type 2 diabetes to determine if the quality of diabetes care increased as the amount of time spent with the patient increased. The authors of this study found that the recommended indicated services (HbA1c screening, lipid panel, urine microalbumin test, and referrals for dilated eye exam and foot exam) were less likely to be addressed by the health care provider during an acute care appointment but were more likely to be addressed during a chronic care appointment. A limitation of this study was that the authors only addressed the amount of time spent with a patient with diabetes during a chronic care visit, which was 19.3 minutes. There were no data on the amount of time spent for an acute care visit.

The length of a clinical visit with a physician is usually shorter than the time allotted as described by Dugdale, Epstein, and Pantilat (1999). Patients spend more time with other persons on the physician's team, such as the nurses, than with the physician during a visit. For the physician, there are components of the care that can be affected by the amount of time spent with the patient including patient satisfaction, chronic disease outcomes, the increase in the number of prescriptions that are prescribed at a short visit versus a longer visit, physician satisfaction with their practice, and the number of malpractice claims (Dugdale, Epstein, & Pantilat, 1999). Physicians who have an independent practice stated that they spent more time with patients and were more likely to answer all of their patients' questions as compared to their counterparts working in large health care systems (DiMatteo et al., 1993).

Expanding on the issue of time, Lin, Albertson, Schilling, Cyran, Anderson, Ware, and Anderson (2001) examined the amount of time health care providers spent with patients in the clinic. Of the 1,486 patient encounters, health care providers in 10% of those encounters stated that they felt rushed to complete the patient visit and move onto the next patient (Lin, et al., 2001). Ritsema, Bingenheimer, Scholting, and Cawley (2014) determined in their study of health care providers and how they deliver health education to patients with chronic disease, that health education is not provided on a routine basis. For all chronic conditions that were assessed in this study, health education delivery was highest among physician assistants and nurse practitioners (Ritsema et al., 2014). The authors of this further explained that health education delivery is time consuming and that physicians may ask patients to make a follow up appointment with physician assistants or nurse practitioners in order to receive the health education component of the health care visit (Ritsema et al., 2014).

Although those professionals working in the dental field only deal with one area of the body, the oral cavity, dental providers have similar experiences working with patients as their medical counterparts. Dental providers also stated that they feel that they do not have enough time to spend discussing oral health issues with their patients while patients state that they feel they are being rushed and that the dental provider is not taking enough time to explain their oral health issue (Macek et al., 2014). Yokoyama et al., (2013), found that those dentists who were more focused on caries prevention activities with individual patients spent more time with the patients. In addition, those dentists who spent more time with patients offered more oral health education in the way of individualized oral hygiene instruction, nutrition advice, and fluoride recommendations (Yokoyama et al., 2013).

Time is a precious commodity in the world of health care. From the research provided here, there are several factors that play a role in the amount of time spent with a patient (DiMatteo et al., 1993; Lin et al., 2001; Macek et al., 2014; Yarnall et al., 2003; Yawn et al., 2003), including the type of visit the patient is being seen for (chronic or acute; Ostbye et al., 2005; Parchman et al., 2006), the length of the visit with the patient with a chronic condition such as diabetes and if recommended testing and referrals to other health care providers are occurring (Andersson et al., 2007; Yarnall et al., 2003), and the number of patients a health care provider sees within the workday (Andersson et al., 2007; Dugdale et al., 1999). All of these factors influenced the research questions as they provided insight into some of the issues that health care providers face when there is limited time in the day to tend to patient care.

## Prioritization of Conditions Associated with Diabetes

The third key concept, prioritization of conditions associated with diabetes, accentuates that there are many conditions associated with diabetes besides periodontal disease, and some of those other conditions have a greater effect on the quality of life of patients. Unfortunately, the literature on how health care providers prioritize medical conditions associated with diabetes is scarce. For the purpose of this literature review, conditions related to diabetes were discussed. These conditions were grouped together into two categories: microvascular and macrovascular. Periodontal disease and diabetes are discussed along with multiple chronic diseases.

### Microvascular Complications Associated with Diabetes

Microvascular complications of diabetes include nervous system damage (neuropathy; Brock, Softeland, Frokjaer, Drewes, & Arendt-Nielsen, 2014; Chiles et al., 2014; Deshpande et al., 2008), renal system damage (nephropathy; Behl, Kaur, Goel, & Pandey, 2014; Deshpande, Harris-Hayes, & Schootman, 2008) and eye damage (retinopathy; Behl et al., 2014; Deshpande et al., 2008). Chronic kidney disease, as associated with diabetes, is an important public health issue, especially in older adults as it can be a burden due to high medical costs associated with the disease, shortened healthy life span, and increased risk of developing end stage renal disease resulting in death (Fisher, Taylor, West, & McCarthy, 2011). In a recent study on end-stage renal disease (ESRD) in American Indians and Alaska Natives with diabetes, of the 45% of new cases in the United States, 71% of those cases are from the American Indian/Alaska Native population (Burrows, Cho, McKeever Bullard, Navara & Eggers, 2014). Although the survival rate for American Indians/Alaska Natives was higher than for Caucasian persons, it has been suggested that the level of risk and the level of American Indian/Alaska Native ancestry (percentage of blood quantum) may play a role in the higher survival rates (Burrows et al., 2014).

Diabetic neuropathy (DN) is a common complication of diabetes (Zhao et al., 2010) which can cause debilitating nerve disorders. DN can have serious effects on a patient's body, including increased risk of amputation, along with limitations on emotional, social, and physical functioning (Jensen, Chodroff, & Dworkin, 2007). In a study conducted by Zhao et al., (2010), results indicated that patients who have diabetes and DN have a higher prevalence of developing other diabetes-related complications.

Diabetic retinopathy is a major cause of visual impairment and blindness in persons with diabetes (Thomas et al., 2012). Early detection and treatment may reduce the risk of premature vision loss (Thomas et al., 2012). In an analysis of 57,199 people with diabetes over a 4 year period who were screened for and did not have diabetic retinopathy, 12,922 people developed diabetic retinopathy at some point during the study (Thomas et al., 2012). The average age at retinopathy diagnosis was 64.9 years (Thomas et al., 2012).

## Macrovascular Complications Associated with Diabetes

Macrovascular complications include complications of diabetes that involve the large blood vessels of the body (Deschpande, Harris-Hayes, & Schootman, 2008).

Macrovascular complications include cardiovascular disease, stroke, and peripheral vascular disease. Peripheral vascular disease may lead to bruises or injuries that do not heal, gangrene, and possible amputation of extremities (Deshpande, Harris-Hayes, & Schootman, 2008).

Cardiovascular disease is a major complication of diabetes and a leading cause of death among people with diabetes (Bairey Merz, Buse, Tuncer, & Twillman, 2002). In researching physicians' attitudes and management of patients with diabetes who had cardiovascular disease, over 900 physicians completed an online survey in which they were asked about the likeliness of their diabetic patients to have a cardiovascular event. Ninety-one percent of the respondents stated that they believed that their patients with diabetes were very likely or extremely likely to have a cardiovascular event at some point in their life (Bairey Merz et al., 2002). The increased risk of cardiovascular disease in the diabetic patient is due to cardiovascular complications of high blood pressure, high cholesterol, and increased risk of stroke (Bairey Merz et al., 2002). Another important point in this research is that according to the physicians who were surveyed, they believed that their patients were more concerned about complications such as blindness and amputations and less concerned about the increased risk of cardiovascular disease as a complication of diabetes.

In a longitudinal study conducted in Poland from 1980 to 1994, 2,175 patients with diabetes were followed to determine which risk factors were prevalent in the patients' risk of developing complications of diabetes such as nephropathy, proliferative retinopathy, cardiovascular disease, and stroke (Nazimek-Siewniak, Moczulski, &

Grzeszczak, 2002). The results of this study conclude that patients with high blood pressure were at increased risk of developing stroke, nephropathy, proliferative retinopathy, and cardiovascular disease (Nazimek-Siewniak et al., 2002). Similar results were found in a similar study of 352 patients that was conducted in Spain over a 10-year period (Mundet et al., 2008). These studies demonstrate that there are several complications, some that are even life threatening, that a patient can be at increased risk of developing due to having diabetes. The information presented here supports the need for me to conduct my study to determine if complications of diabetes are discussed and if they are what complications are discussed by each health professional. Missing from the literature is a comparison of health care providers in a clinical setting and if there is a variance between health care providers, on which complications are discussed with patients with type 2 diabetes.

## Periodontal Disease and Diabetes

Several studies have demonstrated the relationship between diabetes and periodontal disease (Engebretseon, Gelato, Hyman, Michalowicz, & Schoenfield, 2013; Nelson et al., 1990; Schlossman, Knowler, Pettitt, & Genco, 1990; Szpunar, Ismail, & Eklund, 1989). Others conclude that there is no clear association (Oliver & Tervonen, 1993).

People living with diabetes have an increased risk of periodontal disease in addition to tooth loss (Kapp, Boren, Yun, & Le Master, 2007; Jiang, Okoro, Oh, & Fuller, 2013; Silva de Pinho, Borges, Norueira Guimaraes de Abreu, Ferreira e Ferreira, & Duarte Vargas, 2012). Jiang et al. (2013) conducted a study investigating the association between diabetes and tooth loss using 2004 BRFSS data, and found that respondents with diabetes had a higher incidence of losing one to five teeth and six or more teeth. Survey respondents with diabetes were 1.46 times more likely to have had at least one tooth removed as compared to those respondents without diabetes (Jiang et al., 2013). A limitation of this study is that the BRFSS data is self-reported which can lead to respondents being biased in answering the questions truthfully and to the best of their knowledge. An additional study which used BRFSS data from the state of Rhode Island concluded that those who respondents who reported a chronic condition such as diabetes were more likely to report tooth loss. (Jiang et al., 2013)

Emrich, Shlossman, and Genco (1991) in their study of 1,342 Pima Indians with type 2 diabetes, determined that people with diabetes are three times more likely to develop periodontal disease than persons who did not have diabetes. Although this study established a link between diabetes and periodontal disease, a limitation to this study was that they did not look at the glycemic control of the patient. Periodontal disease, if not treated by an oral health professional, can cause ischemic heart disease which could lead to death. Saremi et al., (2005) looked at periodontal disease as a risk factor for death from ischemic heart disease and nephropathy in addition to traditional risk factors for these diseases in Pima Indians. Saremi et al., (2005) determined that, out of 204 deaths, those persons with severe periodontal disease had 3.2 times the risk of cardiorenal death as compared to a reference group of patients with no or mild periodontal disease . These studies are revealing. First, the link between periodontal disease and diabetes is described. Second, they state that good glycemic control is key to preventing periodontal diseases, and third, they provide an example of studies conducted with an American Indian tribe regarding periodontal disease and diabetes.

In a controlled study comparing diabetic and non-diabetic subjects, Sandberg, Sundberg, Fjellstrom, and Wikblad (2000) concluded that patients with type 2 diabetes had poorer oral health, increased need for treatment of periodontal disease, and dental caries, along with a greater need for prosthetic corrections. Patients with diabetes in this study were found to have periodontal pockets of four to five mm deep as compared to the control group (Sandberg et al., 2000). This finding is significant as pockets of greater than 4 mm can lead to tooth loss over time (Sandberg et al., 2000). They also concluded that collaborations between a patient’s primary health care provider and the dentist could improve the patient’s overall general and oral health (Sandberg et al., 2000). Unfortunately, a limitation of this study was the high rate of study participant dropout.

Knowledge about the susceptibility to periodontal disease is important. Yuen, Wolf, Bandyopadhyay, Magruder, Salinas, and London (2009) determined in their study of the Gullah population in the Charleston, South Carolina area and the surrounding Sea Islands that the majority of their education about periodontal disease risk came from dentists and other dental health professionals. Of the 253 participants in this study, more than half did not have any oral health knowledge related to diabetes. On the other hand, 67.6% of those surveyed stated that they were aware of the risk of developing periodontal disease. The studies addressed in this section contribute to my proposed study as health care providers have the opportunity to educate patients with type 2 diabetes about the risk of periodontal disease in addition to other complications of diabetes.

## Persons with Multiple Chronic Conditions and Diabetes

Chronic conditions are becoming an increased health concern in the United States. A person having more than one chronic condition may need additional chronic disease care and management. In some cases, specialized care is necessary, which can lead to overall increased health care needs (Ward & Schiller, 2013). Looking at National Health Interview Survey (NHIS) data on multiple chronic conditions trends spanning from 2001 to 2010, Ward and Schiller (2013) concluded that, overall, 74% of the survey population had zero to one chronic conditions, 21.1% had two to three chronic conditions, and 4.9% had more than four chronic conditions. In the American Indian population, men and women 45 to 64 years old, 68% of respondents for this population reported having two to three chronic conditions as compared to the non-Hispanic Caucasian population of the same age group which reported at 28.1% (Ward & Schiller, 2013). With the American Indian population being diagnosed with two to three chronic conditions as compared to the non-Hispanic Caucasian population of the 45 to 64 age groups, American Indians are at increased risk for being diagnosed with multiple chronic conditions due to having type 2 diabetes. Others (Espey et al., 2014; Schumacher et al., 2008; Sinclair, Bogart, Buchwald, & Henderson, 2011; Wiedman, 2012) confirm that a combination of diabetes and metabolic syndrome increase the incidence of death from heart disease, stroke, chronic renal failure, and infections. This is significant as some chronic conditions can be more harmful than others can but all chronic conditions need to be addressed.

In summary, the information presented here supports why my study needed to be conducted. It is important to discuss all chronic conditions that may affect American Indian patients with type 2 diabetes, including periodontal disease risk.

## Rationale for the Research

The rationale for this research is that little work has been done on the subject of periodontal disease and Native people. Support for this study is based on the findings of Koerber et al. (2006) in their 2004 study of dentists, nurses, and nutritionists working in a Latino community in Chicago, IL. The scope of this study was to determine the knowledge of the health care providers about the association between periodontal disease and diabetes. A total of 14 health professionals were interviewed, including five dentists, seven nurses, and two nutritionists. The main objective for this study was to interview health professionals working in a Latino community about the association between diabetes and periodontitis. After the analysis of the interview data, the researchers were able to assist the health care professionals in developing interventions to promote good oral health behaviors in combination with glycemic control measures among their Latino patients (Korber et al., 2006).

The results of this study identified barriers at the policy level, the community level, and the practice level. From a policy level, two barriers concerning Illinois Medicaid were identified. First, Illinois Medicaid does not cover periodontal treatment and second, there are few dentists in Illinois who accept Medicaid as a form of payment for service.

At the community level, cultural differences along with patients' low health literacy levels were of concern of the health professionals who were interviewed. In addition, many of the health professionals noted that their Latino patients did not believe or understand that oral health was an important in patients with diabetes (Korber et al., 2006). And lastly, at the practice level, some of the health professionals, such as the dentists, had the knowledge base regarding the relationship between diabetes and periodontal disease, but the nurses and the nutritionists who were interviewed either knew about the relationship or did not.

One substantial finding in this study was that each professional devoted their priorities, time, and resources differently when working with the patients. The dentists in this study were more concerned about the oral health of the patients. The nurses and the nutritionists were more focused on overall health and lifestyle and were less focused on the oral health of the patient as expected (Korber et al., 2006).

My study will add to the body of literature as it involved interviewing medical and dental professionals and asking them how they discuss the topic of periodontal disease with their American Indian patients with type 2 diabetes. The Korber et al. (2006) study was relevant to my study as it provided valuable information about diabetes and periodontal disease a minority population, and also included health care provider responses on the topic of diabetes and periodontal disease. For the purpose of my study I interviewed a different population of health care professionals who work with the American Indian population and who work in the same clinic. My study was conducted in a rural setting whereas the Korber et al.'s study was conducted in an urban setting.

## Summary and Transition

Based on the review of the current peer-reviewed literature available, there was little information on the topic of patent to provider communication between health care providers and the American Indian patients that they served. The current body of scholarly literature includes general information on patient–to–provider communication and communication competence of the health care provider. Major themes in the literature included periodontal disease as a significant health problem for persons with diabetes (CDC, 2008; Eke et al., 2012; IHS, 1999; Jeffcoat et al., 2014), social disparities such as limited health literacy (Ackerson & Viswanath, 2009; Garoutte et al., 2006;Wilkinson & Marmot, 2003) and a person's race and ethnicity can affect patient health outcomes (Jaimeson et al., 2013; Kelly & Brown, 2002; Miller et al., 1987; Patrick et al., 2005; Schillinger et al., 2003). In addition, health care providers are relying on other health care providers, to discuss health education topics with patients (Bissett et al., 2013; Collins, 2005; Mouradian et al., 2003). Time is also a limiting factor when discussing health education topics with patients (Andersson et al., 2007; DiMatteo et al., 1993; Dugdale et al., 1999; Lin et al., 2001; Ostbye et al., 2005; Parchman et al., 2006; Yarnall et al., 2003; Yawn et al., 2003).

What was known is that persons who are age 55 and over are most at risk of developing periodontal disease. Health care providers also lack the knowledge to discuss periodontal disease risk with patients with type 2 diabetes. There is also very little information on periodontal disease risk in the American Indian population beside what is written about the oral health of the Pima Indians of the Gila River Tribe in Arizona in the late 1980s and 1990s (Nelson et al., 1990).

What was not known was if communication about the risk of periodontal disease was taking place between health care providers and their American Indian patients with type 2 diabetes. Other unknowns include if health care providers had enough basic knowledge to communicate to patients about the link between periodontal disease and diabetes; if health care providers had adequate time to discuss periodontal disease risk during a patient care visit; and if health care providers focused their communication efforts on other complications of diabetes such as eye and kidney diseases and left discussion of periodontal disease risk out of the picture.

My research addressed a gap in the literature and adds to the current literature on the subject of patient–to–provider communication between health care providers and their American Indian patient’s, the role the amount of time played in patient–to–provider discussions on health information and treatment options, how health care providers prioritized discussions of other medical conditions that are associated with type 2 diabetes, and how health care providers accessed continuing education. Although my study is significant as I interviewed a population of health care providers working within an American Indian community clinic, I in part continued the effort that was begun by Korber et al., and their 2006 study of health care providers working with the Latino community of the Greater Lawn Area of Chicago.

The methodology for this study is discussed in Chapter three. A detailed discussion on how the research was conducted begins Chapter three. Next, a description of the design that was used to conduct the study is given, along with discussion on how the semistructured interviews were conducted. The conclusion of Chapter three includes discussion of how the findings of this study will be disseminated.

# Chapter 3: Methodology

## Introduction

In this study, I examined how health care providers communicated with their American Indian patients with type 2 diabetes about the risk of periodontal disease. In addition, I studied three subtopics that play a role in communication including how the amount of time spent with the patient can affect communication, health care provider knowledge of the link between type 2 diabetes and periodontal disease, and if there was prioritization of other conditions associated with diabetes.

In this chapter, I begin with a description of the qualitative research design and rationale used in this study. Next I discuss the chosen methodology for the study, setting and sample size, how study participants were recruited, how data were collected, the development and testing of the research instrument, and trustworthiness within this qualitative study. I conclude with a description of how I will disseminate the findings of this study.

## Qualitative Research Design and Rationale

Multiple researchers have taken the qualitative approach to researching communication competence using different study designs including observational studies (Parchman, Flannagan, Ferrer, & Matamoras, 2009), audio recordings (Parchman et al., 2009), semistructured interviews (Matthews, Peden, & Rowles, 2009), and surveys (Cegala et al., 1996; Parchman et al., 2009). Others have applied a purely quantitative approach using national survey data (Ackerson & Viswanath, 2009) and some researchers resorted to a mixed methods approach combining qualitative and quantitative methods

(Cupach & Spitzberg, 1983; Hazelton & Cupach, 1986; Kenny et al., 2010; Spitzberg, 1991). Content analysis was also employed in many of the studies (Cegala et al., 1996; Hazelton & Cupach, 1986; Parchman et al., 2009).

A phenomenological approach was used for this study. Phenomenology offers a way for researchers to understand human beings lived experiences that may be difficult to understand (Langdridge, 2007). For the purpose of this research, I used the descriptive phenomenological approach in order to compare each individual interviewee’s lived experiences and find common elements to whether or not periodontal disease risk is being discussed with American Indian patients with type 2 diabetes (Giorgi, 1997).

Other qualitative approaches, such as case study, ethnography, narrative research, and grounded theory, were explored but were deemed to be inappropriate for this research. A case study approach would not fit in this study as I was not researching a specific issue which may involve one or more cases within a specific setting using several data collection methods from observation to interviews to documents to reports (Creswell, 2007). Grounded theory research involves the generation or discovery of a theory as a result of the data gathered (Creswell, 2007).For my intended research, the overall goal of my study was not to generate or discover a theory. The ethnographical approach was considered for this research but was not chosen as I was not looking at processes of persons who are at different locations who may or may not share the same patterns of behavior (Creswell, 2007). My research involved persons who worked in the same environment, but in two distinct health care practices--medicine and dentistry--and how they communicate to their American Indian patients about periodontal disease risk.

Lastly, the narrative approach was excluded as I was not researching a culture’s oral history or looking for a common narrative from study participants (Creswell, 2007). By using the phenomenological approach, I was able to provide a description and a better understanding of the health care providers personal experiences of the phenomenon (the how and why something occurs; Creswell, 2007). The phenomenological approach was also useful for studying a small number of cases in-depth to determine meaning as to why a phenomenon occurs (Cegala et al., 1996; Creswell, 2007; Matthews, Peden, & Rowles, 2009). Although there were strengths and weaknesses associated with many types of qualitative study approaches, it was determined that using the phenomenological approach would be the best fit for this study in order to provide rich detail to determine if health care providers are discussing periodontal disease risk with their American Indian patients with type 2 diabetes.

There were six research questions that I investigated in this study:

1. How much do health care providers know about periodontal disease and its relationship to diabetes? How do they obtain and then maintain that knowledge?
2. How, and by whom, are conversations on the topic of periodontal disease and its relationship to diabetes initiated when patients with diabetes are seen at clinic visits? Are conversations about periodontal disease and diabetes initiated by the health care providers (physician, nurse, dentist, dental hygienist), by the patient, or not at all?

3. How does the patient’s level of health literacy play a role in conversations between health care providers and patients?
4. What modalities (i.e., spoken word, providing brochures, etc.) are health care providers using to communicate information about the risks of periodontal disease to their American Indian patients with type 2 diabetes?
5. How does the amount of time allotted for a patient’s health care visit affect a health care provider’s ability to have a conversation with the patient about the relationship between periodontal disease and diabetes?
6. What importance do health care providers place on periodontal disease as compared to other diabetes-related conditions in regards to severity of risk to the patient with diabetes?

The research questions were developed in order to understand the process in which health care providers interact and communicate with their American Indian patients with type 2 diabetes.

Study data was collected through semistructured interviews. Qu and Dumay (2011) stated that, “Interviews provide a useful way for researchers to learn about the world of others” (p. 239). In addition, semistructured interviews are best used in situations in which the researcher will have only one opportunity to interview someone (Bernard, 1988). In my study, I had one chance to interview the health care providers due to their clinic schedules. Campbell, Adams, Wasco, Ahrens, and Self (2010) argued that persons who are interviewed experience a positive gain from participating in interviews. Wolgemuth et al., (2014) concluded that interview participants benefit more when participating in studies in which they are able to reflect upon the process of the interview, are able to talk professionally about challenging topics, and when they have a trusting relationship with the interviewer. The benefits of using semistructured interviews include gaining a wealth of reliable, comparative qualitative data. For my study, semistructured interviews allowed all participants to answer questions freely in a manner that was based on their opinion.

## Role of the Researcher

For the purpose of this study, I brought clinical experience working in both the medical and dental fields, knowledge of the IHS system, knowledge of the reservation and tribe, and background as a certified patient health educator. As an enrolled member of this tribe, I place high value on the role of the health care provider in providing accurate, up-to-date knowledge on patient conditions. My clinical experience in the medical and dental fields was beneficial in understanding the IHS care delivery system and the knowledge of the health care facility that was studied. In the past, I was an insider at the clinic in question, but now as a researcher, another perspective was taken as I looked from the outside in to understand if communication about periodontal disease was happening between health care providers and their American Indian patients with type 2 diabetes.

All questions were asked in person by me during the semistructured interviews. I interviewed the clinic’s medical providers (physicians, physician’s assistants, nurse practitioners, members of the diabetic team, and those who work as community health nurses) along with the dental providers (dentists and dental hygienists). All persons interviewed were affiliated with the community clinic.

A researcher, especially if that researcher is a member of the community being studied, can be biased; this was set aside. An example of this bias was that along with being an enrolled member of the tribe in this study, I am currently an employee of the tribe. Although I cannot set my membership as a tribal member aside, I let all interviewees know that I was conducting the interviews and the research as a student, outside my normal work schedule. I do have professional relationships with the staff at the clinic. One way that I set this bias to the side was to remind myself and the persons that I was interviewing that I was conducting the interviews as a student and not as part of my job.

A second bias was that the tribe is small and I have several family ties to the community, with some family members working in the dental and medical areas of the clinic. These family members do not conduct direct patient care services and so were not interviewed. Again, I set this bias to the side by not interviewing family members and not discussing the research with family members who work at the clinic.

A third researcher bias was that my uncle is an elected official of the tribe and he has some responsibility over the clinic management. This may have contributed to bias towards me as the researcher as the persons being interviewed may have been skewed in providing the answers that they thought I was looking for instead of providing me with their true opinion. In order to set this bias aside, I let the interviewees know that I am conducting the interviews as a student, apart from my job, and that all that was said in the interviews will remain confidential.

Lastly, at the time of the study I was a current patient of record at the clinic and I did receive health care services at the clinic. This may have been a potential bias as I had been a patient of record at the clinic since I was born and some of the staff has known me for a long time. Unfortunately, the only way I was able to set this bias aside was to not schedule a medical or a dental appointment within the timeframe from which I began the interviews until I officially ended the interviews. With all these biases named, I believe that I was successful in collecting the information needed in order to conduct this study.

## Methodology

I conducted semistructured interviews to collect study data, and used a descriptive phenomenological approach. The descriptive phenomenological approach was chosen over the hermeneutic phenomenological approach as the purpose of the descriptive approach is to compare individuals' experiences to find common elements across participants (Giorgi, 1997; Sousa, 2013). The hermeneutic approach is a more interpretive approach in exploring all the elements within a common lived experience (Boden & Eatough, 2013). This approach did not fit with my intended research as I was looking for a more descriptive approach to explain medical and dental health care providers' communication experiences with their patients.

The phenomenological approach was chosen over all other possible qualitative approaches as I was researching a common lived experience of medical and dental health care providers in an American Indian community clinic. The common lived experience being researched was communicating the risk of periodontal disease with American Indian patients with type 2 diabetes. A main factor of this research was to determine if medical and dental health care providers were communicating with their American Indian patients with type 2 diabetes about the risk of periodontal disease or if no communication occurred.

The semistructured interviews were conducted using a combination of questions from a published data collection instrument and questions that I developed. For the purpose of this study, the population studied was the health care providers at an American Indian community clinic that is based on a reservation in northeastern Wisconsin. Health care providers included the physicians, nurse practitioners, dentists, and dental hygienists. Inclusion criteria for study participants included provision of direct patient care to American Indian patients with type 2 diabetes and employment in either the medical or dental clinic. A list of current medical and dental clinic staff was secured from the medical director and the dental clinic manager.

### The Interview Guide

For the purpose of this study, I composed the interview questions based on those developed by Korber et al. (2006) along with modifications and additions of my own (see Appendix B). Modification of the questions was necessary, as the health care providers who were interviewed in the Korber et al. study worked with the Latino community. The health care providers I interviewed worked with the American Indian population. Interview questions were based on the six research questions involving the topic of provider-to-patient communication along with the subtopics of time, healthcare provider knowledge of the link between diabetes and periodontal disease, and prioritization of conditions associated with diabetes. I also used questions that were created by myself and specifically designed for the population being studied. In addition, all interview questions were reviewed by an expert panel of health care professionals who had experience working with the American Indian population and were not part of the study interviews. The interview guide can be found in Appendix A. Included in Table 1 are information about each research question and how each of the interview questions relates to each research question.

Table 1

*Research Questions and Corresponding Interview Question/s*

| Research Question | Interview Question/s |
|---|---|
| 1. How much do health care providers know about periodontal disease and its relationship to diabetes and how do they obtain and then maintain that knowledge? | What do you know about the link between diabetes and periodontal disease?<br>How did you learn about this link? (If know about link)<br>Please explain why you do not believe there is a link. (If states that there is no link)<br>If you had a question about periodontal disease and diabetes, how would you find more information? |
| 2. How and by whom are conversations on the topic of periodontal disease and its relationship to diabetes initiated when patients with diabetes are seen at clinic visits? Are conversations about periodontal disease and diabetes initiated by the health care providers (physician, nurse, dentist, dental hygienist) or by the patient? | Describe what you tell your American Indian type 2 diabetic patients about caring for their teeth.<br>Why do you discuss these particular issues?<br>How often do you discuss periodontal disease with your American Indian patients with type 2 diabetes? |

(table continues)

| Research Question | Interview Question/s |
|---|---|
| | Why do you use that timeframe?<br>At this clinic, who do you think should be having conversations with patients with type 2 diabetes about periodontal disease?<br>Why did you choose that answer? |
| 3. How does the patient's level of health literacy play a role in conversations between health care providers and patients? | What is your perception of the level of health literacy of your American Indian patient's?<br>Does this perception of their health literacy play a role in how you describe health issues with them? If so, how? |
| 4. What modalities (i.e. spoken word, providing brochures, etc.) are health care providers using to communicate information about the risks of periodontal disease to their American Indian patients with type 2 diabetes? | What modalities (i.e. spoken word, providing brochures, etc.) do you use to communicate to your patients with type 2 diabetes about periodontal disease?<br>Why do you use those modalities? |
| 5. How does the amount of time allotted for a patient's health care visit affect a health care provider's ability to have a conversation with the patient about the relationship between periodontal disease and diabetes? | Describe any limiting factors that prevent you from discussing periodontal disease with your type 2 diabetic patients. (If the answer does not include mention of time, then ask the next two questions)<br>How much time do you spend with your patients with diabetes?<br>Describe any limitations on the amount of time you can spend with a patient.<br>Describe how do these liming factors affect your practice? |
| 6. What importance do health care providers place on periodontal disease as | When discussing complications of diabetes with your American Indian |

(table continues)

| Research Question | Interview Question |
|---|---|
| compared to other diabetes-related conditions in regards to severity of risk to the patient with diabetes? | patients who have been diagnosed with type 2 diabetes, which complications do you discuss the most?<br>-Why do you discuss those complications the most?<br>Which complications do you discuss the least?<br>-Why do you discuss those complications the least? |
| Question asked to participants if they want to discuss additional information. | Is there anything else that you would like to add that we have not discussed? |

## Setting and Sample Size

The setting for this study was at an American Indian community clinic on a reservation in northeastern Wisconsin. The clinic is located within the reservation boundaries and serves not only the enrolled members and descendants of the reservation, but is also open to enrolled members and descendants of other federally recognized American Indian tribes and Alaska Native Villages. Although the clinic is in a rural setting, it is within 20 miles of two major metropolitan areas, which benefit the tribe with access to local hospital, medical, and dental specialty services.

Morse and Field (1995) stated that appropriateness and adequacy are the two key concepts to be explored when determining sample size in a qualitative study. The sample size for this study was 10 to 12 total participants. The rationale for this sample size was that smaller sample sizes are easier to manage as opposed to larger samples, which could take more time to analyze (Mason, 2010). My goal in this study was not to generalize to a larger population, but to collect extensive and specific information that was unique to the population being studied that can add knowledge and significance to the field of public health. All health care providers who agreed to be interviewed were asked the same interview questions. It was my hope to interview all requested participants, but with clinic schedules being altered on a daily basis to ensure all health care needs of the community are met, this was not achievable. Appointments were scheduled to accommodate each health care provider's availability. As a token of appreciation to all health care providers who participated in the study, a piece of art work, done by a local artist of the tribe, will be donated for display in the medical and dental clinics.

## Participants

Participants for this study were recruited from the healthcare providers (physicians, physician assistants, nurse practitioners, diabetic team nurses, dentists, and dental hygienists) who were current clinic employees and who have been employed by the clinic for at least 1 year. This population was selected for this study as they all played a role in educating the American Indian patients of the clinic involved in this study. Participant recruitment took place once all required approvals were received. The health care provider recruitment letter is included in Appendix C. In addition, approval was needed from the tribe's elected branch, and from clinic management. Recruitment was done through a formal letter to health care providers (see Appendix C) explaining the purpose of the research and why their participation is important. All recruitment letters were provided to dental clinic management and were place the letters into the providers' mail boxes. Medical clinic providers were recruited at a medical provider staff meeting at the request of the medical director. Once interview transcripts were transcribed and a preliminary data analysis was completed, a second round of recruitment letters was placed into provider mailboxes by medical and dental clinic management. A result of the recruitment efforts yielded three interviews of medical providers and five interviews of dental providers. All semistructured interviews took place in the time frame of 2 months.

Saturation occurs when the researcher no longer hears or sees new information. In order to have a good representative sample of health care providers participating in this study, the goal was to have a minimum of 12 health care professionals participate. O'Reilly and Parker (2010) stated that the adequacy of the study sample is determined [based] on the appropriateness of the data. My sample was large enough to ensure that all perceptions that are important were covered. Representativeness was determined based on the total number of medical and dental health care providers practicing at the clinic. Analyzing a large sample of medical providers and dental providers would be time consuming and impractical. In addition, a large sample size would provide information that may be repetitive or irrelevant. It was ideal to have 100% participation from clinic health care providers but having at least half of the staff participate would have been sufficient in order to reach saturation. I was able to interview eight out of the target 12 health care professionals. It turned out that by interviews seven and eight that saturation was reached so there was no need to recruit more participants. Once saturation occurred, the interviews ceased.

## Data Collection

Data collection occurred through interviews of health care providers in their clinical office setting or at an outside venue of the health care provider's choice. A data collection instrument (see Appendix B) was developed incorporating questions as developed from the literature review research, the model of communication competence, and from the questions from the study completed by Korber et al. (2006). Analysis of interviews and coding of themes was conducted by me.

## Expert Panel Review

The purpose of the expert panel review was to test the suitability of the questions being asked to the health care providers and to make sure that they are clear and concise and cannot be misunderstood. The study interview questions were piloted with three health care providers who were not in any way affiliated with the clinic where I conducted my research but who were similar to the projected participants. Expert panel reviewers include two registered nurses, one of which is a certified diabetes educator with over 10 years' experience working as a diabetes educator and had prior experience working with the American Indian population. The second registered nurse is a former United States Public Health Service officer who worked for 20 years with the IHS office out of the Phoenix Service Area and is also an enrolled member of a federally recognized American Indian Tribe. A dentist who has an independent practice in another town is the third expert panel review participant. The participating dentist has many years of experience working with the American Indian population. This group of reviewers will not be used in the formal interviews. The expert panel reviews took place at a local restaurant. Expert panel review participants were asked to participate in answering all questions to the best of their knowledge and had the opportunity to provide me with any feedback regarding the wording of the questions and how the topics were brought forward to the health care providers in the formal interviews. No changes were needed to the interview questionnaire.

### Participant Recruitment

Recruitment of health care professionals to be interviewed in this research was done by first contacting the medical and dental clinic management through a phone call and followed by a letter explaining the intent of the study and requesting assistance with placing flyers in health care providers' mailboxes. Once contact was made and permission received to conduct the study, I then provided management with the recruitment letters. Recruitment letters included the purpose and intent of the study and my contact information. Once the health care providers contacted me to participate, I worked with the health care provider to schedule a mutually agreeable date, time, and place for the interview. During the recruitment phase, I did not receive enough health care provider interested in participating so a second wave of letters was placed in health care provider mailboxes by clinic management.

Some interviews took place at the clinic site, in the health care provider's office. Other interviews took place at local restaurants. All interviews were set up once the health care provider contacted me. The goal was have all the interviews completed within a 2 month time frame. This time frame was broad to enable flexibility with the health care providers' work schedules and to enable most health care providers to participate.

## Data Analysis

I transcribed each interview from the audio recording along with any hand written notes I made during the interview. Handwritten notes were taken during the interviews as a backup measure in case of malfunction of the audio recorder and if the audio recorder failed to pick up a participant’s voice, especially in cases where the interviewee may be soft spoken. The transcripts were Word documents and saved on my personal computer’s hard drive. All transcripts are password protected. In addition, copies of the transcripts were placed on a flash drive, password protected, and stored in my home office in a locked cabinet that is only accessible by myself. Analysis of the audio recorded interviews took place once transcripts were finalized along with any hand written notes that were taken during the interview. The analysis was completed utilizing all interview transcripts. All transcripts were loaded into my personal computer and an analysis was completed, looking for themes and patterns pertaining to the main topic of communication and the three sub topics of time, knowledge, and prioritization of conditions associated with diabetes. Discrepant cases were included in this study as the information provided may have value and could possibly reveal more questions for future study.

Additional research data was collected during the interviews. This data included health care providers’ demographic data, such as provider profession, sex, race, and age. I also collected data on the number of years in the provider was in his/her specialty, the number of years worked with American Indian population overall, and number of years worked for the tribally run community clinic. Appendix B contains the interview questionnaire.

All interview documentation was only shared with my committee. All documents will be kept for a minimum of 7 years and are kept in a secured, locked area in my home office. Documents will be destroyed utilizing a local document destruction service after the 7 year period.

Data analysis followed Colaizzi’s (1978) strategy for phenomenological data analysis as described by Shosha (2012) and incorporated the use of the NVivo qualitative software package. Table 2 below outlines the data analysis steps. Final results from this qualitative analysis are reported in Chapter 4.

Table 2

*Data Analysis*

| Colaizzi's Strategy | Completed Steps |
|---|---|
| Transcripts | Each transcript was read several times.<br>Each transcript includes page and line numbers.<br>All transcripts were loaded into the NVivo qualitative software package. |
| Formulated Meanings | Statements relating to patient and provider communication, periodontal disease risk, time, type 2 diabetes, concern for other diabetes related conditions, and health care provider knowledge were extracted from each transcript.<br>Transcript coding was verified by a second person with previous qualitative data experience. |
| Categories | Meanings were developed from the statements.<br>All formulated meanings were grouped into categories and themes were developed. |
| Exhaustive Description of the Phenomenon | An exhaustive description of the phenomenon was developed.<br>Validation of this description was confirmed by me with the assistance of a second person. |
| Fundamental Structure | All themes were checked for additional meanings.<br>Additional checking for redundancy occurred. |
| Validation of Exhaustive Description and its Fundamental Structure | During this step, I will be communicating the results of the study with the study participants.<br>Approval to contact the interview participant to discuss study results will be done in advance during the interview. |

## Issues of Trustworthiness

To ensure rigor of this study, several mechanisms were incorporated to ensure that findings were trustworthy. Credibility, transferability, and confirmability were evaluated. Credibility in qualitative research refers to internal validity in which the researcher measures what is actually intended (Shenton, 2004), basically the truth of the findings of the study. To address credibility in this study, I asked each health care provider who was interviewed to re-read their transcript and to verify for accuracy, (i.e. member checking). Member checking enhances credibility through increasing internal validity and engaging the interview participants further in the research process (Guba, 1981; Munhall, 2007; Shenton, 2004).

Transferability is the degree to which another researcher can apply the findings of a study to another setting (Farrelly, 2013). Transferability was completed through a thorough description of the research in addition to any assumptions that were made during the research process. To address transferability of this study, the results of my research are described in a concise manner. Any assumptions made during the research process were addressed so that readers of this study may be able to apply the results of the study to their own clinic setting.

Dependability is the reliability of the study and how likely the same observations of the study could be made if the study was repeated in another setting (Shenton, 2004). As the researcher, it is my responsibility to describe any changes in the study setting that may or may not have an effect on the content of the interview question answers provided to be by the health care providers (Farrelly, 2013). Changes to the study did occur and are described in Chapter 4.

Finally, confirmability is the extent that the research results can be confirmed by other researchers (Guba, 1981; Shenton, 2004). All data collected in this study came from the semistructured interviews with the health care providers and not my own personal prospective. A second researcher with qualitative study experience was used to check the results of the study to assure that there were no contradictions in the results of the study vs what was said in the interview transcripts (i.e., the data audit; Farrelly, 2013). All procedures for checking and rechecking data were documented.

## Ethical Procedures and Protection of Human Participants

Since this research deals with human subjects working on an American Indian reservation, I received permission from the tribe's business committee in order to proceed with the research. I also received permission to conduct my study from the tribe's clinical directors. Once permission from the business committee, the clinic, and Walden's IRB, was granted on July 16, 2015-#07-17-15-0109795, the study began.

All names and responses provided with regard to this research are confidential and will remain so indefinitely. Each participant was given a participant number. The only person who knows which participant belongs to each number is me. All interviews were audio recorded for accuracy and were transcribed verbatim. All records of the interviews, including recordings, electronic documents, and paper documents, are kept by myself in a locked location within my home office. All electronic documentation is password protected. Each study participant was debriefed regarding the confidentiality of the interviews, all participants received a formal thank you letter from me, and the participating clinic will receive a piece of artwork not to exceed $300 made by a tribal artist to be displayed at the clinic.

Ethical concerns that may develop include potential implicit coercion related to my family's involvement in tribal leadership positions and possible coercion by management to participate in the study. My family has been respectfully asked to not discuss any portion of my study with any tribal member or employee of the tribe. Members of management were asked to play a minimal role in only placing a recruitment flyer in the health care provider's mailbox and were encouraged not to solicit participation. All providers interviewed were provided with the Walden IRB's contact information.

## Dissemination of Findings

There are four ways in which I plan to present my findings once the results of this study are compiled and completed. First, I plan to present the findings to the research participants and to their respective clinic management. Second, I plan to present this information to the tribe's elected body, the Business Committee. Third, since I presented the basic information in this study as a poster at the 2010 American Public Health Association national conference, I plan to do a follow up presentation on this research indicating the results of the research at a future APHA conference. Fourth, I plan to submit a professional paper of the research results to peer-reviewed publications in order to reach a large audience of my peers. I hope that others will question my research and will take the initiative to duplicate the research in another tribal health care setting.

## Summary and Transition

In conclusion, Chapter 3 reflects the proposed methodology, including the use of a qualitative approach that involved semistructured interviews with health care professionals based on the model of communication competence as described by Spitzberg and Cupach (1984). In order to determine the meaning of the semistructured interviews, a true traditional qualitative study was conducted. An expert panel review of the interview questions was completed by three health care providers who are not part of the study, but who have experience working with the American Indian population. The research being conducted for this study was unique as it consists of studying two unique communities of caregivers--medical and dental providers--which have their practices located within the same community facility and see only American Indian patients. Although the sample size of this study was small, the work was completed.

# Chapter 4: Results

## Introduction

The purpose of this study was to explore how medical and dental health care providers at an American Indian community clinic communicate to their adult American Indian patients with type 2 diabetes about the relationship between type 2 diabetes and periodontal disease. Each research question had several corresponding interview questions which were asked at each health care provider's interview and which were detailed in Chapter 3. IRB approval to conduct this study was granted on July 16, 2015 - #07-17-15-0109795. Chapter 4 begins with a discussion of the expert panel review, data collection, data analysis including a discussion of each research question and corresponding interview questions, discussion of the evidence of trustworthiness of the study, study results, and concludes with a chapter summary.

## Expert Panel Review

An expert panel review of the study interview questions was deemed necessary to ensure that all questions asked of the study participants were appropriate, that the interview questions corresponded to the research questions, and to determine if any additional questions were needed. A total of three expert panelists reviewed the interview study questions in July 2015. All reviews of the interview questions were completed one-on-one by me. None of the expert panel reviewers were compensated for their time. All of the expert panel reviewers agreed that the interview questions were appropriate, that they corresponded to the interview questions, and that no additional questions should be created. In addition, the reviewers appreciated that demographic data were being collected. One expert panel reviewer did state that they wished they could participate in the study. All reviewers were thanked for their time and effort.

## Study Setting

This study took place at an American Indian clinic located in northeastern Wisconsin. The clinic is located between two metropolitan areas and serves American Indians from all federally recognized tribes who reside within its reservation boundaries. The clinic contains multiple health care providers in one setting, including medical, dental, optical, pharmacy, community health nursing, and registered dietitians on site. In addition, this facility has a diabetes clinic which is staffed by a podiatrist, nurse practitioner, certified diabetes educators, and nursing staff.

All interviews were conducted either at the clinic in a private room or at a local restaurant of the research participants’ choice. Five interviews were conducted at the clinic and three interviews were conducted at a local restaurant. All of the interviews were completed when there were no patients scheduled to be seen by the health care provider. Interviews were completed before the beginning of the provider’s work day, during the provider’s lunch hour, after working hours, or on a provider’s day off. Out of all the interviews conducted, two of the interviews that were held at the clinic were interrupted as the health care provider was being interviewed. Both interruptions were due to patient concerns that needed to be addressed. When the interruption occurred, the recording device was stopped. Once the provider was ready to resume the interview, the recording device was started again. Other than the interruptions by staff during two interviews, there were no other issues regarding privacy. The interviews held at the local restaurants posed other challenges such as interruptions by the waitress, overhead music, and other loud customers. To combat those challenges, I requested tables as far away from other restaurant patrons as possible. The loud, overhead music was a challenge, but the recording device had a feature which blocked the majority of the background noise. Other than the barriers described, there were no additional barriers to communication and all health care providers answered all the interview questions asked.

There were two personal conditions that I need to disclose that may have influenced the study participants. It is important for me to make this disclosure as I am an enrolled tribal member, employee of the tribe, and I have many social ties to the community. First, my uncle is an elected official with the tribe. He has some oversight of the clinic and its upper management. In order to minimize this potential influence, I did not discuss any part of my research with my uncle or with any other family member working in the clinic. My uncle was asked not to discuss my research with any of the clinic management and he assured me that he would not. Second, I am an employee of the clinic who has supervisory duties over a department which is separate from the medical and dental clinics. Although I have no direct contact with the dental and medical professionals at this clinic, my staff does. I maintain a professional relationship with the medical and dental staff as part of my job duties at the clinic. All study participants were told prior to being interviewed that the research being conducted was being done by me as a student and not an employee of the clinic. As a supervisor to 10 staff, I did not discuss my study with any of my staff. When interviews were scheduled, I used vacation time to conduct the interviews and all communication with the health care providers was done using my personal e-mail address, personal phone, and not my work e-mail address or phone. In addition, I did not schedule medical appointments for myself or my daughter during the study time frame and during working hours, I only went to the medical or dental end of the building as necessary, such as for meetings or to meet with management on subjects related to my department.

## Study Participant Demographics

A total of eight health care providers participated in this study. Of the eight providers, there were four female and four male participants. All participants identified as being over the age of 30 and the majority (80%) of participants identified themselves as European American, while 20% of participants identified as another race. Two physicians and one nurse practitioner participated along with three dentists and two dental hygienists. Interview participants' demographics are listed in Table 3.

Table 3

*Interview Participant Demographics*

| | Profession[a] | Years in Profession | Years' experience working with the American Indian population |
|---|---|---|---|
| A1 | Medical | 26+ | 16–20 |
| A2 | Medical | 16–20 | 6–10 |
| B1 | Medical | 0–5 | 0–5 |
| C1 | Dental | 26+ | 26+ |
| C2 | Dental | 6–10 | 11–15 |
| C3 | Dental | 26+ | 26+ |
| D1 | Dental | 16–20 | 11–15 |
| D2 | Dental | 6–10 | 6–10 |

[a] The different letters represent different health care professions that participated in the study. Professions are not listed to protect participant confidentiality.

When providers were asked if they had ever worked at another American Indian clinic, 100% of respondents reported that they had not. All study participants had some experience working with the American Indian population.

## Data Collection

For the purpose of this study, the initial goal was to secure interviews with 10–12 health care providers. This goal was not reached as only eight health care providers came forward and agreed to be interviewed. Enrollment was not achieved as some providers were on medical leave when recruitment took place, while some health care providers just chose not to participate. Although the study population was small, a wealth of information was gathered from each interview and saturation was reached.

Participant recruitment began the week of July 20th, 2015. Recruitment flyers were given to the dental clinic manager who in turn placed a flyer in each of the six dentists' and four dental hygienists' mailboxes. Recruitment of the medical providers took place at the August 11th, 2015 medical provider staff meeting based on a request of the medical director as most providers would be present. Additional IRB approval was needed in order for this request to be carried out. At the provider meeting, I read the recruitment letter out loud to all the medical health care providers. I also handed out the flyers to each of the six providers present. The medical director asked me for extra flyers to place in the mailboxes of the two medical providers who were not present at the meeting. After all the recruitment letters were distributed, the medical and dental providers began contacting me to be interviewed.

Five medical and dental provider interviews were held at the clinic during the health care providers' lunch hours, before starting their shift, or during their administrative time. Three interviews were held off site at a local restaurant. Interview participants were provided a consent form that included information on confidentiality, the IRB approval number, and contact information. All participants agreed to participate, and then signed and dated the form. A signed copy was provided to interview participants.

Interviews were conducted one–on-one using the interview guide located in Appendix A. Length of time of the interviews ranged from 30–45 minutes with the majority of interviews being completed within 30 minutes. Two of the interviews lasted for 45 minutes. All interview questions were asked in the same order and probing questions were asked when clarification was needed. All study participants answered all the interview questions. All providers were generous with their answers and some providers shared more information than others. Nonverbal communication was recorded through written notes made by myself. Multiple gestures were made by participants including showing me brochures and other handouts that were given to patients in the clinic.

All interviews were recorded on an MP3 player. After each interview, the audio recording was uploaded onto my personal computer and the file was password protected. All recordings were then transcribed by me either the same day or the next day into a Microsoft Word document which was password protected. All health care providers were provided a copy of their transcript to review for clarity and content. Each transcribed document was then uploaded into the QSR NVivo 10 qualitative software package where each transcript was analyzed and coded. Each transcript was reviewed three times to determine if additional codes were needed.

Saturation occurs when the researcher no longer hears or sees new information (O’Reilly & Parker, 2010). Saturation was reached at the eighth participant. Saturation was reached for some of the interview questions at Interview Number 5 with increased repetition in answers being reached in more of the interview questions at Interview Number 8.

## Data Analysis

Data analysis was completed using Colaizzi’s (1978) strategy. Table 4 shows each step and the tasks that were completed.

Table 4

*Data Analysis*

| Colaizzi’s Strategy | Task Completed |
|---|---|
| Transcripts | Each transcript was read three times during the whole process.<br>Each transcript included page and line numbers. |
| Data | All transcripts were loaded into the QSR NVivo 10 qualitative software package. |
| Formulated Meanings | Statements relating to patient and provider communication, periodontal disease risk, time, type 2 diabetes, concern for other diabetes related conditions, and health care provider knowledge were extracted from each transcript.<br>Transcript coding was verified by a second person with previous qualitative data experience. |
| Categories | Meanings were developed from the statements.<br>Once all formulated meanings were grouped into categories, themes were then developed. |
| Exhaustive Description of the Phenomenon | An exhaustive description of the phenomenon was developed.<br>Validation of this description was confirmed by me with the assistance of a second researcher. |
| Fundamental Structure | All themes were checked for additional meanings.<br>Additional checking for redundancy occurred. |
| Validation of Exhaustive Description and its Fundamental Structure | During this step, member checking was conducted with each study participant. |
| Validation of Findings | Approval to contact the interview participant to discuss study results was done in advance during the interview. |

In addition to the steps listed above, I completed the following steps: (a) listened to the MP3 recordings prior to transcribing and (b) transcribed the MP3 recordings. The QSR NVivo 10 qualitative software package served as the central data storage area. Coding began once a transcript was uploaded into the QSR NVivo 10 qualitative software package and codes were created based upon what was described in each transcript. Codes were created by myself and were based on common ideas taken from each interview transcript. Each code was given a numeric identifier which corresponded with each theme. Codes are represented in appendix E.

Based on the codes, meanings and themes were then developed to describe commonalities across participants. Demographic data collected prior to each interview (e.g., age, number of years of experience working with the American Indian population, number of years employed by the clinic, etc.) was sorted by provider. All electronic or written data derived from the study were stored according to the data storage procedure outlined in Chapter 3.

## Results

The results of this study are based on the answers provided by medical and dental health care providers during semistructured interviews that were held between August 3rd, 2015 and September 17th, 2015. A total of eight health care providers participated in the study, including five dental providers and three medical providers, respectively. Five themes emerged from the data (see Table 5). A listing of the nodes and codes for each interview question is located in Appendix E.

Table 5

*Themes*

| Theme | Codes associated |
|---|---|
| Knowledge | Had some type of formal education<br>No formal education<br>Self-taught<br>Continuing education<br>Learned on the job |
| Lack of time with patients | Lack of time spent with the patient<br>Lack of provider training in basic oral health care<br>Multiple patient health problems |
| Periodontal risk communication | No oral health education provided at patient visit<br>If no periodontal problems, no discussion takes place<br>Other diabetes related complications discussed at patient visits<br>Discuss periodontal disease and oral health at every visit<br>Periodontal disease risk only discussed if diabetes is uncontrolled or there is a problem |
| Communication of Information | Provider reliance on other clinical staff to educate patients about periodontal disease risk |
| Patient Level Factors | Patient lack of self-care inhibits provider’s ability to deliver health care<br>Patient denial of diabetes due to historical experiences<br>Lack of patient knowledge and understanding of periodontal disease risk<br>Patient lack of access to health care |

Five themes were developed from the codes. The five themes are knowledge, lack of time with patients, periodontal risk communication, reliance on other staff, and patient health literacy. Each will be discussed with supporting quotations from the interview participants.

### Theme 1: Knowledge

Knowledge about what the health care providers had learned about periodontal disease risk emerged as an important theme. Health care providers at the facility were able to describe the link between diabetes and periodontal disease risk. The only difference was that the dental clinic providers went into more detail as to how periodontal disease can affect the mouth and some dental providers went more in depth with their patients to describe systemic effects diabetes and periodontal disease. When asked how health care providers gained knowledge about diabetes and periodontal disease risk, responses varied.

Health care providers were asked to identify how knowledgeable they were about the link between periodontal disease risk and type 2 diabetes. All the health care providers were able to describe that there was a link between diabetes and periodontal disease, with the majority of responses pertaining to blood sugar level. Providers shared that blood sugar levels can affect periodontal status.

Provider A2 stated that:

> All the other organ systems including periodontal disease are directly affected if your blood sugars aren't well controlled. Basically high blood sugars are putting people at risk for all types of infection and their immune system is not as robust as it normally would be if they didn't have diabetes. (A2)

Similarly, provider B1 shared, "What I understand is that having increased blood sugars can increase the bacteria in the mouth which can lead to gum disease." Provider D1 agreed uncontrolled blood sugar levels contributed to poor periodontal condition but also added that this affected healing. “periodontal disease is more likely to be an issue if blood sugars are not well controlled. With diabetes there is healing and the immune system isn’t as good.”

Health care providers also described how and where they obtained their knowledge. Three providers stated that they learned at school, meaning through medical, dental, dental hygiene, or nursing school. Three other providers stated that they learned about diabetes and periodontal disease risk through continuing education and two health care providers learned through a combination of researching the subject, speaking with other professionals, or on the job. Provider D2 stated that, “I read different articles and publications on it. Different dental journals and different dental publications. I just try to keep up on it, find out what’s new and what’s not.” Provider A2 obtains knowledge through continuing education efforts while in practice at this facility. “[I learned through] continuing education while in practice here.” Provider C2 gained more knowledge through opportunities offered by dental teaching universities, “continuing education as far as what other universities may be presenting on the topic.”

Health care providers at this facility also utilized web resources to seek additional information. The majority of respondents stated that they would look up the information through various web resources such as Up to Date, Epocrates, Google Search, IHS, and the ADA. Providers B1 and A2 stated that they would consult with the health care providers in the dental clinic. Provider B1 states that, “I do consult sometimes with the dentists that would probably be it.” (B1)

Provider A2 added:

> If it comes down to it, I would walk right on down to the dental clinic, which is nice having that access within the clinic, and there is that synergy there. I can go and see Dr. X, Dr. Y, and we do that. Should that happen more frequently? Probably. But it's nice having that resource here. (A2)

At this facility, some of the medical health care providers expressed that they utilized the dental clinic providers as an educational resource due to them being readily available. For the other medical health care providers, searching for the information on their own is another option that is utilized.

In conclusion, theme 1, knowledge, emerged from the data. Providers were knowledgeable about the topic and gained this knowledge in several different ways, including higher education, self-researching the topic, and seeking out members of the dental clinic for advice. Multiple web-based resources were utilized and all health care providers were able to describe the link between diabetes and periodontal disease risk.

**Theme 2. Lack of time with patients.**

This theme evolved as providers discussed not being able to actively engage patients on the topic. For the most part, lack of patient engagement was a result of the amount of time spent with patients. The amount of time a health care provider at this facility has to actively engage patients to undertake preventive health was expressed by a majority of the health care providers during interviews. Five of the eight providers interviewed stated that time in general was a limiting factor that affected their practice.

Provider D2 stated:

> Yes, there are limitations on the amount of time we can spend with a patient because our appointments are only so long; a lot of the time I find myself talking while I am cleaning and I don't like doing that and patients know that. If it's a first or second visit I will do my education after I clean and by the third time I will start to talk to them more while I clean. (D2)

Provider D1 added:

> I spend approximately 50 minutes with patients with diabetes. Tomorrow that time frame decreases down to 40 minutes. As far as the length of the appointment I do not have time to discuss education and I can't just bring them back into the office to do the education. Generally, I am talking to patients while I am cleaning.

Providers D1 and D2 stated that not only were the allotted appointment time decreased, but that the patient education took place while the procedure was being done. This may make it difficult for patients to actually listen to and respond to what is being said during the appointment. For other providers the lack of time inhibits discussion of other diabetes related topics such as periodontal disease risk. Provider A1 stated that, "Because you have patients to see and when you focus on some of the major medical stuff, the dental kind of falls on the low priority and get missed."

Provider C1 added that the scheduling of patients is an issue, especially if an appointment time slot is double booked:

> Number of patients is a limit. If I am scheduled with 2 patients per hour then I am limited. It's all related to how they are scheduled. We don't have time set aside for that. If you are looking to provide that extra counseling, we don't have that.

> More time would always be better I guess especially if patients have questions. It's hard for patients to ask questions especially if I am working in their mouth. It's easier for patients to ask questions when we are talking face to face. (C1)

Provider B1 stated that time was a limiting factor due to the amount of health related issues patients have. "I would say time is probably the biggest limiting factor especially because there tends to be so many issues going on a lot of times" (B1)
Due to the limitations on time, Provider C2 tended to rely more on other staff to deliver the patient education. "It [time] limits our practice as we need to rely more on our support staff for that" (C2)

Theme 2, patient engagement, involves the limiting factor of time and how the lack of time can hinder educational efforts. This hindrance affects the amount of education delivered to the patient and how that education is done as some providers are relying on other providers to educate patients and other providers are educating while doing procedures. A second limiting factor is if the patient has multiple health issues that need to be reviewed within a limited time frame; this hinders the amount of health education that can be delivered.

### Theme 3. Periodontal risk communication.

The periodontal risk communication theme evolved due to health care providers' descriptions of how and if the providers were communicating periodontal disease risk with their American Indian patients with type 2 diabetes. Provider discussion of oral health care during patient visits varied. Providers A1 and B1 stated that they encouraged their patients to have regular visits with the dental department. Provider A1 stated:

> The most important thing that I tell them is really to make sure that you have a regular checkup with the dentist, if you are a diabetic then you have to see the dentist twice a year rather than once a year as for most people which would be considered routine. (A1)

Provider B1 added, "The main thing that I review is to encourage them to have an every six month dental exam and cleaning."

While some health care providers discussed the importance of dental cleanings and exams, other health care providers went into more detail with their patients about the complications that may arise from not caring for the teeth and the mouth in general. Provider D1 stated, "I try to stress that it [diabetes] is important because it affects not only their oral health but their overall health and especially tied in with periodontal disease." (D1) Provider D2 went into more detail with patients by discussing how negative oral health behaviors can have an impact on oral health status:

> Basically, I tell them that if they are not flossing, brushing or flossing, the bacteria are in our mouth and anything that eats produces a waste product, so if you leave that waste product in there, our body responds to that in 24 hours by starting an

> infection. So if that infection progresses you start to get signs of infection like bleeding, swelling, redness, and pain. At that point, when it is in the gum tissue we can get it back to being healthy by starting flossing. (D2)

The frequency of discussion of periodontal disease risk at health care visits varied. Provider C1 made a point to have the discussion at every visit:

> Every time that I see them. I would personally review at every visit relative to whether they came in for an exam, even if they came in for a filling, or a denture adjustment, no matter what they came in for that day I would remind them of that. So it is kind of almost every time. (C1)

Provider D1 only discussed periodontal disease risk if there was a problem. “I generally ask what their A1C is and if they know it is well controlled and if they don’t have a lot of periodontal or gum disease issues going on then I don’t bring it up.” (D1) For provider A1, discussions only took place at the yearly exam or during another type of diabetic exam:

> At least once a year for sure when I do their foot exam which is more than once a year, so if I were to guess I would say at least a couple of times a year, but once a year for sure. (A1)

To conclude, some health care providers at this facility are discussing periodontal disease risk at some point with the patient, although discussion varied from once per year to a couple of times a year to discussion at every appointment. For other health care providers, a periodontal disease risk discussion only takes place if the patient has a problem such as uncontrolled A1C level or active gum disease.

### Theme 4. Communication of Information.

Theme 4 stemmed from the responses from some of the health care providers stating that they seemed to think that discussing periodontal disease risk was not their responsibility because they made an assumption that others were providing the education to the patients. There was also discussion by the health care providers at this facility as to when the discussion about diabetes and periodontal risk should occur.

Providers C2 and A1believed that the dental clinic staff are the appropriate entity to have periodontal disease risk discussions with patients. “I think dental should as we have more of the background information, regarding that relationship.” (C2). Provider A1 stated, “We have a wonderful dental clinic here and all of them [dental clinic staff] should be actively involved.” Provider B1 stated that the dental clinic should be relied upon to have discussions with patients with diabetes about periodontal disease risk, “I don’t go into a lot of home care with the type 2 diabetic patients ‘cause I figure when they do their dental visits they will get those instructions.” Provider C1 depends upon the dental hygienists at the clinic to deliver periodontal disease risk education:

> We do have a great asset in the dental hygienist Z and [this person] takes the extra time and that we are lucky to have that treatment component within the diabetic clinic. This is a whole extra environment and it’s relaxed and more conducive to learning and a dental hygienist is a great asset to that. (C1)

Provider C3 concurred with provider C1 in stating that, “I think that mostly falls on the hygiene. For the most part, the education realm mostly falls in the hygiene realm, I incidentally respond as a part of my treatment.” Provider C3 is saying that he only educates the patient as part of the treatment process and relies upon the dental hygienist to provide the bulk of the patient education.

Health care providers at this facility had varied thoughts on when the communication about periodontal disease risk at the clinic should happen. Provider B1 believed that periodontal disease risk education should occur:

> Definitely any time they come in for a diabetes visit which could be every three months if they are an uncontrolled diabetic or every 6-12 months if they are controlled, definitely everyone on the diabetes team whether it be a dietitian, nurse practitioner, or certified diabetes educator, and myself, I would be considered like a primary care provider so that is definitely who should be doing it on a regular basis as well. (B1)

Provider D2 added that all parties involved in patient care should be having discussions with patients about periodontal disease risk. “I think that it is important that the hygienists, the doctors, the diabetic team, I think that it is important that they all do it and that they are all on the same page and that the patients know that we are all about their health. I think that is the key and we should all be concerned about their health.” (D2)

In conclusion, a majority of the providers in the facility believed it was everyone’s responsibility to deliver the periodontal disease risk communication. There were some providers who relied upon others in the facility such as members of the dental clinic, mainly the dental hygienists, to do the patient education.

### Theme 5. Patient Level Factors

Health literacy involves a person’s capability to obtain, process, and understand basic health information and services and to make an appropriate health decision (Institute of Medicine, 2004). Patient health literacy evolved from the data as several health care providers responded that a patient’s health literacy played an important part into how conversations about different health issues occurred during patient visits. Providers responded that there was an overall lack of knowledge about diabetes and periodontal disease risk. Provider B1 stated that, “For the most part I think it [health literacy] is lower than the average population.” Provider C2 concurred that, “I don’t think that it’s at the level where it could be or should be.”

Provider D2 acknowledged that a limiting factor is patient disconnect as to the consequences of diabetes and periodontal disease on the body by not taking responsibility for their own health care. “I think that a lot of the patients have an idea that there’s a link but I think that a lot of them don’t get the link yet.” (D2) Provider A1 stated the patients may be in denial and thus do not follow through with their health care. “I think the health literacy is there, some of it is just denial maybe and some people know what they have and they deny it or don’t follow through.” (A1)

During the interviews, provider D3 described an additional limiting factor was that patients are not taking responsibility for their own health care, especially when referred to an outside dental specialist. “And on the patient side, there are patients we refer out who do not make their appointment and the specialist will not see them again. So, the patient’s behavior limits our ability.” (D3) Provider D3 added that, due to a patient neglecting to make the appointment with the specialty dental provider, this inhibits the level of care that the clinic provides; the patient is referred to the specialty dentist as that type of service is not offered at the clinic based on the several factors such as severity of the case, patient medical history, etc. This is related to health literacy because if the patient does not comprehend why they are being sent to a specialty provider for their care and are not told about the consequences for non-compliance (i.e., potential for additional complications not only oral but systemic, not being seen by the specialty provider for another appointment, etc.), this results in a patient who does not know that being non-compliant with their personal health could affect their overall health. (Institute of Medicine, 2004)

In addition, the lack of patient self-care may be tied into the lack of patient access to health care appointments at the clinic and patients not showing up for their scheduled appointments.

Provider D2 stated:

> Well, I think that one of the limiting factors is that we have a lot of patients and we are booked out so far and patients aren’t getting in as much as they should. Of course patients who are on a three month recall are not getting in on time. So that definitely is a limiting factor for the dental hygienist, the doctor, and the patient by not getting to have that time with the patient and the patient not getting the cleanings that they need.

Provider C1 added that:

> If the patient BAs (breaks their appointment) then you lost all that time to treat, educate, and prevent. Patients have to come in, they have to not break appointments, if patients comply, then all these other things can happen. Limiting factor, patient in the chair. Because we don't do it any other way.

What provider C1 is stating is that not having patients in the chair is the limiting factor; there is no one to educate.

Provider C3 stated that periodontal disease and diabetes arises from the amount of self-care the patient does outside the services that are offered at the clinic. "A poor periodontal condition and I think that patient attitude as far as caring for your diabetes and we see a lot of patients who have a lot of knowledge on how to take care of their diabetes but it gets neglected. Sometimes that neglect shows up in the quality of home care of their mouth." (C3)

Health care providers' perception of their patients' health literacy level plays an important part into how conversations about different health issues occur during patient appointments. Speaking at the patient's level, speaking to the patient as though they were a friend or family member, and utilizing prior training as to how to speak to patients about oral health were common techniques providers at this clinic used to speak with patients about periodontal disease risk based on the perceived patient health literacy level. These good practice techniques discussed by the providers were based on accommodating the patients' perceived health literacy and are expressed in the following quotes. Provider D1 stated that, "I try to just talk like I am having a conversation with a friend." Provider A2 added that, "I have always talked with someone as though I am talking to my mother, my father, my brother, my sister, so it really hasn’t changed so I literally just use that construct.” Provider C3 utilizes training learned while in school:

> Part of my training, we were trained on how to talk about oral hygiene and to discuss smoking, home care, you know just a whole variety, so I kind of touch on that. I do raise the issue by saying you know that this can have an impact on you and we rely on the patients to have the light come on and say well maybe I should do something about that. (C3)

In conclusion, for Theme 5, patient level factors, multiple factors are involved. First, the belief that the health literacy of the patients being served at this clinic is not at a level that it can or should be. Second, that there is a patient disconnect as patients are not taking responsibility for their own health care. The concern by health care providers is that patients are not showing up for their appointments either at the clinic or when referred to outside providers. Third, health care providers’ perceptions of their patients’ health literacy level is a factor as to how the health care provider communicates information to the patient.

At the end of each interview, all health care providers were asked if there was anything else that they would like to add that was not discussed. The majority of the providers stated that there was nothing to add. Two providers stated that they would like to see more collaborative efforts between the medical and dental departments.

In order to protect the identity of the study participants, I used profession specific codes for each health care provider participant. Using those codes made sense since the population of interview participants is small and participants could potentially be identified by colleagues who may read this dissertation if participants were acknowledged as either dental clinic health care providers or medical clinic health care providers.

## Quality Data Issues

Of all the data collected, there were some data that were not usable as the respondents took a different direction than anticipated when providing an answer to an interview question. There were two instances of health care providers being asked an interview question and they provided an answer but then contradicted them. With these two instances, I was provided data but could not use it due to the contradicting statements. There was another instance where the respondent seemed to ignore the interview question and provided a response that was unrelated to the interview question, which prompted me to ask the interview question a second time. Asking the interview question a second time provided me with a more concise and to the point answer.

### Discrepant Cases

Discrepant cases are those data that do not support or conflict with the emergent themes (Creswell, 1998). During the data analysis of the interviews, I found no evidence of discrepant cases.

## Evidence of Trustworthiness

To ensure rigor of this study, several mechanisms were incorporated to determine that the findings of this study were trustworthy. First, to address credibility, I asked each health care provider who was interviewed to review their transcript and to verify if the transcript was accurate (member checking). Member checking, in addition to validating what was said in the study, also engages the health care provider in the research process (Guba, 1981; Munhall, 2007; Shenton, 2004). Second, I believe that all interview participants were candid and thoughtful in their responses. All respondents were allowed to respond to interview questions as they wanted to. As the researcher, I provided the opportunity for participants to address the questions as thoroughly as was appropriate for them. There were some participants who talked more than others and I welcomed that discussion.

Second, to address transferability, I provided a concise description of the research results in chapter four and will provide the results to the clinic health care providers once the dissertation is approved. Three assumptions were made in chapter one. Those assumptions were that some health care providers were discussing periodontal disease with their patients, all health care providers would answer all interview questions honestly and completely, and study participants would see this study as important to the health care providers being interviewed. The results and assumptions of this study were described in a concise manner as to provide transferability of the information to another context if chosen to do so by any reader of this study. Third, to address dependability, there were some changes in the study setting as described in Chapter 3. All study interviews were held either at the clinic in a private room or at an outside venue of the providers’ choice. The methods of this study could be easily replicated by another researcher. Finally, to address confirmability, all the data collected in this study came from the semistructured interviews with the medical and dental health care providers and not my own personal perspectives. This includes quotes from the interviews which support my findings. In addition, a second researcher checked and confirmed the results of my study.

## Summary and Transition

In conclusion, all eight health care providers who were interviewed contributed a wealth of information to assist with the completion of this study. Based on the information gathered from the interviews, each research question was answered while learning several things about this unique community of health care providers. The first research question was: how much do health care providers know about periodontal disease and its relationship to diabetes and how do they obtain and then maintain that knowledge? From this research question I learned that health care providers at the clinic do know that there is a link between diabetes and periodontal disease, and that the link was learned by various means such as formal education and through on the job learning.

The second research question was: how and by whom are conversations on the topic of periodontal disease and its relationship to diabetes initiated when patients with diabetes are seen at clinic visits? Are conversations about periodontal disease and diabetes initiated by the health care providers (physician, nurse, dentist, dental hygienist) or by the patient, or not at all? Each provider had a different perspective as to who should be speaking with the American Indian patients with type 2 diabetes about periodontal disease. Some providers believed that all clinic providers should be having that discussion while others believed it is a responsibility of the dental clinic.

The third research question was: how does the patient’s level of health literacy play a role in conversations between health care providers and patients? The health care providers at this facility believed that the patients were not at the same health literacy level as the general population outside the clinic. Additional efforts may need to be undertaken as to get the patients to become more responsible for their health care.

The fourth research question was: what modalities (i.e., spoken word, providing brochures, etc.) are health care providers using to communicate information about the risks of periodontal disease to their American Indian patients with type 2 diabetes? Multiple modalities were being used by health care providers to communicate with patients including paper based materials and web based–materials.

The fifth research question was: how does the amount of time allotted for a patient's health care visit affect a health care provider's ability to have a conversation with the patient about the relationship between periodontal disease and diabetes? Time is the most influential limiting factor for the majority of the health care providers.

Lastly, the sixth research question was: what importance do health care providers place on periodontal disease as compared to other diabetes–related conditions with regards to severity of risk to the patient with diabetes? Health care providers are discussing a multitude of diabetes complications with their patients with type 2 diabetes. Discussion of complications between diabetes and periodontal disease risk are, for the main part, being discussed by dental clinic providers.

Discussion and conclusions of this study will be discussed in Chapter 5. In addition, an interpretation of the findings, implications for social change, recommendations for action, and recommendations for further study will also be addressed.

# Chapter 5: Discussion, Conclusions, and Recommendations

## Introduction

The purpose of this qualitative study was to explore how and if health care providers at this American Indian community clinic spoke to their American Indian patients with type 2 diabetes about periodontal disease risk. The research question topics included how other factors played a role in how health care providers communicated with their American Indian patients with type 2 diabetes such as the amount of time a health care provider spent with a patient, how much the health care provider knew about the link between diabetes and periodontal disease, and if health care providers are more concerned about other conditions that are associated with diabetes. This study was conducted based upon a review of the literature from which six research questions were developed.

## Key Findings

I developed interview questions from the six research questions to explore the interview participants' experiences in communicating periodontal disease risk to their American Indian patients with type 2 diabetes. Five themes emerged from the data. The first theme was knowledge; specifically, how health care providers at this facility were knowledgeable about the link between diabetes and periodontal disease risk and were able to describe how they learned about the link. The second theme, lack of time with patients, evolved as providers expressed that they were unable to engage patients in the subject of periodontal disease risk due to lack of time to spend with the patient. Theme 3, periodontal risk communication, was specific to health care provider communication with their patients about periodontal disease risk. The fourth theme, communication of information, related to the way in which each health care provider shared a different perspective as to who at the clinic should be having conversations with patients about the link between diabetes and periodontal disease. Finally, Theme 5, patient level factors, related to how health care providers felt about their patients' health literacy level and how this affected patient and provider conversations.

## Interpretation of the Findings

In this study, five themes were developed. In this section I will discuss in depth the five themes that emerged from this study. These themes include knowledge, lack of time with patients, periodontal risk communication, communication of information, and patient level factors.

### Theme 1: Knowledge

For the first theme, knowledge, the health care providers in my study gained their knowledge about diabetes and periodontal disease in several different ways including learning through higher education (dental, medical, nursing, or dental hygiene school), continuing education, on the job learning, reading scholarly research, using web resources, and by talking with other health care providers, such as the dental health care providers and certified diabetes educators. These findings were similar to what was found in the literature by Bennett et al. (2004), Bennett et al. (2006), Casebeer et al. (2002), Larme and Pugh (1998), and Paul et al. (2013) in their studies pertaining to how health care providers gained knowledge about a health-related topic through the use of the Internet, continuing education, on the job learning, and reading scholarly research.

Bennett et al. found that younger physicians and female physicians tended to use the Internet to look up information about specific patient problems. Although the health care providers in my study were of all ages with three providers being under the age of 50 and five over the age of 50, those providers who were under the age of 50 responded during the interviews that they relied upon web resources for information. In addition, although providers who were 50 and over did not state during the interviews that they used Internet resources does not mean that they did not use the Internet. It is unclear if health care providers age 50 and over used the Internet to look up health-related information for specific patient problems. In addition, those health care providers who were in their profession for 10 years or less learned of the link between diabetes and periodontal disease risk during their formal educational studies. All the health care providers who participated in this study who were in their professions for more than 10 years learned about the link between diabetes and periodontal disease while on the job; this is similar to what was discovered by Gabbay and le Mav (2004) in their study of health care providers and their learning while in their professional practice.

The information gathered during my study about the theme of knowledge supports what was learned from the scholarly literature as health care providers at this clinic are knowledgeable about the topic of diabetes and periodontal disease risk. In addition to being knowledgeable about the subject, health care providers at this clinic used several venues to gain this knowledge.

### Theme 2: Patient Engagement

For the second theme, patient engagement, five of the eight health care providers stated that the amount of time they were allotted to spend with a patient was a practice limitation. This is similar to what was found in studies conducted by Andersson et al., (2007), Lin et al., (2001), and Ostbye et al., (2005), that time and the number of patients seen within the work day can be a barrier to the quality of care provided to the patient. During one interview, a health care provider stated that the amount of time spent with a patient would be reduced by 10 minutes in the upcoming scheduling template. Another provider stated that, due to time constraints, they were only able to do some education, while other providers stated that they did no education and relied upon others to educate the patients. This finding is similar to what Ritsema et al. (2014) and Macek et al. (2014) found in their studies of how health care providers deliver health education to patients with chronic disease. They also found that health care providers were relying on others within the clinic to provide the health education. In my study, other health care providers in this clinic tried to educate the patients while they are completing a procedure (such as a dental cleaning or a foot exam). This finding is similar to what Yawn, Goodwin, Zyzanski, and Stange (2003) found in that health care providers need to be creative in how they are spending their allotted time with the patient as that time may be limited dependent upon the type of visit the patient is being seen for (i.e., routine, chronic care, acute care, etc.).

An additional limiting factor to a health care provider’s practice is that patients are not taking responsibility for their own health care outside the clinic. This lack of self-care can inhibit the type and amount of care a health care provider can give to the patient. In addition to self-care issues, patients not showing up for their scheduled appointments in the clinic or with specialty providers are an additional limiting factor. This is similar to what Ashton et al. (2003), Heisler et al. (2002), Matthews, Peden, and Rowles (2009), and Ulrey and Amanson (2001) found in that patients need to be more aware of their own self-care responsibilities.

## Theme 3: Periodontal Risk Communication

In Theme 3, periodontal risk communication, a wide range of conditions associated with diabetes was discussed during the health care providers' interviews. The medical health care providers stated that they discussed medical issues such as cardiovascular disease, A1C level, renal disease, and eye problems more than they discussed periodontal disease with their patients. The dental health care providers in my study discussed medical issues with the patient in addition to periodontal disease risk as people living with diabetes have an increased risk of periodontal disease. In their study of Pima Indians, Emrich, Shlossman, and Genco (1991) suggested that health care providers at that time were not concentrating on glycemic control of the patient in relation to periodontal disease risk. The majority of the health care providers in my study stated that they asked patients about their blood sugar levels and if those levels were controlled as this is key to not only preventing periodontal disease risk but also other health conditions such as ischemic heart disease. In addition, health care providers in my study stated that they would like to see more collaboration between the medical clinic and the dental clinic. This finding is similar to what Sandberg et al. (2000) found in their study, that collaborations between a patient’s primary care provider and the patient’s dentist could improve the overall health of the patient.

### Theme 4: Communication of Information

For Theme 4, communication of information, Andersson et al. (2007), in their study of physicians in Sweden, found that health care providers lacked the knowledge to accurately address oral health issues with patients and that the patient should discuss oral health issues with the dentist. All the health care providers in my study appeared to be knowledgeable about the link between diabetes and periodontal disease and were able to describe that link. Since this community of health care providers is unique as they are housed within the same building, this may be the reason why the link between diabetes and periodontal disease is known. The majority of the health care providers stated that they discussed oral health minimally with their patients and relied upon other health care providers to deliver the oral health education. These findings are similar to the findings in Andersson et al. in relation to the medical staff at this clinic, as they are relying on the dental providers to deliver the bulk of the oral health and periodontal disease risk education. Yuen et al. (2009) stated that the patients learned about periodontal disease risk from the dentist or the dental hygienist and not the physician. At the same time, the dental providers at this clinic are also relying on the dental hygienists to relay the oral health education to the patient.

### Theme 5: Patient Level Factors

Finally, in Theme 5, the patient level factors also played a role in communication efforts. According to Paasche-Orlow and Wolf (2007), a patient’s health literacy can be linked to several influential factors including the patient and provider relationship, the level of access to and use of health care services, and the relationship between the health literacy level of the patient and a patient's concept of self-care. In the current study, health care providers expressed that they believed their patients were health literate but that the patients lacked responsibility for their self-care outside the clinic. Although type 2 diabetes is a complex disease to understand, providers felt that there were multiple layers to the diabetes problem in the community. One provider expressed that there needs to be more education at the community level as patients  believe they may be diagnosed with diabetes at some time in their life as they have diabetic family members. The findings in my study are similar to what was found by Paasche-Orlow and Wolf (2007) in that there are several factors that influence a patient's health literacy, including access to care and the use of those health care services and how the patients' perceive their own health care needs. In addition, Lee *et al*., (2012) found that patients often minimize the severity and potential consequences of a disease. In my study, this was a concern of some of the health care providers. Jamieson, Divaris, Parker, and Lee (2013) determined that, in comparison to the Caucasian population, American Indians scored lower oral health literacy levels. Again, some of the health care providers at this clinic stated that they thought that the health literacy of the patients they served was lower than the overall population.

## Theoretical Framework

The theoretical framework for this study was the model of communication competence as described by Spitzberg and Cupach (1984) and Spitzberg (2013). The model of communication competence consists of three components: knowledge, skill, and motivation (Spitzberg and Cupach, 1984; Spitzberg, 2013). The first component, knowledge, is the ability to acquire the information necessary to have a competent conversation with another person (Hazelton & Cupach, 1986; Spitzberg & Cupach, 1984). For the purpose of this research, knowledge involved how much the health care provider knew about the topic of periodontal disease and its relationship to type 2 diabetes. Based on the results of this study, I concluded that that the health care providers knew of the relationship between type 2 diabetes and periodontal disease. This knowledge was gained through higher learning, continuing education, and on the job learning.

The second component, skill, involved possessing the ability to apply a behavior to a specific situation (Spitzberg & Cupach, 1984). For the purpose of this research, the skill was communication between the health care providers and their American Indian patients with type 2 diabetes. The behavior was the action to communicate with American Indian patients with type 2 diabetes about the risk of periodontal disease at the time of diagnosis and at subsequent follow up visits. The health care providers in this study communicated to their patients by using various modalities based upon the age and perceived health literacy level of the patient. The behavior was demonstrated through the way in which health care providers communicated with the patients at their visits. Some health care providers discussed periodontal disease risk with the patient, while others relied on the dental providers to educate the patient.

The third component, motivation, is the level of motivation an individual possesses in order to communicate with another individual in the most effective and appropriate manner for the situation at hand (Spitzberg & Cupach, 1984). For the purpose of this research, motivation involved not only possessing the knowledge and skill of communication but also being motivated to discuss the topic of periodontal disease risk and type 2 diabetes with American Indian patients. Some health care providers in this study demonstrated more motivation to educate their patients about periodontal disease risk than others. Most providers depended upon the dental clinic staff to provide the periodontal disease education to the patients. All providers made some effort to communicate to their patients at the patients' health literacy level.

In order to be effective communicators in line with the theoretical framework, the health care providers at this clinic needed to:

1. Know about diabetes and its relationship to periodontal disease;
2. Be skilled in communicating to patients with varied health literacy levels;
3. Be able to utilize different communication modalities in order to get the patient to understand the message;
4. Be motivated to discuss information about periodontal disease risk to the American Indian patient with type 2 diabetes.

At this clinic, all health care providers who were interviewed for this study were able to demonstrate all of the components of the model of communication competence as described by Spitzberg and Cupach (1984).

## Limitations of the Study

There were three main limitations to this study. First, I may have had perceived expectations of the study outcomes that influenced the selection of data to report in the findings. To decrease subjectivity, I maintained uniformity in how I asked the interview questions by following the interview guide and I made sure not to agree or disagree with the respondents' answers. I constantly reminded myself to maintain neutrality. Second, there was a possibility of bias on behalf of the health care providers being interviewed as they may have felt that they needed to provide me with the answers that they thought I wanted and not answer interview questions in full faith. In order to limit this, I reminded health care providers that the final paper would not contain any identifying factors such as their name or profession. Health care providers were reminded that I was looking for honest answers to all questions so I could determine if the results of this research can make a positive impact for the clinic's patients. A third limitation of this study was that I am an enrolled tribal member, an employee of the tribe, and an employee of the clinic. All health care providers who were interviewed were reminded that this study was being conducted by me as a student, and that the interviews would be confidential. Providers were told that all answers to the interview questions that they provided would not impact the working relationship between the health care providers and me or our departments. A fourth limitation stemmed from not achieving the goal of securing 10 to 12 interviews. This may have limited the study results as those providers who did not participate may have had additional information to relay to me that was not discussed by the other participants.

Although I cannot control the fact that I am an enrolled member of this American Indian community, I was able to control how I asked the interview questions which were asked the same way for each interview participant. Overall, I believe that the factor of bias on behalf of the health care providers was a limitation to my study as I cannot control the thoughts, feelings, and answers that the health care providers gave during the interviews. In addition, I put a lot of effort into maintaining an unbiased mindset in order to not be influenced during the data analysis process. Although I did not perceive this as being a limitation to my study, others may due to me being a member of this American Indian community.

## Study Recommendations

There are several recommendations for further research that are grounded in the strengths and limitations of the current study as well as the literature reviewed in Chapter 2. The first recommendation would be to expand on the scope of the study to include interviewing other staff within the clinic such as the dental assistants, the community health nurses, and the dieticians. This recommendation stems from the interviews as some health care providers indicated that they relied upon other staff in the clinic to provide patient education. This recommendation confirms what was found in the literature review in Chapter 2 regarding health care provider communication styles and how this style can influence how much knowledge a patient will retain during the health care appointment (Collins, 2005). In addition, Andersson et al.,2007, and Yuen et al., 2010, found in their respective studies that oral health information can come from multiple providers and the information that is delivered can vary from one health care provider to another.

The second recommendation is to include interviewing other health care providers in the clinic, including podiatry and the providers in the optical department. Those health care providers also see patients with type 2 diabetes but were excluded from the study as I thought that they may not be having discussions with patients about periodontal disease risk. This recommendation comes from some of the providers who participated in this study as they believed that the optical and podiatry provider should have been included. Again, this recommendation is supported by the studies done by Andersson et al., 2007, and Yuen *et al.*, 2010, in their research regarding health information delivery via multiple health care providers.

A third recommendation is to secure the point of view of the American Indian patients with type 2 diabetes in regard to their own health literacy level; how knowledgeable they feel their provider is about diabetes and periodontal disease; the amount of time the provider spends with the patient; how well the patient perceives the providers communication efforts; and how the patient would like the health information to be delivered, by whom, and when. Several health care providers asked if I would be interviewing patients to get their perspective. This recommendation supports the research that was done by Gazmararin et al., 2003, Paasche-Orlow and Wolf (2007), and Schillinger, Bindman, Wang, Stewart, and Piette (2004) regarding health literacy and the research done by Lee, Divaris, Baker, Rozier, and Vann (2012) and Jamieson, Divaris, Parker, and Lee (2013) regarding oral health literacy.

A fourth recommendation would be to look at how all the health care providers in the clinic learn about the link between diabetes and periodontal disease and determine if additional training or education is needed. As indicated by the health care providers during the interviews, there were several venues used by the providers to learn about the link between diabetes and periodontal disease, including learning on the job, through online web resources, scholarly journals, and by speaking with other health care providers about the topic. I also recommend looking at the population of health care provider who are in their profession 10 or more years as four of the health care providers in my study expressed that they learned of the link between diabetes and periodontal disease while on the job. These findings in my study support findings from prior research done by Hagen et al. (2014), Jacques et al., (1991), and Larme and Pugh (1998) on how health care providers learn about the link between diabetes and periodontal disease. As demonstrated in my study, health care providers learn about the link between diabetes and periodontal disease through multiple venues.

## Implications for Positive Social Change

Several implications for positive social change evolved from this study. The first implication is to begin discussion between medical and dental staff regarding patient care and patient messages with regard to diabetes and periodontal disease prevention. The idea is to not only foster collaboration between the medical and dental departments but to make sure that all providers are providing similar educational messages to patients. This initiative has social change possibilities as it will bring together two unique sets of health care providers to increase collaboration on underlying issues that may or may not be unique to this community.

The second implication would be for the clinic to sponsor a yearly conference/workshop with a focus on specific complications of diabetes. For instance, make one year the year of the foot and do increased patient and community education that year about the importance of caring for the feet. Then the following year, concentrate on another complication of diabetes. A collaborative effort between all health care providers will not only increase communication between health care providers but may open the door for future collaborative efforts.

From a societal/policy perspective, I recommend that those persons doing health education at the clinic stay current with how clinic patients get their health information. Several health care providers stated during the study interviews that they provided web resources to their patients. Using alternative modalities such as social media may increase the number of people reached. In addition, I recommend developing more modalities that are not also culturally appropriate, age appropriate, but also incorporate the use of the Native language that is unique to this tribe. This proposed education effort will allow health care providers to become more in tune to how to communicate health information to the patient. The use of different modalities to deliver a message has social change implications as this could affect patient behavior towards their own self-care outside the clinic. This is a social change implication as the American Indian population being served is unique.

The American Indian community clinic in this study was unique as multiple aspects of health care--medical, dental, optical, pharmacy, community health, etc.--are under one roof. The American Indian population served at this clinic is also unique as the majority of the patients are members of the tribe which owns the clinic. Other members of federally recognized tribes who live in the area are also seen at the clinic making this clinic a melting pot of various American Indian cultures. In addition, some tribal members do not seek services at the clinic but seek health care elsewhere in the surrounding area. One point that arose from this study was that health care providers pointed out that tribal members believed that they were going to be diagnosed with diabetes at some point in their lifetime as they have family members who are diabetic. This may or may not be the case based on how the patients care for themselves outside the clinic. This may or may not be unique to this American Indian population. This relates to social change as the perceived behavior and perceived outcome of being diagnosed with diabetes in this population can be changed. The health care providers at this clinic have the capability to act as conduits for this behavioral change in the population.

This study adds to the growing body of literature about health in the American Indian population. This study was completed within a clinical model in which all health care services are available to the population are in one building. By having the medical and dental services offered in one clinic setting, this enables providers the ability to communicate across professional lines about diabetes and periodontal disease risk. This systematic connection to the services offered within the clinic by the medical and dental providers has the potential to increase the quality of life of the patients of this clinic.

The findings of my study demonstrate that there is a health-related social need in terms of access to care and health education efforts within the American Indian population that this clinic serves. In addition, I studied the lived experiences of a set of health care providers who work with the American Indian population, a majority of whom are not of the American Indian population. As a result of this study I learned five things about the health care providers at this clinic who exclusively serve the American Indian population. First, I learned that this population of health care providers was knowledgeable about the link between diabetes and periodontal disease risk, and there were several factors as to why some of those providers did not communicate to their patients about the risk. Those factors include time, reliance on other staff to have the conversation with patient, the low health literacy level of the patients of this clinic, and patients not taking responsibility for their own healthcare outside the clinic.

Second, each provider had a different perspective as to who at the clinic should be speaking with patients about periodontal disease risk. Third, health care providers at this clinic believed that their patients are health literate but need to become more aware of the importance of caring for themselves outside the clinic. Fourth, the amount of time allotted for patients’ clinical appointments is a limiting factor for providers. Fifth, providers are discussing a wide range of complications of diabetes with patients but are relying upon the dental providers to discuss periodontal disease risk.

A unique characteristic of my study is that I, a member of the tribe in which this study took place, was able to study the population of health care providers at the clinic. This may not have been feasible if I was a non-tribal member. Another factor which makes my study unique is that I am addressing a gap in the literature about communication between American Indian patients with type 2 diabetes and their providers about the topic of periodontal disease risk and its relationship to diabetes. To my knowledge, this study is the first of its kind in this population.

## Conclusion

The main goal in conducting this study was to examine the way in which health care providers at an American Indian community clinic communicate periodontal disease risk to their American Indian patients with type 2 diabetes. The experiences described by the health care providers yielded multiple themes related to communication, time, use of modalities, and health care provider knowledge. Chapter 5 five began with a discussion of how the study evolved that was then followed by a brief summary of the findings. Limitations of the study including my subjectivity, bias of the health care providers, and the bias of being a tribal member and an employee of the clinic.

In the results of my study, I concluded that some health care providers are discussing periodontal disease risk to their American Indian patients with type 2 diabetes. Other health care providers are relying upon the dental clinic staff to provide periodontal disease education. A key factor that was discussed by the health care providers is that patients need to take more responsibility for their self-care.

The American Indian community clinic in this study was unique as multiple aspects of health care are represented in this facility. The unique aspects of this facility include medical, dental, optical, pharmacy, community health, etc. There are multiple opportunities for collaboration between specialties to increase the quality of life of the patient and to decrease the disparity of diabetes within the American Indian population.

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# Appendix A: The Interview Guide

The purpose of this interview guide is to provide guidelines for myself for conducting the interview with health care providers at the clinic being studied.

*1. Identify and summarize the purpose of the interview and how the information gathered will be used.* The purpose of this interview is to gather information about how you as a health care provider communicate with your American Indian patients with type 2 diabetes about the risks of periodontal disease. Information gathered today will be used in my doctoral study. Today's interview will be audio recorded for accuracy. All information collected today will be confidential, including the health care provider's name, which will be given a code number. If you are interested in receiving a copy of today's interview transcript, please place your request in writing and e-mail to me If interested, health care providers will be provided a copy of the research findings upon completion of the study.

*2. Interview structure.* The interview structure to be used will be semistructured interviews and should take no more than 45 minutes.

*3. Opening technique to build rapport with the health care provider being interviewed.* Remember to thank the health care provider for taking time out of their busy schedule to participate in the interview and that the results of today's interview will add to the depth and breadth of this study and the body of the scholarly literature in general.

*4. Examples of questions that may come up during the interview.*

a. Are you going to let management know if I provide you with an unfavorable answer? Answer is no.

b. If I tell you some information that I do not wish to be used in the study, will you honor my wishes? Answer is yes.

c. If you are being compensated for conducting the interview.

*5. During the interview.* Ask all questions in order, utilizing prompts as necessary. See Appendix B for interview questions. It is ok if the health care provider asks to refrain from answering a question.

*6. Completion of the interview.* Thank the health care provider for all their answers and for their time. Ask the health care provider if they have any last thoughts they would like to share.

*7. Summarizing the interview.* After the conclusion of the interview and in the van, review any hand written notes made and make any additional notes.

*8. Back in the office.* Once back to the office, immediately transcribe audio recording into a MS Word document. Save transcripts into computer. Save audio recordings onto computer hard drive for later reference.

## Appendix B: Interview Questions

Interview Date: ___________________________ Interviewed by: Jennifer J. Jordan, M.Ed., CHES, HHS

Name of Person Interviewed: __________________________________

Code for Person: ____________________________________________

*Physicians and Physician's Assistants will be provided with an "A" following three zeros and a number.
*Nurses (whether they are NP's, RN's or LPN's) will be provided with a "B" following three zeros and a number.
*Dentists will be provided with a "C" following three zeros and a number
*Dental Hygienists will be provided with a "D" following three zeros and a number
*Certified Diabetes Educators will be provided with a "E" following three zeros and a number
*All numbers will be ordinal (1,2,3…)

### *Interview Questions*

#### *Demographic Questions*

1. **What is your gender?**
   Male Female Refused to answer

2. **Which age group do you fit in?**
   18-29 30-39 40-49 50-59 60+ Refused to answer

3. **What is your race?**
   White Hispanic Black, African American

   American Indian or Alaska Native-Name of tribe__________________________
   (enrolled or principal tribe)

   Asian Indian Chinese Filipino Japanese Korean

   Vietnamese Other Asian (Print race) ___________________
   Native Hawaiian Guamanian or Chamorro Samoan

Other Pacific Islander (Print Race)____________

Other race not listed ________________ Refused to answer

4. **What degrees do you have?**
   MD DO PhD DDS DMD RN PA-C
   Associates Bachelor's Master's Other Refused to answer

5. **What is your profession at the clinic?**
   Physician Physician's Assistant Nurse Practitioner Registered Nurse Diabetic Team

   Community Health Nurse Dentist Dental Hygienist Other

   Refused to answer

6. **How many years have you been in this profession?**
   0-5 6-10 11-15 16-20 21-25 26+

   Refused to answer

7. **How many years have you been employed at this clinic?**
   0-5 6-10 11-15 16-20 21-25 26+

   Refused to answer

8. **Have you ever worked at another American Indian/Alaska Native clinic?**
   Yes No Refused to answer

9. **How many years have you worked with the AI/AN population?**
   0-5 6-10 11-15 16-20 21-25 26+

   Refused to answer

***Interview Questions***

**1.** When discussing complications of diabetes with your American Indian patients who have been diagnosed with type 2 diabetes, which complications do you discuss the most?

**2.** Why do you discuss those complications the most?

**3.** Which complications do you discuss the least?

**4.** Why do you discuss those complications the least?

**5.** Describe what you tell your American Indian type 2 diabetic patients about caring for their teeth.

**6.** Why do you discuss these particular issues?

**7.** How often do you discuss periodontal disease with your American Indian patients with type 2 diabetes?

**8.** Why do you use that time frame? (referring to question 7)

**9.** What do you know about the link between diabetes and periodontal disease?

9a. How did you learn about this link? (If know about the link)

9b. Please explain why you don’t believe that there is a link. (If states that there is no link)

**10.** What modalities (i.e., brochures, spoken word, etc.) do you use to communicate to your patients with type 2 diabetes about periodontal disease?

**11.** Why do you use those modalities?

**12.** What is your perception of the level of health literacy of your American Indian patients?

**13.** Does this perception of their health literacy play a role in how you describe health issues with them? If so, how?

**14.** At this clinic, who do you think should be having conversations with patients with type 2 diabetes about periodontal disease?

**15.** Why did you choose that answer?

**16.** If you had a question about periodontal disease and diabetes, how would you find more information?

**17.** Describe any limiting factors that prevent you from discussing periodontal disease with your type 2 diabetic patients. (If the answer does not include mention of time, then ask the next two questions) How much time do you spend with your patients with diabetes? Describe any limitations on the amount of time you can spend with a patient.

**18.** Describe how these limiting factors affect your practice.

**19.** Is there anything else that you would like to add that we have not discussed?

# Appendix C: Participant Recruitment Letter

Jennifer Jordan, M.Ed., CHES, HHS
XXXXXXX
XXXXXXXX
*Date Here*

*Dr./Nurse/Health Care Provider*
XXXXXXX
XXXXXXXX
XXXXXXX

Dear [Recipient Name]:

I am conducting graduate research on health care provider-to-patient communication at the XXXXXXXX. I am interested in knowing if you as a health care provider communicate the topic of periodontal disease to your American Indian patients with type 2 diabetes. I am inviting you to participate in a one-time interview. This research project has been approved by Walden IRB, Business Committee, and Clinic Management. Interviews are slated to begin on___________, 201_. If you would like more information or would like to schedule an interview, please feel free to call me at XXX-XXX-XXXX or by email.

Thank you for your time and consideration in assisting me with this groundbreaking research.

Sincerely,

Jennifer J. Jordan, M.Ed., CHES, HHS