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Evaluation of an Oral Health Training Program for School Nurses

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**SAN JOSE STATE UNIVERSITY
SCHOOL OF NURSING**

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The project and the manuscript have been successfully completed and meet the standards of the School of Nursing University. The project demonstrates the application of professional knowledge, clinical expertise, and scholarly thinking. An abstract of the project and two copies of the manuscript are attached.

Douglas Conham

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12/9/05

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Virginia Young Curoton

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DATE

Please submit the form to the Graduate Coordinator. Attach abstract, two copies of the manuscript, and the documentation of submission to the journal (i.e., postal receipt).

Title of Manuscript:
Evaluation of an Oral Health Training Program for School Nurses.

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Evaluation of an oral health training program for school nurses

ABSTRACT: Pediatric dental disease is a silent epidemic (Committee on Health, Education, Labor, and Pensions, 2002). Dental decay is commonly unrecognized and under-treated. Dental disease can affect children's growth and development as well as their ability to perform in school. Effective interventions to prevent dental decay include water fluoridation, dental sealants, pediatric dental screenings, and dental health education programs. This pre-experimental design study evaluated the effectiveness of an oral health training program for school nurses. This training program was designed based on the First 5 California Oral Health Training Program, First Smiles (First Smiles Program of California, 2003). The presentation was given to a non-randomized sample of school nurses (N=14). Pre and post test results indicated a statistically significant ($p<.01$) increase in oral health knowledge among the participants. As a result of this study the researchers recommend that school nurses receive formal training in dental health assessments to effectively contribute to the improvement of pediatric oral health in the school setting.

KEYWORDS: school based oral health programs, early childhood caries, dental caries, pediatric oral health

INTRODUCTION

Dental caries and poor oral health continue to be a major health problem for children living in the United States. Less than 50% of schoolchildren in the United States have never had a cavity (Amschler, 2003). Primary or baby teeth begin to emerge from the gums at the age of six to seven months and by the age of 30 months the child has 20 teeth and primary dentition is complete. (Engel, 2002, p.149). Dental caries can begin as soon as the primary teeth appear and can quickly spread to other tooth surfaces. The decay of the primary teeth places the permanent teeth at risk as well. The decay from the primary teeth can quickly spread throughout the entire mouth, leading to decay continuing as the permanent teeth emerge (DenBesten & Berkowitz, 2003). Severe decay can also cause the early loss of primary teeth, which can affect nutritional status, speech development and future placement of permanent teeth. Although dental decay of children's primary teeth is a highly preventable condition, it continues to impact children tremendously. Therefore, early intervention through education of the parents is of utmost importance, and an essential starting point in improving oral health of the children.

Many children in the United States are suffering with pain, poor nutrition, fatigue, and possible life-long health problems as a result of dental caries (Amschler, 2003). Tooth decay is one of the most common childhood chronic diseases (Centers for Disease Control [CDC], 2001). Dental decay in children is 5 times more common than asthma and 7 times more common than hay fever (Center for Health and Health Care in Schools [CHHCS], 2003). Many children have no dental insurance or access to oral health care (Committee on Health, Education, Labor, and Pensions, 2002). Nearly 20% of 2 to 4-year-olds, 50% of 8-year-olds, and 75% of 17-year-olds are affected by cavities (CDC, 2003).

A study performed at the University of North Carolina found that approximately 51 million school hours each year are lost due to dental related illness (National Maternal & Child Oral Health Resource Center [NMCOHRC], 2003). The National Center for Health Statistics found that 1.6 million school days were missed in 1996 as a result of acute dental problems among school aged children, or an average of 3.1 days missed per 100 students (NMCOHRC).

Statistics show that dental disease is most prevalent among children who live in poverty. California alone has accounted for an increase of 800,000 children living in poverty since the late 1970's. In particular, Mexican Americans living at or below the poverty level are found to have rates of untreated dental disease above 70 percent. Dental pain associated with these cavities often leads to diminished school performance and missed school days (Crall, 2003).

Compared to children from a higher socio-economic status, children from low income families missed 12 times as many school days due to dental problems resulting in decreased academic performance (NMCOHRC, 2003). In addition, dental pain and suffering while attending school decreases concentration and performance. "Early tooth loss caused by dental decay can result in failure to thrive, impaired speech development, absence from and inability to concentrate in school, and reduced self-esteem" (NMCOHRC, p. 1). Students who are suffering from untreated dental problems may have trouble concentrating and learning. These children may also experience anxiety, fatigue, irritability, depression, and withdrawal as a result of dental pain (NMCOHRC). Dental pain may also lead to inadequate nutrition because of the inability to chew food comfortably. Tufts University has stated that "inadequate nutrition during childhood can have detrimental effects on children's cognitive development and on productivity in adulthood. Nutritional deficiencies also negatively affect children's school performance, their ability to concentrate and perform complex tasks, and their behavior" (NMCOHRC, p. 2). The

end result of untreated dental decay is poor school performance, diminished social relationships, and ultimately less success later in life (NMCOHRC). Pediatric health care providers need to be aware of the problem of dental decay, and play an active role in prevention and treatment.

Research indicates that there is a gap in the assessment of oral health in children. Lewis, Grossman, Domoto and Deyo (2000), conducted a national study that examined the role of pediatricians in children's oral health care. The researchers found that pediatricians have a distinct lack of knowledge regarding oral health promoting interventions and up-to-date information about oral health. Pediatricians have especially limited knowledge about information that is less than 10 years old. An article published by Ramos-Gomez, Jue, and Bonta (2002), states that there is a need for improvement in the delivery of care by health professionals, including better oral health teaching methods. One recommendation was to add an oral health rotation to pediatric residency programs, and to add oral health and dental care content to medical school physical examination courses (Lewis et al., 2000).

A study conducted in Sweden examined the priorities of families with relationship to dental health. These researchers found that when assessing everyday priorities, "dental care often seems to have a clearly lower priority than for instance school or sports activities" (Arnrup, Berggren, & Broberg, 2001). Families either viewed health from a *health-promotion* viewpoint or a *disease- prevention* viewpoint, with the former being the minority. Health care behaviors are generally learned from the mother, and routine is an important factor in establishing health behaviors. However, the change in family dynamics and the pressures of poverty have resulted in a decrease of modeling health-promoting habits. Therefore, health professionals should provide ways to help the children of these families establish healthy behaviors (Roden, 2003).

The purpose of this study was to address the significant number of dental caries that

occur in the primary teeth of California students by evaluating a prevention education program. Establishing health-promoting habits early in childhood increases the likelihood of healthy habits being maintained throughout life. The research questions for this study were: (a) Will school nurses have an increase in knowledge about dental caries and caries prevention after attending a training session on preventative oral health, as demonstrated by scores on a pre-test and post-test developed by First Smiles (First Smiles Program of California, 2003) to measure knowledge; and (b) Will school nurses be more likely to provide a dental caries prevention program at their schools after attending a training session on preventative oral health, as measured by a validated survey instrument? It is hypothesized that dental health knowledge and use of a standardized dental education program will increase after school nurses attend the First Smiles dental health education program.

LITERATURE REVIEW

Untreated dental decay is a major problem across the nation. The problem has been addressed in the Goals and Priorities listed by the U.S. Department of Health and Human Services in Healthy People 2010 (2000). Some of the suggested solutions to this problem include fluoride varnish applications, fluoridated water, tooth brushing with fluoridated toothpaste, xylitol treatments, dental sealant programs, and increased dental education (United States Department of Health and Human Services, 2000). The following review of current literature explores these dental health interventions.

Topical fluoride is an easily implemented, effective intervention. Topical fluoride applications generally consist of fluoride gel held in contact with the teeth for 4 minutes using foam trays. Studies have shown that semi-annual applications of fluoride varnish result in

decreased dental decay. One study followed 225 3-year-old children for 2 years and found a 44% reduction in carious lesions as compared to a control group. The ease of application combined with the significant reduction in decay make fluoride varnish applications a valuable component of any dental prevention program (Kanellis, 2000). Another effective strategy to increase exposure to fluoride is through fluoridated water.

According to the Centers for Disease Control (2003), over the last 50 years the use of fluoride has significantly reduced the damage caused by dental decay. A study performed in rural Mississippi compared the dental needs of children from two communities, only one of which had fluoridated water and dental services available. Although the two communities were similar in most socio-economic factors, the children from the community with non-fluoridated water needed more dental services and the costs were greater than children from the community with fluoridated water (Moon, 2003). The most effective way for large percentages of people to receive fluoride is through water fluoridation (CDC, 2003). Water fluoridation is also cost effective; "...the per capita cost of water fluoridation over a person's lifetime is less than the cost of one dental filling" (CDC, 2003, Oral Health Problems section, ¶5).

Unfortunately, more than 100 million Americans do not have access to water that is adequately fluoridated. The CDC is actively working to promote water fluoridation for all communities in America. For example, the CDC is working to improve the quality of existing water fluoridation and to extend water fluoridation to new communities by providing water fluoridation training to state water engineers and oral health staff members. The CDC also offers a web-based program to assist in monitoring the quality of fluoridated water (CDC, 2003). In addition to fluoridated water, using fluoridated toothpaste while tooth brushing is an effective way to prevent dental caries.

Tooth brushing with fluoridated toothpaste followed by minimal to no rinsing is beneficial in the prevention of tooth decay. An article by Dr. Michael Kanellis (2000) in the *Journal of Public Health Dentistry* cites studies that support the benefits of brushing with fluoridated toothpaste. The first study was conducted with 3 to 6-year-olds attending kindergarten in southern China. The children brushed their teeth everyday after lunch using a simple scrub technique with 0.2-0.4g of toothpaste each. The children brushed for 2 to 3 minutes, rinsed with water and then spit the water out. The study found that 28% of the carious lesions that had been noted at the beginning of the study and were untreated, had since stabilized. The study also found these children had a 66% decrease in the spread of decay as compared to a retrospective control group. A separate study evaluated the effect of a modified toothpaste technique on decay reduction in preschool children. The modified technique consisted of spreading toothpaste evenly on the teeth with a toothbrush and brushing for 2 minutes. The children were allowed 10 ml of water to rinse with before spitting, and were asked to spit no more than necessary. They were then restricted from eating, drinking and additional rinsing for 2 hours. These children experienced a 26% reduction in decay as compared to a control group who brushed with fluoride toothpaste but were not restricted from rinsing.

Using fluoridated toothpaste while tooth brushing, rather than dry brushing or brushing without fluoridated toothpaste is essential in the fight against tooth decay. Tooth brushing alone helps to remove plaque. Plaque removal is not considered an effective intervention against tooth decay (Wagner & Reisine, 2003). Tooth brushing must be done with the application of fluoridated toothpaste to be an effective intervention in the prevention of dental decay.

Another effective intervention in the prevention of tooth decay is the use of xylitol treatments. Xylitol is a practical and effective component in the prevention of tooth decay

(Peldyak & Makinen, 2002). Xylitol is a five-carbon sugar alcohol that occurs naturally in certain plants as well as in the metabolism of humans (Makinen, 2004). Xylitol inhibits the growth of decay causing bacteria (Williams, 1997). It also prevents decay causing bacteria from excreting the acid that causes tooth decay (Makinen, 2004). Xylitol is available in many forms including gum and lozenges. Repeated studies have shown that exposing the teeth to xylitol (through gum or lozenge) for at least 5 minutes after meals and snacks can reduce the incidence of dental caries (Williams, 1997). The ease of xylitol treatments through chewing gum may allow for more people to participate in this dental intervention.

Another very effective, but less accessible intervention is the use of dental sealants. Dental sealants, a plastic coating applied to the chewing surfaces of the back teeth, are another effective means of preventing dental decay. The American Dental Association asserts that dental sealants are almost 100% effective in preventing cavities when properly placed on the first and second permanent molar teeth (CDC, 2001). Unfortunately sealants are underused, especially among children from low-income families and from minority groups. "Targeted, school-based dental sealant programs can substantially increase the prevalence of dental sealants. Providing sealant programs in all eligible, high-risk schools could reduce or eliminate racial and economic disparities in the prevalence of dental sealants" (CDC, 2001, ¶ 1). A sealant program intervention would lead to fewer disparities in dental decay among low income and racial minority children. The CDC is also working to promote school-based dental sealant programs across the nation.

Another intervention to limit dental decay is dental health education. A study performed by Seow, Cheng, and Wan, (2003) at the University of Queensland School of Dentistry examined the effects of maternal dental health education and tooth-brushing instruction on the

levels of bacteria present in the mouths of pre-school children. This study found that a single session of dental health education and instruction on brushing resulted in a 25% decrease in the presence of mutans streptococci (the bacteria that causes tooth decay) in the mouths of young children.

Dental health education can be implemented with children and with parents. Dental health education should include daily brushing and flossing, fluoride rinse programs, xylitol treatments, screening services, dental sealant applications, and routine dental exams. A dental health education program can promote all of the previously mentioned interventions to improve oral health. School based dental health education is an effective way to target high risk populations and help decrease the disparity of dental care in the lower socio-economic population (Amschler, 2003).

Wagner and Reisine (2003) found that information-only education programs produced minimal results in the improvement of oral health. This study concluded, "education alone can be effective in changing knowledge, but is only minimally effective in changing behavior" (Wagner & Reisine, 2003, p. 35). A review by Kanellis (2000) also found little evidence to support education as an effective intervention for dental decay. Nevertheless, the author states that dental health education does have an important role in the prevention of dental decay. "Despite these limitations, oral health education undoubtedly remains an important component of preventive dental programs. Efforts designed to improve the ability of educational messages to alter behavior and improve oral health should be encouraged" (Kanellis, 2000, p. 213).

CONCEPTUAL FRAMEWORK

Bandura's theory of self-efficacy guided the development of this research project. The self-efficacy theory can be used to understand human behavior and what influences changes in behavior. The theory of self-efficacy presupposes that the way people behave is based on what they, believe, think, and feel (Bandura, 1994). The theory is based on the idea that for individuals to be successful at a certain activity or behavior, they need to believe that they will be successful at that activity (Bandura, 1994). It implies that persons who do not have confidence in their abilities with regards to a particular situation will refrain from engaging in that situation. The theory of self-efficacy is situation-specific and although individuals may be confident in some areas, if they have no previous experience or confidence in the specific situation they will likely avoid the situation (Gorin & Arnold, 1998).

Bandura's theory of self-efficacy includes four sources that contribute to a person's self-efficacy in a particular area. They are enactive attainment, vicarious experience, verbal persuasion, and physiological feedback. Enactive attainment refers to actually performing the activity, and is thought to have the most influence on self-efficacy. Vicarious experience is when someone is observed doing the specific activity. Verbal persuasion refers to the act of telling someone verbally that he/she is capable of performing the activity. Lastly, physiological feedback refers to the emotions that a person associates with the behavior; if there is fear involved the situation will be avoided, and if there is excitement, there is more likelihood of engagement in the behavior (Resnick, 2004). Therefore, with a strong sense of self-efficacy a person will be more likely to increase knowledge, and initiate or maintain a particular behavior.

In this research project, the two main areas influencing the participants' level of self-efficacy are vicarious experience and verbal persuasion. The First Smiles oral health education program provides concepts and materials that can be easily adapted by school nurses when teaching parents and students about oral health. The program includes strategies to actively involve parents and students through hands-on activities, which reflect Bandura's concept of enactive attainment and supports self-efficacy. Interactive activities are important because although education is critical in increasing knowledge, studies have found that an increase in knowledge alone has negligible effects on behavior without behavioral interventions (Wagner & Reisine, 2003). Bandura's self-efficacy theory is applicable in this research study as a framework for integration and application of learning. As the study participants increase their knowledge and expertise related to prevention of dental caries prevention, they will feel more capable in teaching others.

METHODOLOGY

A pre-experimental, pre-test/post-test design was used. One group of participants was selected from a convenience sample of school nurses. No control group was used in this study. There were 14 participants employed in a California, central coast county. All were adults between 30 and 65 years of age. Fifty percent of the participants had a clear Health Services Credential for School Nurses. Thirty-six percent of the participants had a Master's degree in nursing. The participants' level of experience in school nursing ranged from less than 1 month to over 30 years. Of the 14 participants three reported having formal training in dental health assessments: two had received training while performing school screenings with dentists, and one had knowledge from assisting in oral surgeries.

The convenience sample of participants was recruited via the County School Nurse Network and invited to participate through email. The intervention, a two hour educational training session, was developed based on materials from First Smiles oral health education program. The First 5 California Oral Health Education and Training Project provided an all day on-site training session on the First Smiles program attended by the researchers. On-line training video clips about oral health assessments, teaching recommendations for parents, and information about preventative care and treatment were also provided as part of the education package (First 5 California, 2002). The various teaching tools and information sources were incorporated in a presentation (Appendix #1) adapted for the school nurse participants.

The presentation session was conducted at the School District office during the Fall semester of 2005. Handouts, a copy of the power-point presentation, access to video clips, and various other materials were provided to participants in the educational session. A pre-test and post-test (Appendix # 2) measuring participant knowledge related to dental caries prevention, and a general demographic questionnaire (Appendix # 3) were completed by the participants. First 5 California contracted with Barbara Aved & Associates, an independent agency, and a validated measurement tool (Aved, 2004) was developed specific to the First Smiles oral health education program. The tools are designed to measure knowledge, current practices, changes in future teaching and intervention practices. Permission to utilize and adapt this tool to fit the school nurse training was granted by Barbara Aved, of Barbara Aved and Associates (personal communication, May 6, 2005).

Confidentiality was maintained by collecting the demographic information of the participants separate from pre and post-test data. The demographic data were used only to

describe the research participants when discussing the research findings. The primary researchers were the only people who had access to the demographic information. Demographic data was stored in a locked filing cabinet. Pre and post-tests were numbered, and the researchers maintained a key with the corresponding numbers so that results could be correlated for statistical analysis. A statistician and a computerized statistical analysis program were employed for data analysis. Data were statistically analyzed using a two-tailed t-test.

RESULTS

Statistical analysis of the pre and post-test data revealed a statistically significant increase in oral health knowledge of the participating school nurses. The means and standard deviations for pre-test and post-test knowledge were computed (Table 1) and the difference between the means (9.6, 13.7) were tested using a t-test for related samples (Table 2). Results indicated a statistically significant difference ($t=9.9$, $df=13$, $p<.01$). The school nurses also reported favorable responses in regards to the value of the oral health training. Shown in Table 3 are the means and standard deviations for the training feedback items. Although the rating scales for the three categories of items differ, the means are all indicative of a positive outcome.

DISCUSSION

Statistical analysis indicated that there was an overall increase in oral health knowledge among the school nurse participants. The pre-knowledge minimum score was five correct answers out of 16 possible correct answers, with a mean score of 9.6. The post-knowledge minimum score was ten correct answers, with a mean score of 13.8. The only two items that were answered correctly by all participants on the pre-test were recognizing that dental care is

the most prevalent unmet need among special needs children, and recognizing signs and symptoms of gingivitis. Examples of items demonstrating a significant increase in participant knowledge include the ability to remineralize chalky white spots on teeth, and the benefits of xylitol in the reduction of bacteria transfer between caregivers and infants. Pre-test scores were 36% and 50% (respectively) versus 100% correct answers on the post-test. The results of this study were statistically significant at $p < .01$ level, indicating that the program was a successful teaching tool for the participants.

Limitations of this study included a small, non-randomized sample that limits generalization of the findings to a larger population of school nurses. The inability to follow-up on the long term effects of the training was also a limitation.

CONCLUSIONS AND RECOMMENDATIONS

The hypothesis of this study was that dental health knowledge and use of a standardized dental education program would increase after school nurses attended an oral health education presentation. This study indicated that the First Smiles oral health education program is an effective teaching tool for school nurses. Statistical analysis suggests that the participants involved in the study not only had an increase in knowledge, but they also thought that they could be more effective in performing oral health assessments, and in providing oral health teachings to the pediatric population.

The goal of the study was to educate school nurses and increase their knowledge about pediatric oral health. Increased knowledge is intended to increase self-efficacy in providing health related education to a broader population. This study found that although half of the

participants were credentialed school nurses, and one third of the participants held master's degrees, 64% of the participants reported that they had no formal training in dental assessments. At the conclusion of the First Smiles oral health education presentation 100% of the participants reported that they had learned new information and skills, and that they would be likely to apply new information in their practice. The ultimate goal is for school nurses to feel empowered to provide dental screening and dental health education in the school setting thus combating the 'silent epidemic' (Committee on Health, Education, Labor, and Pensions, 2002).

It is recommended that longitudinal studies be implemented to monitor retention of information by the participants, as well as to monitor the utilization of the information provided. Further implementation of the First Smiles program in various school settings, and with additional populations of school nurses is recommended in order to validate the results of this study. It is also recommended that formal dental health training be included in the curriculum of school nurse credential education programs.

IMPLICATIONS

There are several implications for practice based on the study results. School nurses need formal training in dental health assessments to effectively contribute to the improvement of pediatric oral health in the school setting. A strategy to train school nurses is to use a program similar to The First Smiles oral health education program. The program is adaptable in a variety of school settings, and with a variety of school aged children. The program is accessible and easily implemented.

It is especially important to provide training for school nurses working with special needs populations, as dental health problems are the most prevalent unmet need among special needs students (First Smiles Program of California, 2003). Providing school nurses with the skills to implement dental health assessments and interventions can result in improved dental health for children with special needs. Training for all school nurses in dental screening techniques and dental education strategies can affect the dental health of all school aged children.

References

- Amschler, D. H. (2003). A hidden epidemic: Dental disparities among children. *Journal of School Health, 75*(1), 38-40.
- Arnrup, K., Berggren, U., & Broberg, A. G. (2001). Usefulness of a psychometric questionnaire in exploring parental attitudes in children's dental care. *Acta Odontologica Scandinavica, 59*, 14-20.
- Aved, B., (2004). *First smiles evaluation*. Barbara Aved Associates.
- Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press. (Reprinted in H. Friedman [Ed.], *Encyclopedia of mental health*. San Diego: Academic Press, 1998).
- Centers for Disease Control and Prevention. (August, 2001). Impact of targeted, school-based dental sealant programs in reducing racial and economic disparities in sealant prevalence among schoolchildren---Ohio, 1998—1999. *MMWR Weekly, 50* (736-738). Retrieved November 26, 2003 from <http://www.cdc.gov.mmwr/preview/mmwrhtml/mm5034a2.htm>
- Centers for Disease Control and Prevention. (2003). *Oral health: Preventing cavities, gum disease, and oral cancers*. Retrieved October 25, 2003 from http://www.cdc.gov/nccdphp/aag/aag_oh.Htm

- Center for Health and Health Care in Schools. (2003). *Children's dental health needs and school-based services: A fact sheet*. Retrieved September 15, 2003 from <http://www.healthinschools.org/cfk/dentfact.asp>
- Committee on Health, Education, Labor, and Pensions. (2002). *The crisis in children's dental health: A silent epidemic*. Washington, DC: U.S. Government Printing Office.
- Crall, J. (2003). California children and oral health: Trends and challenges. *Journal of the California Dental Association*. Retrieved March 19, 2005, from <http://www.cdafoundation.org.journal/jour0203/crall.htm>
- DenBesten, P., & Berkowitz, R. (2003). Early childhood caries: An overview with reference to our experiences in California. *Journal of the California Dental Association*. Retrieved March 19, 2005, from <http://www.cdafoundation.org.journal/jour0203/denbesten.htm>
- Engel, J. (2002). *Mosby's pocket guide series, pediatric assessment (4th ed)*. St. Louis, MO: Mosby.
- First 5 California. (2002). *California Children and Families Commission Project Proposal*. Retrieved March 19, 2005, from <http://www.ccfc.ca.gov/PDF/Programs/C7.pdf>
- First Smiles Program of California (2003). California First Five Commission. Sacramento, CA.
- Gorin, S. S., & Arnold, J. (1998). *Health promotion handbook*. St. Louis, MO: Mosby.
- Kanellis, M. J. (2000). Caries risk assessment and prevention: Strategies for head start, early head start, and WIC. *Journal of Public Health Dentistry*, 60(3), 210-217.

- Lewis, C., Grossman, D., Domoto, P., & Deyo. (2000). The role of the pediatrician in the oral health of children: A national survey [Electronic version]. *Pediatrics*, 106(6), e84.
- Makinen, K. K. (2004). *History, safety, and dental properties of xylitol*. Xlear Inc.
Retrieved March 13, 2005 from <http://www.xlear.com/xylitol/makinen.aspx>
- Moon, Z. K. (2003). Dental disadvantage among the disadvantaged: Double jeopardy for rural school children (Health service applications). *Journal of School Health* 73, 242-244.
- National Maternal & Child Oral Health Resource Center. (2003). *Oral health and learning: When children's oral health suffers, so does their ability to learn*. Washington, DC: Georgetown University. Retrieved September 15, 2003 from <http://mchoralhealth.org/PDFs/Learningfactsheet.pdf>
- Peldyak, J., & Makinen, K. K. (2002). Xylitol for caries prevention: Literature review. *Journal of Dental Hygiene*, 76, 276-286.
- Ramos-Gomez, F., Jue, B., & Bonta, Y. (2002). Implementing an infant oral care program. *Journal of the California Dental Association*. Retrieved March 19, 2005, from http://www.cda.org/cda_member/pubs/journal/jour1002/infant.html
- Resnick, B. (2004). Self-Efficacy. In S.J. Peterson & T.S. Bredow (Eds.), *Middle range theories: Application to nursing research*. (pp. 97-124). Philadelphia: Lippincott Williams & Wilkins.
- Roden, J. (2003). Capturing parents' understanding about the health behaviors they practice with their preschool-aged children. *Issues in Comprehensive Pediatric Nursing*, 26, 23-44.

Seow, W.K., Cheng, E., & Wan, V. (2003). Effects of oral health education and tooth-brushing on mutans streptococci infection in young children. *Pediatric Dentistry*, 25, 223-228.

Abstract retrieved October 17, 2003 from <http://www.ncbi.nlm.gov>:

80/entrez/query.fcgi?CDM=Mail&DB=PubMed

U.S. Department of Health and Human Services. (November 2000). *Healthy people 2010: Understanding and improving health*. Sudbury, MA: Jones and Bartlett.

Wagner, J., & Reisine, S. (2003). Behavioral management of chronic dental disorders: Methodology and research issues. In *Best practices in the behavioral management of chronic disease*. (Vol. II, Ch. 10). Los Altos: CA. Institute for Disease Management.

Williams, D. (1997). Xylitol in alternatives. *Alternatives*, 6(21). Retrieved March 13, 2005 from <http://www.xlear.com/xylitol/williams.aspx>

Table 1

Knowledge Scores Paired Sample Statistics (N= 14)

<u>Time of Test</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Sample Size</u>
Pretest	9.64	1.98	14
Posttest	13.79	1.25	14

Table 2

Knowledge Scores Paired Samples Test (N=14)

<u>Time of Test</u>	<u>Mean</u>	<u>Std. Deviation</u>	<u>t</u>	<u>df</u>	<u>Sig. (2-tailed)</u>
Pretest/Posttest	4.14	1.56	9.92	13	.000

Table 3

**School Nurse Oral Presentation
Feedback about the training**

Extent of agreement*	<u>Mean</u>	<u>SD</u>
I learned information and skills that were new to me	1.4	0.5
I expect the course references & materials to be useful to me	1.4	0.5
I can apply the information I learned	1.3	0.5
Increase skills**		
Recognizing S/S of oral pathology/dental decay	1.7	0.5
Knowing how, when and who to refer children to	1.6	0.5
Assessing caries risk and protective factors	1.4	0.5
Providing education & anticipatory guidance to parents	1.3	0.5
Utilization of training***		
Oral health risk assessment the way you were taught today	1.9	1.1
Toothbrushing instructions to parents	1.9	0.7

Scales:

* 1-Strongly Agree

2-Agree

3-Disagree

4-Strongly Disagree

**1-Great Deal

2-Some

3-Very Little

4-Very Little-Already Possess Skill

***1-Very Likely

2-Likely

3-Somewhat Likely

4-Somewhat Unlikely

5-Unlikely

6-Very Unlikely

Appendix 1

Dental Health Education for School Nurses

Introduction of Early Childhood Caries (ECC)

Identification

Treatment

Cost

Special Needs Student

Affects on children

Pain

Infection

Self-esteem

Risk Factors

Low Income

Minority Groups

Limited Access to Care

Non-English Speaking

Lack of Fluoridation

Caries Balance

Pathological Factors

Protective Factors

Formation of Cavities

Germs + Carbohydrates = Acid

20-minute acid attack

Decay process and progression

White Spots

Cavities

Severe Decay

Abscess

Facial Swelling due to decay

Prevention

What can school nurses do?

Brushing, flossing, diet, xylitol, dental sealants, fluoride

Infant-Toddler Tooth Decay

Prevention

Pregnant women and mothers

Resources

Appendix 2

Pre-test/Post-test

Indicate whether the following statements are true or false:

	True	False
The infant's first dental visit should be made within 6 months of the eruption of the primary tooth, and no later than age 12 months.	<input type="checkbox"/>	<input type="checkbox"/>

An adult has to help children brush their teeth until about the age of 5 years old	<input type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------

	True	False
Medi-Cal and Healthy Families will reimburse for an office visit at which a fluoride varnish application is provided	<input type="checkbox"/>	<input type="checkbox"/>

Research indicates xylitol gum reduces the number of bacteria transferred between caregivers and infants	<input type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------

Chalky white spots on a child's teeth can be remineralized with fluoride varnish	<input type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------

Which of the following is NOT generally considered a risk factor associated with early childhood caries?

- ☐ Frequent and prolonged exposure to liquids containing carbohydrates
- ☐ Frequent and prolonged breastfeeding
- ☐ Frequent snacking on foods containing protein
- ☐ Frequent snacking on foods containing fermentable carbohydrates

Which of the following is NOT a pathological factor in the caries balance equation?

- ☐ Decay-causing bacteria
- ☐ Frequency of fermentable carbohydrate ingestion
- ☐ Reduced salivary function
- ☐ Infrequent toothbrushing

Which of the following is NOT a protective factor in the caries balance equation?

- ☐ Fluoride and remineralization
- ☐ Daily flossing
- ☐ Antimicrobials such as chlorhexidine and xylitol
- ☐ Saliva and its components

According to national surveys, what is the most prevalent unmet need among children with special health care needs?

- | | |
|---|--|
| <input type="checkbox"/> Medical care needs | <input type="checkbox"/> Vision and eyeglasses needs |
| <input type="checkbox"/> Dental care needs | <input type="checkbox"/> Prescription drug needs |

A toothbrush should be replaced: (check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Every three months | <input type="checkbox"/> After an illness |
| <input type="checkbox"/> Every six months | <input type="checkbox"/> When it drops on the floor |

Appendix 3

Demographic Questionnaire

1. What age range do you fall into?
 < 25 25-35 36-45 46-55 56-65 66+
2. How long have you worked as a school nurse?
3. Have you had any formal training in performing dental assessments?
 (this includes any training you may have received while in school)
4. If you have had formal dental training, please describe your training below.

5. What is your current education level?
BS MS Preliminary Credential Clear Credential