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Calling Dr. Nate: Treating Ignorance and Poverty
to Improve Children's Oral Health

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Introduction

Tooth decay is one of the most common childhood diseases. It impacts children, their parents, and the community in significant ways:

1. More than 50% of children between 5-9 have had at least one cavity (Centers for Disease Control and Prevention [CDC], 2000).
2. By age 17, 78% of children have experienced tooth decay, and more than 7% have lost at least one tooth as a result (CDC, 2000).
3. The cost to repair a decayed tooth is 2-10 times the cost per individual for measures that prevent decay (Klein et al., 1985).
4. Dental illnesses result in a loss of more than 51 million school hours annually (CDC, 2000).
5. Serious general health problems may emerge if oral diseases are left untreated (Biesbrock, Walters, & Bartizek, 2003).

For many minority groups and those living in poverty, the impact of tooth decay is even greater. An estimated 37.2% of Mexican-Americans aged 6-17 have untreated dental caries; the percentage increases to 46.4% for those living below the poverty line (National Center for Farmworker Health [NCFH], n.d.).

The children in the National School District (NSD) in National City, California bear a striking resemblance to those described in the paragraph above. An estimated 60% of students are not fluent in English, indicating a large immigrant population (Moran, 2005); the proximity to the Mexican border suggests that this immigrant group is predominantly Mexican-American. In addition, all students in the NSD are classified as low-income (Moran, 2005).

Dr. Nathaniel Liu has an opportunity to significantly impact the lives of hundreds of children in the NSD by introducing an educational program on oral hygiene and preventive dental care. This program will help solve a significant health problem: excessive tooth decay in lower-income and minority children due to lack of education on preventive measures and access to dental care. In order to make the program a success, "Dr. Nate" (as he is known to the children) can leverage existing positive relationships with NSD schools and students. A key factor for success, however, is engaging the children's parents.

Simply educating children on oral hygiene practices is insufficient. Research demonstrates that "the positive effects of educational programs on oral health are...transient over time, with obvious benefits observed shortly after the program that disappear at later visits" (Biesbrock et al., 2003, p. 6). Without support and practice at home and repetition of educational material at school, the knowledge and behaviors that students acquire will deteriorate over time.

The proposed program uses a three-pronged approach, targeting first- through third-grade students, their parents, and NSD schools. The program attempts to modify the student's entire social and support system, educating students while also making modifications to their environment (school, home) and support system (family) to promote good oral hygiene. The program includes the following elements:

1. Educational materials for the students to use at school and home for learning about oral hygiene practices and promoting positive attitudes toward dental care.
2. Educational materials for parents on oral hygiene practices, the benefits of preventive dental care for children, and information on insurance options to make such care affordable.
3. Instructional materials for use in schools to teach children the basics of oral health and hygiene practices. The school program may also include an introductory presentation by Dr. Nate to gain the students' attention and stimulate interest.

Planning

Planning for this project would begin with an interview with Dr. Nate to learn more about the problem of tooth decay in the children of the NSD, including causes and drivers. Using the template suggested by Rossett (n.d.), questions for Dr. Nate would include the following:

1. Why hasn't this problem been solved by existing educational measures?
2. What are the most critical aspects of the problem of childhood tooth decay?
3. Ideally, what behaviors should children perform to maintain good oral health?
4. What is preventing children from having good oral health?
5. What would it take to promote and maintain good oral health in children?

Analysis would also include a review of applicable literature to learn more about successful programs for dental health education for children, and the particular challenges for the predominant demographic group (recent Mexican-American immigrants). Interviews could be conducted with parents to learn more about communication barriers imposed by language and culture, and to assess knowledge regarding preventive dental care and insurance. The expected results of the initial analysis are summarized below.

Why the Problem Hasn't Been Solved

While some education may take place when children see Dr. Nate during a school visit, a long-term solution to the problem of childhood tooth decay can only be achieved once parents are actively involved. To this end, there are several barriers that exist for parents in the NSD.

According to a fact sheet published by the National Center for Farmworker Health (NCFH), cost and time are the most common barriers for Mexican-Americans in receiving preventive dental care, especially for those living in poverty (NCFH, n.d.). While the NCFH fact sheet describes immigrant farm workers, it is reasonable to expect that immigrants in National City, working minimum labor jobs, would encounter similar challenges with regard to dental care costs. Families cannot afford routine dental care on their own, and do not seek dental care except in an emergency. During emergency visits, patients do not receive the education on preventive care that is typically delivered during routine cleanings and check-ups (NCFH, n.d.).

Language and cultural differences also contribute to the problem. One study found that only 34% of Spanish speakers had visited a dentist, compared to 57% of English speakers (Nurko, Aponte-Merced, Bradley, & Fox, 1998). The language barrier prevents many parents from learning about available insurance, such as Denti-Cal, that makes routine dental care affordable.

Another barrier is the lack of an efficient method for reaching large numbers of students. Dr. Nate can only dispense instruction on preventive care to a relatively small number of students during each school visit. Given the widespread nature of the problem among the children of the NSD, this is inefficient and does not meet the overarching need for instruction on good oral hygiene. A program is needed that reaches the student population in a more systematic and comprehensive manner.

Critical Aspects of the Problem

Cavities and excessive decay in children commonly lead to pain, difficulty in eating, and loss of school time (Biesbrock et al., 2003). Childhood tooth decay also leads to long-term dental problems as the children grow into adults. Finally, poor oral health can contribute to other significant health problems; for example, the American Heart Association (Janket et al., 2004) reported that factors such as gingivitis and other infections are associated with heart disease.

Ideal Behaviors for Children

Children should be able to describe and carry out optimal behaviors for preventive dental care, such as (a) brushing teeth for two minutes at least twice daily, (b) flossing daily, (c) visiting the dentist every 6 months, and (d) avoiding sticky and sugary foods (Biesbrock et al., 2003).

Ideal Behaviors for Parents

Parents must demonstrate and encourage good oral hygiene practices in the home. Parents should use a reward system to encourage children to practice good hygiene techniques. In addition, parents should obtain preventive dental care for their children, including check-ups and cleanings every six months, utilizing insurance to minimize the cost.

What is Needed

The following solutions incorporate interview data from Dr. Nate and NSD parents, relevant information from the literature, and sound theoretical principles of instruction.

For Parents

Parental involvement and education is key. Parents must support and encourage children's oral hygiene practices, because most of this activity takes place at home. It is necessary to find ways to break through communication barriers. Less recent immigrants may be able to assist with translation and provide insight into cultural factors that inhibit communication.

Parents must be informed of the health risks that poor oral health poses to their children. Likewise, parents must be educated on the benefits that preventive dental care – better oral health for their children, a reduction in overall illness, and reduced costs to repair damaged teeth.

Connecting program content to the parents' goals is the key to motivating parents to participate (Keller & Burkman, 1993). An innate goal of almost any parent is to be a "good parent" by promoting a child's health and wellbeing. Parents generally consider a child's health a high priority, and are eager to engage in activities that promote good health.

The program's content can also be made relevant and applicable by providing concrete examples of how parents can apply content at home (Keller & Burkman, 1993). For instance, rather than simply telling the parent to provide a reward system to encourage a child's oral hygiene practices, the instructional materials should suggest what types of rewards to provide (e.g. a chart to track good behavior, small tokens or toys, etc.). Another example would be to provide contact information for providers of dental insurance instead of merely advising parents that such coverage is available.

Table 1 summarizes the materials that will be provided to the parents that participate in the program, as well as face-to-face components that could be added with sufficient resources.

Table 1

Proposed Program Content/Materials for Parents

Component	Description
Brochure	Booklet (10 X 10 inches). Contains general information on oral health and anatomy; recommendations for regular check-ups/cleanings (6-month intervals), and contact information for dental insurance providers (including language assistance). Cites benefits of preventive dental care for both children and parents.
Reward Chart	Printed chart (11 X 17 inches) to track child's progress in practicing good oral hygiene behaviors. Back of chart suggests other rewards to promote desired behaviors.
Procedure Card	Laminated card (8.5 X 11 inches) with instructions and graphic illustrations of oral hygiene procedures (brushing teeth, flossing, etc.). To be used by parent for instructing and coaching, and then posted as a reference for the child.
Contact/Help Card	Business card sized, containing contact information for Dr. Nate's office or other program contacts.
Orientation Meeting	Evening/weekend meeting at the child's school to introduce and promote the program. Provides parents the opportunity to meet program representatives and ask questions.

Note. All print materials will be initially published in English and Spanish, but can be translated into other languages as needed.

For Children

While adult motivation may be achieved by relating program content to the intrinsic goal of being a good parent, it may be more difficult to motivate children to be interested in oral hygiene and dental care. Keller and Burkman (1993) state that extrinsic rewards, such as privileges or tokens, can increase motivation when intrinsic motivation is hard to develop or maintain.

An essential component of the program is to promote a positive attitude among children toward dental care and oral hygiene. Bednar and Levie (1993) provide several suggestions for promoting attitude change that could be used in the program:

1. Use of high-credibility sources: If children hear the message from a likeable and respected figure (Dr. Nate), attitudes toward dental care will improve.
2. Modeling: Children need to see good oral hygiene practices modeled by parents and teachers. In addition, if the modeled behavior is reinforced by a reward, children will be inclined to perform the behavior.
3. Successive Approximations: Positive attitudes toward dental care will not develop overnight. Children should take small steps (for example, starting with brushing teeth on a regular basis) and gradually add desired behaviors until the ultimate goal is reached.

Bednar and Levie (1993) also recommend demonstrating “the social acceptability of the desired attitude and the reward available socially for behavior consistent with the attitude” (p. 300). Children are extremely sensitive to the attitudes of their peers and seek acceptance. Instructional materials should help children see that good health and hygiene promotes acceptance among one’s peers, a strong motivating factor for many children and adolescents. Good oral hygiene and regular dental care may reduce or eliminate factors that cause embarrassment, such as discolored and damaged teeth, difficulties in eating, and the ridicule of other children (Moran, 2005; NCFH, n.d.).

The teaching of oral hygiene practices involves the use of certain motor skills. Romiszowski (1993) and Gagne, Briggs, & Wager (1992) offers several suggestions for the teaching of motor skills, including (a) demonstration and explanation of the skills using an illustrated narrative, (b) learner observation of a behavior prior to executing it, (c) guided and prompted practice, (d) repetition to improve accuracy, and (e) provision of feedback to inform the learner how well they performed the task.

Table 2 summarizes the materials that will be provided to participating children, as well as multimedia components that could be added if there is sufficient funding.

Table 2
Proposed Program Content/Materials for Children

Component	Description
Storybook	Booklet (10 X 10 inches) containing the story of David, who learns to brush & floss teeth and sees his dentist regularly. Narrative includes content on anatomy of teeth & gums, gives illustrations of proper brushing/flossing procedures, and stresses the importance and benefits of regular dental visits. Illustrates higher self-esteem and social acceptance among peers due to a healthy smile.
Hygiene Tools	Toothbrush, toothpaste, and a spool of dental floss in a plastic carrying case.
Videotape/DVD	Video presentation of the story of David. Similar content to storybook, but presented in a format that provides access to children who do not enjoy reading.

Note. All print materials will be initially published in English and Spanish, but can be translated into other languages as needed.

For Schools

Ideally, the NSD will also become actively involved in the program. This provides the district an opportunity to aid the health and welfare of the children that are enrolled in its schools, and at the same time reduce the amount of school time lost due to illness and other dental-related issues. Given the current willingness of the district to allow Dr. Nate to see patients at school sites, it is reasonable to assume that, provided adequate funding, the NSD would participate in a program that promotes preventive care. In addition, the recent appearance of Dr. Nate in the San Diego Union Tribune might motivate the NSD to participate in a project that is high profile and socially valuable.

NSD can build on the example of organizations that have implemented successful oral health education programs for children. The proposed NSD school program is based largely on the “Crest Healthy Smiles” national program described by Biesbrock et al. (2003), which in a recent study demonstrated a significant improvement in oral health in children ages 6-15 over a four-week period.

Using age-appropriate lessons, existing health classes in the schools can teach topics such as (a) self-esteem related to healthy teeth and gums, (b) good oral hygiene behaviors such as brushing and flossing, (c) anatomy of teeth and gums, (d) positive attitudes toward dentists, and (e) nutrition (Biesbrock et al., 2003). Lessons should be no longer than one hour in length to retain learner attention, and should include games, exploratory activities, and practice exercises.

To leverage the existing relationship of many NSD children with Dr. Nate, it would be extremely effective for the program to begin with a kick-off assembly featuring Dr. Nate. Dr. Nate's presence and a short address would lend credibility to the program in the eyes of the children; they would be hearing about the importance of dental care from a trusted source. The presentation would also contribute to a program goal of promoting positive attitudes toward dentists and dental visits by presenting a highly personable dentist as an example. The level of Dr. Nate's participation would depend on his willingness or comfort level with making presentations; if needed, another resource could be used to present the majority of the content. The assembly could also include age-appropriate visual presentations, such as video or PowerPoint, to illustrate the benefits of good oral health and the dangers of poor dental care.

Evaluation

To demonstrate the effectiveness of this program, it is suggested that a pilot program be implemented at an NSD school. A four-week study, replicating the model used by Biesbrock et al. (2003), will be conducted to evaluate overall oral health and hygiene practices at the beginning and end of the study period. In addition, a follow-up evaluation will be conducted 12 weeks after the end of the initial study period to evaluate the longer-term effects of the program.

Evaluation will include assessments of basic oral hygiene knowledge in both the participating children and their parents. In addition, each child will receive a dental examination at the beginning of the study period, at the four-week mark, and 12 weeks after the end of the initial study period to evaluate general oral health.

Survey questions for the children will be identical each time the survey is distributed. The multiple choice questions utilized by Biesbrock et al. (2003) will be used so that the results of this study can be compared to the results from the study of the "Crest Healthy Smiles" program. These questions include:

1. Is plaque (bacteria) on your teeth bad or good?
2. How many times a day should you brush your teeth?
3. How long should you brush your teeth?
4. How often should you see your dentist?
5. Which type of foods is risky for your health? (Biesbrock et al., 2003, p. 4)

Survey questions for adults will also be consistent at each milestone date. Survey questions for adults will include the following:

1. How many times a day should my child brush his/her teeth?
2. How long should my child brush his/her teeth?
3. How often should my child see the dentist?
4. I have dental insurance for my child. (Yes/No)
5. If the answer to #4 is No, I know how to obtain dental insurance. (Yes/No)
6. I check daily to make sure my child has brushed his/her teeth. (Yes/No)

It is expected that at the end of the initial four-week study period, both parents and children will exhibit increased knowledge of basic oral hygiene procedures. In addition, parents will demonstrate more awareness of the need for regular dental care, and the means by which they can obtain insurance. Finally, parents will demonstrate that they are actively participating in and supporting the oral hygiene practices of their children.

Conclusion

If “ignorance and poverty” are Dr. Nathaniel Liu’s primary diagnoses with regard to the poor oral health of National City’s children, then the treatment is surely education on better oral hygiene practices and the insurance options that make dental care affordable. To truly cure these ills, it is not enough to simply treat the children; it is necessary to treat their parents as well. Without making changes in the child’s support and social system, the benefits of the program will be short-lived. By impacting the entire system, children have the best chance of incorporating good oral hygiene practices into their daily lives and enjoying a lifetime of good health.

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