

Preventive Services Program: A Model Engaging Volunteers to Expand Community-Based Oral Health Services for Children

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Introduction

Oral Health in America: A Report of the Surgeon General summarized the significance of oral health, identified the current evidence that dental caries is preventable and documented the profound disparities that affect the poor, the geographically isolated and those with special oral health care needs.¹ In response to this report, another report was developed - The National Call to Action to Promote Oral Health. The National Call to Action laid out three national goals:²

- Promote oral health
- Improve quality of life
- Eliminate oral health disparities

The Call to Action acknowledges that success requires collaboration between the public, health professionals and policy makers.² Furthermore, the Call identified 5 specific actions to meet their goals:²

- Change perceptions of oral health
- Overcome barriers by replicating effective programs and proven efforts
- Build the science and accelerate science transfer
- Increase oral health workforce diversity, capacity and flexibility
- Increase collaborations

As a response to the Call to Action, Missouri set out to document the oral health needs of its children. The "Show Me Your Smile" survey was conducted in Missouri from 2004 to 2005, to collect baseline information about the oral health of Missouri children.³ Oral screenings were conducted on third graders throughout the state, by 11 dental hygien-

Abstract

Purpose: This paper describes the Preventive Services Program (PSP), a community based oral health program model which engages volunteers to provide preventive services and education for underserved children in Missouri. In 2006, the Missouri Department of Health and Senior Services created a program for children designed to use a systems approach for population-based prevention of oral disease. Currently, 5 part-time dental hygienists serve as Oral Health Program Consultants to work with the citizens of a community to engage dentists, dental hygienists, parents and other interested stakeholders in the activities of the program. Dental volunteers evaluate oral health and disease in the community's children and facilitate referrals for dental care. Other volunteers apply fluoride varnish and provide educational services to the children.

Program Outcomes: In 2006, 273 volunteer dentists and dental hygienists and 415 community volunteers provided oral screenings, oral health education, 2 fluoride varnish applications and referral for unmet dental care for 8,529 children. In 2011, 775 volunteer dentists and dental hygienists and 1,837 other community volunteers provided by PSP services to nearly 65,000 children.

Conclusion: It has been demonstrated that when the local citizens take responsibility for their own needs that a sustainable and evidence-based program like PSP is possible. Guidelines which provide criteria for matching models with the specific community characteristics need to be generated. Furthermore, a national review of successful program models would be helpful to those endeavoring to implement community oral health program.

Keywords: population-based, oral health education, preventive services, fluoride varnish, community-based models, community volunteers

This study supports the NDHRA priority area, **Health Promotion/Disease Prevention:** Validate and test strategies that increase health promotion and disease prevention among diverse populations.

ists, using the protocol and diagnostic criteria developed by the Association of State and Territorial Dental Directors.⁴

The "Show Me Your Smile" study describes the study population and data collected from randomized oral screenings of 3,525 third grade students

from 113 Missouri elementary schools during the school year of 2004 to 2005.⁵ Key findings gathered from the data include:

- Fifty-five percent had a history of tooth decay
- Twenty-five percent had untreated dental decay
- Five percent had some form of urgent dental care need (often demonstrated as a painful lesion which interfered in school, play or daily life activities)
- Twenty-nine percent had dental sealants
- The amount of untreated dental decay was twice as high for African American children when compared to white children
- Children from Missouri schools where at least 75% of children qualified for free or reduced lunch programs had a higher rate of decay and lower percentage of dental sealants

The report concludes that considerable progress must be made if Missouri is to meet the Healthy People 2010 oral health objectives.⁶ To address the findings of the 2004 to 2005 survey, the Missouri Oral Health Preventive Services Program (PSP) was developed to facilitate community-based health interventions utilizing local partnerships.⁷ This paper will describe the PSP, a community based oral health program model which engages volunteers to provide preventive services and education for underserved children in Missouri. In addition the authors will discuss lessons learned, future plans and recommendations.

Evidence to support the efficacy of fluoride varnish programs has been well-established in the literature, and many states and local groups have incorporated varnish programs as interventions to promote oral health among their citizens.⁸⁻¹⁴ Fluoride varnish is cost effective, easy to apply and simple to implement in a public health setting. Additionally, application of fluoride varnish is adaptable to many types of populations including young children, adults with high caries risk and people with special health care needs. Weintraub suggests that fluoride varnish programs for people with special needs and adults with high caries risk will be superior to meeting the challenges presented with rinses and tray applications.¹⁵⁻¹⁷ This adaptability allows fluoride varnish to be a benefit to a wide variety of people within a community.

Programs are more likely to be successful if local citizens participate. Involvement develops a sense of community responsibility and plays a large role in program sustainability. Partridge et al discussed the success of a local cancer screening program when the community members came together to

build a feeling of mutual trust, shared experience and volunteer empowerment.¹⁸ The concept of community collaboration was recognized and promoted in The National Call to Action.² This publication suggested that the lay public, policy makers and health professionals responding to the Call "... need to work as partners, sharing ideas and coordinating activities to capitalize on joint resources and expertise to achieve common goals."²

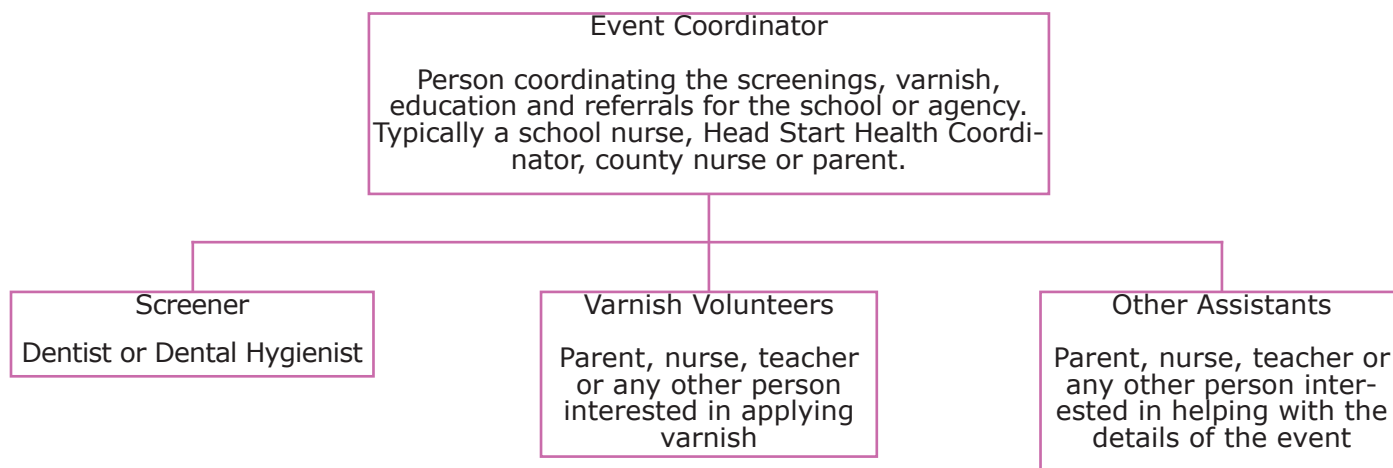
The Chronic Care Model suggests the importance of community partners, families and health care professionals working together to improve the health of individuals.¹⁹ This model places the responsibility of health management equally on lay persons as well as health care professionals. The Cochrane Collaboration conducted a systematic review to examine the efficacy of health programs which involved lay people in the implementation. A total of 82 studies were examined and the majority of them spoke favorably of the collaboration of lay people with health care professionals.²⁰ A number of models exist that describe oral health programs for delivery of care to children in school based settings. Albert et al lists several of these, which include placing a dental health center directly in a school, collaborations between schools and community clinics and programs which provide screenings and preventive services only in the school setting. The authors speak of the need for these programs to be sustainable and replicable.²¹

Simpson has proposed a model that illustrates a framework for sustainable oral health interventions.²² This multilevel model is built around 4 stages of implementation which, if embraced, will lead to long-term sustainability. The 4 stages include effective training and program dissemination, adequate planning and program adoption, effective implementation, and continual practice and improvement. Simpson offers the analogy of comparing a seed which is left unattended with the seed that is cultivated and nurtured. Much like the unattended seed, programs which do not embrace the multiple stages of program growth will become haphazard and short-lived. Those which follow a sustainability framework, or like the nurtured seed, will more likely have a long term impact.²²

Preventive Service Program Description

PSP, although available to all children in the state of Missouri (infant to 18 years of age), is targeted toward the populations of underserved and low income children in rural areas of the state and is offered free of charge to all communities. This program is a partnership between the Missouri Department of Health and Senior Services (5 part-

Figure 1: Individual Volunteer Roles and Responsibilities for the Implementation of a PSP Event



time oral health consultants), the Maternal and Child Health Bureau (funding organization), public schools, head start facilities, local community volunteer dentists and dental hygienists, and volunteer lay members of the community who help facilitate program implementation. The collaborative actions among these community volunteers who share a common purpose are dedicated to improving the oral health of children in their communities.

The program involves 4 components. The first is an evaluation of the state of oral health/disease in the community's children through annual oral screenings. The second component ensures that all children receive toothbrushes, toothpaste, floss (age appropriate) and educational materials/presentations. The third component is the application of fluoride varnish 2 times per year. Positive parental consent is required for applications of the fluoride varnish. The fourth component establishes a referral network for immediate/urgent needs identified during the oral screenings. PSP is offered free of charge to all communities and utilizes local community dentists, dental hygienists and other volunteers for implementation.⁷ The following sections will describe program training, planning, and implementation in detail.

Training (Dissemination)

The PSP utilizes local community dentists, dental hygienists and other volunteers to sustain and support the program.⁷ Figure 1 describes the roles of the various volunteers participating in a PSP event. The participation of community-wide volunteers is essential to the implementation and success of the PSP.⁷ Volunteers are recruited from the community and are assisted by 5 part-time dental hygienists known as Oral Health Consultants (OHC). Community dentists and dental hygienists are recruited by

personal contacts or in some cases from a form letter provided by the OHC. Others are recruited from a local list of individuals who have completed the online PSP calibration session. Lay volunteers are typically parents, grandparents, teachers and health clerks.

Each OHC is responsible for a specific region of the state and has become locally known to most of the volunteers. This key element of utilizing local volunteers allows the community to be invested in the health of their own communities.⁷

Training and distribution of materials are key responsibilities undertaken by the OHCs, who work individually with local event organizers to coordinate paper work, order supplies and make suggestions for successful implementation of PSP.⁷ All volunteers are trained online via a 30-minute voice-over PowerPoint course prior to participating in a PSP event. Two specific courses are offered - 1 for dental professionals conducting the screenings and 1 for volunteers who will be applying fluoride varnish. Dental professionals are instructed on how to complete the screening form and other community volunteers learn application techniques for the fluoride varnish.²³ During the oral screening course all participants are calibrated on how to complete the screening form with correct information. For example, decay must be obvious and visible with a flashlight and mouth mirror. No explorer or other instruments are used. Other community volunteers learn fluoride varnish application techniques by participating in a 30 minute course. The course provides the volunteer detailed instructions using photographs that demonstrate the application process. In addition, information about the benefits of fluoride varnish is included. The Missouri Dental Board does not regulate the actions of lay volunteers. The fluoride varnish training program for

the PSP has been reviewed by the Missouri Dental Board and the Missouri Dental Association.^{24,25}

Adoption (Planning)

The decision to adopt PSP is usually made at an administrative level. For example, in a school district, the principal or school board often makes the final decision as to whether PSP will be implemented. The needs of the community are well-known to the local leaders and access to services is linked with those needs via the OHCs. The OHCs make access to this state resource affordable, convenient and compatible with the specific needs of the community. The recommendation to adopt is often brought forward by a school nurse, concerned parent or health department leader. These individuals make the choice to proceed based on program adaptability and flexibility.

Champions were developed at the inception of PSP. Meetings were held with state wide groups such as the Head Start Collaborative, the Missouri Coalition for Oral Health and the Missouri School Nurses' Association. Leaders within the state Department of Health and Senior Services and Missouri Dental Board were called upon to embrace the program and offer support. Local dental and dental hygiene societies were contacted to identify leaders to champion the program back to communities. Collectively, this networking created support for the decision to adopt PSP in the local community.⁵

Implementation

In an effort to "not recreate the wheel," Missouri offers PSP as a package of materials, forms, training and instructions that can be used by each local community. This allows the community to proceed with PSP without a great deal of up-front development. Forms are versatile and modifiable for use by a specific population. For example, the permission/consent form can be replicated on agency-specific letterhead which allows the community an easy adoption process without the need for time-consuming form development.^{5,7}

Resources such as toothbrushes, toothpaste, floss (if age appropriate) and educational materials are provided by the state. Timing of the shipments to the local organizations is facilitated by the OHCs. The no-cost element of the program makes implementation possible for many groups. If costs were imposed, participation would most likely decrease.^{5,7}

PSP requires 2 events throughout the year. Typi-

cally 1 event is held in the fall of a school year to provide the screenings and first fluoride varnish application, and 1 event is held in the spring to apply the second fluoride varnish.

Program Outcomes

The overarching goal of the PSP is improvement in oral health of a community. In public health, the community is the patient.²⁶ Individual students were not followed, but rather, the oral health of a group of school children in 1 year was compared to the oral health of a similar group of children 4 or 5 years later. PSP utilized a screening instrument modified from the Association of State and Territorial Dental Directors, the Basic Screening Survey.⁴ This instrument measured sealants, untreated decay, treated decay, treatment urgency, oral hygiene, rampant decay and white spot lesions. Data from 4 different communities, geographically scattered around the state of Missouri, were used to illustrate the success of the program.

The communities selected had participated in the program for 4 to 5 years, and in the case of the Head Start group represented a unique age group. Table I displays the percent of children with untreated decay, treated decay and treatment urgency ratings for those selected communities.^{5,27,28} The positive outcomes of PSP in a fifth grade population are displayed in Table I. The untreated decay in this representative population decreased from 52 to 13%, indicating a decrease in caries activity among fifth graders measured year 1, and fifth graders measured year 5. Similar results with a decrease in untreated decay are found in the other representative groups of third graders (44.9 to 39.7%), second graders (42.5 to 26%) and Head Start children (38 to 20%).

Two of the 4 groups demonstrated a greater percentage of treated decay at year 5 (year 4 for the Head Start children). Third graders and Head Start children demonstrated a much greater percentage of treated decay after several years in the program than the fifth and second graders. This could be due to a lower decay rate and the lesser need for restorative treatment. It may also indicate that the community has spent time establishing referral sources that are accepting and treating cases. The third column represents the percentage of urgent care needed within the population. Urgent care as defined in the PSP is an abscess, swelling or pain. It appears that, with the exception of second graders at year 1, most of the treatment urgency ratings hovered between 0.03 to 0.09%.

Table I: Percentage of Children with Untreated Decay, Treated Decay and Urgent Treatment Needs

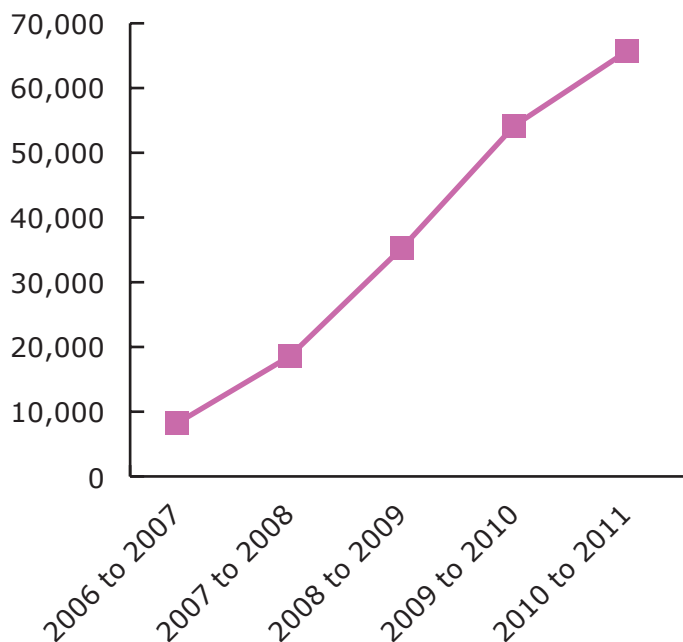
Population	Untreated Decay		Treated Decay		Treatment Urgency	
	Year 1	Year 5	Year 1	Year 5	Year 1	Year 5
School #1 Fifth Grade Year 1 (n=19) Year 5 (n=15)	52%	13%	47%	13%	0.05%	0.06%
	Year 1	Year 5	Year 1	Year 5	Year 1	Year 5
School # 2 Third Grade Year 1 (n=167) Year 5 (n=165)	44.9%	39.7%	28.7%	39%	0.04%	0.03%
	Year 1	Year 5	Year 1	Year 5	Year 1	Year 5
School # 3 Second Grade Year 1 (n=54) Year 5 (n=69)	42.5%	26%	38.8%	35%	14.8%	0.07%
	Year 1	Year 4	Year 1	Year 4	Year 1	Year 4
School #4 Head Start Year 1 (n=62) Year 4 (n=92)	38%	20%	0.08%	19%	0.06%	0.09%

The number of participants can be another measure of success for a program. When the PSP began in the fall of 2006, a total number of 8,259 children participated.^{5,27} During the last 5 years the total number of children receiving PSP services has significantly grown (Table II). Data from the 2010 to 2011 fiscal year indicates that the number of children participating in PSP has increased to nearly 65,000.^{5,27} Table III indicates the number of children that received the first and second applications of the fluoride varnish from 2008 through 2011.

Not only have the number of children participating increased, but also the number of community volunteers (Table IV). In 2006, approximately 273 volunteer dentists and dental hygienists and approximately 415 other volunteers throughout a variety of counties in the state offered their personal time to assist with PSP. During the 2010 to 2011 school year, approximately 775 dentists and dental hygienists and approximately 1,837 other volunteers offered to assist with this program.^{4,5,27}

The "Show Me Your Smile" survey was repeated in 2009 to 2010 as a comparison to the 2004 to 2005 survey. Although this survey was not intended to specifically evaluate PSP and the time frame had been very short between inception of the program and the follow up "Show Me Your Smile" sur-

Table II: Growth in the Number of Children Participating in the PSP from 2007 to 2011



vey, a small improvement was noticed.^{3,5,29} Table V compares data on the percentage of third graders with no obvious problems, a need for early dental care, and a need for urgent dental care from the "Show Me Your Smile" survey of 2005 and 2010.

Discussion

Long-lasting sustainability of oral health interventions depends on “service and organizational readiness, sufficient resource allocations and supportive team climate which include proper coordination of staff roles to maintain successful intervention implementation.”^{22,30,31} The increased number of Missouri children receiving PSP oral screenings from 2007 to 2011 combined with the increased number of dental professionals and other volunteers assisting with PSP clearly illustrate that these parameters have been in place. A number of enhancements since the inception of the program have been implemented which add to the success that is demonstrated. These include the development of on-line volunteer training, an increase in number of OHCs and the development of a program-specific website.

However, despite its success, the PSP is not without barriers and challenges. Demonstration of successful outcomes is imperative to maintaining the program. Now that the program has been active for 5 years, it is time to do a full program evaluation. This evaluation should include focus group interviews with parents, school nurses and administrators. Individuals with the state’s Department of Health and Senior Services (DHSS) need to be queried for evaluative data. This would include DHSS administrators, the OHCs and staff who assist with the inventory and distribution of supplies. Furthermore, the cost effectiveness of the program should be evaluated to determine the numbers of children who have benefited and the costs per child.

Both the adoption of PSP and training of volunteers are necessary steps in preparation for the program. Success will not be possible without the readiness of the services and the community. The following example illustrates this concept. In 2007, a local school district in a small Missouri town, population 8,500, chose to implement the program and began the planning and preparation. The program was championed by a concerned school nurse and approved by the school board. As the planning process continued, it became evident that some in the local community

Table III: Number of Missouri Children Receiving the First and Second Applications of Fluoride Varnish from 2008 to 2011

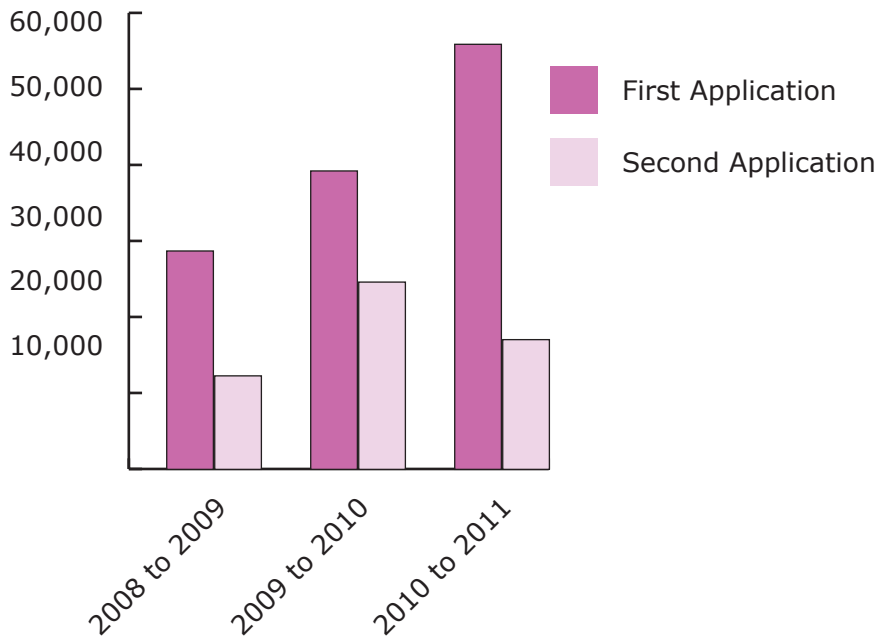
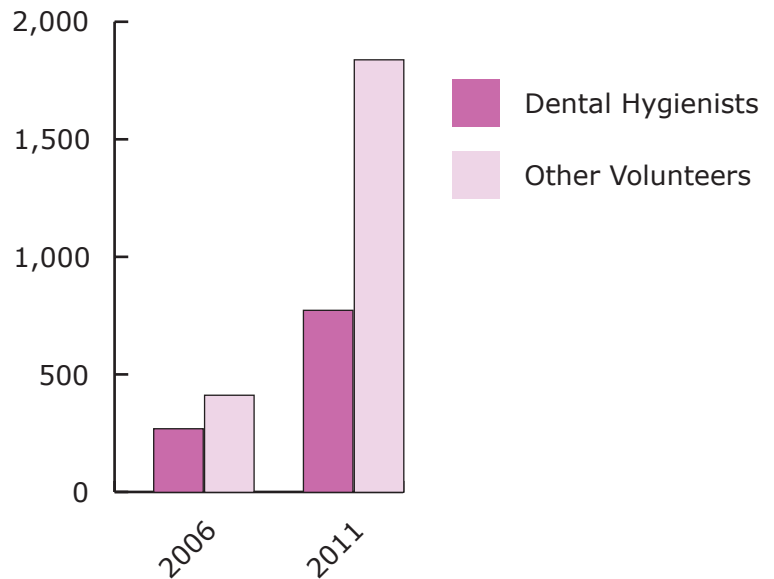


Table IV: Increase in the Number of Dental Professionals and Other Volunteers Assisting with PSP from 2006 through 2011



were not ready for the adoption of the program and the process was halted.^{5,7} This example,²² when applied to Simpson’s Stages of Implementation Process, graphically illustrates how the process cannot be sustained if there is not a readiness to proceed and the program is fully adopted.

The barriers of time, space and resources need to be dealt with continually. Most of the programs occur during the fall and spring and this presents calendar challenges.⁷ These 2 seasons are often busy with other school events, such as sports, festivals, stu-

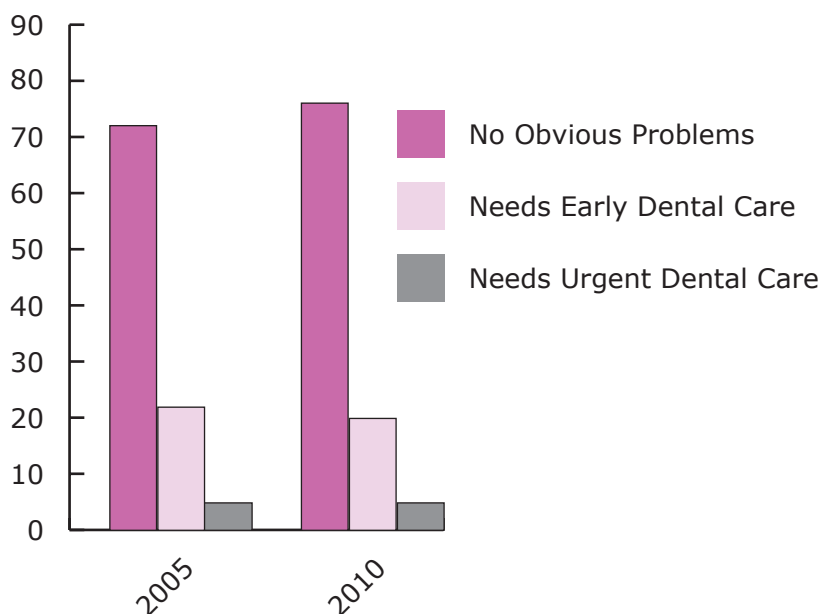
dent testing and musical programs. Time to conduct a PSP event is not always a priority due to other school-related activities. Space utilization is another common barrier. A PSP event is usually held in a large area such as a cafeteria, library or school gymnasium. Individuals are sometimes resistant to the intrusion of PSP in these spaces. Another limitation that can influence the amount of children participating is the return of the permission/consent letter. The coordinator of the PSP event must be diligent and encourage participation by communicating with the parents to return the signed letter. Without positive consent, the child may not participate in the event. A program that has been thoroughly researched, is well-accepted and is meticulously planned can easily falter at this point if turf battles ensue. The importance of planning with all stakeholders is vital to avoid these problems. Of course, the barrier of funding can cause immediate problems if resources are decreased or eliminated. PSP is nearly at capacity and needs additional funding to expand.

The decision to repeat the process in succeeding years is an important one that must be determined. It is essential that this decision is consciously made by the community at the end of each program so that planning for the future remains an on-going process.^{5,7,22} The program should be evaluated from a materials and costs point of view. Furthermore, the smoothness of delivery is critical to consider. Barriers experienced during training, adoption and/or implementation can choke off sustainability.

The role of the OHC is extremely important. The OHC communicates with the local agency to determine the willingness to proceed for the coming year. If barriers were encountered, it is here that solutions can be created. Excellent service from an OHC and the timely delivery of materials and supplies can be major determinants in whether a program is sustained. It is important to continually develop the skills and knowledge base of the OHCs so that their service will be valuable to the communities.

Data collected from PSP is very beneficial. The data provides a snapshot of the oral health of children in Missouri. These data are valuable to future planning decisions. It is important to keep in mind that the data are only as accurate as the ability of the professionals collecting the data. Although all professionals complete an online training program, dis-

Table V: Comparison of "Show Me Your Smile" Survey Data from 2005 and 2010. Percentage of Third Graders with No Obvious Problems, Early Dental Care needs and Urgent Dental Care needs



Early Dental Care: refers to tooth decay not associated with symptoms, spontaneous bleeding of gingival tissues, soft tissue lesions or faulty fitting appliances.

Urgent Dental Care: refers to pain, swelling, infection, or soft tissue ulceration of more than two weeks.

crepancies will still exist in determination of disease status. Therefore, those making program decisions should bear in mind that calibration issues will exist with data collection. The same will be true for the application of fluoride varnish. Volunteers, although trained, will develop a personal system that will vary from that used by others.

Careful planning needs to go into developing a referral protocol for children with dental decay, especially those with urgent needs. This can be a barrier to success when dental care is located sparsely across a large geographic area. Also financing the follow-up care can be difficult when uninsured children are involved. Creative strategies will need to be sought to overcome these barriers.

New models will continue to emerge as the efficacy of varnish programs is demonstrated. It is important to bear in mind that the model for this program may evolve over time. Several other states have programs utilizing fluoride varnish.³²⁻³⁵ These programs are aligned in such a way as to meet the oral health objectives of the respective state. Some programs utilize pediatricians and nurse practitioners to place the varnish at well-baby checks. Other programs utilize the certification visits through Woman, Infant and Children (WIC) to serve as the venue for delivery of

the varnish. Fluoride varnish is an evidenced based treatment for the prevention of dental decay and its utilization in a variety of programs is to be expected.

Conclusion

The PSP, a community-based oral health program, has been successful in reaching a large number of children and improving their oral health through the use of volunteer training, community adoption, individualized planning, program implementation including the development of a referral network and continuous evaluation. It has been demonstrated that when the local citizens take responsibility for their own needs that a sustainable and evidence-based program like PSP is possible. Guidelines which provide criteria for matching models with the specific community characteristics need to be generated. Furthermore, a national review of successful program models would be helpful to those endeavoring to implement community oral health programs.

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