Capstone Cover Page

Weber State University Bachelor of Integrated Studies Program

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Date: 11/25/2014

Project Title: Periodontal Disease, a Common Occurrence among Mexican-American

Brief summary of project: This creative project is an educational pamphlet directed to the Mexican-Americans to demonstrate and educate about periodontal disease. The goal and purpose of this creative project pamphlet is to educate Mexican-Americans about periodontal disease and encourage appropriate actions of prevention, detection and treatment.

Area of Emphasis 1: Spanish

Committee Member from that discipline: Tom Mathews

Area of Emphasis 2: Zoology

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Area of Emphasis 3: Radiology

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Periodontal Disease, a Common Occurrence among Mexican-Americans:

Bachelor of Integrated Studies Creative Project Support Paper

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Abstract

This support paper is a product of a Bachelor of Integrated Study creative project. There are three areas of emphasis that are integrated into the creation of it. The three areas of emphasis are Spanish, Radiology and Zoology. The creative project is an educational pamphlet directed to the Mexican-Americans to demonstrate and educate about periodontal disease. Periodontal disease is a common occurrence among the Mexican-American culture (Genco & Williams, 2010). Studies performed by (Eke, Dye, Wei, Thornton-Evans, & Genco, 2010) show that among the many ethnic groups of the United States, Mexican-Americans present the largest percentage of individuals 30 years old and higher with some type of periodontal disease. Periodontal disease is caused by the consumption of unhealthy meals, not brushing or flossing, and infrequent visits to the dentist (Nield-Gehrig & Williams, 2011). Various factors such as behavior, age, gender, environment, financial, and education all influence the prevalence of periodontal disease among Mexican-Americans. The lack of education presents the greatest correlation with the rise of periodontal disease among Mexican-Americans (Eke et al., 2010).

The goal and purpose of this creative project pamphlet is to educate Mexican-Americans about periodontal disease and encourage appropriate actions of prevention, detection and treatment.
Periodontal Disease, a Common Occurrence Among Mexican-Americans:

Bachelor of Integrated Studies Creative Project Support Paper

This Bachelor of Integrative Studies creative project is an educational pamphlet presenting information about periodontal disease directed to Mexican-Americans. The intention of this project is not to point the finger or carry a negative connotation towards this group in any form. The purpose, however, is to provide information to this particular group about the prevalence of periodontal disease and encourage appropriate action.

There are three areas of study that are integrated in an attempt to express the prevalence of periodontal disease among Mexican-Americans, the detection of it by oral radiographic and physical examination (Genco & Williams, 2010) and the disease process. The three areas of study are Spanish, Radiology and Zoology.

The first area of emphasis in the BIS creative project is the study of Spanish. The study of Spanish encompasses behaviors, education, events, language, history, transportation, even the hour or type of a main course meal, expressed by the Hispanic culture. This Spanish emphasis will contribute to the underlying reasons behind periodontal disease and it’s prevalence among the sub group Mexican-Americans.

The second area of emphasis is the study of Zoology. This is a broad area of study that encompasses genetics, evolution, and pathophysiology. The particular interests of this project will focus on human anatomy, physiology and pathophysiology.

The third area of emphasis is the study of Radiography. This area of study is a beneficial health technology that provides imaging by conventional and digital x-ray for the purpose of prevention, detection and treatment for various pathologies. The Radiology emphasis will
contribute to the indication and severity of bone loss involved in the periodontal disease and providing proper diagnosis.

According to Paulk, 2010 Mexican-Americans are currently the fastest growing minority group in the United States. They also present the highest percentage of periodontal disease in the United States (Eke et al., 2010). It may seem to many that Mexican-Americans represent the entirety of the Hispanic culture within the United States but this is not true. There are many different cultures that make of the Hispanic culture. Mexican-Americans are a group within the group Hispanics.

Mexican-Americans among all ethnic groups in the United States display the highest percentage of periodontal disease of individuals 30 years and older at 67% . The other groups include non-Hispanic black at 58% and non-Hispanic white at 43% (Eke et al., 2010). This same study recorded four factors that are related to periodontal disease that are considered potential contributors. While testing these individuals for periodontal disease these four factors were also recorded. The four factors tested are gender, poverty level, educational level, and smoking status. The correlations of these factors with either direct or inverse correlations were recorded. The factor that had the greatest correlation with the rise in periodontal disease of Mexican-Americans, age 30 and older, is lower level education. Individuals with lower levels of education showed an increase detection of periodontal disease. The second greatest factor that correlated with the rise in periodontal disease is gender. There was a greater prevalence among the men than was found in the women. The third greatest factor correlation is individuals who live 100% of the federal poverty level that showed an increase in periodontal disease detection. The fourth factor is smoking status. Those individuals that smoked also showed an increase in the detection of periodontal disease (Eke et al., 2010).
The order in which they correlate to periodontal disease is not a large difference which means that each factor is a potential contributor to periodontal disease among this group. These same factors were not only contributors with Mexican-Americans but they are also major contributors of periodontal disease among other ethnicities. If each of these factors are contributors to periodontal disease, then regardless of what race is being tested there would be a greater likelihood of experiencing periodontal disease. Hypothetically if these four factors are the only contributors of periodontal disease then the percentages among races would be the same across the board, but since there is a greater percentage of Mexican-Americans 30 and older that are experiencing some form of periodontal disease this means that there is a practice or behavior not adopted by the other ethnicities that is contributing to the higher percentage of periodontal disease among Mexican-Americans. So what is it that puts Mexican-Americans at the top of the list?

The main reason why periodontal disease occurs is due to plaque build-up. Plaque builds up due to foods and liquids that are not cleaned from the teeth daily. The answer to the high percentage may be due to the diet of the Mexican-Americans and also the hour of consumption.

The Mexican-American diet is rich in complex carbohydrates, which are provided mainly by corn and corn products, beans, rice, and breads. Food is often spicy and because of the extensive use of frying as a cooking method, the diet is also high in fat. As for beverages coffee with large amounts of milk and sugar is preferred. Many of the preferred drinks are high in sugar instead of the traditional fruit-based beverages.

Traditionally Mexicans ate four to five meals each but through their immigration to the United States the three-meal pattern prevailed of breakfast lunch and dinner. Breakfast consists of mainly coffee, sweet rolls (pan dulce), tortillas and beans and occasionally eggs. Lunch is the
main meal of the day which is eaten between 1 and 3 p.m. A variety of foods make up Lunch which include, soups, meat, rice, tortillas, coffee and dessert. The dinner tends to be a lighter meal and is eaten after 9 p.m.

Often times morning and night are common times of the day to brush and floss teeth following large meals such as breakfast and dinner. If the largest meal of the day consists of the largest amounts of potentially plaque forming foods then there is a greater amount of time that these food particles would sit on the surface of the teeth before the individual would brush at night time. The combination of these two factors would create the perfect situation for periodontal disease to form and would create a compounding effect if this were the individual’s daily routine. Once debris is on the teeth, bacteria can form an acquired pellicle and contribute to the buildup of plaque bio film, and furthermore into a hardened form of plaque called calculus. Plaque can often be removed by brushing and flossing daily but when individuals fail to brush and floss teeth daily the plaque begins to harden making it difficult to remove. Once plaque hardens into calculus, the individual can no longer remove it themselves, and the hardened buildup can contribute to bone loss and periodontal disease if not taken care of, and can eventually lead to tooth loss. This process occurs over a period of hours to days. The longer the debris is on the teeth the increase in forming plaque which builds to form calculus if it is not cleaned off properly.

The etiology of periodontal disease begins as plaque forms on the tooth’s surface. This surface plaque can be removed by brushing. If the plaque is left untreated the bacteria from the plaque and bacteria from the mouth can wedge itself between the neck of the tooth and the gingiva into place called the gingival sulcus. Here in the gingival sulcus the plaque is out of reach of the bristles of the tooth brush making this cleaning method ineffective. This area of the
gingival sulcus creates a small space called a pocket. This pocket is now invaded with plaque particles and bacteria. This combination of these particles and bacteria mineralize in what is known as calculus. This newly formed calculus and bacteria is recognized by the soft gingival tissue as a threat. The body responds through the vascular network of the gingiva by sending more blood to this area and immune cells to fight off the bacteria. The increase blood flow caused the gums to swell, redden and bleed easily. This occurrence is called gingivitis. As gingivitis is left untreated this response by the body will pull and destroy the periodontal ligaments that are holding the tooth to the gingival together. The tooth is now losing support of the surrounding tissue and the sulcus is deepening down the root of the tooth. As gingivitis detaches these ligaments further down the root of the tooth it becomes known as periodontitis. The sulcus depth which ended near the neck of the tooth has now deepened to the root of the tooth creating a large pocket. The alveolar bone has now started to recede and causes the tooth support to weaken until the tooth needs to be removed. Losing a tooth is not the only outcome caused by periodontal disease. At this stage the bacteria has the possibility of going systemic and affect other areas of the body leading to other diseases.
There are times that brushing and flossing are unable to remove the plaque buildup and removal of buildup by scaling and root planning by a professional is required. The scaling and root planning can be performed by either a Dentist or Dental Hygienist. This image is a before and after a professional cleaning and
removal of calculus. The image depicts well how much of the tooth support and gingival have receded due to periodontal disease.

In the early stage of periodontal disease when the patient is experiencing gingivitis it is commonly the result of poor dental hygiene. Gingivitis can be very painful but it is reversible. When individuals fail to receive the proper treatment for gingivitis, periodontitis develops and reversible treatment is not longer an option, only maintenance. Once bone is lost there is no way for the body to grow it back and therefore is irreversible. There are artificial options to replace loss of bone to integrate more bone where the bone has been destroyed, which include bone grafts. But once the bone has been destroyed through bacteria involved in periodontal disease, the main goal is to maintain these bone levels so that destruction of the bone does not continue to progress. If destruction continues to occur, individuals will eventually lose their teeth.

There are many Mexican-Americans who already have some form of periodontal disease, many of which may not even know that they have some form of periodontal disease. The study that was performed by the CDC showed that 67% of all Mexican-Americans ages 30 and older showed some form of periodontal disease. This is a large percentage of this population. That means that the majority of this group is currently in the maintenance stage. This is why it is important to get an examination of the teeth to see the level of periodontal disease. One important way to exam the level of periodontal disease is by Radiographic examinations of the teeth and gums.

A radiographic examination of the teeth is like taking a picture of the teeth and gums with the use of Xrays. Xrays are first produced by the presence of electrons that are negatively charged through thermionic heating of a filament wire or in other words a wire that is heated and releases negatively charged particles called electrons. Once these small particles are emitted into
the air or this small space called the space charge they need to be accelerated and stopped in order to produce X-rays. The way in which this occurs is by placing an anode that is positively charged a small distance from the source of electrons. Because the electrons are negative and the anode is positive, the negative electrons are attracted to the anode and therefore are accelerated. As they move to the anode they hit the anode and are essentially stopped. This moment of impact produces an X-ray. X-rays are high energy electromagnetic photons or in simpler terms very small bundles of energy. This type of radiation is similar to visible light but here is a big difference in the energy of radiation and wavelength of X-rays compared to light. The energy is much greater and the wavelength is much shorter in x-rays which allow it to penetrate soft tissue and bone. An image is produced by directing these X-rays at the particular area of interest for examination. The X-rays will pass through some material and some will not this creates contrast and densities. The higher the density of the particular structure the more likely the X-ray will not be able to pass through this structure. For example, in this radiographic image of the teeth, the teeth and parts of the teeth appear much whiter or more radio opaque than the surrounding tissue.
This is because many of the X-rays were unable to pass through this area of high density. Whereas the darker or more blackish areas more X-rays were able to pass through because that are is less dense and more easily penetrated. The X-rays that pass through are received by material that is sensitive to X-rays whether it is a film strip or an image receptor. A latent or invisible image is made and various forms of processing are used to acquire a visible image. This now visible image is made up different contrasts and densities that produce a diagnostic image of the teeth.

Signs of periodontal disease include bleeding gums, pain, and bulbous gum tissue. There are times when no signs of periodontal disease are present for the patient. An example is tobacco use. Tobacco causes the gums to adhere very tight to the teeth and become less vascular in which none of these signs occur. However, with radiology technology bone loss occurring underneath the gum tissue is made visible. The loss of bone due to periodontal disease would result in darker areas within the image of the tooth compared to that of a mouth without periodontal disease. This is because the bone that is being attacked by periodontal disease is disintegrating and becoming less dense, which means that more X-rays are passing through this area and are creating a darker image of the tooth. Here is an example of an X-ray of teeth affected by periodontal disease.

This radiograph shows significant bone loss between two teeth (black region). There is little material in this affected area for X-rays to penetrate due to bone loss. This results in a dark
area. The spongy bone has receded due to infection under tooth, reducing the bony support for the tooth. As you can see there is not much holding onto the two teeth compared to the teeth on the opposite sides of them. This X-rays allows the health care professional to determine periodontal disease diagnosis and severity of the disease. Follow up examinations are important for comparison X-rays to track the rate of progress of the disease.

The patients that enter a facility for an examination of the teeth will receive two types of examinations, one is a radiographic examination and the other is a physical examination that measure pocket depth. Pocket depth is measured using a periodontal probe. The probe is placed with light pressure into the gingival sulcus, which is an area of potential space between a tooth and the surrounding tissue. The probe is placed down to the base of the pocket. The first marking visible above the pocket indicates the measurement of the pocket depth. The average, healthy pocket depth is around 3 mm with no bleeding upon probing. Depths greater than 3 mm can be associated with "attachment loss" of the tooth to the surrounding alveolar bone, which is a characteristic found in periodontitis.

Checking for pocket depth may be uncomfortable and sometimes painful but it is not harmful and may result in bleeding gums. As for radiographic examination it is essentially painless. There is a concern about whether or not dental X-ray exams are harmful. Four
bitewing X-rays, which is what many people get in a routine exam, give about .005 millisieverts of radiation, according to the American College of Radiology. That's about the same amount of radiation you get in a normal day from the sun and other sources. A panoramic dental X-ray, which rotates around your head, has about twice that amount of radiation. Six months is the recommended amount of time in between radiographic examinations. It is difficult to determine the harmful effects, if any, of these examinations. Radiation is considered linear/non threshold in a dose to response graph. This means that any amount of radiation will create a response in the individual that received that dose, the greater the dose the greater the response.

![Dose vs Response Graph](image)

The danger is that the X-rays have the potential to damage cells. They can destroy cells, create mutations and have the potential to affect offspring, but the body has a unique ability of repairing damaged cells. The lower the dose the more likely the body will repair any damage, if any that occurred. The potential risk of harm caused by X-rays is outweighed by the ability to diagnose and properly treat.

A reduction in the occurrence of periodontal disease among Mexican-Americans can be achieved by visiting a dental professional every 6 months for a physical and radiographic
examination, brushing and flossing after every meal (not just morning and night), and eating well-balanced meals.
References


¿Cómo saber si tengo enfermedad periodontal?

La evaluación de la enfermedad periodontal se realiza con un examen oral y las imágenes radiográficas de los dientes. Las radiografías tomadas de los dientes es un procedimiento sin dolor.

Existe la preocupación de los daños causados por los efectos de la radiación, pero el riesgo potencial se compensa por un diagnóstico adecuado. El examen oral puede ser irritante para las encías, pero el dolor puede ser mantenido por un higienista dental. El examen oral consiste en colocar una sonda que mide la profundidad de la bolsa entre los dientes y las encías. Estos dos exámenes son esenciales para el diagnóstico.

¿Qué hacer ahora?

Llame a la Clínica de Dental Hygiene Weber State en 801 626 6130. Pueden detectar la enfermedad periodontal mediante exámenes radiográficos y orales. Ofrecen precios reducidos para estos servicios y la traducción española se pone a disposición por el Departamento de Lenguas Extranjeras de Weber State.

Desarrollar buenos hábitos de higiene dental de cepillado y uso de hilo dental entre las comidas y sobre todo después del almuerzo. Cepille los dientes al menos dos veces al día y comer comidas bien balanceadas.

Si usted tiene gingivitis puede revertir sus efectos mediante la práctica de buenos hábitos de higiene dental. Si usted tiene enfermedad periodontal hay tratamiento disponible para el mantenimiento.

Enfermedad Periodontal
La prevalencia entre Mexican-Americans

Use el QR código para encontrar la información de contacto para el departamento de Dental Hygiene Weber State
Enfermedad Periodontal

La enfermedad periodontal se produce cuando la bacteria ataca el tejido y el hueso de los dientes. La enfermedad es una causa importante de pérdida de dientes en los adultos de 30 años y mayores. Por lo general no causa dolor y por esa razón puede pasar mucho sin detectarlo. Las encías comienzan a separarse de los dientes y se vuelven sensibles y sangran con frecuencia.

¿Por qué es la enfermedad periodontal más frecuente entre los mexicano-americanos?

La dieta mexicano-americanos es rica en hidratos de carbono complejos, que son proporcionados por el maíz y productos de maíz, frijoles, arroz y pan. Una tendencia común entre todas las razas es el cepillado y el hilo dental los dientes después del desayuno y la cena. Tradicionalmente el almuerzo es la comida principal de los mexicano-americanos. Esto puede indicar que hay más tiempo que las partículas de alimentos que son ricos en hidratos de carbono complejos quedan en contacto con los dientes y aumenten el potencial de acumulación de placa hasta la próxima limpieza después de la hora de cenar.

¿Qué causa la enfermedad periodontal?

La causa principal de la enfermedad periodontal es la acumulación de placa. La placa se acumula debido a los alimentos y líquidos que no se eliminan de los dientes todos los días. La placa que no se remueve puede endurecerse y formar tártaro. Gingivitis formarán a menudo como resultado. La gingivitis se produce antes de la enfermedad periodontal y cuando se demora sin tratar puede avanzar a periodontitis. Cuando esto pasa las encías se alejan de los dientes y los espacios se infectan. Esta infección de las toxinas bacterianas destruyen las encías de hueso y tejido que sostienen los dientes.
Periodontal Disease

What causes Periodontal disease?

Why is Periodontal disease more prevalent among Mexican-Americans?

Frequently, gums begin to pull away from the teeth and become sensitive and bleed. This infection of bacterial toxins and proteins that become infected gums pull away from the teeth and advance to "periodontitis." Here the disease and when let untreated can cause bone loss. The main cause of periodontal disease is plaque.

Periodontal Disease occurs before periodontal disease and when let untreated can cause bone loss. The main cause of periodontal disease is plaque.

Periodontal Disease occurs when bacteria attack the gums and bone and cause bone loss. The main cause is plaque.

With periodontal disease individuals 50 years and older the highest percentage of "Mexican-Americans show..."
Periodontal Disease

Mexican-Americans: Prevalence among

Preventative

Information for the Dental Hygiene

Use the QR code below to access connect

Teeth and gums These probes help measure the pocket depth

by a periodontist. The oral

examination consists of placing a

probe to the gums. The gum can be managed

to the gums. Pain can be managed.

The oral examination can be initiating.

Diagnosis.

Potential risk is outweighed by proper

by the choice of radiation. But the

damage caused is concern of

procedure. There is a passage

radiographs

Radiographic images of the teeth.

Examination of Periodontal Disease is

Evaluation of Periodontal diseas

How do I know if I have

periodontal disease?

What do I do now?

balanced meals

at least two times a day and eat healthy well

and especially after lunch. Brush teeth at

brushing and flossing in between meals.

Develop good dental hygiene habits by

Department

The Weber State College Language

Spanish translation is made available by

discounted price for those services and

professionally clean teeth. They offer

examinations and provide services to

diseases by radiographic and oral

diseases. By radiographic and oral

801 626 1930. They can detect periodontal

call the Weber State Hygiene Clinic at

"you don't have to lose teeth to

"periodontal disease. They often

can be treated successfully."