Parents' Experiences with a School-based Dental Sealant Project in Central Appalachia: A Qualitative Study

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Objective: In this study, I describe parents' experiences with a rural school-based dental sealant project (SBSP), a *Healthy People 2020* objective for optimizing population-level protection against dental decay and reducing oral health disparities. **Methods:** I conducted parent interviews (N = 16) and coded them with NVivo 10, using deductive and inductive codes, from which I identified themes. **Results:** Parents enrolled children in the SBSP based on their confidence in local public institutions and the project's convenience and accessibility. Parents did not understand the prevention orientation of the project, what services were offered or delivered, service limitations, or next steps, in particular their need to complete referrals to dentists. Parents' recommendations for program improvement included strengthening communications and reviving a defunct dental public health mobile unit that had previously treated children's existing dental problems. **Conclusions:** SBSPs should proactively identify and address family and contextual factors when planning and implementing projects. SBSPs should also strengthen case management capacity, collaborate with schools to bolster communications and message clarification, and be relieved of administrative and duplicate travel burdens that impede team members' capacity to fulfill technical and case management-oriented duties, namely support the transition and maintenance of children into dental homes.

Key words: oral health disparities; school health; dental sealants; dental hygienists; parents; Appalachian health
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Tooth decay (also known as dental caries or cavities) is the most common chronic disease of school-aged children in the United States (US).[1] Dental decay causes pain and psychosocial suffering, susceptibility to subsequent dental and other health problems, and education-related consequences, including school absenteeism, difficulty concentrating, and diminished school performance.[2-5] Whereas behaviors such as limiting sugar intake, drinking fluoridated water, and practicing home hygiene impede caries onset and development, simple evidence-based preventive services reduce incidence both among individuals and at the population level.[6,7] Dental sealants are thin plastic coatings that are painted on the chewing surfaces of teeth to protect them from lingering food particles that, when metabolized by some oral microorganisms, begin the decay process.[8,9] Dental providers place sealants on pristine permanent teeth, in particular molars when they erupt, typically between ages 6 and 11.[10]

Sealants are clinically-effective and cost-effective, and reimbursed by all major insurers in the US including public insurers.[7-10] Among the appeals of dental sealants is their ease of use, without compromising the quality of the treatment. Dental sealants can be safely and effectively delivered using portable equipment and placed by dentists, dental hygienists, and dental therapists. Yet, sealant coverage is not adequate among patients groups who both bear the majority of unmet dental needs and are historically the most excluded from care – resource-lim-

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ited, publicly insured, and under-insured people, racial, ethnic, and linguistic minorities, and rural populations.[11-13] Accordingly, the Association of State and Territorial Dentists, the American Academy of Pediatric Dentistry, and many other national oral health and children's health stakeholders recommend delivering sealants in community settings. School-based sealant programs (SBSPs) demonstrably improve sealant coverage and make substantial gains toward dental sealant and oral health parity at a saved cost to society.[15-19] Increasing the proportion of US children age 6 and older who have received dental sealants on one or more of their permanent molars and the proportion of school-based health centers with an oral health component including dental sealants are *Healthy People 2020* Goals OH-12.2 and 12.3 and OH-9.1.[7]

SBSP implementation guidance emphasizes the importance of cultivating relationships, in particular with school leadership and personnel.[20,21] The CDC's Community Preventive Services Task Force, the School-Based Health Alliance, and other SBSP stakeholders also recommend, broadly, that SBSPs engaging parents in implementing projects, consistent with evidence of parents' influence on children's oral health, healthcare utilization, and participation in school health programs.[22-27] Yet, this topic remains inadequately explored in the scientific literature. This research responds to that knowledge gap.

In this paper, I examine parents' experiences with an SBSP in a rural Dental Health Professional Shortage Area (DHPSA) characterized by a disproportionately high burden of dental problems and co-morbid conditions, and high rates of poverty, disability retirement, and Medicaid enrollment.[28] The SBSP, which occurred in 7 counties in southwest Virginia, was initiated, staffed, and supported by the Virginia Department of Health (VDH), with initial funding from a Health Resources Services Administration (HRSA) grant.[29] Following best practices, the SBSP (1) was implemented at schools selected based on the rate of students eligible for free and reduced cost lunch, and (2) was accessible to all third graders regardless of insurance status or type, to limit stigma surrounding participation in a public program. The SBSP used a "remote supervision" model, in which teams of trained public health dental hygienists and dental assistants practiced semi-autonomously under the supervision of an off-site public health dentist. Sealant teams also delivered dental screenings, fluoride varnish, prophylactic cleanings ("prophies"), oral health education, home hygiene materials, and, for children with unresolved dental problems, most of whom were, therefore, ineligible to receive sealants, referrals to local private practice dentists for dental treatment. Teams' administrative duties included outreach and scheduling with elementary schools; communicating with parents including obtaining consent and delivering follow-up reports; maintaining records and reporting data; scheduling quality control checks; and recruiting local private practice dentists to take referrals.

METHODS

This descriptive study utilized qualitative methods of data collection and analysis to identify parents' insights into the SBSP and recommendations for its improvement, guided by a pragmatic approach common to health services research.[30] Research was conducted as part of a broader 16-month ethnography of oral health disparities and the dental safety net in far southwest Virginia.[31] In addition to the interview data utilized in this study, as principal investigator, I also conducted participant-observation with SBSP staff to improve understanding of the project's day-to-day operations, including attending team meetings and trainings, accompanying staff to schools and setting up materials, and filing and organizing paperwork when permitted.

Participants

Participants (N = 16) were parents or legal guardians whose children participated in the SBSP. They were recruited through convenience sampling due to VDH restrictions on data sharing. A study advertisement was attached to the completed report that the dental teams sent to parents after children completed SBSP services. I contacted parents who were interested in being interviewed to tell them more about the study and facilitate their decision about whether to participate. Parents who agreed to participate were subsequently interviewed at their preferred day, time, and location.

Instruments

Data were collected using semi-structured individual in-depth interviews. The interview guide was

developed based on the Virginia SBSP protocol, existing literature on SBSPs and determinants of children's oral health and healthcare utilization, and my contextual knowledge as an ethnographer of oral health disparities in central Appalachia. Interview topics included families' histories of oral health and dental care access and utilization; parents' understanding of their children's dental needs and services required; and parents' viewpoints on the SBSP. The interview guide was reviewed by my doctoral dissertation chair, 2 local health department directors, and representatives from 2 local social services providers.

Procedure

Prior to commencing data collection, each research participant was consented into the study. Once consent was obtained, I conducted the interview. Interviews commonly lasted 50 minutes, with the shortest interview completed within 35 minutes and the longest interview reaching nearly one hour and 45 minutes. Upon completion of each interview, the participant was provided with a $20 gift card to a regional supermarket chain.

Data Analysis

I transcribed all interviews and coded them in NVivo10, a qualitative analysis software program. I analyzed coded data following the pragmatic approach common to health services research that combines thematic analysis with an adapted grounded theory approach.[29] Deductive codes were derived from the interview guide and literature from which it was developed and SBSP protocol, and applied to a subset of records (N = 6). Emergent concepts were identified during initial coding and used to adapt existing codes or to create new codes. A draft final codebook was shared with my doctoral dissertation chair, 2 local health department directors, one state-level dental public health supervisor, 2 local SBSP team members, and 2 state-level oral health equity advocates, then finalized by incorporating their feedback. Final codes were then applied to all records in the data set (N = 16), from which themes were generated. Themes were reviewed by the aforementioned team.

RESULTS

Data analysis yielded 3 major findings. Parents enrolled their children in the SBSP for a variety of reasons. Many parents misunderstood SBSP provisions and their own role in follow-up care. Finally, parents suggested numerous program improvements.

Enrollment

Parents primarily enrolled their children in the SBSP based on favorable experiences with the school and public health department, and the pilot's convenience and accessibility, among other reasons. Parents offered various reasons for enrolling their children in the SBSP. Foremost, parents expressed confidence in and appreciation for their local school system and public health department based on prior experiences, in particular the public sectors' vetting services for safety, quality, and impact. As one participant explained: "We take advantage of anything (the school) offers."

Some parents observed that school health programs normalized participation and mitigated challenges found in clinically-delivered preventive care. As one parent described:

> "(My daughter) was terrified. Terrified of (clinicians). Don't know why, it was just one of those things. She doesn't want to go to the doctor to get the flu shot. But she absolutely loved it when it was time to do it at school. I don't know if it's because the other kids are there or what."

Another parent enrolled her children in the SBSP because she wanted to familiarize them with all services available at public institutions:

> "I really want my kids to realize that they need the flu shot, that they need to get their teeth cleaned, they need all this and that the health department does provide. So when they do get older, and they have families of their own, they know they can go there, and know that they're going to get help."

Similarly, another parent whose family had received services at the public health department's recently decommissioned dental clinic explained how the interactions that characterized those expe-

riences influenced her decision to enroll her children in the SBSP:

> "I'd always had very good care at this health department before I had insurance. My kids loved (the public health dentist)…They'd seen a (private practice) dentist who didn't have a good -- what's it called? -- bedside manner. (The public health dentist) has a really nice personality, and they feel better around him. He jokes around with them and stuff. My little son likes it where he gives him a dollar when he pulls his teeth [laughs]. And he'll talk to me. He doesn't make me feel like I'm just a, you know, a number. I'm human, and he'll talk to me, and I really appreciate that."

Like this parent, other parents described their experience with the now-shuttered dental public health dental clinic as favorable. They appreciated that the public health dentists treated existing dental problems in addition to delivering preventive services and were disappointed that the closure of the clinic, which was concurrent with SBSP implementation, indicated limited service opportunities and arrays of treatments. Parents also expressed satisfaction that, at the dental public health clinic, they were treated not just as patients or patients' parents but as collaborators in pursuit of their children's oral health and well-being.

In addition to feeling mutual respect during appointments at the public health dental clinic, which differentiated those encounters with ones in private practices, parents observed that the SBSP deepened the accessibility and convenience of public services. According to parents, only one local private practitioners accepted *new* publicly-insured patients despite the ubiquity of claims to accept *all* publicly-insured children. Whereas private practitioners in adjacent regions would enroll newly Medicaid-insured children for services, few families could absorb the inconvenience, schedule disruption, and expense of traveling such distances, up to 2 hours each way. As one parent explained: "Even if I get the appointments early in the morning, by the time 2 kids seen the dentist, and then got back in the car, you know, something to eat, get back over to here…it was all day." By contrast, the SBSP relieved parents of the need to choose between missing work to transport children, often at the expense of wage-based compensation, or having children forego care; it also ensured that children remained in school for the full day.

Finally, a few parents enrolled their children in the SBSP because their children had existing dental problem, such as a cracked filling. The mismatch between this rationale for enrolling children in the SBSP-P and the actual services provided is explored in the next finding.

Prevention Orientation

Many parents did not understand the SBSP's prevention orientation, services provided, service limitations, and who was responsible for completing next steps. All parents who participated in this research expressed enthusiasm for and satisfaction with the SBSP. Yet, few could accurately describe the project's purpose, array of services offered generally or delivered to their children specifically, service limitations, or next steps, in particular how the SBSP impacted children's transitions into or continuations within ongoing dental care. Only one parent indicated understanding that the SBSP provided children with dental sealants and other preventive services, rather than treated existing dental needs. Two participants described services that *could have* been provided to their children – cleanings, fluoride rinses, or screenings – but they could not elaborate the purpose of the screening or how results would be used. No participant could explain what steps followed the SBSP, either in the short-term or long-term, or their own role in subsequent steps. This was consistent across both parents whose children were referred to private practice dentists for the treatment of existing decay and other problems, and parents whose children would need to continue with biannual routine preventive care visits, as the SBSP only targeted children in third grade. Indeed, it was not uncommon during interviews for parents to respond to one of my questions by requesting information on services provided to all enrolled children or to their own child, or to ask if the SBSP replaced routine dental care altogether.

Numerous participants described the SBSP as delivering the services previously delivered on-site by public health dental team working out of mobile units, an approach that was discontinued before the SBSP was implemented due to an agency realignment to only provide preventive oral health

services. Participants described the public health dentist "checking" and "fixing" their children's teeth at school through the SBSP, as in prior years. Indeed, the favorable reputation of dental public health mobile care generated interest in the SBSP among families that had not previously participated in it. As one parent explained:

> "I knew (my children) would get probably cleaning and I figured they would maybe try to fix (a cavity). Maybe not put them to sleep or nothing, but, you know, if they needed a little filling or something they might fix it or put a little cap… I didn't do it last year because I didn't know much about it…But other parents were telling me that you could just get it done at the school."

Many parents misunderstood not only which services were provided in the SBSP but also which services were *not* provided or how to obtain them. Numerous parents described themselves as, in the words of one parent, "uninformed…if she needed to go see a dentist or not." This dynamic was particularly common among parents whose children were ineligible for sealants due to existing decay or prior treatment of decay, resulting in a referral by the SBSP team to a private practice dentist who agreed to absorb children from the project who needed care. As one parent explained early in an interview:

> "The paper that they sent home – they said that there was some concern but they didn't indicate what it was, and I really don't know what it was…Everything seemed to be good other than them telling me he needs to have a check-up by a dentist...There was [sic] other parts of the paper where they indicated the problem and circled the thing. And I look in his mouth and I don't see any kind of cavities or things like that. So, I'm just going through the process to get him set up with the dentist so if he ever does have any problems or there's something there that I can't see."

Later in the interview, this parent continued:

> "I don't know how many dentists work for Medicaid or do it under Medicaid. I don't know. If I had to pay for it myself, I would struggle. I don't know how I would do it. So, that was a big plus for me to hear from the school that there was some kind of program that would at least let me know how (my son is) doing and maybe they can guide me on how to get him to the dentist and where to go."

Indeed, the guidance that this parent desired was delivered in the form of the double-sided paper report that, on one side, reported the child's screening results and dental needs, and on the other side, a list of private practice dentists who had agreed to treat children referred by the SBSP, including publicly-insured children. Other recommendations for project improvements including enhanced communication and perhaps case management are addressed in the next finding.

Parents made numerous recommendations for improving SBSPs. Overwhelmingly, parents wanted school-based dental programs to provide treatments for existing needs, including fillings and stainless steel crowns. Whereas the few participants who understood the SBSP's emphasis on preventive services and screenings requested a return to the former model, parents who did not understand the SBSP's prevention-only focus can be understood to tacitly endorse a treatment-based model. Parents framed their preference for comprehensive school-based services in terms of both personal benefit and community impact: "A lot of children in this area do not have a regular dentist and this is only time they see a dentist."

Most parents encouraged strengthening communications with SBSP staff, both generally and in specific ways. This recommendation was especially consistent among parents who did not understand that SBSP staff had delivered individualized hard copy reports, despite the report being the way that they found out about this research project. Numerous parents observed that hard copy reports were likely to get lost, whether sent home with children or by mail, and encouraged the use of electronic communication methods, as one parent described: "If they just wanted to have the parents sign up something, and they can just send them a text message, or an email ... send it out really quick, if they're doing the report or whatever." In addition, parents encourage SBSP staff to consider using multiple methods of communication for time-sensitive mes-

sages, in particular, time-sensitive communications such as urgent need for dentist appointments, such as following up a text message with a phone call.

Finally, whereas participants did not explicitly recommend the introduction of case management to help facilitate their ability to optimize SBSP-provided services long-term by translating the education, home hygiene materials, preventive services, or referrals to dental homes, numerous participants described aspects of case management that may be translated to bolster the program's achievement of goals, in particular transitioning into dental homes those children who had unmet dental needs, and thus, were ineligible to receive sealants.

DISCUSSION

School-based sealant programs (SBSPs) deliver evidence-based, stakeholder-endorsed preventive oral health services to elementary school-aged children in a familiar and accessible environment.[15-19] SBSPs are poised to make population-level oral health gains, save costs to society, and reduce individual experiences of caries and associated suffering, in particular among groups who have inadequate access to routine dental care and families whose parents feel confidence in public institutions.[13,19,21] Successful implementation of SBSPs requires nuanced understanding of parents' experiences with, perspectives on, and comprehension of their school's SBSP.[16,21] As this study shows, parents' reflections on the school and community's dental landscape present *and* past are invaluable to SBSP implementation, to inform enrollment, communications, and children's transition into and ongoing utilization of dental homes, as well as to manage parental expectations, including disappointment in service limitations, and to support ongoing success.

Limitations

Findings should be considered within the context of the study's limitations. This study collected data from a convenience sample to VDH restrictions on data sharing that limited recruitment opportunities. Participants' children participated in an SBSP that was implemented in the specific context of a rural DHPSA, under comparatively restrictive state dental practice law, and with limited administrative support that resulted in service delivery limitations.

IMPLICATIONS FOR HEALTH BEHAVIOR OR POLICY

Oral health is a *Healthy People 2020* priority area and school-based sealant programs a strategy that is endorsed nearly ubiquitously among oral health and children's health stakeholders including the US Community Preventive Services Task Force, the Association of State and Territorial Dental Directors, the American Dental Association, the American Academy of Pediatric Dentistry, the Pew Center on the States, the School-Based Health Alliance, and others. Although this support reflects the strength of clinical, epidemiologic, and economic studies of the impact of school-based sealant programs on individual and population oral health outcomes, implementation guidance also centers almost exclusively on the mechanisms of the *delivery* of SBSPs, to the exclusion of their *receipt* by families, resulting in a limitation in their impact.[11] This knowledge gap concerns both large-scale evidence, such as predictors of schools' program uptake, parental consent, children's participation, and dentists' absorption of referrals, and context-specific evidence that, together, might be used to improve the tailoring of SBSPs to respond to the local school environment. Accordingly, oral health stakeholders should support translational studies of SBSPs to identify essential opportunities for customization that reflect local schools', parents', and dental teams' priorities, limitations, and opportunities. In addition, to optimize the reach and impact of SBSPs across the US, health policy, public health, and dental sectors at the federal, state, and locality level should:

- Synchronize SBSPs with other school-based preventive health programs, including both information sharing to drive parental consent and service delivery to minimize disruptions to essential pedagogical activities.
- Enact meaningful data-sharing agreements between elementary schools and public health departments, in particular (1) record-sharing with school nurses, social workers, and behavioralists so they can support case management of children with persistent dental needs to help transition them into ongoing care, and (2) report-sharing so parents can access copies of SBSP reports through electronic and hard-copy school file sharing

systems. Schools may also consider timing recruitment materials and post-services reports to be included in children's weekly home communications packets.

- Collaborate with fixed-site dental providers and dental professional organization to reduce or halt the failed referrals of SBSP-referred children whose prior year-long gap resulted in service dismissals.
- Ensure communications plans reflect parents' norms including health literacy levels, design preferences, and sense of actionability. Create HIPAA-compliant consent pathways for parents who prefer to be contacted through text messaging.
- Adopt school-based toothbrushing and water-between-meals policies, particularly for early childhood education and lower elementary school students, to socialize children to cleaning and neutralizing their mouths between meals.
- Provide resources for non-clinical components of SBSPs, in particular case management for families whose children were referred for care to address unmet dental needs and administrative support in advance of services and on-site so that dental teams' efforts can be spent delivering services. Consider collaborating with other oral health professionals such as Community Dental Health Coordinators to accomplish these goals.

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Human Subjects Approval Statement

The University of Arizona Institutional Review Board (#0900001151) and the Virginia Department of Health Institutional Review Board (#40119) approved the research protocol.

Conflict of Interest Disclosure Statement

Dr. Raskin contributes volunteer expertise to the Virginia Health Catalyst, which advances oral health equity in Virginia through partnerships with public and private entities including some that deliver school-based sealant programs. Dr. Raskin is a paid research consultant with Dentaquest Partnership for Oral Health Advancement.

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