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The Assessment of a School-Based Dental Program

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THESIS

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Dedication

This thesis is dedicated to the children and adolescents who without the school-based clinic would have never received the oral care they are so deserving of. This is in regard for their voices we as health professionals so loudly hear. May they always be given the opportunity for optimum oral health through the school-based dental clinics.

To my wonderful parents, Dr. Bill J. Harris and Helen Harris. You have always instilled in me the need for education. I can hear the very words from you both, "Education is something that can never be taken away from you". Thank you for always encouraging me to strive for the top and make me feel like I could achieve anything I set forth to do.

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A mind should never go to waste with all of the opportunities available to learn and progress in any area of interest. Living is learning something new every day and broadening your horizons. As a professional it is a responsibility to learn and be aware of new findings and research as they are made public.

In doing this research project the perception of a whole new world has evolved and for that I am grateful.

The Assessment of a School-Based Dental Program

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ABSTRACT

Purpose:

The purpose of this study was to compare non-participants and participants of a school-based dental program and assess the utilization and satisfaction of services offered.

Methods:

Sixty-seven hundred questionnaires, containing 20 questions, were distributed to the parents/guardians of the Carlsbad and Loving school systems. Surveys were taken home by the students, given to the parent/guardians and returned within 1 week.

Descriptive statistics was used to report all data and proportions test was used to compare the non-participants and the participants and determine statistical significance. The significance level or P value was calculated using a general z –test.

Results:

A total of 748 questionnaires, were returned resulting in an 11% response rate. Of this population 70% had never used the program, 19% had participated one time, and 10% participated 3 or more times. Ninety-nine percent of those who participated reported the experience was pleasant. Sixty-one percent of the participants reported no decay, 15% reported one cavity, 17% reported two cavities and 7% reported more than two cavities.

Three questions were used to determine whether there was enough evidence of difference with the participants' vs non-participants. Statistical significance was seen for question 1"Does it make receiving dental care easier and more available with the school-based program?"($p<0.0001$). Question 2 If the school-program was not available would you have taken your child to the dentist? ($p<0.0317$). Question 3 "Do you have a dental home?" ($p< 0.0001$).

Conclusion:

This study revealed statistically significant differences between the non-participants and the participants in regard to satisfaction and utilization of the program. Many believed the school-based program makes utilization easier but the satisfaction comes in the participation of the program. The non-participants believe it does make

utilization easier but choose not to use the program for various reasons. The school-based programs provide care for the underserved but many families choose to participate out of the ease of utilization. Parents do not have to take off from work; child misses very minimal class time. This is a big advantage of the school-based programs.

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Chapter 1

Introduction:

Children who suffer from oral health problems experience serious social and health issues. Some of these include chronic pain, problems with eating and speaking, inability to concentrate in school, reduced social and family interaction, low self-esteem and self-image.

Surprisingly, dental disease is one of the leading causes of school absenteeism for children. An estimated 51 million school-hours are lost each year due to dental related illness.[1] Tooth decay still remains the first most common chronic childhood disease and occurs 5 times as frequently as asthma which is the second most chronic disease in children.[1]

The federal government's *Healthy People 2020* initiative, calls for increasing the proportion of children receiving sealants on their molar teeth, increasing the proportion of low-income children and adolescents receiving preventive dental services, and increasing the number of school-based oral health programs.[2] There are two relevant factors here: first, the relationship between dental caries and social and economic deprivation is undisputed, and despite oral health improvement in the overall population, dental caries remains prevalent in underprivileged populations. Secondly, the occlusal surfaces of first molars are the most highly caries-susceptible tooth surface, immediately post eruption.

By adolescence, 80% of carious lesions are found on the occlusal surfaces of first permanent molars. [3]

All children are entitled to preventive and other needed dental services from an early age to optimize their chance for good oral health and the development of health-promoting behaviors. The fact that high levels of preventable disease persist in underserved children and that the majority of these children still do not access dental care provides a strong argument for enhanced efforts to address this important health problem.

Statement of the Problem:

How effective is a school-based dental program at increasing the utilization and satisfaction of dental services for children?

Significance of the Problem:

In America despite the availability of public funded dental care coverage for those in need, children are still suffering from dental disease. The unmet need for dental care is concentrated in certain groups. Reports suggest that 80% of untreated cavities in permanent teeth are found in about 25% of children 5-17 years old.[4] These children are from low-income families. Children in families with income below the federal poverty level had twice as many carious lesions as higher income children and are less likely to receive treatment.[5]

In 2013, children's dental care utilization was at its highest level since the Medical Expenditure Panel Survey began tracking in 1996 and has increased from 45.4% to 48.3%.[3, 6] More children are now visiting the dentist, with the largest increase being seen in low-income children.[7] Several states have implemented comprehensive multi-pronged reforms to their Medicaid dental program to put in place key "enabling conditions" needed to ensure access to dental care. Expanded dental benefits coverage for children, mainly through Medicaid and The Children's Health Insurance Program has played a key role in this increase. Another factor that may affect this increase is the

growth of large group practices which increase the availability of Medicaid-accepting dental care providers. It is important however, to acknowledge that the study referred to only an increase of dental care utilization but did not focus on treatment plan completion rates or oral health status.[7]

Another barrier to dental health care is language and literacy.[1] Culture barriers have the potential to affect the level of dental health care obtained. These patients are least likely to find health care providers and health services. Filling out forms can be difficult and often embarrassing. A solution addressing this barrier is to have health questionnaires available in various languages. Studies have shown that simplified and less complicated information has improved health behaviors in people with low health literacy.[1]

There are various reasons that continue to affect access to care. Although, many children are covered by Medicaid /CHIP (Children's Health Insurance Program) programs they go without regular dental care and many remain uninsured.[5] Adding to the problem, is a geographic maldistribution of dentists found especially in rural areas.[5] Some dentists do not want to accept Medicaid due to poor reimbursement rates of services. Additionally patients may have appointments for treatment scheduled and miss their appointment due to lack of transportation, forgetting the appointment, not being able to take off work, or simply placing a low value on this care.

To address access to care for low-income and minority children, the school-based dental clinic model may be a viable option. School-based dental programs use a variety

of delivery systems including a mobile van, or portable equipment that is moved from school to school. Funding for these programs comes via the individual program director, a private foundation or sponsor. The size of the school determines the number of personnel needed. Staffing for the program varies and may consists of dentists, dental assistants or dental hygienists. The collaborative practice dental hygienist is the perfect health professional to develop a portable on-site dental program. In fact, Dr. Fones once said, "It is primarily to this important work of public education that the dental hygienist is called."[8] His primary goal for the dental hygienist was to have them work in schools and teach and promote oral hygiene. Additionally, an administrative assistant would be beneficial to keep records organized, get pre-authorizations done and file claims electronically.

Treating children at school makes dental care more accessible and can increase the number of children who are seen and receive dental treatment. Being in the school environment removes fear and may help alleviate anxiety when having the necessary treatment done. It also provides convenience for the parents as they do not have to miss any time from work. Participation is voluntary and parents/guardians must sign a consent form before their child can be seen. Services vary among school based dental clinics, thus the child may receive a complete exam, prophylaxis, oral hygiene instructions, nutritional counseling, radiographs, sealants and a fluoride treatment. Typically they are also given a home care package that includes a new toothbrush, floss and toothpaste. Depending on the source of the funding these services may be offered to children with or without dental

benefits. A form with all treatment completed and with further follow-up treatment recommended is sent home with the students to keep parents informed.

School based dental programs with limited resources can provide another solution for preventing and addressing the prevalence of dental decay. Sealant programs can help to increase the placement of dental sealants among children in low-income families and reduce the incidence of decay. Sealants have been shown to be effective but are not being utilized as often as they should. Dental sealants are thin resin coatings that are placed on the occlusal surfaces of the teeth by oral health professionals. They are safe, painless, and the most effective means of reducing tooth decay when properly placed. Studies have shown that school-based dental sealant programs can increase the prevalence of dental sealants and can help to reduce or eliminate the racial and economic disparities with the use of sealants.[1]

Success of school based dental programs requires the cooperation and trust of the school district and school staff. Teachers, school nurses and other school staff work with these children's families and can provide help to determine their needs and encourage families to participate and appear to be an effective way to reach children that are not receiving treatment anywhere.

These programs help to decrease or eliminate barriers to access. They can increase the number of children who receive dental sealants and improve their knowledge of oral health. It would be a dream come true to have all children have access to dental

care and have optimum oral health which in turn makes them healthy and happy individuals who can learn and eat with no pain and have a good self-image.

Operational Definitions:

Socio-economic barrier to care- A low socioeconomic status increases the chance of having more barriers to receiving dental care.

Dental sealant-Thin resin coatings that are bonded to the occlusal surfaces of permanent molars to seal the pit and fissures of these teeth to prevent decay.

Portable equipment- Mobile equipment used for the portable on-site school based dental program.

Collaborative practice hygienist- A dental hygienist that has had over 2400 hours of active practice for the past eighteen months; or a total of 3000 hours of active practice and had been engaged in active practice for two of the past 3 years. The board must approve based on the recommendation of the dental hygienists committee.

Access to care- Oral health care and services available to all populations

School –Based Dental Program- This dental program is found only in the school system and mainly serves the underserved population.

Review of Literature

Chapter 2

Introduction:

This review of literature will discuss access to care for children in the United States. School-based dental programs aid in the utilization of dental services by bringing the dental clinic in to the school environment. Whether they be full care programs, preventive programs, or sealant programs they are all beneficial in targeting the problem of access to care. The portable school-based dental program may be vital in reaching children who are without care. Various factors that contribute to this problem will be discussed in detail.

There are many funding programs available such as, Medicaid and Children's Health Insurance Program (CHIP). According to Medicaid.gov, more than 31 million children are provided with health coverage through these programs. In families with income up to $44,700/year (for a family of 4) they are likely to be eligible for Medicaid or Chip coverage. This oral health coverage includes a prophy and fluoride treatment every 6 months with bitewing x-rays covered 2 times a year. All states are required to

provide dental care to Medicaid-enrolled children.[9] Unfortunately, the poverty level continues to increase and fewer doctors are accepting Medicaid.

Literature was reviewed through PubMed and the University of New Mexico Health Science Center Library. Some videos of portable school-based programs were reviewed. A discussion of the access to care problem, methods and materials, financial feasibility, state laws, rules and regulations and summary will be included. Key words such as: Portable school-based dental programs, tooth decay in children, sealants, and dental public health were used.

A very important topic in the literature was the Surgeon General's Report on Oral Health[1] which states, "Oral health means much more than healthy teeth and periodontium. Oral health means being free from oral pain, oral cancers, birth defects and other diseases or problems that affect our daily functioning". Oral health affects the ability to eat certain foods, it affects the communication, and it affects the perception of others. This completely puts into perspective the importance oral health is to all, especially children. In 2011, Devlin et al. stated that more than 51 million hours are lost each year due to oral health related illness.[1] Prevention is a major component to general and oral health. Children who receive preventive dental care early in life will encounter a 40% reduction in overall dental costs when compared to children who do not receive care.[10]

Access to Care:

Although there have been numerous changes to improve access to care, the financial aspects are still problematic. The Children's Health Insurance Program (CHIP) was enacted in 1997 for uninsured children living in families with income that is low but too high to be eligible for Medicaid. Until February 4, 2009, dental coverage was optional under the CHIP program. The reauthorization includes oral health provisions, where children of families that meet income and other eligibility of CHIP requirements will also have dental benefits through CHIP.[11] One other aspect to mention is Medicaid has an early periodic screening, diagnostic and treatment program which has always included comprehensive dental coverage for low income children, but the number of participating dentists fees fall below that which is needed to provide the necessary services in a timely manner. The deterrents reported by dentists include low reimbursement rates, administrative hassles, and frequent broken appointments.

A tragic example of coverage and access happened in 2007 when a 12-year-old boy from Maryland died as a result of complications from an acute dental infection that spread to his brain. This boy never received routine dental care. The family like many others, experienced systemic problems with the Medicaid system, compounded by barriers such as lack of transportation and periods of erratic telephone and mail service.

This case exemplifies the severity of dental access problems that low-income children face. Children are 2.6 times more likely to lack dental coverage than medical coverage.[5] Still, more than half of children covered by Medicaid/CHIP programs go without regular dental care and many others remain underserved. [5]

Policymakers are addressing this oral health access to care problem but they must choose solutions that will meet the needs of all sectors of the United States population. Many universities are coming up with collaboration programs between the schools of Dentistry and the school districts. They have a collaborative practice or ECP-I (extended care permit) dental hygienist working and organizing the program. [10] They rotate the dental and dental hygiene students through these portable clinics and it introduces them to another aspect of dentistry besides private practice. The programs are usually with Title 1 schools. Title 1 can be defined as exceeding 40% poverty based upon the number of students that qualify for free or reduced lunches. All of the participants receive comprehensive preventive oral health services that includes (radiographs, prophylaxis, sealants, fluoride varnish, oral health education and nutritional counseling) in their school during normal school hours. The children never miss more than 30-45 minutes of class. Parents sign a consent form and complete a medical history and their child is seen at school. A note of treatment provided is sent home with the child also telling the parent if any other follow-up treatment is needed; however, only 11% receive recommended treatment.[7] Children who do not have Medicaid are eligible for a free screening or eligible for a sliding fee schedule. Many times the treatment is done with no out-of-

pocket expense. Participation in the school- based program is voluntary. Parents can withdrawal their children at any time. This model of dental care is growing and the trend is it will keep increasing.

According to *Healthy People 2020*, the objective of the program is to increase the proportion of children ages 6-9 who have received dental sealants on one or more of their permanent first molar teeth.[2] To determine whether or not *Healthy People 2010* objective was met a school-based dental sealant program managed by a Boston dental school reviewed the school years 2003-2004 through 2008-2009, 1609 dental screenings were provided for 2nd grade children. Of those, 1189 received dental sealants. The number of children who received dental sealants from the school-based program was added to the number of children who already had their first permanent molars sealed by parent report. In total, the whole second grade enrollment having sealants during the designated school years was 54%. *Healthy People 2010* objective was achieved.

Dental screenings are of utmost importance. They not only tell the health of the child but calculations and data can be stored from them. All variables must be documented which include: number of teeth filled, number of teeth with untreated decay, number of teeth extracted, identification of first permanent molars with existing sealants and identification of first permanent molars in need of sealants. This determines the direction of the program and the treatment of the children.

Equipment:

The school-based dental program has a variety of options when it comes to equipment. [1] Some school based dental clinics use all stationary equipment and have designated space to provide services. Other programs have equipment that is considered mobile like the mobile van or trailer. There also is true portable equipment that can be packed up and moved from school to school. Regardless of the set up all equipment should be maintained regularly so it is in optimal operation. Radiographs are taken with portable x-ray unit as well. These work well with film, digital media, and phosphor plates. All x-rays units must be registered with the state. Individual states may vary in their approval and requirements for handheld x-ray devices including storage, use of protective vests, and dosimetry badges or rings. If film is used then an automatic processor is also needed.

Staff:

Staffing for the program is typically completed by the program coordinator or director and includes licensed or certified dentists, dental hygienists, and dental assistants. [1] The dentist provides the exams and diagnosis and determines patient's treatment needs. The dental hygienist often serves multiple roles, such as program coordinator, oral health educator and the dental health provider to provide cleanings, apply sealants and fluoride varnish. The dental assistants work chairside with the hygienist to assist with sealants and fluoride application and to record the information on the dental forms. The program director provides general oversight to the program. An

administrative assistant would be helpful if possible to keep records organized and get pre-authorizations done in a timely manner and file claims electronically.

Barriers to Care:

For many parents and children English is their second language. In order to address language barriers forms should be available in languages commonly spoken in the community. These cultural barriers have the potential to affect the level of health literacy. People with limited health literacy may have difficulty locating health providers and health services, filling out complex health forms or seeking prevention health care.[1]

Success of the Program:

Success of the program depends heavily on the collaboration between program director, school nurse, teachers and administrators working closely together[1.] For K-12 programs, the school board or the superintendent usually makes decisions about whether to allow a new program into a school district; the decision may apply to the whole district or be left to the discretion of each principal in the district. [11] A commitment from the classroom teacher is also crucial for the success of the program. The least disruption of the classroom and respect for the activities going on in the classroom is of major importance. Forms can also be left with the school nurse along with a list of referrals

that were made in order be able to follow-up with the dental team. A successful program has many entities working smoothly together.

One of the biggest operational challenges is enrolling children who are in need of services. Obtaining consent from parents and/or guardians for treatment requires a great deal of effort. Teachers, school nurses, and other school staff ,along with the program staff, help to access children in the schools and encourage families to return the consent forms.[13] Enrolling at the beginning of the year might be the best way to implement the program, but it is also a good idea to reintroduce the program throughout the year to inform people who move in during the year. Communication materials should be made available at back-to-school nights, open houses and parent orientations. Also, placing the information on school websites, Facebook page, writing articles about oral health care available in the schools, and providing information at local health fairs is a positive way to advertise the availability of the program.

Financial Feasibility:

Many Medicaid programs have very low fees and relatively few dentists participate. This is the primary reason for the low utilization rates. The goal is to bring dental care utilization rates of low-income children to a level seen in middle-income children. This requires increasing the percentage of low-income Medicaid and CHIP-eligible private insurance. A study done in Connecticut showed the financial feasibility

of a model school-based dental program used in several states. [12] The analysis uses expense data from Connecticut. Connecticut is one of the wealthiest states in the nation, so expenses are high compared to other states. An efficient program operation with two chairs is essential to reduce down time if the need arises for repairs and the maintenance of equipment. In calculating the financial feasibility of a model program assume the dental hygiene team treats 14 patients per day, five days per week, for 250 days per year, and staff is paid at competitive rates, including fringe benefits. The hygiene team provides services for 1750 hours per year, generates nearly $139 per hour, and has gross revenues of $243,040; dentist revenues are $86,940. For 3500 visits, total revenues are $329,980- $189 per child. Expenses for hygiene team are $158,875. (133,875 for salaries and $25,000 for equipment, supplies, and liability insurance) and $235,662 for dentist services. Total operating expenses for 3500 visits (1750 children) are $ 394, 537. Total expenses are $ 426,100 or $243 per child.[12]

The total expenses exceed total revenues by $96,120. The Medicaid fees in Connecticut are too low for hygiene teams to generate sufficient surpluses. This seems to be a major problem in production. Medicaid fees have gone up some since this study was conducted but Connecticut Medicaid fees have always been among the lowest.

Another important aspect to consider is that a school-based dental program operates on a part-time basis. Most school-based oral health programs operate during school hours, which is less than a typical working day. The majority of school-based programs are typically available only 9 or 10 months of the year but

there are a few that operate year round. Most school-based programs offer basic diagnostic services (examinations, radiographs) and preventive services (prophylaxis, dental sealants, fluoride varnishes/rinses) which reimburse at lower rates compared to treatment services.

Finding a way to fund these programs and keep them in existence is a major operation. Many times grant funds are used for start-up capital expenses such as portable equipment, mobile vans, and construction of fixed school-based clinics. Some apply for a small business loan to purchase equipment needed. The idea of dental schools collaborating with school systems is a major advancement for these programs. It is truly a win-win situation.

State Laws, Rules and Regulations:

A number of states have adopted laws and regulations governing licensure requirements, certification, and/or staffing for mobile or portable dental programs. Some of the states that have a Board of Dentistry or Medicaid Mobile/Portable program requirements include, California, Tennessee, Texas, and Virginia. Links to some of these documents are found in the Association of State and Territorial Dental Directors (ASTDD) Mobile-Portable Dental Manual. Other states are also in the process of considering regulations.

There are requirements for biannual registration of a mobile dental facility found in Indiana's Administrative Code. Topics that were discussed were physical requirements, names of licensed personnel, proof of radiographic inspection, written procedure for emergency follow-up care, and copies of valid driver's license, consent form, and patient information sheet and proof of a communication process with the facility.

Finally, the Association of State and Territorial Dental Directors (ASTDD) makes several recommendations for action at both state and federal levels which include:

1. Create a database of state laws, rules, and regulations related to mobile or portable dental services and school oral health services.
2. Collect examples of best practices or promising models for providing dental services in preschool and school settings using mobile and portable systems.
3. Research additional ways to maximize reimbursement and other funding or cost-sharing mechanisms with all of the healthcare reform.
4. Develop or adapt already existing manuals and templates for schools and preschools to use in making decisions and creating contractual arrangements and policies for onsite mobile and portable dental services.
5. Develop statewide tracking systems of mobile and portable dental services provided in or for preschools and schools. State oral health programs would need to work closely with state departments of education and state Medicaid and CHIP dental programs.

6. Consider use of teledentistry in combination with portable programs in schools to improve consultation and electronic options, as well as the most efficient use of personnel in areas where access to care is difficult.

PEW Report

The 2010 report: The Cost of Delay: State Dental Policies Fail One in Five Children calls attention to the crisis among disadvantaged children.[14] There are three broad systemic factors that need to be addressed with access to care among the disadvantaged. They are:

1. Too few children have access to proven preventive measures, including sealants and fluoridation.
2. Too few dentists are willing to treat Medicaid-enrolled children.
3. In some communities, there are simply not enough dentists to provide care.

The school-based dental program has several advantages versus the traditional dental care system. First, far fewer dentists are needed to provide care to children. As a result the utilization of the advanced hygiene practitioner would be advantageous in this situation. As an estimate, the school-based vs. the traditional dental care systems require fewer dentists per child. This is because hygiene teams rather than dentists care for the majority of the students.

Second, the study showed the unit cost providing dental care to the children was substantially reduced. They estimated that the cost per child with a visit is about $243 in the school-based system vs. $424 in the traditional system. [12] So, for the Medicaid funds available in each state, the lower costs per child will allow more children to receive dental care.

Third, the school –based program is much less dependent on parents taking their children to dental offices and clinics. This is a huge issue in low-income areas, where single-parent families have many economic and social challenges. Also, parents do not have to be at the school when their child is seen. They may be if they would like but many cannot take off of work and keep their jobs.

Fourth, the school –based program is expected to greatly improve children's oral health. With the increasing acceptance and use of dental sealants to prevent dental decay, school-based sealant programs have grown exponentially, according to the ASTDD. In 2010, the *Synopsis of State and Territorial Dental Public Health Programs*, published by the Centers for Disease Control and Prevention, most states (78.4%) reported supporting dental sealant programs targeted to elementary children. A 60% decrease in tooth decay has been documented in multiple studies when sealants are provided through a school-based or linked program, the ASTDD said. Targeting dental sealants to children at high risk for dental caries has emerged as a desirable strategy for many school-based programs. [15] These children are seen two times a year. They are getting the optimum dental care possible. They are being assessed and watched. If something should arise it

will be taken care of before it gets out of hand. If states are serious about reducing access disparities, they will need to provide the necessary funds to support these programs. The primary advantage of the school-based model is a major reduction in access and oral health disparities. More needs to be done at the state level to provide sealants to low-income students through the school-based dental clinics. [16] Whether it is state funded or privately funded programs they are the clinic of the future. All of the literature stands firm on the need and success of these programs. The school-based models, incorporating dental hygienists with expanded functions of practice to provide preventive oral health services and referrals, can serve as one approach to overcoming barriers and reaching vulnerable children that desperately need oral health care. [12]

With the dental hygiene profession moving forward, the need to keep expanding the scope of practice is very apparent. School-based oral health care increases public awareness of the profession. As a health-related profession, it is important to show where and how dental hygiene has been able to affirm its fundamental commitment to better oral health of all people.[17] If lessons can be learned, it is through helping some of the vulnerable citizens which are best achieved by collaborating and stepping out to remove existing barriers. Partnering with other professions, such as medicine, social science, and economics will provide opportunities to research and expand the profession.

Conclusion:

School-based dental programs seem to be an excellent way to provide oral health services to children in underserved communities. Children from low-income families are

at a particular risk for poor oral health and difficulties in accessing care.[18] The success of the program is so dependent on keeping a positive relationship with school administrators, school nurses, teachers, parents, and other staff members. These programs may serve as the student's primary care provider or complement services provided by other health care providers. If the parents and community members support school-based dental health programs and adequate facilities and space are available successful models can be implemented. The utilization of these types of dental services would reach many more children and see that they receive the preventive care and the restorative care if needed and once and for all solve the problem of access to care.[19]

Another aspect to mention is encouraging more dental hygiene students to seek a career in public health by exposing them while in school to alternative practice settings. A model for this was done that involved a collaborative program between the University of Missouri-Kansas city School of Dentistry, the Olathe School District and an ECP-I dental hygienist, collectively working to provide school-based, preventive oral health care to disadvantaged children. Much success came out of this endeavor. There was an increase in access to oral health care and many found permanent dental homes. Dental hygiene students were awakened to the need for oral health care for the underserved and introduced to what might be an interest in the mid-level provider as a career.

There are many issues related to addressing access to care. School-based oral health models as already mentioned using dental hygienists with expanded scope of practice to provide preventive oral health services can serve as one approach to

overcoming barriers and reaching vulnerable children that desperately need oral health care. In order to foster the desire within dental hygiene students to work with underserved populations and to be a solution to access-to-care issues, it is important to always maintain relationships with their state and local health departments, be familiar with ever-changing trends that affect national health care, be knowledgeable about their particular states' dental practice acts, stay abreast of legislation that may change the nature of dental hygiene practice, keep an open mind about advancing the practice of dental hygiene with expanded functions, remain aware of the specific health needs within own communities, and be prepared to be a spokesperson or advocate for the support of programs designed to decrease the disparities in oral health care.[20]

One other approach to consider is strictly the prevention of dental caries in schoolchildren. A prototype school-based preventive dentistry program was tested combining the effects of ingestion of fluoridated water, the topical application of fluoride varnish, the use of pit and fissure sealants, participation in dental health education programs, and the early detection of caries and the provision of restorative care. After one year, occlusal surfaces of permanent teeth in children in the treatment group showed an average reduction in caries of 84%, contrasted to those children in a comparison group.[21]

The major practical value of these results lies in the support of this type of program that the school-based programs offer. The fluoridated water supply being the

most cost effective dental public health measure, and sealants as extremely effective in the prevention of caries.[22]

With the school-based programs the largest focus is on providing preventive services to the underserved. This is also known as the high risk population meaning they have a higher incidence of untreated caries, no recent dental visit, and less likely to have private insurance.[23] This population would benefit from the school-based program immensely. Upon recognizing that prevention is fundamental to general and oral health and understanding that children who receive preventive dental care early in life will encounter a 40% reduction in overall dental costs when compared to children who do not brings in to perspective the importance of treating these children through the school-based dental programs. [24]

Eliminating health disparities remains a monumental challenge. Dental care has been recognized as the most prevalent unmet health care need for children in the United States. If the challenges of underserved and vulnerable populations are not addressed, the burden of oral disease will continue to grow and the cost and impact associated with these disparities place a great amount of economic burden on the nation.[25]

In looking at some of the reasons why dental care may be unmet many times dental offices are concentrated in more affluent districts and areas of cities. This places the residents of the low-income areas of the inner cities and rural areas at a serious disadvantage. Transportation is more difficult, and where working parents must accompany children, taking time off means no pay. Also, cultural barriers sometimes

exist as well when low-income people feel that teeth are going to be lost anyway and the professional attitudes of health providers are different. If preventive care is to be brought to low-income populations where they are located, the school-based dental program is the answer. They are convenient and most of the time right in their own neighborhoods.[26] Parents can attend the appointment but do not have to if they are unable to take off from work.

To put in to prospective in order to make access to care and utilization easier according to *Healthy People 2020,* "there will need to be an increase in the proportion of school-based health centers with an oral health component that includes dental sealants. There will also need to be an increase in the proportion of school-based health centers with an oral health component that includes dental care." Last but not least, "there needs to be an increase in the proportion of school-based health centers with an oral health component that includes topical fluoride.[27]

Methods and Materials Checklist

Chapter 3

Sample Descriptions:

The sample defined in this study was the parents/guardians of the children in the Carlsbad School System and Loving School System. This sample included all parents/guardians whether or not their children participated in the school-based dental program. Participation in the study was voluntary and there was no coercion to participate. No free services were awarded for participating.

Research Design:

A descriptive approach was used. A questionnaire containing 20 questions was distributed to the parents/guardian throughout the Carlsbad and Loving school systems. This study intended to evaluate the utilization and satisfaction of services of the school-based dental program. A meeting was scheduled with the superintendent of Carlsbad and Loving Schools to explain the research and permission was obtained to conduct the research.

The surveys were sent out with a letter explaining the program and the questionnaire at the beginning of the year. The questionnaire was taken home by the students and given to the parents/guardians to fill out and send back with the student. The number of forms that are sent out were counted and documented as they were returned to the main office at each school.

There is 1 early child education center, 6 elementary schools, 1 6th grade academy, 1 middle-school, 1 high school and 1 Montessori school. Elementary schools are 1-5 grades, middle school is 7-8 grades and high school is 9-12 grades. The Loving Schools have 1 kindergarten, 1 elementary, 1 middle school, and 1 high school.

Human Subjects:

The surveys targeted to the parents or guardians of the students in the Carlsbad and Loving school systems. This study was approved by the University of New Mexico's Human Research Protections Office (UNM-HRPO).

Materials:

All materials used were the paper for questionnaires. Thirteen thousand four hundred sheets of paper were used. Printing was done on 8x11 paper.

Data Collection:

This data collection was quantitative as well as qualitative. All questionnaires were returned at the schools where they were sent out. Forms were picked up after one week.

Data was recorded on a spread sheet. Graphs of number of students and number of sealants and decayed teeth were recorded as well as referrals, bitewing x-rays, and fluoride treatments done.

Headings used:

Participate	Non-participant
No decay	Decayed teeth
No referral	Referral
Follow-up	No follow-up
Completed	Not completed
Sealants with school-based program or elsewhere	No sealants
Bitewing x-rays	No Bitewing x-rays

Fluoride Treatment	No Fluoride treatment
Would participate again	Would not participate

Data Analysis:

Two groups were evaluated, the group that participated and the group that did not participate. Results were taken from a questionnaire and were analyzed. Proportions test were used to compare the non-participants vs. participants for 3 questions to each group and then evaluating the data. The significance levels or p-values were evaluated. Also, topics such as the satisfaction of services and the utilization of services were evaluated. This was completed through the answers received from the questionnaire.

Results, Discussion, and Conclusion

Chapter 4

Results:

A 20 question survey was produced in English and Spanish and distributed to parents or guardians of the students in the Carlsbad School system and the Loving School system.

The surveys were taken home by the students and given to the parent/guardian to complete. They were then returned within one week by the student to their teacher and handed to the school nurse. Individuals had the right to participate or not participate in this study.

Six thousand seven hundred surveys were dispersed and 748 were returned yielding an 11% response rate. Of the population 526 identified as non-participants of the school based dental program, 144 participated 1 time and 78 were participants of the program for 3 or more years .

This study was intended to determine the utilization and the satisfaction of services offered through a school-based dental program.

Results from the questions asked on the questionnaire:

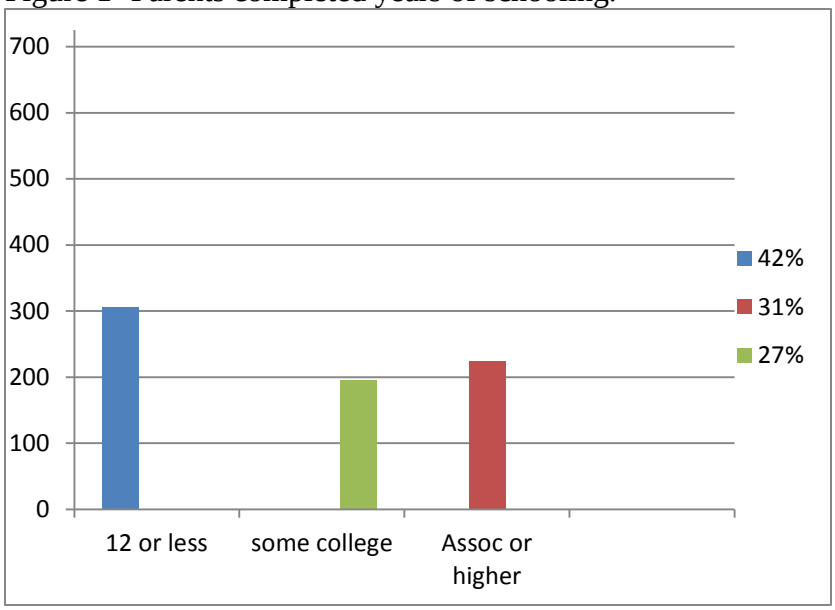
1. How many years of schooling did you complete? N= 725

This question evaluated the educational level of the parents. Calculations Showed 42% (n=306) had 12 years or less of schooling. 27% (n=195) indicated having some college experience with 31 %(n=224) having an Associate degree or higher. Table 1 and Figure 1 reflect these findings.

Table 1- Parents completed years of schooling.

	n	%
12 years or less	306	42%
Some college	195	27%
Associates degree or higher	224	31%

Figure 1- Parents completed years of schooling.



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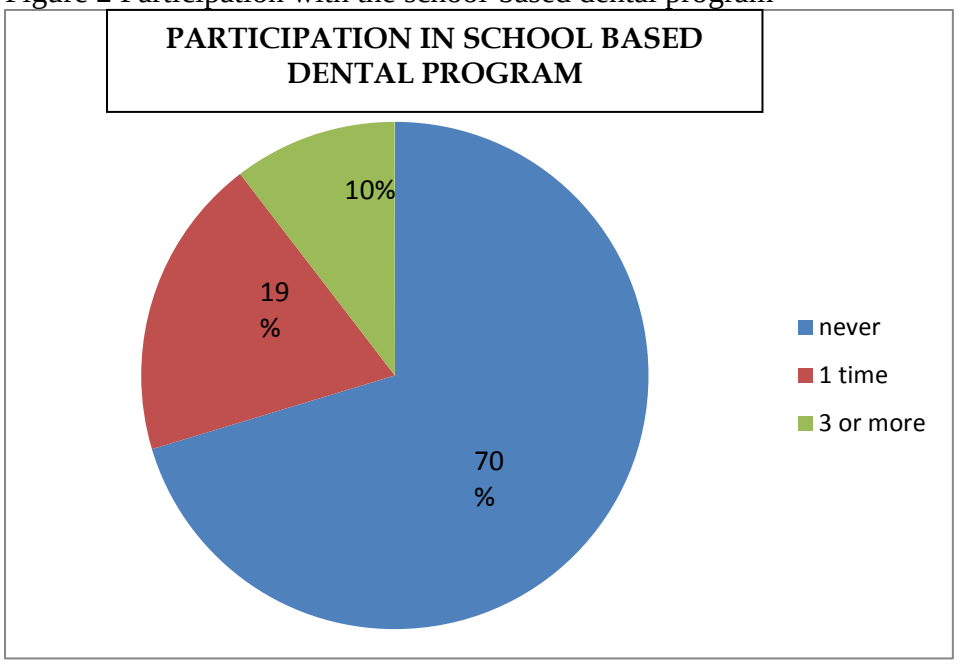
2. Has your child participated with the school-based dental program? N=748

This question determined the amount of participants and non-participants in the school based dental program. Calculations revealed 70 % (n=526) never participated, 19% (n=144) participated only 1 time and 10% (n=78) participated for 3 or more years. Table 2 and Figure 2 reflect these findings.

Table 2 Participation with the school-based dental program

	n	%
Never	526	70%
Participated 1 time	144	19%
Participated 3 or more years	78	10%

Figure 2 Participation with the school-based dental program



3. If your child participated in the school-based dental program was the experience pleasant? N=192

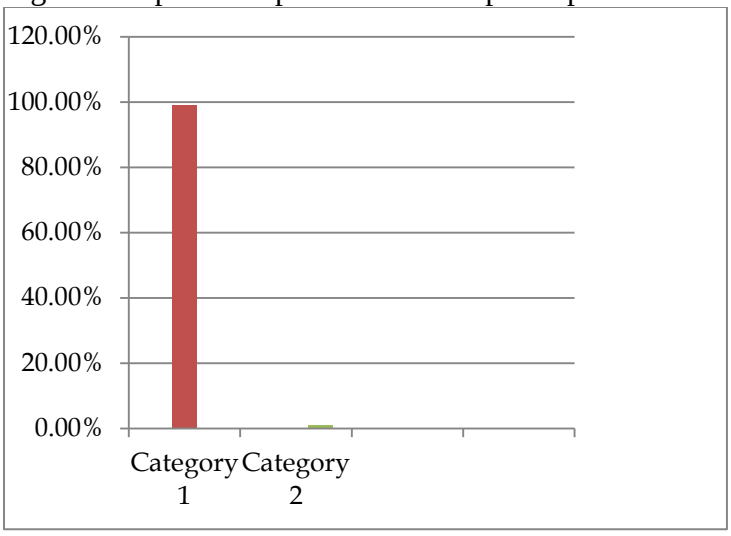
This question reported the experience of those who participated in the school-based dental program. 99% (n=190) indicated they had a pleasant experience while 1% (n=2) did not.

Table 3 and Figure 3 reflect these findings.

Table 3 Reported experiences of the participants

	n	**%**
Yes-pleasant	190	99%
No-not pleasant	2	1%

Figure 3 Reported experiences of the participants



4. Did you receive a form after your child was seen explaining all treatment done and further treatment needed? N=217

   This question reveals those that received a form following the visit to the school based dental clinic and those that did not. 85% (n=184) did receive a form and 15% (n=33) did not receive a form. Table 4 reflects these findings.

   Table 4- Received a form following visit

	n	**%**
Yes	184	85%
No	33	15%

5. How would you rate the oral health of your child? N=705

   This question indicates how the parents/guardians rated the oral health of their child. 33% (n=230) indicated excellent, 54% (n=381) indicated good, 12 %(n=82) indicated their child's oral health as fair, and 2 %(n=12) reported poor. Table 5 and Figure 4 reflect these findings.

   Table 5 Rate the oral health of your child

	n	**%**
Excellent	230	33%
Good	381	54%
Fair	82	12%
Poor	12	2%

Figure 4 Rate the oral health of your child

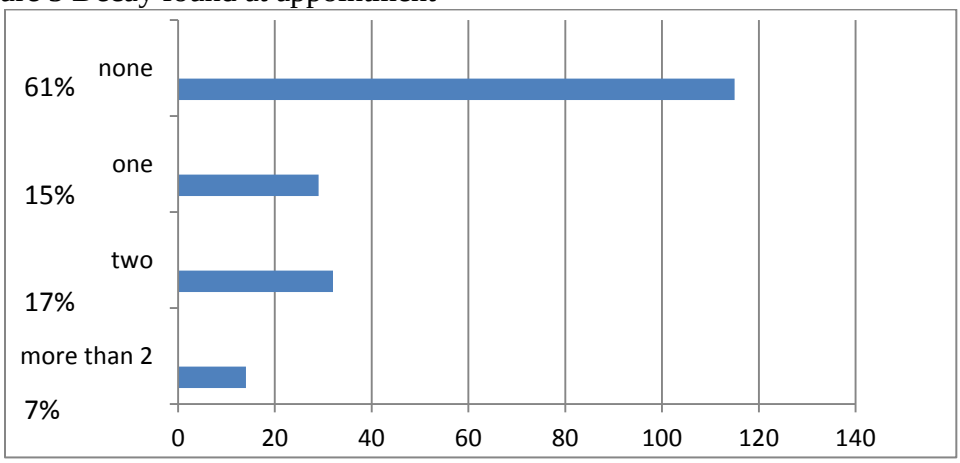
6. Did your child have cavities found during the appointment? N= 190

This question revealed the amount of decay found in the population who participated in the school based-dental clinic. There were 61% (n=115) with no decay. 15% (n=29) were reported to have one area of decay. 17% (n=32) were reported with two areas and 7% (n=14) were reported with more than two areas of decay. Table 6 and Figure 5 reflect these finding.

Table 6 Decay found at appointment

	n	**%**
None	115	61%
One	29	15%
Two	32	17%
More Than 2	14	7%

Figure 5 Decay found at appointment



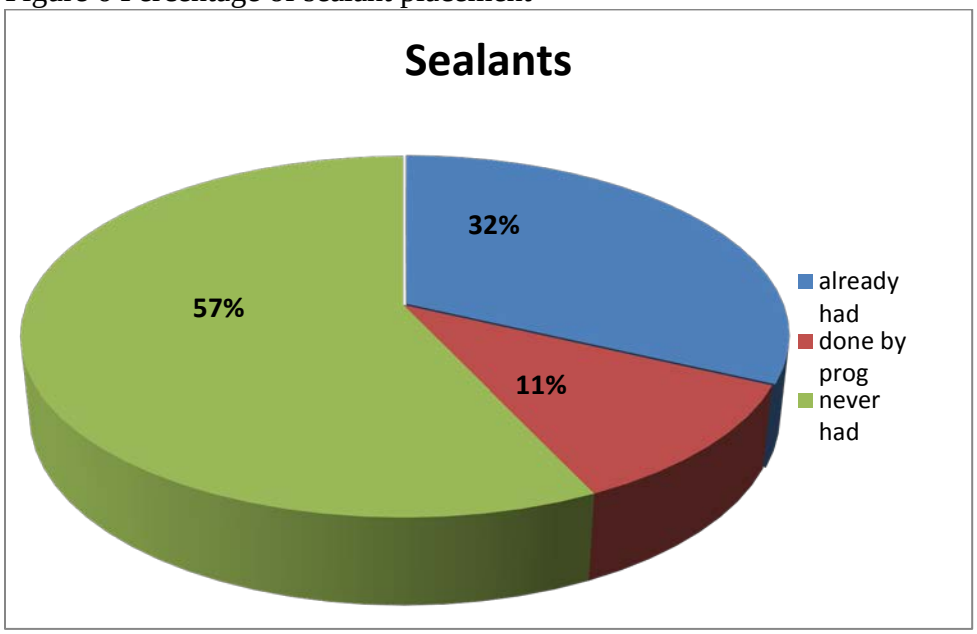
7. Did your child already have sealants in their teeth or were they done by the school-based dental program? N= 183

This question addressed the amount of sealants that had been done by the school-based program, the amount that were already done and the population that had none. 32 %(n=58) already had sealants, 11% (n=20) were done by the school-program and 57 %(n=105) had never had any. Findings are reflected in Table 7 and Figure 6.

Table 7 Percentage of sealant placement

	n	**%**
Already had	58	32%
Done by school-program	20	11%
Never had	105	57%

Figure 6 Percentage of sealant placement



8. Did your child receive x-rays? N=184

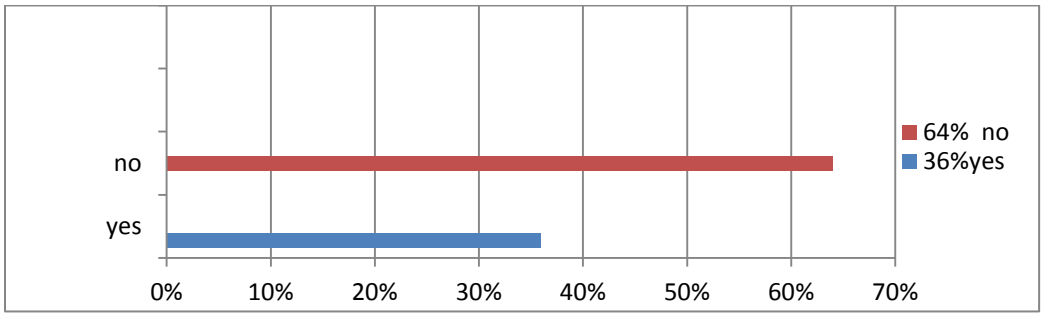
   The findings indicate 36% (n=66) had x-rays done and 64% (n=118) had none.

   Table 8 and Figure 7 reflect these findings.

   Table 8 X-rays received at appointment

	n	%
Yes	66	36%
No	118	64%

   Figure 7 X-rays received at appointment



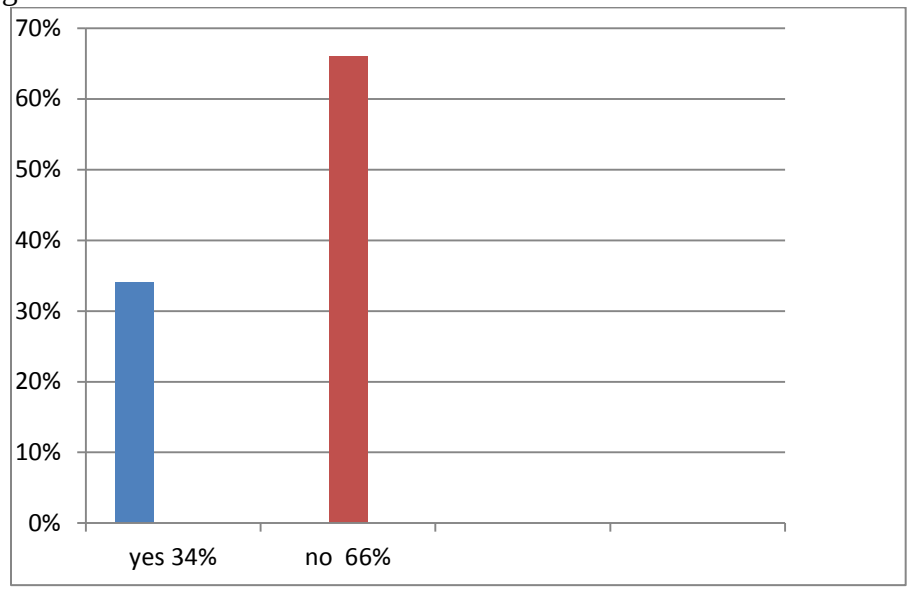
9. Did your child receive a fluoride treatment? N=96

The calculations showed 34% (n=33) did receive a fluoride treatment and 66% (n=63) that did not receive treatments. Findings reflected in Table 9 and Figure 8.

Table 9 Fluoride treatment received

	n	%
Yes	33	34%
No	63	66%

Figure 8 Fluoride treatment received



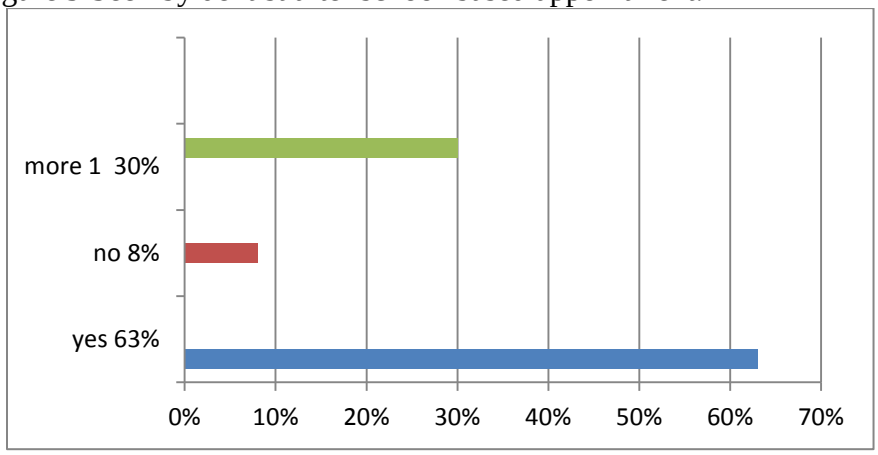
10. Was your child seen by a dentist after he/she was seen by the school-based dental program? N=195

63% (n=122) reported going to a dentist, 30% (n= 58) went more than once, and 8% (n=15) did not go. Table 10 and Figure 9 reflect these findings.

Table10 Seen by dentist after school-based appointment.

	n	%
Yes	122	63%
No	15	8%
More than once	58	30%

Figure 9 Seen by dentist after school-based appointment.



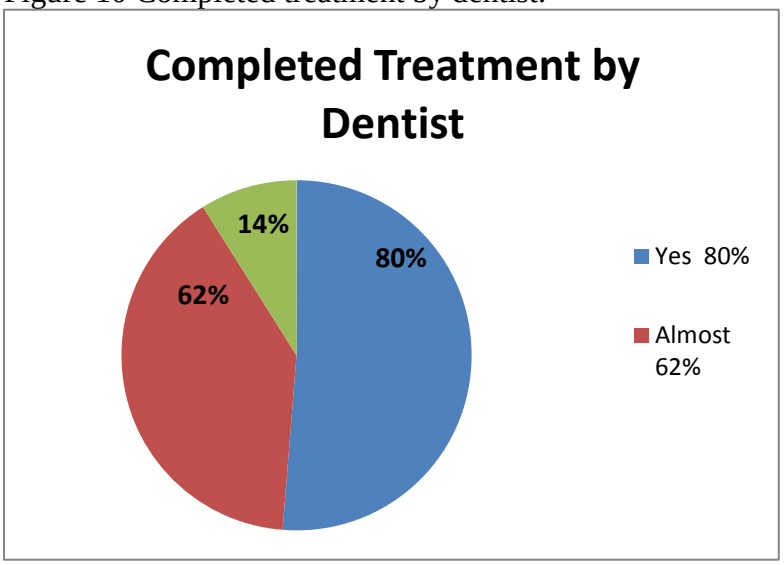
11. Was the treatment with the dentist completed? N=163

80% (n=130) reported treatment with the dentist was completed, with 62% (n=10) almost completed. 14% (n=23) however, did not have treatment completed. Table 11 and Figure 10 do reflect these findings.

Table 11 Completed treatment by dentist.

	n	%
Yes	130	80%
Almost	10	62%
No	23	14%

Figure 10 Completed treatment by dentist.



Questions 12 “If the school-based dental program was not available would you have taken your child to the dentist for their regular preventive care?” and question 13 “Do you feel having a dental program in the schools makes it easier and more available to receive preventive dental care for your child?” will be evaluated as a comparison is explained in detail further in the results

14. Would you use this program again? N=188

Ninety-three percent (n= 175) indicated they would use the program again and 7% (n=13) would not. Table 14 reflects these findings.

Table 14- Use program again?

	n	%
Yes	175	93%
No	13	7%

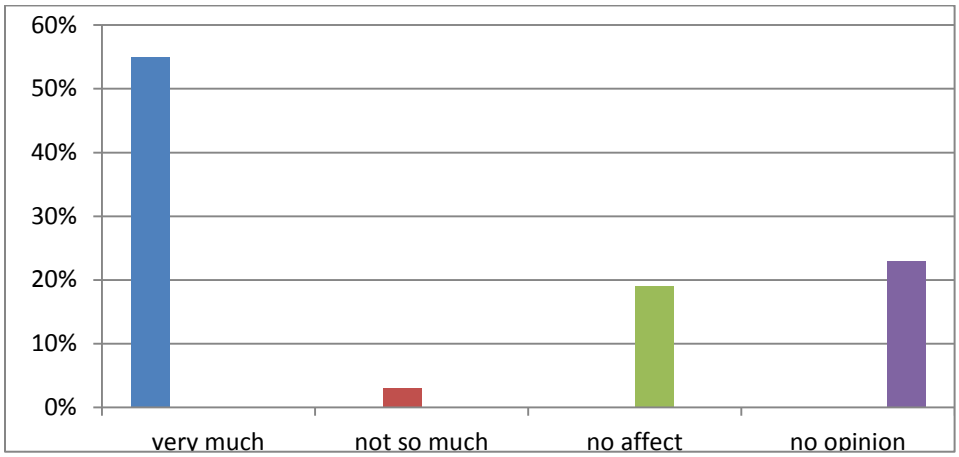
15. Were you pleased with your child missing less class time and you not having to miss work to allow your child to receive dental care? N=515

This question evaluated the satisfaction of the participants and the non-participants. 55% (n=282) of parents/guardians were very much pleased with their child missing less class time and them missing less work, while three percent (n=18) were not so much pleased. For 19% (n=98) it had no effect on them an 23% (n=116) simply had no opinion. Table 15 and Figure 11 reflect these findings.

Table 15 Pleased with missing less class and work.

	n	%
Very much so	283	55%
Not so much	18	3%
No effect	98	19%
No opinion	116	23%

Figure 11- Pleased with missing less class and work?



16. Do you already have a dental home or clinic that you and your family attend regularly?

This question used as a comparison question and will be discussed in detail later in results.

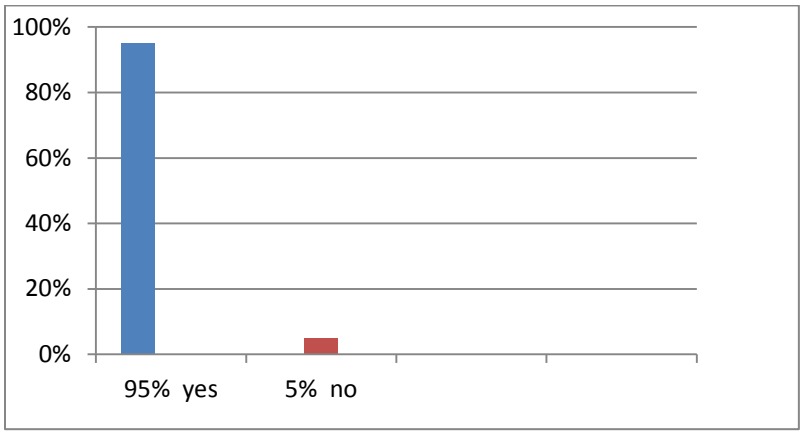
17. Do you value oral health care and the impact it has on the whole body? N=652

95% (n=622) indicated that yes they did value oral health care and the impact it has on the whole body, while 5 %(n=30) did not. Table 17 and Figure 12 reflect these findings.

Table 17 Participants value of oral health care

	n	**%**
Yes	622	95%
No	30	5%

Figure 12 Participants value of oral health care



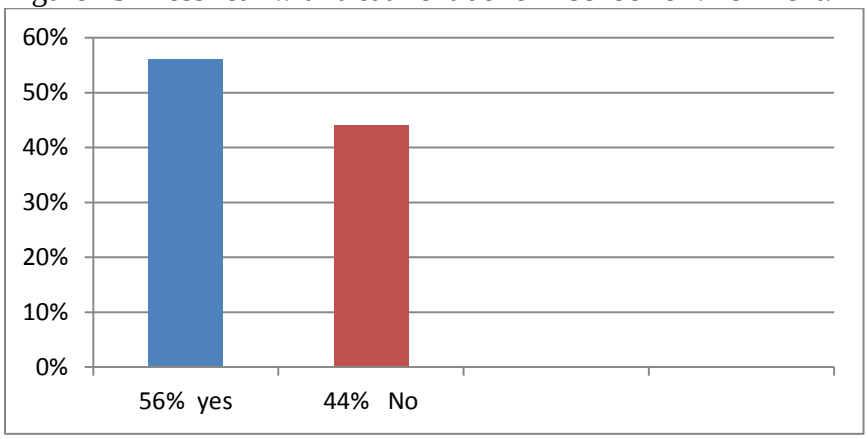
18. Do you feel being in the school environment makes your child more comfortable and less fearful of having treatment done on his/her teeth? N=461

This question was used to determine if the population felt having dental treatment done in the school environment reduced the fear and made them more comfortable.56 %(N=260) agreed it did and 44% (N=201) said it did not. Table 18 and Figure 13 reflect the findings.

Table 18- Less fear with treatment done in school environment.

	n	**%**
Yes	260	56%
No	201	44%

Figure 13- Less fear with treatment done in school-environment.



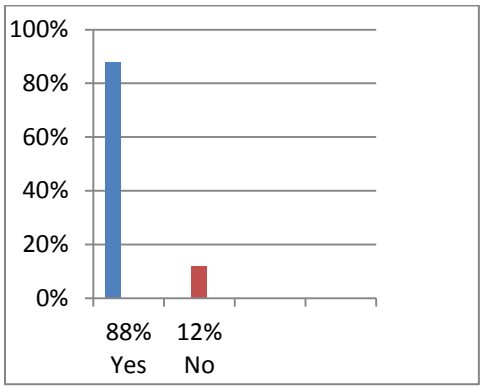
19. Studies show children who receive dental care early in life will encounter a 40% reduction in overall dental costs- does this interest you? N=667

This was a question used to evaluate the value placed on the importance of dental care early in life and the overall savings it created. 88% (n= 585) said yes it was an interest to them and 12% (n= 82) reported it was not of importance to them. Table 19 and Figure 14 reflect these findings.

Table 19 Interest on receiving early dental care and cost reduction.

	n	**%**
Yes	585	88%
No	82	12%

Figure 14 Interest in receiving early dental care and cost reduction.



20. How can we improve your child's experience with the school-based dental program?

Responses Included:

1. Come more often
2. This sounds convenient.
3. Do not want children to be afraid to go to school for fear of the dental treatment.
4. Do no use for lack of insurance.
5. Cannot afford.
6. Insurance company says dentist at school is out of network.
7. Parents want to be with child during treatment.
8. Level of responsibility put on school administrators and staff not good.
9. More bi –lingual forms sent out
10. Have not heard of the program

Questions used for comparison:

Descriptive data and comparison analysis between the non-participants and participants of the school based dental clinic were evaluated. Question # 12 “if the school-based dental program was not available would you have taken your child to the dentist for their regular preventive care?”

91% (n=345) of non-participants would take their child to a dentist if the school-based dental clinic was no available and 9% (n=36) would not. Those that participate reported that 96% (n=181) would seek dental care and 4% (n=7) would not. Table 20 and 21 displays the results.

Table 20 Subjects who would seek dental care if no program

	Non-participants n= 381		Participants n =188	
Yes	345	91%	181	96%
No	36	9%	7	4%

Table 21 Statistical comparison of proportions test:

Difference	5%
95% CI	0.2851 to 9.0568
Chi-squared	4.614
DF	1
Significance level	p< 0.0317

Question #13 was asked to determine if the non-participants vs. the participants felt having the dental program in the school made it any easier and more available to receive

dental care. Non-participants reported 76% (n= 333) that having a dental program in the schools makes it easier for preventive care for their child and 24% (n=106) said it did not. Those who participate reported 96% (n=181) reported yes and 4% (n=8) indicated no. Table 22 reflects these findings.

Do you feel having the dental program in the schools makes it much easier and more available to receive preventive dental care for your child**?**

Table 22 Does dental program in school make it easier to receive care?

	Non-participants n= 439		Participants n =189	
Yes	333	76%	181	96%
No	106	24%	8	4%

Table 23 Statistical comparison of proportions

Difference	20%
95% CI	14.4910 to 24.8596
Chi squared	35.777
DF	1
Significance level	p< 0.0001

Question#16: Do you already have a dental home or clinic that you and your family attend regularly? This question was asked to reveal the number of non-participants vs. the participants who already had a dental home they regularly attended. Non-participants 96% (n=498) indicated they had a dental home and 4% (n=23) did not. 85% of those who participate (n= 164) had a dental home and 15% (n=28) did not. Tables 24 and 25 reveal these findings.

Table 24 Reported having a dental home

	Non-participants n= 521		Participants n =192	
Yes	498	96%	164	85%
No	23	4%	28	15%

Table 25 Statistical comparison of proportions

Difference	11%
95% CI	5.8381 to 17.0422
Chi-squared	26.171
DF	1
Significance level	P< 0.0001

A Chi-square analysis using 95% confidence interval and 1 degree of freedom was used to compare participants and nonparticipants of the school based dental program. Statistical significance was seen when comparing whether or not parents would you have taken your child to the dentist for their regular preventive care if the school-based dental program was not available ($p< 0.0317$). When comparing how the population feels about having the dental program in the schools making it much easier and more available to receive preventive treatment, again a statistically significant difference was seen between the groups ($p< 0.0001$). Lastly when comparing to see whether the non-participants and participants had a dental home, the calculations yielded a p-value of $p<0.0001$ resulting in a statistically significant difference.

Discussion:

School based dental programs bring awareness about dental health to both students and parents. Successful school-based programs depend on the collaboration of all parties involved. This includes school administration, the program coordinator, teachers, school nurses, students and parents. The results of this study suggest that school-based programs are becoming more accepted.

School-based programs help the underserved, by affording direct access to dental services, being convenient for parents who are unable to take off work and minimizing missed class time for the students by decreasing travel time for such services. Even the non-participants acknowledged that the school based program makes utilization much easier. The data also suggests that there are those that feel like the school environment would make their child feel comfortable and less fearful. Twenty-nine percent of the students enrolled in the study, participated in the school based dental program. Ninety-nine of those parents whose child received services from the school-based program reported that the experience was pleasant and 93% reported that they would use the program again. This positive response indicates success of the program.

A variety of reasons were given for the low participation such as, not hearing of the program, wanting to be with their child at the appointment, not wanting to send their child to someone they did not know, they did not think their child should miss school for

a dental appointment and not being able to afford the dental care. Other participants reported that they did not want their child to be fearful of going to school because of having dental treatment at the school. These finding suggests that school-based programs are not important to all parents. Interestingly, some of the reasons provided as to why the school-based services were not utilized, are some of the most important qualities of school-based services. Some ways to address the concerns of the parents and underutilization of services School based programs could work more diligently on getting the word out about the program like posting up flyers or having a small section on the school's internet page. It would be important to have forms available in different languages to address needs of parents. Schedules can be made to allow parents to be present during the appointment and if parents are unable to afford services the director of the school based program could work on a payment plan or help them get signed up for assistance with Medicaid or CHIP programs.

Majority of this study population indicated they had a dental home and used the school-based dental program primarily for preventive services that included prophys, radiographs, sealants and fluoride treatments. Radiographs are an important and necessary diagnostic service for the detection of caries. Data from this study revealed 64% of students had not received radiographs. This could be an inaccurately reported number as parents were asked to recall from memory this information and may not remember correctly if their child had x-rays taken. Fluoride continues to remain the most

effective tool in the caries prevention armamentarium,[37] but is only applied if approved by the parent. Data showed 34% of students received professional fluoride treatments.

The use of dental sealants to prevent tooth decay has been increasing in recent years. According to the Association of State and Territorial Dental Directors a 60% decrease in tooth decay has been documented when sealants are provided through a school-based or linked program.[2] The data in this study showed 57% of children never had sealants. Again, this could be an inaccurately reported number as parents were asked to recall from memory this information and may not remember correctly if their child had sealants.

Assessing the number of students that scheduled and presented to a dentist after being referred by the school-based program was very encouraging. Sixty-three percent saw a dentist for a dental exam after being seen in the school based dental clinic. Sixty-one percent of parents reported that their child had no tooth decay. Fifteen percent reported decay on one tooth, 17% reported two decayed teeth and only 7% reported more than two teeth decayed. Eighty percent had the required treatment with the dentist completed. This is typically not the norm for a school-based clinic.[40] Many times urgent referrals will receive follow-up care but smaller non-emergent needs are often not a priority. An indicator of the importance placed on oral health care by the parent is a follow-up care obtained by the child. In a study reported by the Journal of Public Health Dentistry, children without receipt of follow-up had caregivers who were more likely to report not

visiting a dentist within the last five years and a greater number of missed days from work due to tooth problems.[29,40]

Limitations

A limitation in the study is using a self-reported survey design. This relies solely on the parent's ability to accurately remember or observe the behavior or the procedure being done. This may lead to some questions to be answered inaccurately because parents were answering about services for their children.

Conclusion:

Studies suggest that parents with more education have a direct effect on the oral health behaviors of their children.[32] The data speaks very strongly for how the parents feel about oral health and its effect on the whole body. Ninety-five percent reported value on oral health care. The majority of parents, though having a high school education or less, still felt that dental health was very important and they had a strong interest in their child's oral health.

The research study suggests that the school-based dental programs are an acceptable mode of oral health care for children. They help to solve the access to care problem and make utilization of services easier. Taking the program into the school environment not

only serves more children but exposes them to a world of dental health that they might not ever be a part of. The school environment is the ideal place for the development of oral health programs, allowing children and young people to learn healthy oral behaviors.

Further Studies:

A comparison study of a school without a school-based program vs. a school with a school-based program and compare the oral health of the students.

Another aspect for further study would be to compare the DMFT rate before a school-based program is initiated then look at the rate after 2 years of having the program and see if the rate has decreased.

Also, the educational level of the parents in relation to the oral health of the students. This was addressed but would be valuable and interesting to concentrate deeper on this subject.

The use of fluoride topically and also added to the water system. Study a group ingesting fluoride water and a group applying topically. After 3 years collect data and look at results of the 2 groups.

Chapter 5: Article for Submission

Title Page:

The Assessment of a School-Based Dental Program

Peggy Hyden, RDH, BS

Key words: School-based dental program, collaborative practice dental hygienist, sealants, cultural barrier to care

Introduction

Prevention is a major component of oral health and general health. Children who receive preventive dental care early in life will encounter a 40% reduction in overall dental costs when compared to children who do not receive care.[1] Children who are suffering from oral health problems experience serious social and physical health issues. Some of these include chronic pain, problems with eating and speaking, inability to concentrate in school, reduced social and family interaction, low self-esteem, and self-image.

The federal governments *Healthy People Initiative for 2020,* calls for increasing the proportion of children receiving sealants in their molar teeth, increasing the proportion of low-income preventive dental services, and increasing the number of school-based oral health programs.[2]

There are two relevant factors: first, the relationship between dental caries and social and economic deprivation is undisputed, dental caries has become concentrated in underprivileged populations. Second, the occlusal surfaces of first molars are the most highly caries-susceptible tooth structure, particularly immediately post eruption.[3] By adolescence 80% of carious lesions are found on the occlusal surfaces of first permanent molars. [3] All children are entitled to preventive and other needed dental services from an early age to optimize their chance for good oral health and the development of health-promoting behaviors.

The fact that high levels of preventable disease persists in underserved children and that the majority of these children do not access dental care provides a strong argument for enhanced efforts to address this important health problem.

Many parents and children use English as their 2nd language. In order to combat these language barriers, forms must be in available in the languages spoken. These cultural barriers have the potential to affect the level of health literacy. People with limited health literacy may have difficulty locating health providers and health services, filling out complex health forms or seeking prevention health care.

Does the participation in a school-based dental program provide satisfactory preventive services making utilization easier leading to healthier children?

Methods and Materials

A descriptive approach was used. A 20-question survey produced in English and Spanish was distributed to parents or guardians of the students in the Carlsbad School system and the Loving School system. Surveys were sent home to parents and included a letter explaining the program and the questionnaire. The student then returned surveys within one week to either their teacher or the school nurse. Participation in the study was voluntary and there was no coercion to participate. No free services were awarded for participating. The University of New Mexico's Human Research Protections Office (UNM-HRPO) granted approval for this study. Descriptive statistics were used for all

inquiries and statistical comparisons of proportions test were used to compare questions between the non-participants of the program vs the participants.

Results

Six thousand seven hundred surveys were dispersed and 748 were returned yielding an 11% response rate. Of the population 526 identified as non-participants of the school based dental program, 144 participated one time and 78 were participants of the program for 3 or more years.

A Chi-square analysis using 95% confidence interval and 1 degree of freedom was used to compare participants and nonparticipants of the school based dental program. When asked to determine if having the dental program in the school made it any easier and more available for their child to receive preventive dental care non-participants reported 76% (n= 333) that it did make it easier and 24% (n=106) said it did not. Participants of the program reported 96% (n=181) reported yes and 4% (n=8) indicated no. When comparing how the two populations a statistically significant difference was seen ($p<0.0001$). Table 1 reflects these findings.

Table 1 Does dental program in school make it easier to receive care?

	Non-participants n= 439		Chi squared	p-value	Participants n =189	
Yes	333	76%	35.777	p< 0.0001	181	96%
No	106	24%			8	4%

The study then assessed whether or not each group had a dental home or clinic that the family attended regularly. 96% of non-participants (n=498) indicated they had a dental home and 4 %(n=23) did not. Those who have participated in the program reported that 85% (n=164) do have a dental home, while 15% (n=28) do not. A statistically significant difference was seen between the groups ($p < 0.0001$) when compared. Table 2 reflects these findings.

Table 2 Do you have a dental home that you attend regularly?

	Non-participants n= 521		Chi squared	p-value	Participants n =192	
Yes	498	96%	26.171	$p < 0.0001$	164	85%
No	23	4%			28	15%

Finally, the study asked subjects if a school based dental program were not available would they still take their child to dentist for regular preventive care. Ninety-one percent (n=345) of non-participants responded yes and 9% (n=36) would not. Those that participate in the dental program reported that 96% (n=181) would seek dental care and 4% (n=7) would not. Statistical significance was seen when comparing both groups ($p<0.0317$). Table 3 reflects these findings.

Table 3 Would subjects take child to dentist if the school based dental program was not available?

	Non-participants n= 381		Chi squared	p-value	Participants n =192	
Yes	345	91%	4.614	p< 0.0317	181	96%
No	36	9%			7	4%

Discussion:

School- based dental programs bring awareness about dental health to both students and parents. Successful school-based programs depend on the collaboration of all parties involved. This includes school administration, the program coordinator, teachers, school nurses, students, and parents. The results of this study suggest that school-based programs are becoming more accepted.

School-based programs help the underserved, by affording direct access to dental services, being convenient for parents who are unable to take off from work and minimizing missed class time for the students by decreasing travel time for such services. Even the non-participants acknowledged that the school-based program makes utilization much easier. The data also suggests that there are those that feel like the school environment would make their child feel comfortable and less fearful. Twenty-nine percent of the students enrolled in the study, participated in the school-based program. Ninety-nine of those parents whose child received services from the school-based

program reported that the experience was pleasant and 93% reported that they would use the program again. This positive response indicates success of the program.

A variety of reasons were given for the low participation such as, not hearing of the program, wanting to be with their child at the appointment, not wanting to send their child to someone they did not know, they did not think their child should miss school for a dental appointment and not being able to afford the dental care. Other participants reported that they did not want their child to be fearful of going to school because of having dental treatment at the school. These findings suggest that the school-based programs are not important to all parents. Interestingly, some of the reasons provided as to why the school-based services were not utilized, are some of the most important qualities of the school-based services. Some ways to address the concerns of the parents and underutilization of services would be to work more diligently on getting the word out about the program like posting up flyers or having a small section on the school's internet page. It would be important to have forms available in different languages to address needs of parents. Schedules can be made to allow parents to be present during the appointment and if parents are unable to afford services the director of the school –based program could work on a payment plan and help them get signed up for assistance with Medicaid or Chip programs.

The majority of this study population indicated they had a dental home and used the school-based program primarily for preventive services that included prophys, radiographs, sealants, and fluoride treatments. Radiographs are an important and

necessary diagnostic service for the detection of caries. Data from this study revealed 64% of students had not received radiographs. This could be an inaccurately reported number as parents were asked to recall from memory this information and may not remember correctly if their child had x-rays taken. Fluoride continues to remain the most effective tool in the caries prevention armamentarium, [4] but is only applied if approved by the parent. Data showed 34% of students received professional fluoride treatments.

The use of dental sealants to prevent tooth decay has been increasing in recent years. According to the Association of State and Territorial Dental Directors a 60% decrease in tooth decay has been documented when sealants are provided through a school-based or linked program.[2] The data in this study showed 57% of children never had sealants. Again, this could be an inaccurately reported number as parents were asked to recall from memory this information and may not remember correctly if their child had sealants.

Assessing the number of students that scheduled and presented to a dentist after being referred by the school-based program was very encouraging. Sixty-three percent saw a dentist for a dental exam after being seen by the school-based dental clinic. Sixty-one percent of parents reported that their child had no tooth decay. Fifteen percent reported decay on one tooth, 17% reported two decayed teeth and only 7% reported more than two teeth decayed. Eighty percent had the required treatment with the dentist completed. This is typically not the norm for the school-based clinic.[5] Many times urgent referrals will receive follow-up care but smaller non-emergent needs are often not a

priority. An indicator of the importance placed on oral health care by the parent is a follow-up care obtained by the child. In a study reported by the Journal of Public Health Dentistry, children without receipt of follow-up had caregivers who were likely to report not visiting a dentist within the last five years and a greater number of missed days from work due to dental problems.[6]

Study Limitations:

Weaknesses:

A limitation in the study is using a self-reported survey design. This relies solely on the parent's ability to accurately remember or observe the behavior or the procedure being done. This may lead to some questions being answered inaccurately because parents were answering for services that were done on their children by memory.

Future Implications:

Children are "slipping through the cracks" so to say and the school-based dental program may be one answer to treating these children by making dental treatment more accessible and utilization easier. Communication is the key to the success of the program.

The Affordable Care Act continues to provide millions of additional children with dental coverage. The need to continue making sure children are being offered the opportunity to continue dental coverage is so important. Educating the parents through

the school-based clinics by communication and by forms in English and other spoken languages on oral health care and the body connection is a high priority. The future may bring medical-dental collaborations. School-based clinics with both medical and dental are a possibility. Continue to increase the use of sealants as recommended by *the Healthy People 2020.*[7]

Conclusion:

Studies suggest that parents with more education have a direct effect on the oral health behaviors of their children.[8] The data speaks very strongly for how the parents feel about oral health and its effect on the whole body. Nine-five percent reported value on oral health care. The majority of parents, though having a high school education or less, still felt that dental health was very important and they had a strong interest in their child's oral health.

The research study suggests that the school-based dental programs are an acceptable mode of oral health care for children. They help to solve the access to care problem and make utilization of services easier. Taking the program into the school environment not only serves more children but exposes them to a world of dental health that they might not ever be a part of. The school environment is the ideal place for the development of oral health programs, allowing children and young people to learn healthy oral behaviors, which lead to optimum overall health.

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Appendices

Appendix A-HRPO Approval Letter

Human Resources Review Committee
Human Research Protections Office

October 26, 2016

Diana Aboytes
DAboytes@salud.unm.edu
Dear Diana Aboytes:

On 10/26/2016, the HRRC reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	The Assessment of a School-Based Dental Program May be the Answer to Better Utilization of Services
Investigator:	Diana Aboytes
Study ID::	16-35
Submission ID:	16-359
IND, IDE, or HDE:	None
Submission Summary:	Initial Study
Documents Approved:	• UNMHSC-Consent-Survey-Research SBHC Dental.pdf • HRP-583 - Exempt protocol.pdf • UNMHSC-Consent-Survey-Spanish-SBHC Dental.pdf • School permission to conduct research • School permission to conduct research • Survey-SBHC Dental English.pdf • Survey-SBHC Dental Spanish.pdf
Review Category:	EXEMPTION: Categories (2) Tests, surveys, interviews, or observation
Determinations/Waivers:	Provisions for Consent are adequate. HIPAA Authorization Addendum Not Applicable
Submission Approval Date:	10/26/2016
Approval End Date:	None
Effective Date:	**10/26/2016**

The HRRC approved the study from 10/26/2016 to inclusive. If modifications were required to secure approval, the effective date will be later than the approval date. The "Effective Date" 10/26/2016 is the date the HRRC approved your modifications and, in all cases, represents the date study activities may begin.
Because it has been granted exemption, this research is not subject to continuing review.

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

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

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

Sincerely,

Thomas F. Byrd, MD
HRRC Chair

Appendix B-Consent letter: English

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

STUDY TITLE
The Assessment of a School-Based Dental Program May be the Answer to Better Utilization of Services

Diana Aboytes, RDH and Peggy Hyden, RDH from the Department of Dental Medicine, is conducting a research study. The purpose of the study is to establish the acceptance and the benefits of the school-based dental program. You are being asked to participate in this study because your son or daughter is enrolled in the Carlsbad or Loving school district.

Your participation will involve completing a survey. Upon completion of the survey return it to your child's teacher. The survey should take about 15 minutes to complete. Your involvement in the study is voluntary, and you may choose not to participate. There are no names or identifying information associated with this survey. The survey includes questions such as "has your child participated with the school-based dental program" and "Do you feel having the dental program in the schools makes it much easier and more available to receive preventive dental care for your child?". You can refuse to answer any of the questions at any time. There are no known risks in this study, but some individuals may experience discomfort when answering questions. All data will be kept for 30 days in a locked file in Peggy Hyden's office and then destroyed.

The findings from this project will provide information on the utilization of dental services offered in the schools. If published, results will be presented in summary form only.

If you have any questions about this research project, please feel free to call Diana Aboytes at (505) 272-3641. If you have questions regarding your legal rights as a research subject, you may call the UNMHSC Office of Human Research Protections at (505) 272-1129.

By returning this survey in the envelope provided, you will be agreeing to participate in the above described research study.

Thank you for your consideration.

Sincerely,

Diana Aboytes, RDH , Assistant Professor
Peggy Hyden, RDH, Graduate Student

HRRC#16-359
Version Date 10/7/2016

Appendix C-Consent letter: Spanish

Universidad de Nuevo México Centro de Ciencias de la Salud
Forma de Consentimiento para un Cuestionario Anónimo

Título del Estudio
El Avalùo de un Programa Dental en las Escuelas pueda ser la Soluciòn para una Mejor Utilizaciòn de los Servicios

El Departamento de Medicina Dental, Diana Aboytes, RDH y Peggy Hyden, RDH del Division de higiene dental están conduciendo un estudio. El propósito del estudio es establecer los beneficios de la programa dental de las escuelas . A usted se le ha pedido que participe en este estudio porque su hijo/a esta inscrito en una esculea dentro del districto de Carlsbad o Loving .

Su participación va a envolver completar una encuesta. Devuelve la encuesta completada a la maestra de su hijo/a. El cuestionario va a tomar cerca de 15 minutos para completarlo. Su participación en el estudio es voluntaria, y puede decidir no participar. No va a haber nombre o información que lo/a relacionen con este estudio. El cuestionario incluye preguntas como ¿ha participado su hijo/a en la programa dental en la escuela? y ¿cree Ud que este programa dental en las escuelas lo haga mas facil y disponible recibir el cuidado dental preventive para su hijo/a?. Puede decidir no contestar alguna o varias preguntas en cualquier momento. No hay riesgos conocidos en este estudio, pero algunas personas pueden experimentar malestar al contestar algunas preguntas. Todos los datos se van a guardar por 30 dias en una oficina bajo llave en la officina de Peggy Hyden y luego serán destruidos.

Los resultados de este estudio proveerán información sobre la utilizicion de los servicios que ofrecen la programa dental en las escuelas. Si publicamos los resultados del estudio, será únicamente en forma de sumario y no de casos en particular.

Si tiene alguna pregunta acerca de este estudio, por favor llame a Diana Aboytes al (505) 272-3641. Si tiene preguntas acerca de sus derechos como participante en este estudio, puede llamar al Comité de Revisión de Investigaciones Humanas de la Universidad de Nuevo México al (505) 272-1129.
El Comité de Revisión de Investigaciones Humanas de la Universidad de Nuevo México es un grupo de personas de la Universidad y la comunidad que provee supervisión independiente de la seguridad y ética relacionadas con estudios de investigación en humanos. Para más información, puede entrar a su sitio web a http://hsc.unm.edu/som/research/hrrc/.

Al retornar este cuestionario en el sobre provisto, usted estaría de acuerdo en participar en el estudio descrito arriba.

Gracias por su consideración.

Sinceramente,

Nombre del Investigador y Departamento
Diana Aboytes, RDH, MS Profesora
Peggy Hyden, RDH Estudiante graduada

HRRC#16-359
Version Date 10/7/2016

Appendix D-Survey

Please check the answer that best explains

1. How many years of school did you complete?
   12 or less___
   Some college___
   Associate degree or higher___

2. Has your child participated with our school-based dental program?
   Number of years____
   Only one time___
   Never___

3. If your child participated was the experience pleasant?
   Pleasant___
   Unpleasant___

4. Did you receive a form after your child was seen explaining all treatment done and further treatment needed?
   Yes___
   No___

5. How would you rate the oral health of your child?
   Excellent___
   Good___
   Fair___
   Poor___

6. Did your child have cavities found during the appointment?
   None___
   One___
   Two___
   More than two___

7. Did your child already have sealants, or were they placed at the appointment ?
   Already had sealants___
   Had sealants done by Smart Smiles___
   Never had sealants___

8. Did your child receive x-rays?
   Yes___
   No___

9. Did your child receive a fluoride treatment?

Yes___
No___

10. Was your child seen by a Dentist after he/she was seen?
    Yes___
    More than once___
    No___ If no, please share why_____

11. Was the treatment with the dentist completed?
    Yes___
    Almost___
    No___ If no, please share why_____

12. If the school-based dental program wasn't available would you have taken your child to the dentist for their regular preventive care?

    Yes___
    No___ If no, please share why_____

13. Do you feel having the dental program in the schools makes it much easier and more available to receive preventive dental care for your child?
    Yes___
    No___ If no, please share why_____

14. Would you use this program again?
    Yes___
    No___ If no, please share why_____

15. Were you pleased with your child missing less time from class and you not having to miss work to allow your child to receive dental care?
    Very much so___
    Not so much ____
    Did not affect me__
    No opinion___

16. Do you already have a dental home or clinic that you and your family attend regularly?

    Yes___
    No___

17. Do you value oral health care and the impact it has on the health of the whole body?
    Yes___
    No___

18. Do you feel that your child being in his/her school environment makes him more comfortable and less fearful of having treatment done on his/her teeth?
    Yes___
    No___

19. Studies have shown that children who receive preventive dental care early in life will encounter a 40% reduction in overall dental costs when compared to children who do not receive care. Would this be something that would catch your attention?
    Yes___
    No___

20. How can we improve your child's experience with a school-based dental program?

Appendix E

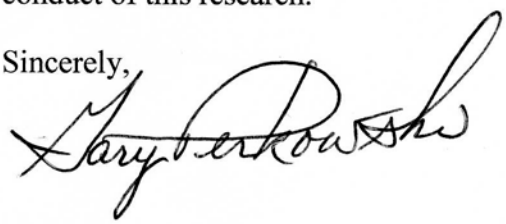
SCHOOL PERMISSION TO CONDUCT RESEARCH

August 29, 2016

Dear Institutional Review Board:

The purpose of this letter is to inform you that I give *Diana Aboytes, RDH Principal Investigator and Peggy Hyden, RDH co-investigator* permission to conduct the research titled *The Assessment of a School-Based Dental Program May be the Answer to Better Utilization of Services* at The Carlsbad Municipal Schools. This also serves as assurance that these schools comply with requirements of the Family Educational Rights and Privacy Act (FERPA) and the Protection of Pupil Rights Amendment (PPRA) (see back for specific requirements) and will ensure that these requirements are followed in the conduct of this research.

Sincerely,



Appendix F

SCHOOL PERMISSION TO CONDUCT RESEARCH

August 29, 2016

Dear Institutional Review Board:

The purpose of this letter is to inform you that I give *Diana Aboytes, RDH Principal Investigator and Peggy Hyden, RDH co-investigator* permission to conduct the research titled *The Assessment of a School-Based Dental Program May be the Answer to Better Utilization of Services* at The Loving Municipal Shools. This also serves as assurance that these schools comply with requirements of the Family Educational Rights and Privacy Act (FERPA) and the Protection of Pupil Rights Amendment (PPRA) (see back for specific requirements) and will ensure that these requirements are followed in the conduct of this research.

Sincerely,

Ann Lynn McMurray
Superintendent