IMPLEMENTATION OF AN EDUCATIONAL CURRICULUM TO ADDRESS THE ORAL HEALTH NEEDS OF THE TUCSON COMMUNITY

By

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A Thesis Submitted to The Honors College

In Partial Fulfillment of the Bachelor's degree
With Honors in

PHYSIOLOGY

THE UNIVERSITY OF ARIZONA

May 2009

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Abstract:

Tooth decay is a universal infectious disease that affects people of all ages, races, and social classes. Although the formation of dental caries can be easily prevented by the application of basic oral health principles, tooth decay is still considered the most common, chronic disease among children. In the U.S., dental care has become one of the most prevalent health disparities for those who come from ethnic minority populations or economically disadvantaged backgrounds. Assessing the ramifications of dental infections is becoming increasingly important as recent studies are showing links between oral disease and several systemic diseases such as stroke, diabetes, and cardiovascular disease.

In Arizona, over 39 percent of kindergarten through third grade children have untreated tooth decay. In order to increase awareness of basic dental hygiene habits among Tucson's youth, an oral health educational curriculum was developed for 4th and 5th grade students. With the help of the University of Arizona Pre-Dental Club, the curriculum was presented to over 281 elementary kids, most of who were Hispanic and came from economically disadvantaged households. A Pre- and Post-Test was distributed to test the effectiveness of the presentations. Eighty-two percent of the students scored higher on their Post-Test, indicating that the curriculum successfully helped to increase the understanding of basic oral health habits among the youth in Tucson.

Introduction:

Relevance

The death of Deamonte Driver, a twelve year old boy who died in 2007 from a dental infection, sounded an alarm to many health professionals across the country. Such

a tragedy could have been easily prevented with a routine tooth extraction. However, lack of access to a dentist, inadequate dental coverage, and a deficiency in awareness prevented Driver from receiving appropriate care. By the time his tooth received any attention, bacteria from his abscess had spread to his brain. After two surgical operations, $250,000 in costs, and over six weeks in the hospital, the young Maryland boy died (Felland 2008). A calamity of this magnitude underscored an often overlooked concern in the discussion of health care: dental care.

Although dental care is considered to be the largest unmet health need among low-income children, it still struggles to garner the attention it deserves from Congress, health professionals, and the general public. Tooth decay is a widespread infectious disease that affects people of all ages, cultures, and socioeconomic backgrounds. Unlike many physical ailments that can be resolved through rest and self-awareness, dental caries spread and harbor decay within the mouth until dental treatment is provided. The U.S. surgeon general's 2000 report acknowledged the magnitude of oral health deeming it a "silent epidemic [that causes] needless pain and suffering" (Gehshan 2008).

Physiological Impact of Dental Caries

The formation of dental caries, commonly referred to as tooth decay, occurs through the gradual demineralization of the tooth enamel and dentin. Bacteria in the mouth react with sugars to generate acid that slowly eats away at the enamel. To aid in this process, sucrose, commonly known as table sugar, produces a sticky polysaccharide known as Dextran which allows bacteria to stick to teeth. The accumulation of bacteria, dextran, and sugar compounds leads to the formation of dental plaque. Plaque serves as a physical barrier that impedes saliva's ability to buffer the acid, which ultimately leads to

the dissolution of the tooth's mineral content. If left untreated, build up of plaque along the gum line can lead to the inflammation of the gums known as gingivitis. Patients diagnosed with gingivitis and other periodontal diseases have much greater rates of abscess formation, oral infections, and tooth loss (Tortora and Grabowski).

The physiological consequences of neglecting dentition are by no means restricted to the mouth. Recent studies have revealed that local oral infections are associated with several systemic diseases including cardiovascular disease, stroke, diabetes, premature births and lung disease (Felland 2008). In the past decade, researchers are finding more and more links between oral infection and increased risk of thrombosis and atherosclerosis (Slavkin and Baum). According to a recent study done by DeStefano et. al, men under 50 with periodontitis were three times more likely to die from coronary heart disease than those without periodontitis. A longitudinal study done by Beck et al. found that individuals that suffer from periodontal bone loss were also three times more likely to experience a stroke. Although there is no definitive evidence that these relationships are causal, it is evident that chronic dental infections are at least an independent risk factor for other systemic diseases. In the most severe cases, as Deamonte Driver life shows, abscessed teeth can even be life threatening.

Non-Physiological Impact of Dental Caries

Beyond the acute pain and increased health risks, dental disease has also become a social detriment. The capability of students to thrive in the classroom is being significantly impeded by oral infections. In fact, dental disease annually leads to more than 52 million lost school hours (Gerard 2005). Pain associated with poor oral health has been related to a decrease in overall school performance because it creates a difficult

environment for kids to concentrate on their school work. Additionally, dental disease has been shown to reduce self-esteem, impair speech development, cause nutritional deficiencies, and give rise to poor social relationships (New York State Dental Foundation).

Prevalence of Dental Caries

Over the past fifty years, the frequency of dental caries among school children has decreased due to the implementation of several preventative measures such as community water fluoridation, dental sealants, and the increased use of fluoridated toothpaste and mouthwash. However, in the last decade dental caries have remained a significant problem among low income people groups and several ethnic minorities. In America, studies show that 80 percent of caries found in children ages 5-17 are concentrated in 25 percent of that child-adolescent population (Healthy People 2010). A disproportionate number of the latter children come from economically disadvantaged minorities. This disparity can be primarily attributed to a lack of accessibility and affordability for dental care. According to the Center for Studying Health System Change, dental care is one of the most difficult health care services for those in financial distress to acquire. In 2004 and 2005, approximately 40 percent of people living in poverty—those earning incomes less than or equal to $21,200 for a family of four—lacked dental coverage and only 25 percent visited the dentist during a year's span. Likewise, only a quarter of those of Hispanic or African American descent visited the dentist in the past year (Felland 2008).

Arizona's Oral Health Status

During a four year period from 1999-2003, Arizona's Office of Oral Health administered a statewide dental survey to assess the oral health status of children living in

Arizona. Over 13,000 kindergarten-3rd grade kids were screened. According to the data, an alarming 39 percent of third grade students were found to have untreated tooth decay; this ranks third highest in percentage among other states with published oral health data (Arizona Dental Workforce Survey Data Tables 2003-04). The findings from the dental screenings showed that nine percent of Arizona's children were in need of urgent treatment due significant dental pain, oral infection, or decayed teeth. In addition, 81 percent of children were in need of dental sealants to prevent tooth decay on chewing surfaces of molars. Application of sealants is procedure that is only performed by dentists and hygienists. Since merely 57 percent of children kindergarten through third grade have visited the dentist in the past year, many children do not even have the opportunity to receive basic preventative care. The American Academy of Pediatric Dentistry recommends that all children should see a dentist by one year of age; however, one in four kindergarteners in Arizona have never visited a dentist (Arizona Dental Workforce Survey Data Tables 2003-04).

Children that manage to see the dentist are more likely to be of non-Hispanic descent, part of higher income households, and owners of private insurance. More than 50 percent of children from low income households have untreated tooth decay. In addition, without controlling for income, Hispanic children are 224 percent more likely to have tooth decay. Interestingly, after controlling for income, Hispanic children are only 37 percent more likely to suffer from decay (Arizona Dental Workforce Survey Data Tables 2003-04). Due to the high percentage of untreated tooth decay among Arizona's children, Arizona has fallen far short of the objectives set forth by Arizona 2010 and Health People 2010.

Primary Objective

The aim of this project is to increase oral health awareness among Tucson youth by creating and implementing and oral health educational curriculum in classrooms across Pima County. Proper oral hygiene can be easily maintained through the application of a few basic preventable measures, mainly brushing, flossing, healthy diet, and visiting the dentist. By exposing youth to proper oral health habits, we hope to take one step towards improving oral health in Arizona.

Materials and Methods:

Study Design

The study was a pre-experimental investigation that utilized a pre- and post-test to assess the effectiveness of the educational curriculum. Oral health presentations were given to elementary students living in areas of lower socioeconomic status in Tucson, Arizona. Approval of the curriculum was granted by the Sunnyside Unified School District and directors of Youth Enrichment Services after school programs.

Intervention

The educational curriculum was designed to increase understanding and awareness of foundational oral hygiene principles for fourth and fifth grade students. Using the American Dental Association's oral health curriculum as a general guide, an interactive, module based lesson plan was created (Smile Smarts Oral Health Curriculum). Instruction material was comprised of six categorical topics that were presented in the following order: General Oral Health Introduction, The Value of Teeth, Cavities and Plaque, Brushing and Flossing, The Significance of Healthy Nutrition, and finally the Importance of Visiting Your Dentist (See Appendix 1). Each module included

an assortment of visuals and interactive demonstrations to engage the students. At the end of the presentation, students received a free toothbrush, toothpaste, and dental floss, which were kindly donated by local dentists and members of the Southern Arizona Oral Health Coalition.

Twelve University of Arizona undergraduates who were active members of the UofA Pre-Dental Society were recruited and trained as instructors to give the oral health presentations. The twelve volunteers were divided into groups of three; each team was then trained separately in order to assign modules and build cohesion amongst the members. Depending on the coordination of schedules, each trained team presented the oral health educational curriculum in a single session typically lasting 45 to 60 minutes to classes that did not exceed 30 persons. All school presentations were given over a two month span.

Study Sample

To gain access into classrooms, the curriculum was first presented at a Sunnyside School District school nurses meeting. Nurses who were interested in having this material presented at their school informed their 4^{th} and 5^{th} grade teachers of the opportunity, at which point the Pre-Dental club was contacted to schedule an appropriate date. A similar process was done to get access into after-school programs in the Flowing Wells School District. A total number of 281 students were tested across five different schools in the Tucson area (Schools 1-5). The primary demographic at each school, by an overwhelming majority, was Hispanic. Across the five schools, the average percentage of students classified as economically disadvantaged was 68 percent (See Table 1).

Table 1

Elementary School	Total Number of Subjects Tested	Percentage of Hispanic Students	Economically Disadvantaged (%)
1	168	90.7	60.9
2	58	92.6	58.1
3	18	92.7	62.7
4*	15	71.9	85.2
5 *	12	49.3	70.9

*After school program

Data Collection

The evaluation of the curriculum was carried out by means of a Pre- and Post Test constructed by members of the UofA Pre-Dental Society. The Pre-Test consisted of 11 multiple choice questions that addressed major concepts covered in the oral health presentation (See Appendix 2). The Pre- and Post-Test was first tested on 4^{th} and 5^{th} graders at after-school programs from Schools 4 and 5, after which some questions were revised. The Post-Test was identical to the Pre-Test except the order of the questions and answer choices were altered (See Appendix 3). The Pre-Test was administered by the classroom teacher prior to the arrival of the UofA Pre-Dental students. Once the students had listened to each module of the curriculum, the Post-Test was administered by the team of presenters. The test was examined for content validity by a local pediatric dentist and members of the UofA Pre-Dental Club.

Statistical Analysis

The number of correct responses before and after the oral health presentations was compared for each student using Microsoft Excel. In order to assess the statistical significance of the change in test scores, GraphPad Software was used to conduct a paired t test that generated a P value and confidence interval.

Results:

Over a two month period, there were a total of 281 4th and 5th grade students that were physically present for the oral health presentations. Children from after-school programs, designated by Schools 4 and 5, were used as test subjects to evaluate the quality and content of the Pre- and Post- Tests. After acquiring a better gauge for what content is reasonable to test in this particular age group, several modifications were made to the exams. Consequently, Schools 4 and 5 were not taken into consideration during the generation and analysis of the data. Since, Pre-Tests were distributed prior to the presentation day, 21 students, who were present for the curriculum, did not take a Pre-Test. Therefore, the Post-Test results for these 21 students were not considered during processing of the data. In all, 233 corresponding Pre- and Post-Tests were collected and analyzed.

According to the data, 82 percent of students scored higher on their Post-Test, 14 percent of students scored the same on both Pre- and Post Tests, and 4 percent scored lower on the Post-Test (Figure 1). Of those who did not display a change in score, 45 percent earned perfect scores on both exams.

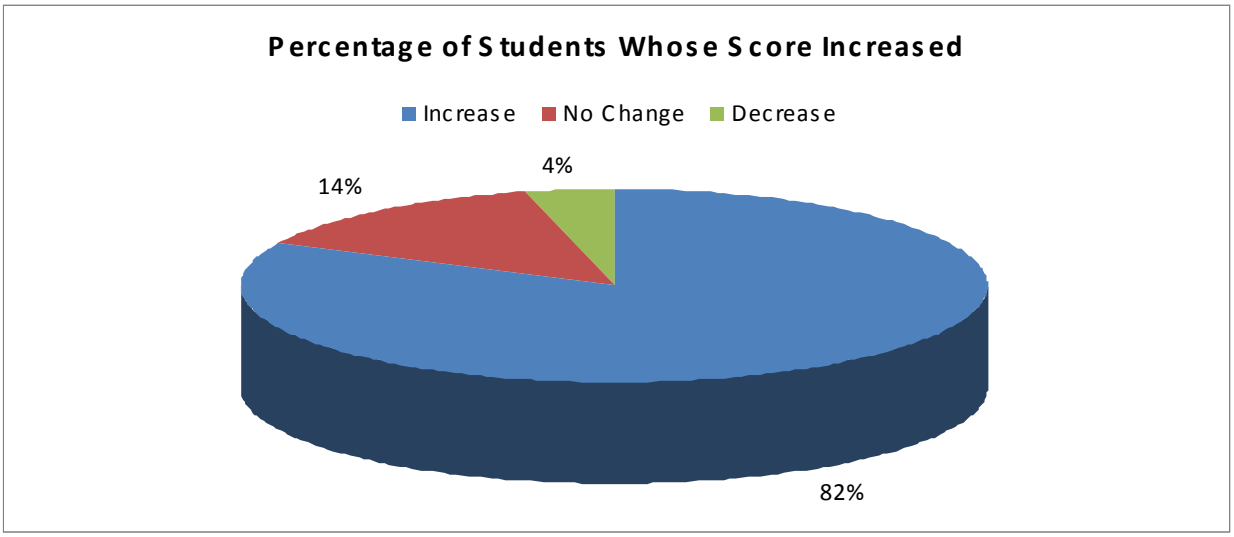

Figure 1. A total of 233 students took both the Pre- and Post-Test. After listening to the oral health presentations, Eighty-two percent (191) scored higher on their post test, 14 percent (33) received the same score, and 4 percent (9) had a lower score on their post test. Of the 33 students who attained the same score on both the Pre- and Post-Test, 15 received a perfect score on both exams.

Analysis of individual schools revealed similar percentage increases from Pre- to Post-Test scores (Figure 2). School 1, which had a sample size of 168 students, saw an increase in 15 percent from an 80 percent average on the Pre-Test to a 95 percentage average on the Post-Test. School 2, which had a sample size of 58, showed an 18 percent increase from a 74 percent average on the Pre-Test to a 92 percent average on the Post-Test. Similarly, School 3, which had a sample size of 18, also saw an increase of 18 percent from 64 percent to 84 percent.

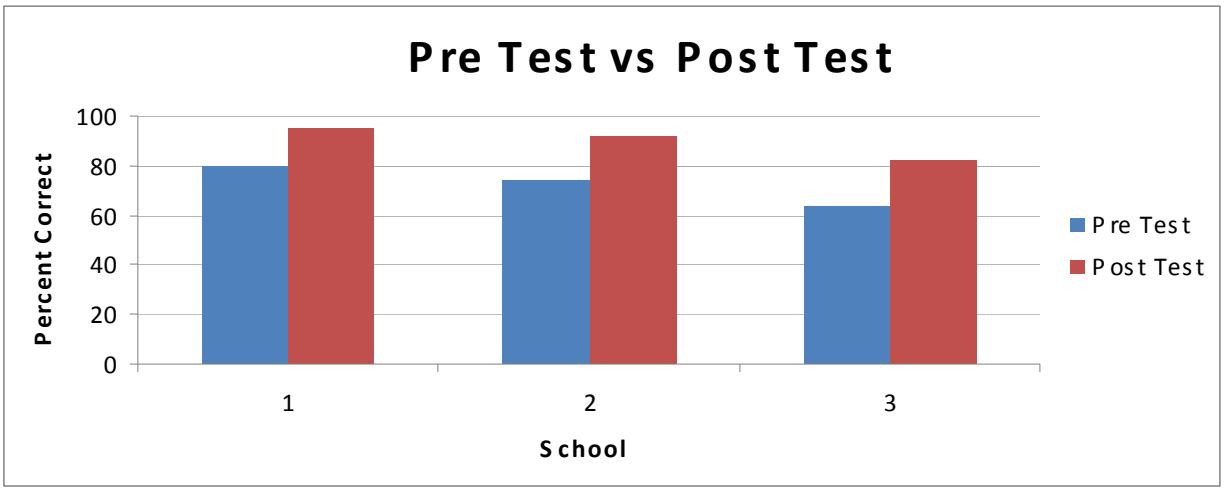

Figure 2. School 1 (90.7 % Hispanic, 60.9% Economically Disadvantaged) experienced a 15 percent increase in score from an 80 percent average on the Pre-Test to a 95 percentage average on the Post-Test. School 2 (92.6 % Hispanic, 58.1% Economically Disadvantaged) showed an 18 percent increase from a 74 percent average on the Pre-Test to a 92 percent average on the Post-Test. School 3 (92.7% Hispanic, 62.7% Economically Disadvantaged) saw an increase of 18 percent from 64 percent to 84 percent.

In order to examine the statistical significance of the change in test scores, GraphPad Software was used to run a paired t-test. According to the results, the two tailed P-value was less than 0.0001, which by conventional criteria is considered extremely statistically

significant. The mean difference in point total between Post-Test and Pre-Test was 1.79. The 95 percent confidence interval of this difference was 1.98 to 1.60 demonstrating a reliable estimate.

Discussion:

Oral health is essential in the maintenance of overall health throughout life. Recent studies are identifying more and more connections between poor dental hygiene and several systemic diseases. Unfortunately, dental caries continue to remain the most common chronic disease of childhood having a five to eight fold higher prevalence rate than asthma, the second leading chronic disease in children. It is now well-documented, that minority groups and those from economically disadvantaged backgrounds bear a disproportionate burden of oral disease in America.

A significant reason why people of low income have difficulty receiving dental care is because there is a shortage of dentists that are willing to accept public insurance and take on the risk inherent in treating people of this demographic. In addition, many public insurance programs provide limited dental benefits for the patient and little reimbursement for the dentist (Gehshan 2008). This lack of access to dental care for those of low socioeconomic status has led to a deficient understanding concerning the significance of dental health to overall health. As a result of these barriers, low income people tend to not receive adequate preventative care and their dental disease often times exacerbates to the point where restorative treatment is not an option.

Dental Care Coverage

Coverage under Medicaid and State Children's Health Insurance Program (SCHIP) has a significant impact on the number of people who receive dental treatment. Although all children enrolled in Medicaid receive comprehensive dental care, the amount of dental care coverage for adults enrolled in Medicaid and children in SCHIP is under the control of the state legislation and fluctuates greatly depending on state budgets (Felland 2008). Although most states provide some dental care under SCHIP, there is a high deal of variance for individuals in adult Medicaid. For instance, in 2006, when Massachusetts budget was in good condition, they decided to provide emergency dental treatment coverage and two routine cleaning visits for Medicaid adults. However, with the current struggling economy, there is an increased likelihood that these benefits will be removed (Felland 2008).

Reimbursement Rates

Nevertheless, even when states provide partial coverage under Medicaid and SCHIP, many of these patients still struggle to find a dentist that will treat them. Low reimbursement rates limit the number of dentists that are willing to accept Medicaid and SCHIP patients. However, when states have increased Medicaid payouts to a level similar to private rates, dentists appear to respond positively. For example, in Syracuse, New York's 250 percent increase in reimbursement rates prompted the opening of two dental practice chains whose mission is to treat Medicaid patients and SCHIP children (Felland 2008). Several private practices followed their path and agreed to participate. In addition to low reimbursement rates, the complicated administrative paperwork associated with claims processing also impedes dentists' participation. In order to address this issue, some Medicaid programs, like that of Michigan's, have collaborated with commercial

dental insurance plans to simplify the administrative process. However, even when provided with higher Medicaid payouts and easier claims processing, several dentist remain hesitant to treat low-income people. Unfortunately, low income groups have a reputation for being noncompliant, unreliable, and difficult to accommodate in regards to scheduling and maintaining appointments (Felland 2008).

Safety Net Providers

Since many of the financially disadvantaged cannot receive care through private practicing dentists, they often rely on safety net providers to provide treatment. However, unlike the medical care system that has an extensive bank of providers—community health centers, public and not-for-profit hospitals, free clinics, and local health departments—committed to serving low income groups, the number of dental care providers is much more sparse (Felland 2008). Although most emergency departments admit that there is a high demand and desperate need for dental services, few hospitals staff dentists; the cost of maintaining a dental clinic is not profitable compared to other streams of revenue. Consequently, many ED doctors provide only temporary pain relief and must refer out patients to dentists. To meet the need, some emergency departments in New York, New Jersey, and Boston have dental clinics that house dental residents in oral surgery and general practice residency programs. However, since dentistry heavily relies on continuity of care, such programs are limited in the scope of treatment that they can provide (Felland 2008).

Dental Care Misconceptions and Ramifications

The inability to access dentists at affordable rates is one of the primary instigators for a number of common misperceptions that devalue oral health. There is an emerging

tendency for the public to view dentistry as a commodity rather than as a necessity, as a luxury rather than as healthcare. Many people see poor oral health as equivalent to poor nutrition or cosmetic problems. When it comes to overall health, oral health is low on the list of priorities. Researchers also discovered that most of the general public views poor oral hygiene as a private matter that warrants parental and personal responsibility (Gehshan 2008). Consequently, there is little support policy makers and grant makers for public and private sector programs that address the oral health concerns of the community. In 2005, merely 1.6 percent of total health grant making was given for dental care and education. Getting policy makers to buy into public programs that significantly improve oral health can often be an uphill battle. Even though school-based dental sealant programs have shown to prevent dental caries and reduce treatment costs, only about half of the states in the U.S. fund such programs. Despite the progress that has been recently made in the fluoridation of water systems, 33 percent of people living in community water systems still lack fluoridated water (Gehshan 2008). In order to build support from the government and policy makers, much must be done to break down the common misperceptions that permeate our society.

Expanding Oral Health Care

In order to address these issues, many organizations are working to increase awareness of oral health issues and expand dental care for low income groups. Several communities are implementing programs aimed at providing dental education and preventative care in schools that primarily consist of families of lower socioeconomic status. For instance, dental students in Cleveland travel to local elementary schools to offer preventative treatment including routine cleanings, X-rays, fluoride varnish, and

sealants to inhibit tooth decay (Felland 2008). Such programs are effective and relatively inexpensive when compared to the cost of providing future restorative treatment. Other communities have started to employ mobile dental units that visit schools in a dental van. Such programs can effectively target those areas that have the most need. In order to provide continuity of care for these mobile clinic patients, many local health departments have created a list of dentists willing to give follow up treatment. However the lack of resources and restricted capacity of dental offices, limit the number of children that can receive treatment in a timely manner. For example, in Little Rock, Arkansas, some youth have reportedly had to wait several years to see a dentist (Felland 2008).

In order to supply adequate dental care for the 100 million Americans that cannot afford it, many dentists who specialize in public health believe that the role of the hygienists and dental therapists should be expanded to include basic dental treatment skills like extractions and filling cavities; Minnesota and Alaska are currently in the process of developing such training programs (Berenson 2008). According to Dr. Ron Nagel, a dentist and consultant for the Alaska Native Tribal Health Consortium, "[dental] therapists are a low-cost way to provide care to people who might not otherwise have access to it…there's a huge need for these basic services." However, the American Dental Association (ADA) and many dental societies oppose such efforts claiming that they do not want patients to receive "substandard care". Several public health advocates believe that the ADA is using "substandard care" as a guise for their true concern: low-cost competition; dental therapists generally earn one-third to one-half the salary of a typical general dentist (Berenson 2008). This suggests that if the range of procedures that hygienists perform expands, more patients will migrate away from private practice to

dental therapists. The ADA disagrees contending that it, “wants to protect patients from inadequately trained therapists, who may not be able to handle the emergencies, like uncontrolled bleeding” (Berenson 2008).

Another approach that many communities are using to increase access dental care is expanding the role and efficiency of community health centers (CHCs). The primary focus of CHCs is to increase the wellbeing of the community by providing accessible and affordable healthcare to those in need. They are often key providers for the uninsured, ethnic minorities, and the homeless (Rosenblatt 2006). Due to an increase in the number of federal grants funding CHCs, the breadth and volume of dental services has increased 85 percent from 2000 to 2005. More and more clinics are beginning to provide not only preventative care, but also restorative, emergency, and rehabilitative care. Despite this growth, patients often have to wait long periods of time to see the dentist; since many of these clinics do not have the adequate funds to offer competitive compensation, CHCs have a difficult time recruiting dentists to join (Felland 2008). To address this issue, health organizations and dental schools are partnering with CHCs to provide targeted incentives for young dentists and early exposure to the immense need in the community. Organizations like the National Health Service Corps, awards scholarships that pay for dental school in return for a service commitment in underserved areas. Several dental schools, such as ASDOH and Midwestern, are developing dental programs whose vision completely revolves around a community health service mentality. As part of their curriculum, they require students to spend an extended amount of time serving at one of many CHCs around the country. Since most of these programs are relatively new, the long term impact of such efforts is yet to be seen.

Oral Health Curriculum as an Educational Model

Because Pre-Dental students do not have the adequate training needed to provide basic preventative treatments, it can be difficult finding opportunities that allow them to positively impact the oral health of their community. The oral health curriculum created in this project provides an educational model that Pre-Dental Societies can use to increase oral health awareness among youth in their community.

A few limitations that are worthy of noting became evident throughout the duration of the project. First, since the nature of the Pre- and Post-Tests were multiple choice, it was difficult to discern whether the students knew the correct answer or were simply led to it through a process of elimination. Although the average Pre-Test score was an unusually high 73 percent, it was apparent when interacting with the students that there was a significant knowledge gap in basic oral health principles. Also, since the Pre-Test was distributed prior to the presentation date, there was never a guarantee that children in attendance for the curriculum were also present during the dispersal of the Pre-Test; 21 students fell into this predicament and consequently their results could not be used.

In addition, the distribution of brushes, toothpaste, and dental floss was contingent on the number of donations received from local dentists and dental organizations. Fortunately, an adequate amount of supplies were donated to ensure that every kid in this study received these materials. However, in the future, a deficiency in donations could serve as a limiting reagent in the number of classrooms that can be reached. In order to assure a more consistent stock of supplies, work is currently being done to see if school

districts would be willing to fund the distribution of toothbrushes to classrooms that receive our oral health presentation.

Although there was a significant increase in the understanding of proper oral health habits, there is no way to determine if an increase in knowledge leads to a change in personal hygiene practices without performing some form of dental screening analysis. To address this issue, we are looking to collaborate with community dental programs to combine educational awareness prevention with screening analysis.

Despite these limitations, the positive feedback received from both students and teachers was overwhelming. Since each student was able to take home a toothbrush, we heard stories of kids who taught and encouraged their parents to practice proper oral health habits. In addition to the schools that we visited this year, there were numerous other schools in the Sunnyside School District that expressed a strong interest in having us present this curriculum to their schools next year.

The response from the UofA Pre-Dental members was also tremendous. For every oral health presentation, a waiting list had to be created because there were so many members who were eager to get involved with the program. Several trained instructors expressed that engaging in these presentations opened their eyes to the rising oral health concerns in their community. In a debriefing session, one member stated that, “This program helped revitalize my passion for dentistry.” The initial success of this curriculum will hopefully serve as a collaborative bridge between the UofA Pre-Dental Society and the youth of the Tucson Community.

***Conclusion*:**

Although oral health has improved overall in the past 50 years, widening oral health inequalities remain between social classes and those from certain ethnic minority populations. Problematic access to dental care functions as the primary barrier contributing to this growing disparity. Several measures are currently being taken to mitigate inequalities in oral health including the implementation of dental sealant school programs, the increased use of mobile dental clinics, and the development of more community health centers. Research has shown that basic preventative steps that maintain proper oral hygiene can play a significant role in decreasing the rate of dental cavity formation. The oral health educational curriculum designed in this project served as an effective means to increase the understanding of foundational oral health principles among 4th and 5th grade students, most of who were of Hispanic descent and considered economically disadvantaged. Over 82 percent of the students who were in attendance for the educational presentations scored higher on their oral health Post-Test. Based on the results, this curriculum serves as an effective educational model for pre-dental students to impact oral health awareness among youth in their community.

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Appendix 1:

UofA Oral Health Educational Curriculum (4th-5th Grade)

Fundamental Message

- Your teeth are valuable
- Developing simple habits to improve your oral health can ensure that your teeth last a lifetime

Expected Outcome

Upon completion of this presentation, students should be aware of the following facets of oral healthcare:

- Basic Tooth Anatomy
- Impact of Cavities and Plaque
- Proper Brushing and Flossing Techniques
- Significance of good nutrition
- Importance of visiting your dentist regularly

Section 1: General Introduction

*Materials Needed: one disclosing tablet, sink, water, typodont

1) **Introduce Presenting Members**
   a) Your Names, where you're from, and why you're here
   b) Ask: How many times do you brush your teeth each day? [Get responses]

2) **Attention Getter: Disclosing Tablet Experiment**

   a) This Tablet identifies areas on your teeth that are not properly cared for
      i) Has harmless dye that is attracted to plaque (germs)
      ii) The areas on their teeth that become pink are the areas where germs recently developed and blue is where plaque accumulated for a long period of time
      iii) Dye is easily removed with a toothbrush
   b) Choose a volunteer who feels they take care of their teeth and is willing to chew the tablet
      i) Have him/her chew the tablet, swish the accumulated saliva in their mouth for 60 seconds, and then spit and rinse
      ii) Have volunteer smile in front of the class; analyze the location of the pink and blue areas using the typodont as a visual to clarify the location of accumulated plaque

- **Conclusion:** Even the best of us can make improvements in the way that we take care of our teeth. We're going to tell you the BEST way to keep these germs off your teeth.

- Note: (30 Disclosing Tablets can be purchased at http://www.dental-mart.com/ for $3)

Section 2: Your Teeth are Valuable and Durable

*Materials Needed: white board with markers

1) Teeth are Precious

a) Teeth help us not only eat but also talk and give us beautiful smiles
   iii) Ex. Elderly people who lose their teeth have difficulty enunciating words. The voices of kids that lose their front two teeth sound differently.
b) Ask: How many sets of teeth do we get in our lifetime?[Get responses]
   iv) First set: Baby Teeth (20)
   v) Second Set: Permanent Teeth (32)
c) Ask: Why don't we have one set of teeth that last us our entire lifetime? [Get responses]
   i) As you grow older you need stronger teeth that can generate more force
d) If you lose a permanent tooth another tooth will not replace it; permanent teeth are supposed to last you your entire lifetime
e) Question: Over an entire lifetime (assume 60 year period) how many times do you think you chew with your teeth? [Answer: 33 million; get 3 answers and reward closest answer with sugar free candy]

***2*) Lets look at what each of these durable teeth are composed of: Tooth Anatomy**

- Ask: How many layers do your teeth have? [Get opinions. Answer=3] Draw layers of tooth on whiteboard:

a) Enamel:
   i) Outside layer
   ii) Hard protective covering
   iii) The hardest substance in our body, even harder than bone

b) Dentin
   i) Underneath the enamel
   ii) Makes up the largest part of a tooth
   iii) Hard, but not as hard as enamel

c) Pulp:

i) The inside layer
ii) The live part of the tooth
iii) Has blood vessels and nerves

- Portray on your diagram the idea that there are thousands of germs in your mouth whose goal is to eat away at the layers of your tooth until they get to the pulp; this leads to PAIN

Section 3: Cavities and Plaque

*Materials Needed: cavities and plaque poster board, whiteboard and markers

1) Intro

a.) Ask: "What happens if we don't take care of our teeth?" [Wait until some answers 'cavities']
b.) The formation of cavities is not instantaneous but rather forms through a gradual process

2) Plaque

a) Ask: "Have you ever woken up in the morning after not brushing the night before? What is the grainy substance that you feel on your teeth?" Explain that the white, gritty substance is called plaque and it forms in your mouth all night when you sleep.

b) Plaque is a sticky, clear film that is forming on your teeth all the time. Plaque contains germs, and since it is clear, it cannot be easily detected by the naked eye.

c) Eating and drinking sugary food causes sugars and plaque to mix together to make an acid. The acid attacks your teeth to cause decay. [Write on the following equation on the whiteboard plaque + sugar = acid] This acid then attacks your enamel [draw arrow from acid to the enamel that was drawn on the board from Section 2]

d) Then have a discussion about acids with the students and have them name as many acids as they can [soda, orange juice etc]. Explain that the more exposure your teeth have to acid, the larger the cavities will be.

3) Cavities

a) Ask: "What is a cavity?" Explain to them that it is a little hole in a tooth and can lead to pain, tooth loss, and infection. Cavities are a sign that your tooth is decaying.

b) Point to the visual of the cavity on the poster board. Explain that this huge cavity first started with the formation and accumulation of plaque. Then over time the small tiny hole formed from the acid got bigger and bigger because it was not properly taken care of.

c) Then ask the students what happens when something decays so that they can relate the idea of decay to everyday objects. When things decay they lose strength and fall apart.

d) What are some ways we can make sure that acid doesn't lead to tooth decay [get responses; brushing, flossing, eating healthy food, going to dentist]. Now we're going to talk about some of these ways.

Section 4: Brushing and Flossing

*Materials Needed: typodont, toothbrush, dental floss, hardboiled egg soaked in Coke, water

1) **Basic brushing techniques**
   - **a.** How often should you brush your teeth? [Get Responses. Ideally, we should try to brush after every meal]. This prevents the sugar from combining to the plaque to create acid.
   - **b.** What do you put on your toothbrush? Why do you use tooth paste?
     i. Tooth Paste has FLUORIDE. Fluoride prevents tooth decay and makes teeth more resistant towards cavities. Other sources of fluoride include most drinking water (tap water) or fluoride mouth rinses.
     ii. Always spit out all the toothpaste

Demonstration of Brushing with Typodont:

1. Place the toothbrush at a 45-degree angle to the gums
2. It is important to brush every tooth (especially the back teeth) and all the sides of these teeth: outer surfaces, inside surfaces, and chewing surfaces
   a. Allude back to disclosing tablet experiment and how most plaque is seen on the chewing surfaces of the back teeth on the inside surfaces
3. Ask: Where else in our mouth should we brush besides our teeth?
   a. It is important to brush your tongue to remove the bacteria on your tongue; this helps your breath smell better!
   b. Roof of your mouth
   c. Gum line
4. It is still possible to get cavities even if you brush your teeth and mouth properly. Ask: Why is that? [Get Responses]. Cavities can form between your teeth because the bristles of your brush are too large to clean the areas in between your teeth.

2) **Flossing Techniques:**
   - **a.** Flossing is the best way to prevent cavities from forming between your teeth. Flossing is just as important as brushing because it keeps your teeth AND gums healthy.
   - **b.** You should floss your teeth very gently *once a day*

Demonstration of Flossing on Typodont:

1. Use a piece of floss about 12 inches long
2. Gently guide the floss between the teeth. When it reaches the gum line, curve the floss into a C-shape and move the floss gently up and down the side of the entire tooth. Repeat for both sides of each tooth.
3. If your gums bleed, it may be a sign that your gums are weak and you need to floss more to keep your gums healthy

ACTIVITY: Hard boil an egg. Then soak the egg overnight in Coca Cola. The eggs should appear brown in color. Explain to the students that egg shell represents your tooth and the brown color represents what happens if you expose your tooth to acidic substances like soda or allow plaque to grow for extended periods of time. Then use a brush and water to brush the outside of the egg. The egg should turn from brown to white. Explain to them that when we brush our teeth we are essentially brushing away the plaque and acidic substances so that are teeth can remain clean and healthy! Pass the egg around the class.

Section 5: Significance of Good Nutrition

*Materials Needed: Nutrition Poster Board, sugar jar, measuring teaspoon, clear cup, empty 12oz soda, empty 20oz soda bottle

1) **Good Nutrition**
   - **a.** "It is great to remove the germs on our teeth by brushing and flossing, but it's EVEN BETTER to prevent these germs from getting there in the first place!" One of the best ways to prevent germs from getting on our teeth is to limit the amount of sugary foods we eat.

   - **b.** How quickly cavities develop depend on 3 factors that you can easily control

     - **i.** The kind of food (sugary or starchy)
     - **ii.** The number of times that the food makes contact with the teeth
     - **iii.** How long the food remains in contact with teeth

   - c. Food composition and texture plays a vital role in the production of acid.

i. Starchy foods like cookies, donuts, and sweet cereal are bad for your teeth because they tend to stick to your teeth.
ii. But the WORST food for your mouth is hard candy (suckers and breath mints) because it remains in contact with your teeth for a long period of time and is also very sugary; thus it has the potential to create a sugary coat over your teeth.

d. If you do eat sugary and starchy foods always eat them with a meal. When you eat a meal your mouth generates a lot of saliva, which contain lysozymes that destroy bacteria.

2) Snacks

a. Sometimes we need to eat between meals. During these situations it is best to select nutritious foods like [point to poster board] fruit, vegetables, and yogurt. Save the sugary snacks for a meal!

ACTIVITY: Have a jar of sugar, a teaspoon and an empty clear cup ready for use. Ask children how much sugar is in a can of soda and hold up an empty soda can. Have students come up and physically put the number of teaspoons of sugar they think are in a 12oz soda can into the clear cup. Once a few students have guessed, show them that the answer is actually ten teaspoons of sugar! Display the cup with 10 teaspoons of sugar. Now ask how much sugar they think is in a 20 ounce bottle of soda and show them an empty 20 ounce bottle. Have students come up and estimate the number of teaspoons into a clear cup again. Tell them that the answer is 17 teaspoons of sugar. Display a jar with 17 teaspoons of sugar in it. Pass the cup of sugar around the class. Now ask if anyone could imagine eating this much plain sugar at one time.

b. Great alternatives to soda are water and milk

3) Chewing Gum:

a. Ask: Is chewing gum good for your teeth? [Get Opinions]
b. As long as the gum is sugar free, it is alright to chew gum. Chewing gum actually helps your mouth generate more saliva, which can then destroy bacteria.

Section 6: Visiting Your Dentist Regularly

*Materials Needed: Fillings Poster board

1) Overview:

a. So far we have talked about the three important ways you can care for your teeth. Ask: Who can name all three? (Brushing, flossing, and eating nutritious foods) but we forgot one more very important thing we should

all do to keep our teeth and gums healthy. Who can tell me what it is? [Answer: visiting the dentist]

2) Dental Appointments

a) Ask: How many times a year should you go to the dentist? [Answer: Twice a year]
   i) Once a cavity forms it can only be repaired by a dentist, it does not heal by itself.
b) A few things you can expect to be done when you go to the dentist:
   i) Examination of your teeth and mouth to see if they are properly being cared for.
   ii) X-Rays
      (1) Helps dentist locate cavities that are not visible to the naked eye
   iii) Removal of Tartar
      (1) When plaque gets hard it becomes Tartar. This can only be removed by a dentist.
c) Fillings
   i) Removes decay and prevents cavity from penetrating deeper into the tooth. [Point to the poster board and explain the 3 types of fillings]

d) Dental Sealants (not always applied)
   i) Provide extra protection for your teeth that seals out decay

3) Answer Any Questions and Administer the Oral Health Post Test and then Distribute Brushes, Toothpaste, and/or Dental Floss

Appendix 2:

Pre Oral Health Test

Name:_____ **Grade**:____ **School:**_____ **Date:**_____

1. What is a cavity?
    a. germs on your tongue that can make your teeth decay
    b. germs on your gums that make your mouth bleed
    c. a little hole in a tooth that can lead to pain, tooth loss, or an infection
    d. a chipped tooth that can lead to a lot of pain

2. What causes cavities?
    a. Brushing your teeth
    b. Using a toothpick instead of dental floss
    c. Eating sugary foods like candy bars and brownies
    d. Biting your nails

3. There is a very important ingredient in most toothpastes that helps your teeth. What is it?
    a. Bleach
    b. Fluoride
    c. Baking soda
    d. Soap

4. When eating sugary snacks like cookies, soda, and candy, the best way to protect your teeth is to:
    a. Eat or drink the sugary foods by themselves and not with other food
    b. Eat or drink the sugary foods with a meal
    c. Eat or drink the sugary foods in the morning
    d. Drink as much soda as you want but don't eat candy

5. At least how many times a year should you go to the dentist?
    a. Twice a year
    b. Once a year
    c. Every Month
    d. Only when you have pain

6. How often should brush your teeth?
    a. Once a day
    b. Once every two days
    c. Only when my mouth feels dirty
    d. After every meal

7. In order to remove the germs in your mouth that **give you bad breath** it is best to brush your

a. Teeth
b. Tongue
c. Gums
d. Top of your mouth

8. Which statement is true about flossing?
    a. Flossing is not important because it does not help clean your teeth
    b. Flossing is not good for me because it makes my gums bleed
    c. Flossing is important because it keeps my teeth and gums healthy
    d. Flossing is optional. I don't have to floss if I don't want to.

9. Plaque mixing with _____ makes Acid. Acid then attacks your teeth causing _____.
    a. Sugar; Cavities
    b. Water; Bad Breath
    c. Fluoride; Cavities
    d. Saliva; Sore Throat

10. How many sets of teeth do people get in a life time?
    a. One set—the teeth that you are born with are the teeth that last your entire life
    b. Two Sets—your baby teeth and your permanent teeth
    c. Three Sets—your baby teeth, your permanent teeth, and your super permanent teeth
    d. None of the Above

11. Which of the following foods would be the worst for your teeth
    a. Chocolate Chip Cookies
    b. Hard Candy
    c. Brownies
    d. Orange Juice

Please Turn in this Test to Your Teacher

Appendix 3:

Post Oral Health Test

Name:_____ **Grade**:____ **School:**_____ **Date:**_____

1. How often should brush your teeth?
    e. After every meal
    f. Once a day
    g. Only when my mouth feels dirty
    h. Once every two days

2. There is a very important ingredient in most toothpastes that helps your teeth. What is it?
    a. Bleach
    b. Baking soda
    c. Soap
    d. Fluoride

3. What is a cavity?
    a. a chipped tooth that can lead to a lot of pain
    b. germs on your gums that make your mouth bleed
    c. a little hole in a tooth that can lead to pain, tooth loss, or an infection
    d. germs on your tongue that can make your teeth decay

4. Which statement is true about flossing?
    a. Flossing is not good for me because it makes my gums bleed
    b. Flossing is not important because it does not help clean your teeth
    c. Flossing is optional. I don't have to floss if I don't want to
    d. Flossing is important because it keeps my teeth and gums healthy

5. What causes cavities?
    a. Brushing your teeth
    b. Using a toothpick instead of dental floss
    c. Eating sugary foods like candy bars and brownies
    d. Biting your nails

6. At least how many times a year should you go to the dentist?
    a. Every Month
    b. Only when you have pain
    c. Once a year
    d. Twice a year

7. When eating sugary snacks like cookies, soda, and candy, the best way to protect your teeth is to:

a. Eat or drink the sugary foods with a meal
b. Eat or drink the sugary foods in the morning
c. Drink as much soda as you want but don't eat candy
d. Eat or drink the sugary foods by themselves and not with other food

8. In order to remove the germs in your mouth that **give you bad breath** it is best to brush your
    a. Gums
    b. Tongue
    c. Teeth
    d. Top of your mouth

9. Plaque mixing with _____ makes Acid. Acid then attacks your teeth causing _____.
    a. Sugar; Cavities
    b. Water; Bad Breath
    c. Fluoride; Cavities
    d. Saliva; Sore Throat

10. How many sets of teeth do people get in a life time?
    a. Three Sets—your baby teeth, your permanent teeth, and your super permanent teeth
    b. Two Sets—your baby teeth and your permanent teeth
    c. One set—the teeth that you are born with are the teeth that last your entire life
    d. None of the Above

11. Which of the following foods would be the worst for your teeth
    a. Chocolate Chip Cookies
    b. Orange Juice
    c. Brownies
    d. Hard Candy

Please Turn in this Test to Your Teacher