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**AN ASSESSMENT OF A VIDEO ON THE LINK BETWEEN DIABETES
AND PERIODONTAL DISEASE TO EDUCATE NATIVE AMERICAN
POPULATIONS**

By

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B.S., Dental Hygiene, University of New Mexico, 1992

THESIS

Submitted in Partial Fulfillment of the
Requirements for the Degree of

**Master of Science
Dental Hygiene**

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ABSTRACT

The Native American population of the Navajo Nation is increasingly diagnosed with diabetes; therefore, dental providers across the Navajo Reservation must ensure that evidence based knowledge is being presented on the oral-systemic link of diabetes and periodontal disease. The purpose of this descriptive study was to evaluate dental hygiene learners' perception of a video educational tool that is to be used for patient education of Native Americans with periodontal disease and diabetes. A total of 22 surveys were returned. A score of 10 was given by 68.2% (n=15) of participants for Accuracy, and 54.5% (n=12) for Educational and Informative content areas. Half of the participants (50%) responded that they were extremely likely to benefit from the video. The overall responses to the culturally focused dental educational video were positive. Participants found the information to be accurate and they felt it would be beneficial for the Navajo populations who have diabetes and periodontal disease.

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CHAPTER 1: INTRODUCTION

The Navajo Indians make up the largest tribe in the United States with a population of 356,890. The Navajo Nation covers the largest land area by a Native American Tribe and includes portions of northeastern Arizona, southeastern Utah, and Northwestern New Mexico.

The Native American population has battled diabetes for decades. Diabetes was reported to be a rare disease among Navajos before World War II. Even as rates of diabetes increased through the 1960's, it was thought to be a milder form of glucose intolerance than what was found in other populations and was characterized as a benign chemical abnormality unassociated with the typical complications of diabetes.¹ Recent reports among adults suggest estimates of type 2 diabetes to be two to four times those of non-Hispanics white (NHW) populations and rising over the past 20 – 30 years.² Additionally, this population has a problem with periodontal disease that has affected both younger and older generations.³ Since diabetes mellitus and periodontal disease are both prevalent among the Navajo population more education and awareness is needed to highlight this oral-systemic connection.

Dental hygienists who work closely with this population recognize the need to increase awareness of the bidirectional relationship between diabetes and periodontal health. Finding opportunities to provide evidence-based information to patients is often underutilized by the profession. Perhaps an adjunct, such as an educational video may be used to relay this much needed information to patients that present with diabetes and periodontal disease. The appointment time should be treated as an educational session and not just a mechanical service.

Statement of the Problem

Does a culturally-specific video help inform the Native American dental patient about the bi-directional relationship of diabetes and periodontal disease?

Significance of the Problem

This specific research is important since Native Americans have been on the forefront of an increase of diabetes (uncontrolled) and periodontal disease for years. There are many Native American tribes throughout the United States who have an oral-systemic crisis and are unaware of the long term health outcomes. The focus of this research will be to assess a video that provides information to the Navajo population who live on the Navajo Reservation within the Arizona communities. This video will attempt to bring more acknowledgment to this problem.

Dental hygienists attempt to educate their patients on the relationship between diabetes and oral health during the dental appointment. This is a significant amount of important information trying to be delivered in a small amount of time. Topics such as how the oral flora influences the whole-body connection and how it impacts the patients' A-1c numbers need to be discussed. Patients should be encouraged get their blood work done to see if the numbers change and determine whether there are pending issues with diabetes control.

With limited time during a dental hygiene visit, the use of a video can be one method of getting this information to the patient. This knowledge in turn, gives the patient the ability to be proactive with their own oral home care responsibilities and to work towards improving their oral health status. If there are other medical issues identified during the appointment, then referrals can be provided. However, in order

to enhance the mindset of this population and instill value, evidence-based education is critical.

Operational Definitions

Diabetes - a metabolic disorder in which the body is one is unable to produce or unable to use insulin sufficiently

A1c- A stable glycoprotein formed when glucose binds to hemoglobin A in the blood

Oral hygiene- is the practice of keeping the mouth and teeth clean to prevent dental problems, most commonly, dental cavities, gingivitis, periodontal diseases and bad breath. These are also pathological conditions in which good oral hygiene is required for healing and regeneration of the oral tissue

CHAPTER 2: LITERATURE REVIEW

Introduction

The prevalence of Native American adults with diabetes mellitus and periodontal disease on the Navajo Tribal Reservation has been shown to be greater than any other race or ethnicity.⁴ In 2008, the prevalence of Type 2 diabetes mellitus in people greater than 20 years old on the reservation was 21.47%.⁵ For centuries uncontrolled diabetes mellitus and periodontitis has been among the prominent systemic diseases on the Navajo Reservation, making this more of risk factors for future generations.⁴ The prevalence of periodontal disease is increasing among the Native American Indians. Type 2 diabetes accounts for significant increases in periodontal disease and tooth loss in Native American populations.⁵ This systemic disease affects the younger generation just as much as the older generations, and many families have accepted this as a role it will play some time in their life. Therefore, dental hygienists working on the Navajo Reservation will likely treat a patient who has both diabetes and periodontal disease.

Diabetes has many long term-systemic effects on the body. This literature review will focus on the relationship of diabetes, its effects on the body and periodontal health.

Diabetes Mellitus

Diabetes mellitus is a chronic disease in which the body either does not produce insulin or cannot correctly use insulin produced. Insulin is a hormone that the body needs to break down sugar, starches, and other food that the body needs for energy and daily life. Normally, insulin helps take glucose from the blood out to

the body's cells. A patient with diabetes has trouble making or using insulin, thus glucose remains in the blood, not allowing body to get the fuel it needs.

In the Northern continent, it is estimated that more than 30 million adults and children in the United States have some form of diabetes.^{6,7} Among the general population at least, 23 million have been diagnosed with diabetes and 7.2 million unaware they have it.^{6,7} Generally, there are two basic types of diabetes, insulin dependent (IDDM) and noninsulin dependent mellitus (NIDDM).⁴ Other types include gestational diabetes and prediabetes. Patients that have, NIDDM typically have Type 2 diabetes, and this type is considered the most common. It is characterized by elevated plasma glucose and plasma cholesterol in blood and urine.⁴ Individuals with type 2 diabetes have a reduced biological response to insulin. This type is often associated with obesity and is cardiovascular disease. High blood sugar triggers processes that can lead to complications, such as heart, kidney, and eye disease and other serious problems.^{6,7} Common signs and symptoms of diabetes are: constant thirst, frequent urination, blurred vision, and constant fatigue, unexplained weight loss, poor wound healing, dry mouth, itchy dry skin, tingling or numbness in the hands or feet.^{6,7}

Periodontal Disease

Periodontal disease is a bacterial infection that affects gingiva, periodontal ligaments, and alveolar bone that supports the teeth. Left untreated it can lead to mobility and eventually tooth loss. The primary etiological factor is bacterial dental plaque, a sticky, colorless microbial biofilm that forms on the teeth. Clinically, plaque presents as a milky white or yellowish deposits, usually found between the teeth,

producing a foul odor in the mouth.⁸ When certain pathogenic bacteria release endotoxins, it results in a breakdown effect of the gums, causing infection and stimulate the hosts immune system.⁸ The host response produces major inflammatory and immunopathology components that contribute to the overall tissue damage.⁹

The clinical signs and symptoms of periodontal disease are inflamed, erythematous gingiva that often bleeds easily during brushing and flossing. The gingiva is often tender to the touch, and in some cases dental recession has occurred, exposing the overlying cementum of the root.

Chronic periodontitis is the most common type and is a slowly progressing condition that has periodic bursts of activity.⁹ Due to the nature of chronic periodontitis; it can go undetected until a dental professional assesses the patient. Periodontal charting reflects the current health of the gingiva or displays the areas of past or present infection. This periodontal assessment keeps the health professional informed of the patient's current condition therefore, allowing the ability to provide optimal care.

Diabetes and Periodontal Disease Relationship

Over the past 10 years, evidence based-research has been conducted, supporting the link between diabetes and periodontal disease.¹⁰ The oral-systemic connection between diabetes and periodontal disease is bidirectional. Within the past decade, there has been a conceptual shift from periodontal diseases as only an oral problem, to periodontitis having an impact on overall systemic health.¹⁰

Research shows that people who have diabetes are 2-4 times more susceptible to periodontal disease when the metabolic control or blood sugar levels are high.^{6,7} This poor glycemic control causes increased susceptibility to infection and more severe periodontal breakdown. Patients are often unaware of the breakdown of oral health, and do not understand the long term impact.

Periodontal infection then complicates glycemic control and enhances insulin resistance producing hyperglycemia.¹¹ Bacteria from periodontal disease can enter the bloodstream and activate immune cells. These activated cells produce inflammatory biological signals that have a destructive effect throughout the entire body.⁸ For instance, in the pancreas, the cells responsible for insulin production for insulin Type 2 production can be damaged or destroyed by the chronic high levels of cytokines.⁸ Because of this relationship, periodontal disease is often referred to as the sixth long term complication of diabetes, but often goes unrecognized by physicians who treat patients with diabetes and remains unaddressed.¹¹

Though, there has been a resurgence of interest in the possible causal link between periodontal disease and other systemic diseases the concept that oral disease can adversely impact systemic health is not new. The history of this relationship has been well described in two articles, one by Barnett 2006 and Williams in 2008. Miller proposed a role of oral bacteria in the causation of numerous diseases in organs that are distant from the oral cavity. In the late 1800s, Miller published his book entitled "The Microorganism of the Human Mouth." He also published a frequently cited article entitled the "Human Mouth as a Focus of

Infection”. Both publications supported a causal relationship between oral and systemic disease and date back to 1891.¹²

Diabetes and Periodontal Disease in the Navajo Population

With diabetes being so prevalent among Navajo reservations and other indigenous tribes, it is important to provide additional evidence-based information to highlight the significance of the bi-directional relationship between diabetes and periodontal disease. Patients with uncontrolled diabetes are more susceptible to oral complications such as gingivitis and periodontitis. The severity of periodontal disease is positively correlated with the length of time a patient’s diabetes remains in an uncontrolled status. Equally, metabolic control and glycated hemoglobin levels (A1C) are negatively impacted by active, or unmaintained, periodontal disease.¹¹

Native American Navajo Population

The Navajo Nation land, or reservation, expands over 17 million acres of remote terrain. The territory covers four states within the four corners of Utah, New Mexico, Arizona and Colorado. The Navajo population is one of the greater tribal populations totaling 356,890 people according to the 2016 census bureau. For household income traditional trades are performed such as jewelry making, rug weaving, raising cattle and sheep.

Navajos are unique in their tribal and cultural beliefs. Traditionally, people of this population perform ceremonies and rituals to promote or improve health. Though Navajos strongly value cultural tradition, tribal membership includes access to, and coverage for, modern or westernized health care. This includes coverage for vision, medical, and dental care.

Barriers to Care for the Navajo Population

Perceived Value of Health Care

Though health care coverage is a benefit to the Navajo population the perceived value of free health services may influence the utilization of dental care. The inaccurate perception that cost, or lack thereof, is correlated with value facilitates the illusion that free dental care provides no benefit. This de-valued perception can result in patients missing appointments or disregarding the recommendations of their dental provider.

Economic Factors

Additionally, there are many economic factors that the Navajo people experience that create barriers for accessing health care. The poverty level and unemployment rate for the Navajo population is relatively high at 42% with the annual median household income averaging \$20,000. This economic hardship creates an additional barrier as many do not have their own form of personal transportation and thus rely on free transportation to access dental care.

Language and Educational Barriers

Language also presents as a barrier as the native language is not English thus requiring an interpreter to discuss all aspects of health management, including but not limited to: disease status, treatment needs, and preventive strategies. Navajo people who only speak the traditional language may also have a poorer level of health literacy. Higher education may improve health literacy of the population however 32.3% of the Navajo population has only completed some high school while approximately 18% have earned a college degree.¹³ As education level can

influence a person's health trajectory, and the fact that the prevalence of diabetes and periodontal disease is high for this population, it may be beneficial for the Navajo people to receive supplemental oral-systemic health education.

Quantity of Evidence Based Research

Most Native American oral health literature and studies have focused on dental caries and with only a selected few on periodontal disease on systemic health. Research on Native Americans on the Navajo Nation who have both uncontrolled diabetes and periodontal disease is limited or outdated. However, a group that has been diligently studied is the Alaskan Natives. This research involved the Alaskan Natives and the prevalence of dental caries and periodontal disease, however similar, not the correct target population.

Bridging the Barrier Gap

Since the mid-1950's the Indian Health Service (IHS) dental program has maintained a system for monitoring oral health and estimating the needs of Native Americans and Alaskan Indians. This has enabled the groundwork for future research among the Native American populations. With diabetes being the most prevalent systemic disease among Native Americans tribes a more proactive approach in the prevention of oral-systemic diseases is required. It is vital for any patient with uncontrolled diabetes to have regular and routine dental appointments and practice compliance with oral health recommendations. To promote oral and overall health, IHS has facilities available on the reservation at Fort Defiance Medical Center which includes a 24 dental chair facility. This creates opportunity for dental providers to integrate education on oral-systemic diseases and preventive

strategies to help decrease the prevalence, and severity, of periodontal disease and diabetes for this population.

Dental Health and the Navajo Population

Among the studies with the South Dakota tribes with diabetes in 2011, among 27% of adults in the US 43% of Native Americans 35 to 43 year old's had untreated decay and periodontal disease.³ The two most common diseases are dental caries and periodontal disease, making this priority among studies. Unfortunately, only a small reduction in prevalence or severity of disease was noted in American Indians and American Natives.⁴ The Native American population does have limited means of oral health care in remote areas. The Navajo reservation has a vast amount of remote areas that can be affected by weather or dirt roads, therefore limiting health care. A recent study has underscored the fact that poor oral health is the most serious problems the nations Native American populations.⁴ The Native communities have a high poverty rate in remote sections on the reservation. However, that is where many Indian Health Services (IHS) are located across the United States / Alaska, to serve the Native American populations since the beginning of the 1950's.¹

Since periodontal disease and diabetes are a growing epidemic among Native American Tribes, American Indians and Alaskan Indians people have more severe periodontal diseases partially due to high prevalence of diabetes.⁴ Yet many patients may not be aware they have periodontal disease until they get diagnosed by an oral health professional, dental hygienist are the first to screen for periodontal disease. This is a multifactorial disease process initiated by oral bacteria.⁸ For patients those become aware of their periodontal condition can have more of a

home care regimen resulting in maintaining their condition and not advancing the disease. During adolescent years periodontal disease usually begins and if left untreated results in the loss of tissue that holds the teeth in place in the jaw.⁸ On the other hand, while the exact etiology of periodontal disease is not completely understood certain medical and lifestyles conditions increase an individual's likelihood of having advanced periodontal disease, including smoking and diabetes.⁸ One study found that poorly controlled type 2 diabetic's patients are more likely to develop periodontal disease than well- controlled diabetics.¹⁰ Research has emerged that suggest that the relationship between periodontal disease and diabetes goes both -ways, pointing towards periodontal disease may make it more difficult for people who have diabetics to control their blood sugar.¹⁰

Many preventive programs across the reservation have been established to combat this issue such as public health education, diabetes clinics and dental clinics. Limited data are available to see whether these preventive measures have brought any impact to overall health and oral health. However, many community outreach programs have been established in Navajo reservation clinics or what is termed (CHR's) Community Health Representatives. The Tribe has taken this responsibility on since 1968 as a partnership with tribal leaders, the CHR program has delivered culturally-appropriate healthcare information to service Native communities.

CHAPTER 3: METHODS AND MATERIALS

The purpose of this study was to evaluate dental hygiene learners' perception of a video educational tool that is to be used for patient education of Native Americans with periodontal disease and diabetes. Feedback regarding the quality, the information, the content and the message will be assessed.

Hypothesis

This video will bring more education of the oral systemic connection to the Native American uncontrolled diabetic population and can make an impact during dental visits.

Sample Defined

The sample included dental hygiene students enrolled in a regionally accredited university or community college dental hygiene program within the state of New Mexico. These institutions are all CODA accredited programs and are recognized by the United States Department of Education and include at least two academic years of post-secondary college education.

Research Design

A descriptive study using an online survey tool was used to evaluate a video developed to serve Native American populations by providing education on the link between diabetes mellitus and periodontal disease. The video was developed with an emphasis on Native American patients of the Navajo nation. The video was approximately five minutes in length and covered a variety of educational topics. Participants in the study were asked to watch the video and complete a ten question

survey containing both open and closed-ended questions. The survey was provided in an electronic format using the online survey tool, Survey Monkey®.

Upon approval, by the University of New Mexico's Institutional Review Board and the Human Research Protection Office (HRPO) an email containing the informed consent cover letter and along with a link for the educational video and survey were sent to the directors of each eligible program. The email asked that they forward the email to their students informing them of the study. The participants were given three weeks to enroll, watch the video and complete the survey. Upon completion of the first week a second email was sent out to program directors to serve as a reminder. After the three weeks the survey was no longer available for more responses.

The data was exported into Excel for analysis. Descriptive statistics were calculated for each question and presented in bar charts and tables. Additional data was analyzed using the Microsoft Excel add in from the Data Analysis tool pack.

CHAPTER 4: RESULTS, DISCUSSION AND CONCLUSION

Results

A total of 22 surveys were returned. Demographic responses regarding what types of degrees are offered at their program are as follows: 73% (n=16) have Master's degrees, 13% (n=3) have Bachelor's degrees, with no participants indicating their program offering an Associate's degree or Certificate. Three participants chose to not pick an option. (Figure 1)

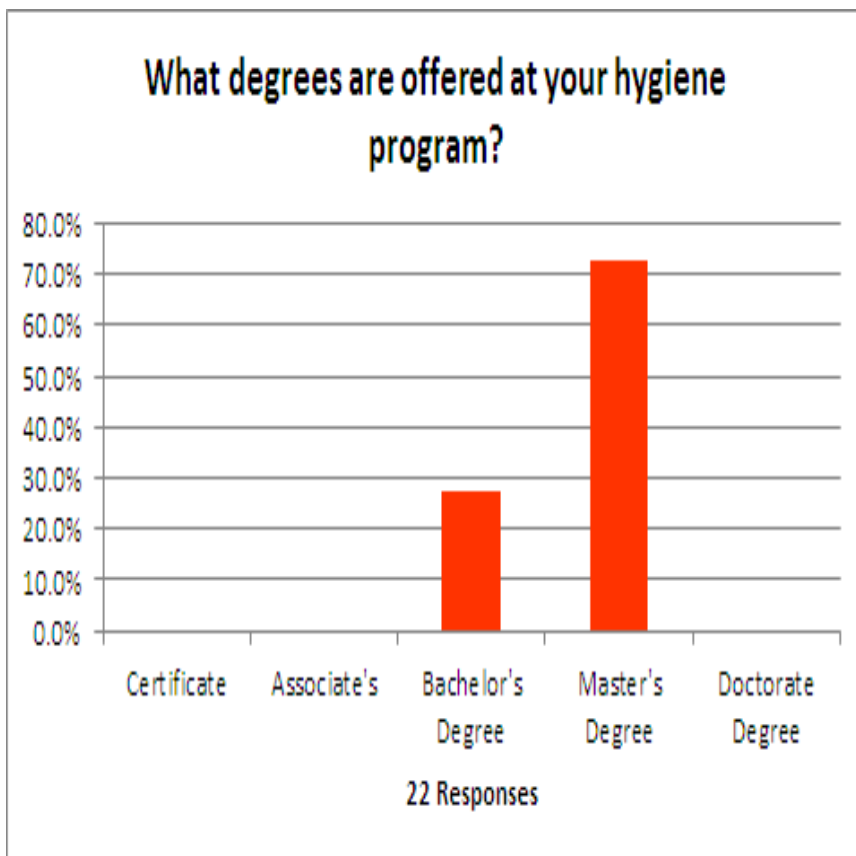


Figure 1: Degrees are offered at your hygiene program.

Additional demographics revealed that 90% of the participants attended a Public University, 4.5% a Non-Profit Private College and remaining 4.5% from a For

Profit Private College. (Figure 2) One percent of the participants did not indicate the type of program they attended.

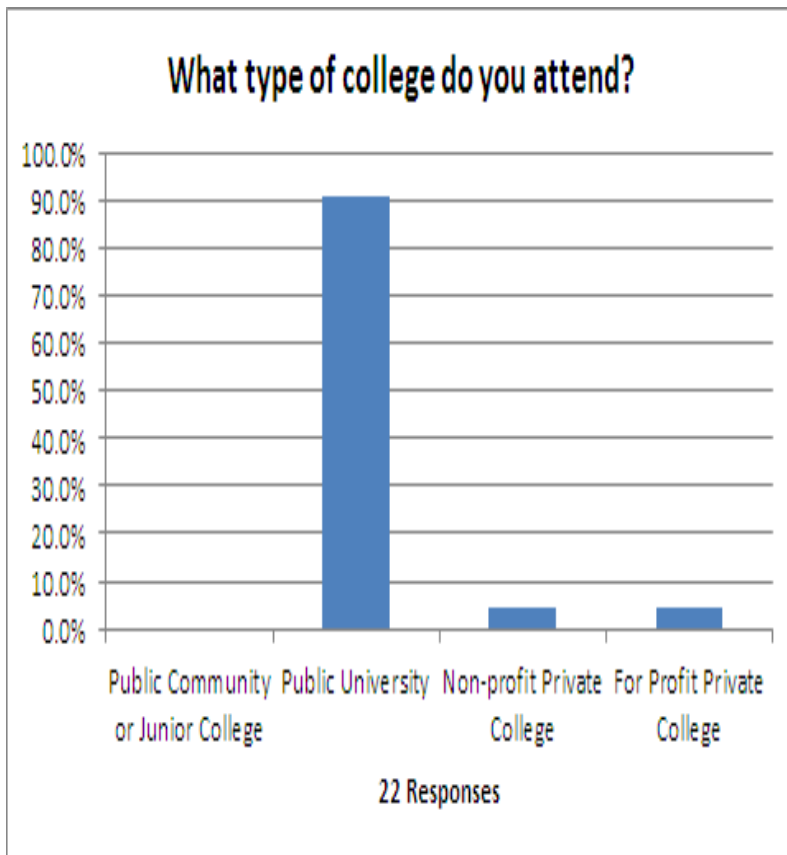


Figure 2: Type of college attending.

For the next question, participants were asked to rate on a scale of 1 (poor) to 10 (excellent) the attributes of five content areas of the video: *Educational, Informative, Evidence-Based, Accuracy and Clarity*. Accuracy was the top ranked content areas with a score of 10 given by 68.2% (n=15) of participants. This was followed by the Educational and Informative content areas which both received a ranking of 10 by 54.5% (n=12) of participants. The Evidence-based content area received a ranking of 10 from half of the participants (n=11) while Clarity scored a 10 by the lowest percentage of participants 36.4% (n=8). (Table 1)

Table 1: Attributes of the Educational Video

How would you rate each of the following attributes on the oral systemic diabetic/periodontal disease educational video? (N= 22) Responses 1=Poor; 10=Excellent					
	1	3	5	8	10
Educational:		9.1% (n=2)	4.5% (n=1)	31.8% (n=7)	54.5% (n=12)
Informative:		9.1% (n=2)		36.4% (n=8)	54.5% (n=12)
Evidence-based:		9.1% (n=2)		40.9% (n=9)	50.0% (n=11)
Accuracy:		9.1% (n=2)	4.5% (n=1)	18.2% (n=4)	68.2% (n=15)
Clarity:	4.5% (n=1)	13.6% (n=3)	22.7% (n=5)	22.7% (n=5)	36.4% (n=8)

Question two asked how participants would you rate the notion that Native American patients have received accurate information about the bi-directional relationship between diabetes and periodontal disease from the video?

Using a scale of 1-10 with 1= *not at all* and 10= *definitely*, 38% of participants rated the accuracy of the information a 10 indicating it was definitely accurate. A score of 9 was given by 23%, 8 by 19%, 5 by 9%, 7 by 6% and 3 by 6%. (Figure 3)

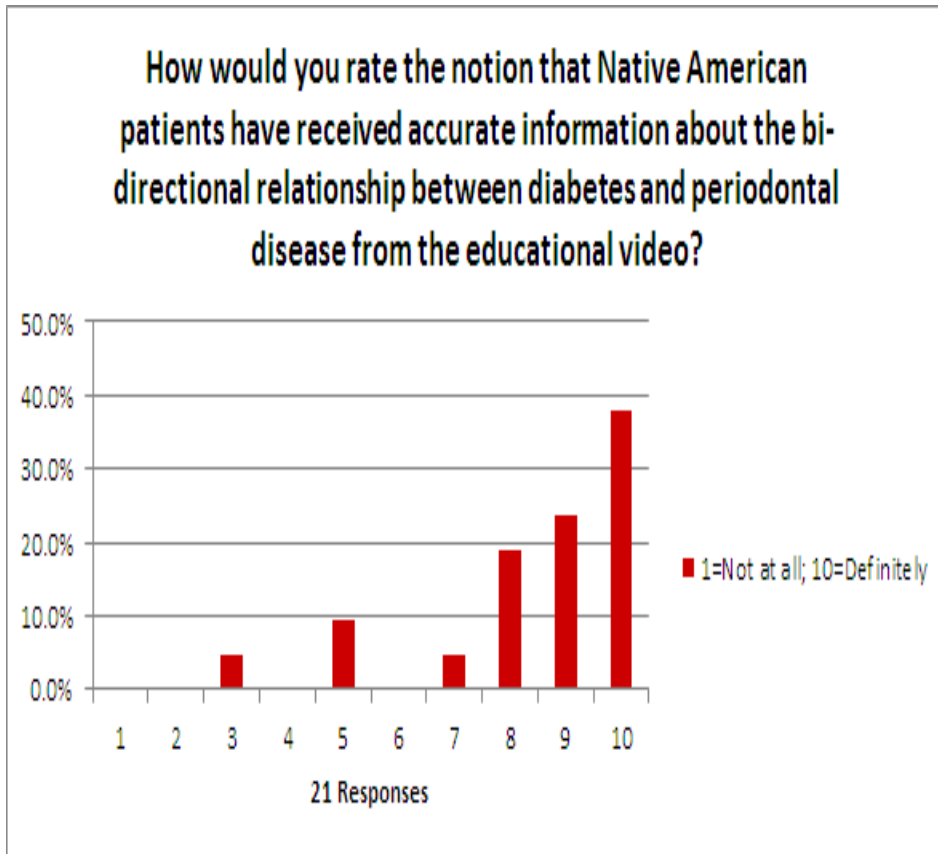


Figure 3: Accuracy of information from the educational video.

Question three asked whether participants thought patients with periodontal disease and diabetes would benefit from the educational video. Half of the participants (50%) responded that they were extremely likely to benefit from the video. Twenty-seven percent reported probably likely, and 23% were neutral (Figure 4). Overall the responses indicate that this video would likely provide a benefit for the patient gaining more insight on the bidirectional relationship of the oral systemic connection.

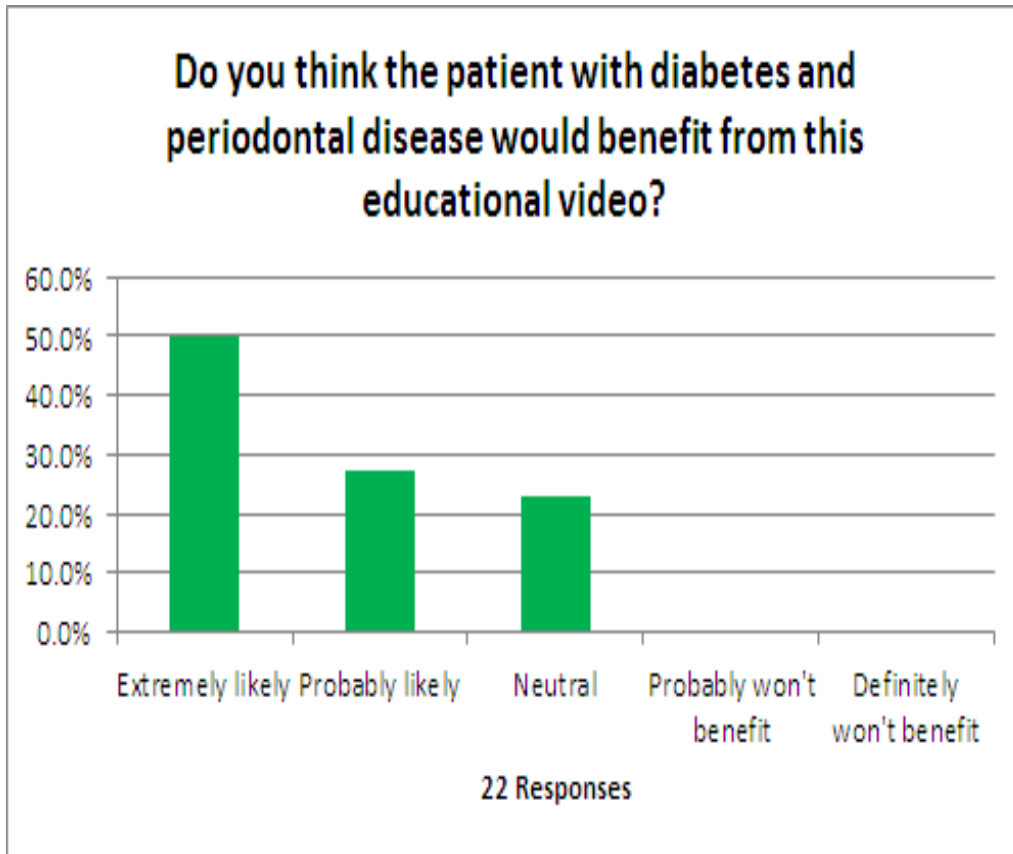


Figure 4: How beneficial is the video?

Question four asked whether the participants thought that this video is needed as part of the oral health education. Results showed 27% responded that they probably need the education.

Question five asked participants whether they believed that patients would receive the intended message from the video. Overall all participants believed that the message from the video was conveyed to the population with 54.5% (n=12) reporting it was professionally conveyed and 45.5% (n=10) reporting that it was somewhat conveyed to the population. (Figure 5)

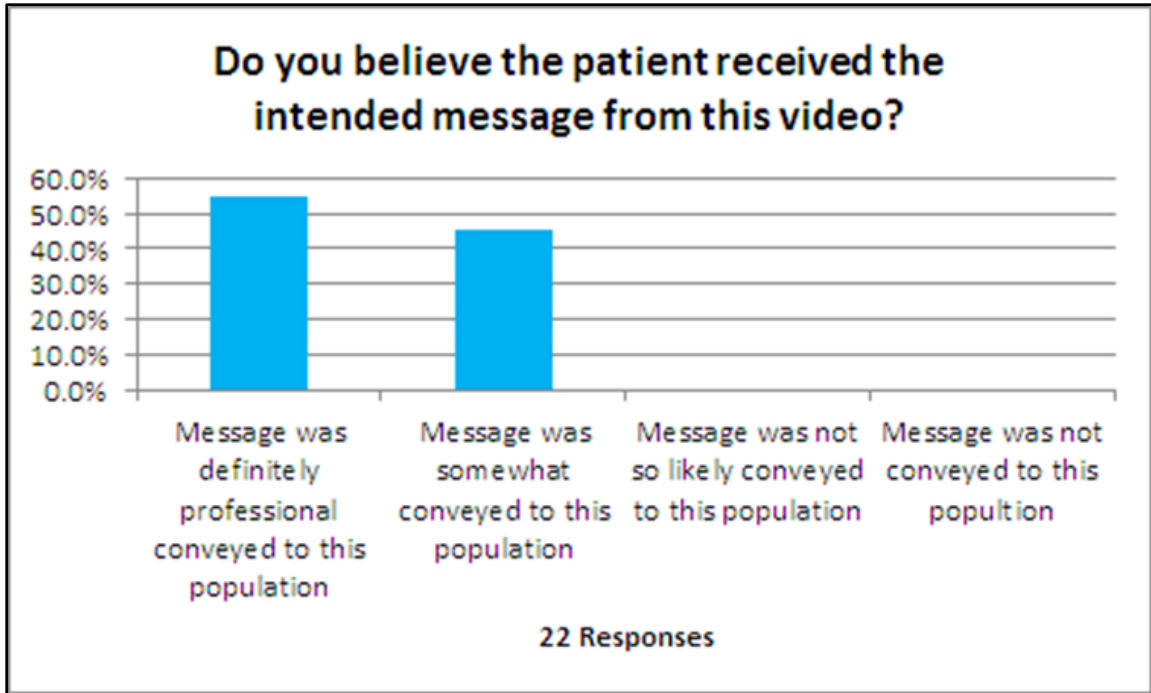


Figure 5: Do you believe the patient received the intended message from this video?

Question six asked participants if there were any changes that they would like to add to the video. The responses were that 4.5% felt that the introduction was not sufficient and more websites should be added to the toolkit. Others reported (27%) more oral-systemic information needed. Sixty-three percent selected “other” and indicated written comments. (Figure 6 and Table 2)

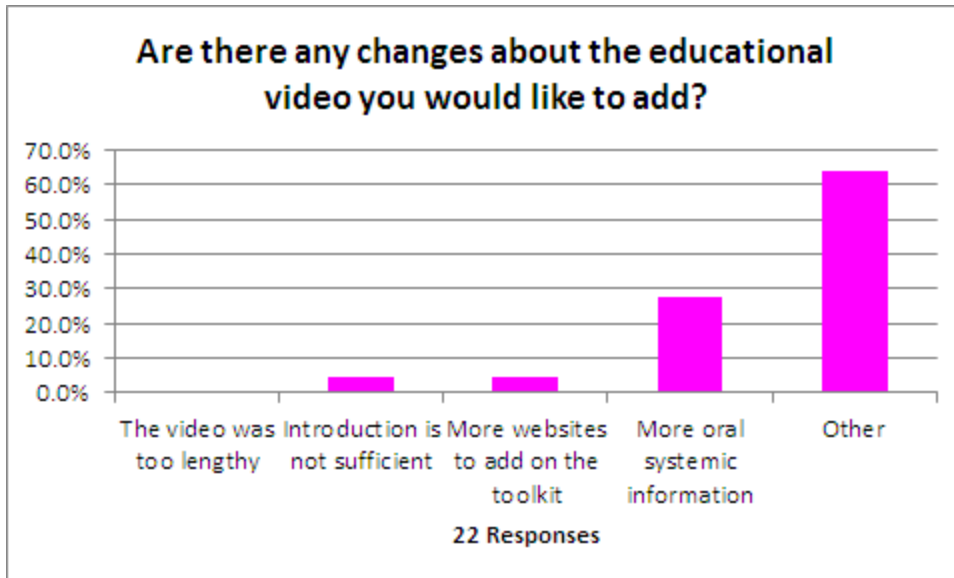


Figure 6: Are there any changes about the educational video you would like to add?

Table 2: Changes that participants would like to add to the video.

Written responses:
<ul style="list-style-type: none"> • More oral systemic education • More websites to add to the tool kit • Simplify, too wordy, the visuals, more clear writing • A more inviting backdrop, change font to something solid, easier to read • Different font, video was lacking no excitement, typos should have been filmed closer, presentation better prepared and clear • Some of the language is too technical for the general population • More clear, easy to read font, More pictures of healthy vs unhealthy mouth. Discuss connection between chronic infection of diabetes and periodontal disease • The black screen with the writing was hard to follow. There were too many words on the black screen with the white writing made it difficult to read • Video too lengthy. Too many pauses in instruction. Typos in written slides. Check grammar • The text, white on black in the video was hard to read, Maybe if the font was different and the with was colored in it would have been a bit more clear. I also think that changing the font, it was hard to read split up the speaking part of the video into chunks in between to transition between topics

Questions seven and eight were open ended question that asked participants what they liked about the video (Table 3) and to give any suggestions for improving the video (Table 4). All comments made were reported, sorted and listed in tables below.

Table 3: What did you like about the educational video?

Shorter Responses:	Longer Responses:
Is was short and informative	I like that the video added Native American culture in and the jewelry and music. It definitely made it more personal to the specific audience
I liked the way she used the model	I liked the fact that she used models, because it's easier to understand where there are visuals.
Props were useful	Making clear importance of oral, physical and mental health with all, especially this population
It is a very appropriate length	I liked the mouth model you used to show progression of disease
The use of pictures and models	I liked her demonstration of pictures with the gingivitis and periodontitis and the way she explained the process and how it occurs.
Information was great	The information was great, but visuals, text and voice over was hard to follow
It keeps the audience attention	I loved that it was true to the culture with the music, chanting and videography, I would suggest being more stable filming the places on the reservation
The visuals	Not a very common topic so it's a good idea to have this for this specific population
Very informative for this population	I liked the intro because it is oriented towards the population
	I enjoyed the beginning where it switched from video to video with a voiceover
	Great use of lay language to your message across about the oral systemic link between periodontal disease and diabetes

Table 4: Suggestions to improve the video.

Responses:
<ul style="list-style-type: none">• Five participants had no comment• Adding a brief explanation• More information at the end• Going in more depth of how diabetes and periodontal disease affect one another• Simply terminology for the audience• Emphasizing that systemic complications are preventable• Text was hard to see, add to pictures• More pictures and visuals• Have a longer availability time at the end, change the font• Splint up the speaker sections and the toolkit• Adding more information on how blood sugar directly, more close up of the model

Discussion

In recent years, more evidence has emerged strengthening the link between oral health and systemic health conditions. The relationship between periodontal disease and diabetes continues to gain attention of both medical and dental professionals. While studies have shown that medical health providers admit to having lower amounts of oral health education and thus lower knowledge regarding oral health, the primary responsibility of this education may lie with the dental professional.¹⁴ Oral health providers, especially dental hygienists, have the advantage of seeing their patients multiple times a year. Giving this educational information during dental hygiene visits allows for more education and preventive care. For dental hygienists who don't have enough appointment time to reinforce evidence based research on the oral systemic connection, the use of an adjunct video may be quite beneficial. The majority of participants that agreed the

educational video is an asset to the appointment time and then the subject matter can be reinforced by the end of the hygiene appointment. This evaluation step is important, in confirming that the patient understood the information.

The oral-systemic connection message needs to be a priority among the dental hygiene community with the Native American diabetic population, and especially those uncontrolled diabetics who have periodontal disease. By presenting the information with a patient's culture in mind this could potentially instill value and provide a greater, more applicable benefit. This educational video is specifically for the Navajo tribe and can help reinforce the significant correlation between diabetes and periodontal disease. It was intended to work within the time constraints of a dental hygiene appointment but still allow the patient to receive this much needed education. Overall survey responses revealed that the video reinforced concepts of the oral systemic connection for the Native American uncontrolled diabetic population. Responses were positive and offered constructive suggestions to improve the video.

Limitations

The responses were limited for this survey and feedback was provided by student learners. This study could not allow for representation of the general population.

Conclusion

With the bidirectional relationship of periodontal disease and diabetes mellitus clinicians must take part in accurately shaping their patients view of oral health in order to promote and facilitate overall health. Appointments times for both medical and dental are often limited and discussion about this link is often lacking. The

purpose of this study was to assess a cultural focused dental educational video that could be used as an adjunct during appointments. Overall responses were positive, and participants found the concepts to be accurate and they felt it would be beneficial for the Navajo populations who have diabetes and periodontal disease.

CHAPTER 5: ARTICLE FOR SUBMISSION

An assessment of a video on the link between diabetes and periodontal disease to educate Native American populations

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Key words: diabetes, periodontal disease, video education, Native American

Disclosure: Author has no conflict and nothing to disclose

Abstract

Purpose: The purpose of this study was to evaluate dental hygiene learners' perception of a video educational tool that is to be used for patient education of Native Americans with periodontal disease and diabetes.

Methods: A descriptive study using an online survey tool was used to evaluate a video developed to serve Native American populations by providing education on the link between diabetes mellitus and periodontal disease. The sample population included dental hygiene students enrolled in a regionally accredited university or community college dental hygiene program within the state of New Mexico.

Results: A total of 22 surveys were returned. Accuracy was the top ranked content areas with a score of 10 given by 68.2% (n=15) of participants. This was followed by the Educational and Informative content areas which both received a ranking of 10 by 54.5% (n=12) of participants. . Half of the participants (50%) responded that they were extremely likely to benefit from the video.

Conclusion: The overall responses to the culturally focused dental educational video were positive. Participants found the information to be accurate and they felt it would be beneficial for the Navajo populations who have diabetes and periodontal disease.

Introduction

The Navajo Indians make up the largest tribe in the United States with a population of 356,890. The Navajo Nation covers the largest land area by a Native American Tribe and includes portions of northeastern Arizona, southeastern Utah, and Northwestern Utah.

The Native American population has battled diabetes for decades. Diabetes was reported to be a rare disease among Navajos before World War II. Even as rates of diabetes increased through the 1960's, it was thought to be a milder form of glucose intolerance than what was found in other populations and was characterized as a benign chemical abnormality unassociated with the typical complications of diabetes.⁴ Recent reports among adults suggest estimates of type 2 diabetes to be two to four times those of non-Hispanics white (NHW) populations and rising over the past 20 – 30 years.² Additionally, this population has a problem with periodontal disease that has affected both younger and older generations.¹⁵ Since diabetes mellitus and periodontal disease are both prevalent among the Navajo population more education and awareness is needed to highlight this oral-systemic connection.

Dental hygienists who work closely with this population recognize the need to increase awareness of the bidirectional relationship between diabetes and periodontal health. Finding opportunities to provide evidence-based information to patients is often underutilized by the profession. Perhaps an adjunct, such as an educational video may be used to relay this much needed information to patients that present with diabetes and periodontal disease. The appointment time should be treated as an educational session and not just a mechanical service.

Methods

A descriptive study using an online survey tool was used to evaluate a video developed to serve Native American populations by providing education on the link between diabetes mellitus and periodontal disease. The sample population included dental hygiene students enrolled in a regionally accredited university or community college dental hygiene program within the state of New Mexico. These institutions are all CODA accredited programs and are recognized by the United States Department of Education and include at least two academic years of post-secondary college education.

Upon approval, by the University of New Mexico's Institutional Review Board and the Human Research Protection Office (HRPO) an email containing the informed consent cover letter and along with a link for the educational video and survey were sent to the directors of each eligible program. The email asked that they forward the email to their students informing them of the study. The participants were given three weeks to enroll, watch the video and complete the survey. Upon completion of the first week a second email was sent out to program directors to serve as a reminder. After the three weeks the survey was no longer available for more responses.

The video was developed with an emphasis on Native American patients of the Navajo nation. The video was approximately five minutes in length and covered a variety of educational topics. Participants in the study were asked to watch the video and complete a ten question survey containing both open and closed-ended

questions. The survey was provided in an electronic format using the online survey tool, Survey Monkey®.

The data was exported into Excel for analysis. Descriptive statistics were calculated for each question and presented in bar charts and tables. Additional data was analyzed using the Microsoft Excel add in from the Data Analysis tool pack. Feedback regarding the quality, the information, the content and the message will be assessed.

Results

A total of 22 surveys were returned. Demographic responses regarding what types of degrees are offered at their program are as follows: 73% (n=16) have Master's degrees, 13% (n=3) have Bachelor's degrees, with no participants indicating their program offering an Associate's degree or Certificate. Three participants chose to not pick an option. Additional demographics revealed that 90% of the participants attended a Public University, 4.5% a Non-Profit Private College and remaining 4.5% from a For Profit Private College. One percent of the participants did not indicate the type of program they attended.

For the next question, participants were asked to rate on a scale of 1 (poor) to 10 (excellent) the attributes of five content areas of the video: *Educational*, *Informative*, *Evidence-Based*, *Accuracy* and *Clarity*. Accuracy was the top ranked content areas with a score of 10 given by 68.2% (n=15) of participants. This was followed by the Educational and Informative content areas which both received a ranking of 10 by 54.5% (n=12) of participants. The Evidence-based content area

received a ranking of 10 from half of the participants (n=11) while Clarity scored a 10 by the lowest percentage of participants 36.4% (n=8). (Table 1)

Another asked whether participants thought patients with periodontal disease and diabetes would benefit from the educational video. Half of the participants (50%) responded that they were extremely likely to benefit from the video. Twenty-seven percent reported probably likely, and 23% were neutral. (Figure 7) Overall the responses indicate that this video would likely provide a benefit for the patient gaining more insight on the bidirectional relationship of the oral systemic connection.

Discussion

In recent years, more evidence has emerged strengthening the link between oral health and systemic health conditions. The relationship between periodontal disease and diabetes continues to gain attention of both medical and dental professionals.¹⁴ While studies have shown that medical health providers admit to having lower amounts of oral health education and thus lower knowledge regarding oral health, the primary responsibility of this education may lie with the dental professional. Oral health providers, especially dental hygienists, have the advantage of seeing their patients multiple times a year. Giving this educational information during dental hygiene visits allows for more education and preventive care. For dental hygienists who don't have enough appointment time to reinforce evidence based research on the oral systemic connection, the use of an adjunct video may be quite beneficial. The majority of participants that agreed the educational video is an asset to the appointment time and then the subject matter can be reinforced by the

end of the hygiene appointment. This evaluation step is important, in confirming that the patient understood the information.

The oral-systemic connection message needs to be a priority among the dental hygiene community with the Native American diabetic population, and especially those uncontrolled diabetics who have periodontal disease. By presenting the information with a patient's culture in mind this could potentially instill value and provide a greater, more applicable benefit. This educational video is specifically for the Navajo tribe and can help reinforce the significant correlation between diabetes and periodontal disease. It was intended to work within the time constraints of a dental hygiene appointment but still allow the patient to receive this much needed education. Overall survey responses revealed that the video reinforced concepts of the oral systemic connection for the Native American uncontrolled diabetic population. Responses were positive and offered constructive suggestions to improve the video. The responses were limited for this survey and feedback was provided by student learners. This study could not allow for representation of the general population.

Conclusion

With the bidirectional relationship of periodontal disease and diabetes mellitus clinicians must take part in accurately shaping their patients view of oral health in order to promote and facilitate overall health. Appointments times for both medical and dental are often limited and discussion about this link is often lacking. The purpose of this study was to asses a cultural focused dental educational video that could be used as an adjunct during appointments. Overall responses were positive,

and participant found the concepts to be accurate and they felt it would be beneficial for the Navajo populations who have diabetes and periodontal disease.

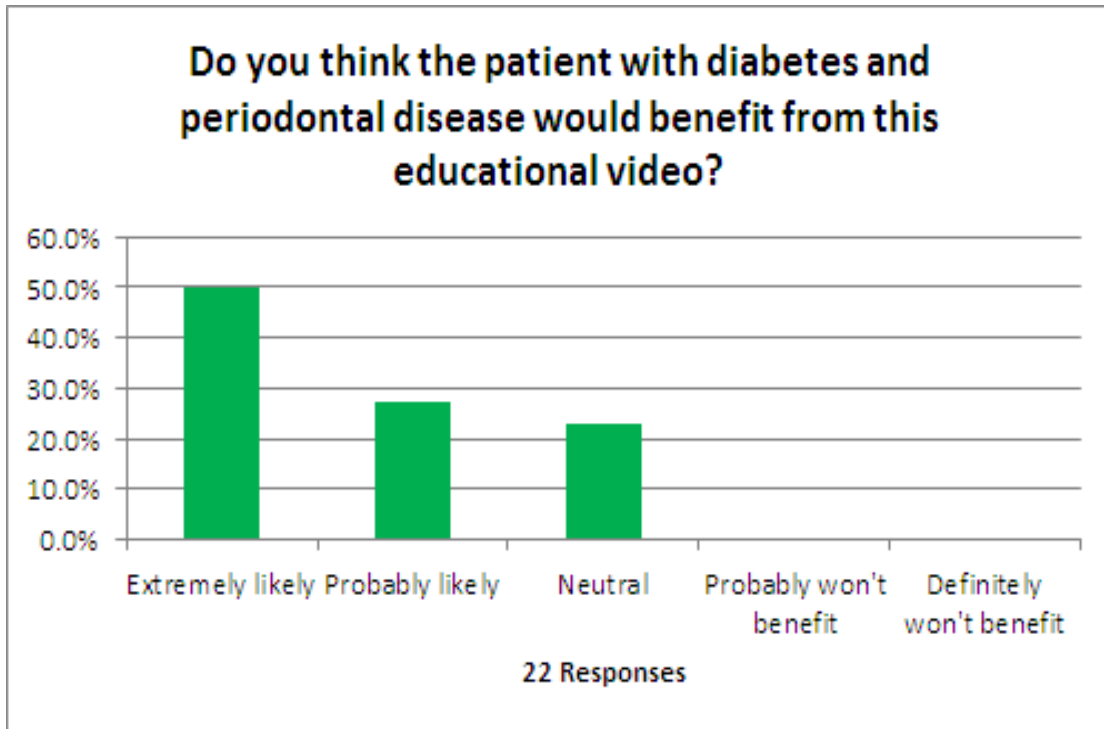


Figure 7: Do you think the patient with diabetes and periodontal disease would benefit from this educational video?

Table 1: Attributes of the Educational Video

How would you rate each of the following attributes on the oral systemic diabetic/periodontal disease educational video? (N= 22) Responses 1=Poor; 10=Excellent					
	1	3	5	8	10
Educational:		9.1% (n=2)	4.5% (n=1)	31.8% (n=7)	54.5% (n=12)
Informative:		9.1% (n=2)		36.4% (n=8)	54.5% (n=12)
Evidence- based:		9.1% (n=2)		40.9% (n=9)	50.0% (n=11)
Accuracy:		9.1% (n=2)	4.5% (n=1)	18.2% (n=4)	68.2% (n=15)
Clarity:	4.5% (n=1)	13.6% (n=3)	22.7% (n=5)	22.7% (n=5)	36.4% (n=8)

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APPENDICES

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Appendix A: HRRC/HRPO Approval Letter



Human Research Review Committee
Human Research Protections Office

April 4, 2018

Diana Aboytes
DAboytes@salud.unm.edu

Dear Diana Aboytes:

On 4/4/2018, the HRRC reviewed the following submission:

Type of Review: Initial Study
Title of Study: An assessment of a video on the link between diabetes and periodontal disease to educate Native American populations.
Investigator: Diana Aboytes
Study ID: 18-182
Submission ID: 18-182
IND, IDE, or HDE: None

Submission Summary: Initial Study

Documents Approved:

- Email Link to access video
- Consent VLong.pdf
- SURVEY-Q-questionnaire
- Protocol 584 VLong

Review Category: EXEMPTION: Category (1) Educational settings.

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

Submission Approval Date: 4/4/2018
Approval End Date: None
Effective Date: 4/4/2018

The HRRC approved the study from 4/4/2018 to inclusive. If modifications were required to secure approval, the effective date will be later than the approval date. The "Effective Date" 4/4/2018 is the date the HRRC approved your modifications and, in all cases, represents the date study activities may begin.

Because it has been granted exemption, this research is not subject to continuing review.

Please use the consent documents that were approved by the HRRC. The approved consents are available for your retrieval in the "Documents" tab of the parent study.

Appendix A: HRRC/HRPO Approval Letter (continued)

As a reminder, it is the responsibility of the principal investigator to ensure that amendments must include a plan to re-consent subjects.

This determination applies only to the activities described in this submission and does not apply should you make any changes to these documents. If changes are being considered and there are questions about whether HRRC review is needed, please submit a study modification to the HRRC for a determination. A change in the research may disqualify this research from the current review category. You can create a modification by clicking Create Modification / CR within the study.

In conducting this study, you are required to follow the Investigator Manual dated April 1, 2015 (HRP-103), which can be found by navigating to the IRB Library.

Sincerely,



Thomas F. Byrd, MD
HRRC Chair

Appendix B: Informed Consent and Recruitment Email

University of New Mexico Health Sciences Center
Informed Consent Cover Letter for Anonymous Surveys

STUDY TITLE

An assessment of a video on the link between diabetes and periodontal disease to educate Native American populations

Graduate student, Valerie Long RDH, BS along with Diana Aboytes, RDH, MS from the Department of Dental Medicine at the University of New Mexico, are conducting a research study. The purpose of the study is to evaluate a video tool that is to be used for patient education of Native American's with periodontal disease and diabetes. You are being asked to participate in this study because as patient educators your feedback regarding the quality, the content, the information, and overall message will be used to improve and utilize this video tool.

Your participation will involve a watching a short video and completing a ten-question survey. Both the video and survey should take approximately 10 minutes to complete. Your involvement in the study is voluntary, and you may choose not to participate. There are no names or identifying information associated with this survey. The survey includes questions such as "do you think the patient with uncontrolled diabetes and periodontal disease would benefit from this educational tool kit?" and "do you think this video is needed as part of the oral hygiene education?" You can refuse to answer any of the questions at any time. There are no known risks in this study, but some individuals may experience discomfort when answering questions. All data will be kept for two years in a locked file in Diana Aboytes' office and then destroyed.

The findings from this project will provide information on the whether the information and message being delivered in the video will benefit the target group or if changes or improvements are needed. If published, results will be presented in summary form only.

If you have any questions about this research project, please feel free to call Valerie Long at (505) 879-4921. If you have questions regarding your legal rights as a research subject, you may call the UNMHSC Office of Human Research Protections at (505) 272-1129.

By clicking on the link and completing this survey, you will be agreeing to participate in the above described research study.

Thank you for your consideration.

Sincerely,
Valerie Long, RDH, BS
Graduate Student
Master's Degree Candidate

HRRRC #18-182
Version date 2/20/2018

Appendix C: Survey Questionnaire

SURVEY QUESTIONNAIRE

1. How would you rate each the following attributes on the oral systemic diabetic/periodontal disease educational video? Please circle one. (1-Poor 10-Excellent)

-Educational: 1 2 3 4 5 6 7 8 9 10
-Informative: 1 2 3 4 5 6 7 8 9 10
-Evidence-based: 1 2 3 4 5 6 7 8 9 10
-Accuracy: 1 2 3 4 5 6 7 8 9 10
-Clarity: 1 2 3 4 5 6 7 8 9 10

2. How would you rate the notion that Native American patients have received accurate information about the bi-directional relationship between diabetes and periodontal disease from the educational video?

Please circle one. (1- Not at all 10-Definitely)

1 2 3 4 5 6 7 8 9 10

3. Do you think the patient with diabetes and periodontal disease would benefit from this educational video? Circle your response.

- a. Extremely likely
- b. Probably likely
- c. Neutral
- d. Probably won't benefit
- e. Definitely won't benefit.

4. When you think of this educational video, do you think it's needed as part of the oral hygiene education? Circle your response.

- a. Definitely needed
- b. Probably need
- c. Neutral
- d. Probably don't need
- e. Definitely don't need

5. Do you believe the patient received the intended message from this video? Circle your response.

- a. The message was definitely professional conveyed to this population
- b. The message was somewhat conveyed to this population
- c. The message was not so likely conveyed to this population
- d. The message was not conveyed to this population

6. Are there any changes about the educational video you would like to add? Circle all that apply

- a. The video is too lengthy
- b. Introduction is not sufficient
- c. More websites to add on the toolkit
- d. More oral systemic information
- e. Other _____

7. Do you have any suggestions for improving the evidence-based research that was presented in the video?

8. What did you like about the educational video?

9. What degrees are offered at your dental hygiene program? Circle all that apply

- a. Certificate
- b. Associates
- c. Bachelor's Degree
- d. Master's Degree
- e. Doctorate Degree

10. What type of college do you attend? Circle all that apply

- a. Public Community or Junior College
- b. Public University
- c. Non-profit Private College