Workforce Policies and their Influence on School-Based Oral Health Programs: A synthesis of four case studies

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Abstract

Purpose: Childhood caries disproportionately effects children who are poor, live in low-income rural and urban areas, and come from racial and ethnic minority groups. The purpose of this study was to explore the effect of public policy related to dental hygienists' level of supervision and policy uptake at the state level on the organization, delivery, and financing of school-based oral health programs (SBOHP).

Methods: A multiple case study methodology was used to compare SBOHPs in the states of Missouri and Kansas. Interviews were conducted with an administrator, dental hygienist, and dentist at each Federally Qualified Health Center (FQHC) that operated a SBOHP. Mixed methods were used to conduct and analyze interviews, examine supporting documents, and to report descriptive details. Analytic categories were used to examine the various facets of the organizational structures, delivery processes, financing and billing, and operations.

Results: Five themes revealing differences between two states emerged; historical development of SBOHPs, the structure of SBOHPs, staffing and professional relationships, finance and billing, and capacity of school-based oral health network.

Conclusion: Dental hygienists' supervision requirements play a critical role in school-aged children's access to oral health services and the capacity of SBOHPs. The variations in the degree of practice autonomy accorded to dental hygienists under the Missouri and Kansas dental practice acts resulted in different oral health delivery models. Greater autonomy for dental hygienists is essential for realizing the promise of dental public health.

Keywords: access to care, school based oral health programs, dental public health, dental hygiene workforce models, health policy.

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Introduction

The epidemic of childhood caries, a completely preventable disease, was highlighted in the 2000 United States (U.S.) Surgeon General's report, *Oral Health in America.*[1] In the nineteen years following this publication, the incidence of caries in children remains virtually unchanged. National Center for Health Statistics data suggests that children who are poor, live in low-income rural and urban areas, and come from racial and ethnic minority groups are disproportionately affected by this disease.[2] Low socioeconomic status, lack of dental insurance, low reimbursement from Medicaid, few providers in rural communities and even fewer who accept Medicaid all impede poor children's access to oral health care.[3-6] The impact on children is significant. Even in the absence of pain, children with poor oral health have three times as many school absences, lower self-esteem, and perform worse academically than those who have good oral health.[6-11]

The oral health goals *of Healthy People 2000* and *Healthy People 2010* have not been achieved. To promote progress, the U.S. Surgeon General asserted that oral health services need to be "accessible outside the parameters of a traditional dental practice".[12] *Healthy People 2020* specifically addressed oral health delivery systems with a new goal of "increasing the proportion of school-based health centers with an oral health component."[12] Similar to many other states, school-based oral health programs (SBOHP) have been established by Federally Qualified Health Centers (FQHC) in Missouri and Kansas with the goal of providing services to children who may otherwise lack access to care.[13] However, the structure of the SBOHPs in these two states differ.

Missouri passed a workforce statute in 2001 addressing the needs of low income children in public health settings.[14, 15]

Specifically, this statute allows registered dental hygienists (RDH) who have been in practice for at least three years, and employed in specific public health settings (such as FQHCs and public health departments), to provide fluoride, oral prophylaxis, and sealants to children identified as "eligible for medical assistance," without the supervision of a dentist.[14, 15] Currently, 81% of Missouri's RDH workforce have been in practice for the minimum requisite number of years to qualify.[16]

Kansas decreased RDH supervision mandates in 2003 by creating the Extended Care Permit (ECP).[17, 18] In addition to passing legislation designed, in part, to address the oral health needs of low-income children lacking access to traditional, private practice oral health services.[17] ECP RDHs can provide oral health services without the supervision of a dentist, provided they are "sponsored" by a dentist. Currently 5% of the RDHs licensed in Kansas hold ECP permits.[19] Tasks and procedures performed by ECP RDHs may be provided to "dentally underserved" children birth to age five, children in both public and non-public schools, kindergarten through grade 12, year-round; in addition to children participating in youth organization activities. A comparison of the RDH supervision requirements for Missouri and Kansas as they relate to this case study is shown in Table I.

Table I. Comparison of Missouri and Kansas workforce statutes addressing supervision requirements for dental hygienists

	Missouri	Kansas
	Statute 332.311.2.	Statute 65-1456
Requirements	Have been in practice for at least three years	Must have a sponsoring dentist, their own professional liability insurance, and 1,200 hours of practice in the past three years under the supervision of a dentist
Settings	Specific public health settings such as FQHCs and city or county public health departments	Children from birth to age five; children attending public and non-public schools, kindergarten through grade 12 regardless of the time of year, and children participating in youth organizations
Patient Qualifications	Must be "eligible for medical assistance"	Must be "dentally underserved"
Allowable Services	Fluoride, oral prophylaxis, and sealants	Fluoride, oral prophylaxis, sealants, and radiographs

A variety of researchers have investigated the outcomes and financial feasibility of SBOHPs.[20-23] Assessments of such programs utilizing dental therapists or dental hygienists suggest their success over models in which dentists provide care for children in private practice settings.[24, 25] However, minimal information is available regarding the organizational and policy-related issues associated with school-based oral health services. Two exceptions are the strategies described by Jackson et al. for creating a school-based mobile dental program;[26] and the case study description of Connecticut's school-based dental care system, run by FQHCs, as one of five promising programs for reducing access disparities for children.[27]

The purpose of this study was to begin exploring the effects of public policy related to RDH levels of supervision and policy uptake at the state level on the organization, delivery, and financing of SBOHPs, as the first step in the process of better understanding the role played by state workforce policy on the structure and efficiency of SBOHPs.

Methods

Multiple case studies were conducted at four FQHCs in two Midwestern states (Missouri and Kansas) with similar but distinctly different experiences with workforce reform. As preparatory to future descriptive and analytic research, the following research questions were posed: How are the SBOHPs organized and financed, and how are services delivered? How do the identified school-based oral health delivery systems differ? What accounted for the observed differences and similarities?

A case study strategy of inquiry was chosen to examine how SBOHPs organize, finance, and deliver services.[28] Multiple case studies were used as analytic conclusions resulting from multiple cases are more compelling than single-case studies, and because multiple cases provide opportunities to explore the impact of context on common conclusions.[28] Trustworthiness, using Lincoln and Guba's framework, and the integrity of data were considered throughout each phase of this project.[29] Rich descriptions were provided to illustrate the similarities and differences between each case.

The protocol for this study was reviewed by the Institutional Review Board (IRB) at the University of Missouri at Kansas City and determined to be exempt from IRB review. Informed consent was obtained for all participants.

Sample

In consultation with officials from Missouri and Kansas State Departments of Oral Health, a purposeful sample of four FQHCs with SBOHPs were selected for this study. Two cases were selected from each state to examine differences between processes. Semi-structured qualitative interviews with dentists, RDHs and administrators were conducted at each FQHC.

Data Collection

State-specific interview guides were developed. Although individual guides differed at the margins to reflect current dental care system characteristics of the two states, the interview guides were similar. To assure data trustworthiness and credibility, all respondents (n=12) within the cases were asked several identical questions. One-day visits were conducted at the primary location of each FQHC to interview key informants. Interviews were conducted by the same individual with experience in interviewing and policy analysis. The interviewer did not know any of the individuals who were interviewed. All interviews were recorded; recordings were transcribed verbatim and checked against the original recordings. Interviews lasted approximately 60 minutes. Supporting documents (memorandums of understanding, outreach promotional materials, and outreach facility agreements) were also collected. Additionally, researchers asked each site to complete an inventory of the outreach criteria used for selecting participating schools, the number of counties where their SBOHPs deliver care, the number and type of clinics where SBOHPs operate, the types of services delivered, and staffing for 2017 calendar year.

Data Analysis

Case studies of the four FQHCs were prepared based on the interviews, documents, field notes, and the inventory.[28] Studies were initially drafted using eleven *a priori* analytic categories to establish confirmability and aid in future analysis: 1) communities served; 2) historical development of SBOHPs; 3) structure and mission of SBOHPs 4) staffing and professional relationships; 5) facilities and equipment; 6) marketing and consent (communications between the program/school and parents); 7) service delivery process; 8) services offered; 9) information systems; 10) financing and billing; and 11) magnitude of school-based oral health network.

The analytic categories reflected various facets of the organizational structures, delivery processes, and financing and billing operations of the SBOHPs. The analysis began by considering each case as a separate study, preparing summaries identifying the themes, developmental influences, and unique environmental situations.[28] A table with the analytic categories was populated with data (i.e., narrative descriptions) from each case and then analyzed for cross-case patterns and themes, similarities and differences among all cases and between the two states, with the researchers achieving consensus about themes.

Results

Differences between the SBOHPs of the two states emerged in five of the *a priori* analytic categories and are shown in Table II.

Category 1: Historical development of school-based oral health programs

In each of the cases, the SBOHP began with the FQHC approaching the school, and with the school nurse playing a critical role in establishing the structure and organization of the SBOHP in order to meet the specific needs of their school.

The development of the SBOHPs was facilitated by state-specific forces. Health departments in both states established screening programs within the last 10 years, creating a demand for providers within the schools. The Missouri Department of Health and Senior Services established the Preventive Services Program (PSP) in 2006 which encouraged schools and communities to cooperate in the provision of dental screenings, fluoride varnish applications, oral health education, and referrals in school settings.[30] In Kansas, an innovative public-private partnership known as the Dental Hub Program (2009-2011) provided funding to FQHCs to develop outreach networks with community entities, such as schools, in unserved and underserved counties (hubs and spokes) to provide preventive services using RDHs with an Extended Care Permit (ECP) as the key providers.[31] The Dental Hub Program offered funding to purchase mobile equipment and supplies, and supported the hiring of new ECPs and the advancement of currently employed RDHs to ECP status.

Category 2: Structure of SBOHPs

The structure of the SBOHPs hinged largely on the interpretation of the states' dental practice act. Missouri's statute allowed dental hygienists to provide care without the dentist's exam only if the child was eligible for medical assistance. To treat all children in a school-based setting, the dentist had to examine the child and diagnose the need for preventive services (prophylaxis and sealants) prior to the RDH providing care. Dentists and RDHs worked side by side in permanent or mobile school-based clinics. RDHs working alone, were limited to providing screenings and applying fluoride varnish to all children, regardless of financial status. In Kansas where ECPs were accorded greater practice

Table II. Comparisons of school-based oral health programs in Missouri and Kansas in five a priori analytic categories

	Missouri	Kansas
Category 1: Historical development	Health departments established screening programs Missouri Department of Health and Senior Services established the Preventive Services Program	Health departments established screening programs A public-private partnership (Dental Hub Program) provided funding to develop outreach networks to provide preventive services using Extended Care Permit dental hygienists
Category 2: Structure of the school-based oral health program	Dentist must examine the child and diagnose the need for preventive services prior to dental hygienists providing care Dental hygienists can conduct screenings and apply fluoride varnish to all children regardless of financial status without a dentist's exam Dental hygienists can provide comprehensive preventive care without a dentist's exam only if the child is eligible for medical assistance	Extended Care Permit dental hygienists can provide comprehensive preventive services to children who lack access to care without a dentist's exam and diagnosis
Category 3: Staffing and professional relationships	Dentists, dental hygienists, and dental assistants staff programs	Extended Care Permit dental hygienists and dental assistants staff programs Sponsoring dentists provide retrospective record review and consult with extended care permit dental hygienists as needed
Category 4: Finance and billing	Sources of operating revenue include Medicaid, State Children's Health Insurance Program, private dental insurance, and self-pay on a sliding-fee schedule	Sources of operating revenue include Medicaid and State Children's Health Insurance Program
Category 5: Magnitude of oral health networks	Served 50 schools, screened 4,502 children, and provided preventive services to 2,751 children (2017 calendar year)	Served 172 schools, screened 35,700 children, and provided preventive services to 7,775 children (2017 calendar year)

autonomy, RDHs and dental assistants working under their direction provided all of the preventive services. Dentists did not accompany the outreach team on their visits to schools; no restorative procedures were performed in schools.

Even within this dichotomy, there were variations. In Missouri, the full range of general dental services were provided in permanent clinics located in schools and in mobile vans and semi-trailers allowing the SBOHP to provide comprehensive dental services. In Kansas, RDHs provided preventive services only in permanent clinics housed on school property and via mobile programs using portable equipment.

Category 3: Staffing and professional relationships

Kansas FQHCs employed more RDHs than those in Missouri. Kansas also used RDHs on an as needed basis to deliver care during the school year which helped with SBOHP sustainability. One Kansas FQHC reported having seven permanent SBOHPs on school properties, staffed exclusively by ECP RDHs. Staffing and locations of the FQHCs are shown in Table III.

Staffing differences between the Missouri and Kansas SBOHPs were a function of the professional relationships between RDHs and dentists. The Kansas dental practice act allows for ECP RDHs to deliver care without the direct supervision of a dentist in a variety of community settings, including schools, that "lack access to dental care." There were no financial restrictions and the scope of practice increased with the level of the permit. Sponsoring dentists provided retrospective record review of the care provided by ECPs; offered advice concerning unusual circumstances prior to a school visits (e.g., an uncommon medical history); and consulted with ECPs in the field to resolve problems. The

Table III. Description of FQHC locations and staffing for the 2017 calendar year

FQHC	Location	Dentist f/t*	Dentist p/t**	Dentist prn***	Dental Assistant f/t	Dental Assistant p/t	RDH f/t	RDH p/t	RDH prn	Office Manager	Care Coordinator
#1	**Missouri** Waverly, Concordia, & Buckner	3	0	0	5	0	3	0	0	3	0
#2	**Missouri** House Springs, Hillsboro, Arnold, & Festus, Missouri	5	3	1	16	1	7	3	0	5	3
#3	**Kansas** Wichita	5	0	0	14	0	14	1	7	1	1 Outreach Coordinator 1 Outreach Support Person
#4	**Kansas** Hutchinson	2	0	0	4	1	2	1	3	1	1

* f/t: full-time ** p/t: part-time ***prn: as needed

level of autonomy accorded to ECP RDHs allowed them to provide school-based preventive services without the need for a dentist to be on-site.

While the Missouri dental practice act allowed RDHs with at least three years' experience to provide preventive dental care to children who were "eligible for medical assistance" in community settings without the supervision of a dentist, the actual autonomy provided RDHs, in regards to SBOHPs, was slight. Two statutes for delivery of services by RDHs were relevant. If the RDH was following the statute set forth for care in "public health settings", then only children who were financially distressed or "eligible for medical assistance" could be treated without the examination of a dentist. Concerns about equal treatment of students made schools unwilling to separate only students who were financially distressed to receive preventive services from the RDH without the initial direction of the dentist. The RDHs had to provide care under another statute by which they were permitted to provide preventive care services only after the need for those services has been diagnosed by a dentist. Although fully capable of making such a diagnosis, as demonstrated by the other statute, Missouri RDHs were not allowed to diagnose the need for preventive services for children who did not require financial assistance. The implicit legal barriers could only be overcome in SBOHPs by fielding a team of dentists and RDHs working in traditional supervisory relationships. When this traditional team was in place, RDHs could provide prevention services but only to *all* children diagnosed with a need for the service.

Category 4: Finance and billing

In Missouri, FQHCs billed Medicaid and State Children's Health Insurance Program (SCHIP) as well as other private dental insurance and self-pay individuals on the sliding-fee schedule of the FQFC. Conversely, in Kansas, Medicaid and SCHIP were the only sources of operating revenue for the school-based oral health outreach programs. One Kansas FQHC opted to not bill private dental insurance or accept self-pay for any school-based oral health services because this FQHC did not want to be perceived as competing with community dentists. Children who had private dental insurance were still provided oral health services when they signed up to participate in the program, but, the care was not reimbursed. All of the cases reported that reimbursement for services alone was not sufficient and that they relied on federal and state grants and private gifts and was especially important during the formative years of their development.

Category 5: Magnitude of school-based oral health networks

Each FQHC's outreach criteria, type and number of clinics where SBOHPs deliver care, and number of children who were provided various oral health services are shown in Table IV.

All of the FQHCs targeted underserved communities within their catchment area. One clinic in Missouri also considers absenteeism for dental and medical related issues and water fluoridation. Kansas SBOHPs had a larger catchment area and were in nearly four times more counties. The number of schools and children served by each SBOHP varied widely between states. The two FQHCs in Missouri collectively served 50 schools, screened 4,502 children, and provided preventive services to 2,751 children. The two FQHCS in Kansas collectively served 172 schools, screened 35,700 children, and provided preventive services to 7,775 children. Restorative services were provided to 994 children in Missouri schools only.

Discussion

Results of this study suggest a clear distinction, between preventive and curative oral health services, due largely to state legislative policies and their implementation. In Kansas, preventive oral health services in the form of prophylaxis, fluoride applications and sealant placements were provided to a large number of school-aged children. In public health terms, this would be considered primary prevention. In Missouri, access to curative dental services were provided, in addition to primary preventive services, to a smaller number of school-aged children who were unable to access and receive services on their own. Such care reflects the way in which traditional dental services are delivered, albeit in less-than-traditional settings.

Table IV. Summary of FQHC fixed location(s), and number of children who were provided services in 2017.

FQHC	Location	Outreach Criteria	# of Counties Served	# Fixed School-based Satellite Clinics	# Schools Served using Mobile Vans	# Schools Served using Portable Equipment	# Children Screened	# Children Provided Preventive Services	# Children Provided Restorative Services
#1	**Missouri** Waverly, Concordia, & Buckner	Inside Catchment Area; Locations that have indicated need for dental services	4	1	5	0	795	368	223
#2	**Missouri** House Springs, Hillsboro, Arnold, & Festus, Missouri	High percentage of children who qualify for free or reduced lunch program; High absenteeism for dental and medical related issues; Non-fluoridated water	2	1	43**	43**	3,707	2,383	771
#3	**Kansas** Wichita	Title I schools – large free and reduced lunch population	18	7*	0	130	30,000	6,500	0
#4	**Kansas** Hutchinson	Inside Catchment Area; Locations that do not have access to dental care or a dentist; Occasionally provide preventive services in schools where a local dentist who does not accept Medicaid provides screenings	5	0	0	35	5,700	1,275	0

*preventive services only

**the same schools were served using both mobile vans equipped with dental operatories and portable equipment

One of the findings of this case study was the impact of state level infrastructure on improving access to oral health care, specifically how RDH scope of practice policy influenced the development of SBOHPs. Although other studies have focused on SBOHPs, few have fully explored the impact of workforce policy on service delivery. For example, the National Network for Oral Health Access (NNOHA) surveyed dental directors from 62 health centers across the nation to learn about characteristics and operations of SBOHPs.[13] The Maternal and Child Health Bureau (MCHB) conducted an evaluation of 12 comprehensive SBOHPs operating within existing school-based health centers that were funded by MCHB.[23] NNOHA and MCHB both reported the majority of school-based health centers in their respective studies utilized different delivery models for diagnostic and preventive services; however, neither study attempted to link RDH scope of practice to the differences.[13, 23] The NNOHA survey examined staffing; however, researchers did not examine staffing in relation to utilizing RDHs to the full extent of their license at school-based clinics.[13] RDHs are an integral part of SBOHPs in many states, especially those working in states that have expanded licensure policies allowing for the provision of preventive services (prophylaxis, sealants, and fluoride varnish application) without direct supervision by a dentist.[23, 32-34]

In 2016, the Center for Health Workforce Studies (CHWS) quantified the dental hygiene scope of practice for each state as defined by each state's dental practice act. Missouri and Kansas earned scores of 63 and 53 respectively.[35] Missouri scored slightly lower than Kansas in the supervision and tasks sub-categories, slightly higher than Kansas in the regulation category, and significantly higher than Kansas in the reimbursement category. These scores implied similarity between Missouri and Kansas in terms of allowing RDHs to practice to the full extent of their license. Additionally, the scores implied that Missouri allows RDHs to be directly reimbursed by Medicaid.

This case study examined these reimbursement policies in regards to their actual implementation. Findings revealed the CHWS scores were misleading. Very few of the 81% RDHs in Missouri who were eligible were taking advantage of Missouri Statute 332.311.2. This was in spite of the fact that no additional training was required, because schools were not considered to be a public health setting. Only RDHs employed by FQHCs were allowed to provide oral health services in schools without the supervision of a dentist.

While the Missouri RDHs examined in these cases met this qualification, they could only provide care to children who were "eligible for medical assistance." This requirement necessitates that schools divide students into two groups, which they were unwilling to do. Another misleading aspect of the Missouri statute is the RDH's ability to directly bill Medicaid. Even though the statute states that "Medicaid shall reimburse any eligible provider," Missouri Medicaid had not yet developed a method for direct reimbursement for RDHs. Conversely, the Kansas ECP RDH had a liberal range of settings to deliver care. However, the Kansas ECP RDHs cannot not directly bill Medicaid. In order to be reimbursed for services provided in Kansas, the ECP RDHs need a relationship with an FQHC or a dentist willing to bill Medicaid. Wing explored the effects of such regulation and concluded that direct reimbursement from Medicaid to dental hygienists increased utilization.[36] Direct reimbursement is an important policy tool that demonstrates great promise for increasing access to oral health services. Implementation of direct reimbursement should be examined on a state by state basis and best practice guidelines established.

Based on the four cases in two states, the RDHs ability to practice to the full extent of their license without the direct supervision of a dentist appeared to be a primary determinant of the efficiency of SBOHPs focused on screening and prevention. The independent outreach practices enabled by these new workforce policies allow RDHs to travel to more schools, and deliver care to more children than oral health outreach teams composed of RDHs and dentists. Consequently, it appeared to be an effective dental public health intervention targeted at an especially vulnerable segment of the population. Future studies should explore the relationship between RDH scope of practice and access to oral health services, outcomes, efficacy, cost and sustainability in SBOHPs across the country.

One of the inherent limitations of case study research is lack of generalizability. While findings from the present cases are not generalizable to other SBOHPs outside of Missouri and Kansas, they nevertheless enable the understanding of this phenomenon more fully and to suggest areas for further empirical exploration.

Conclusion

The cases examined revealed that SBOHPS are structured and organized around the individual state's dental practice act and are financed through billing Medicaid and securing grants. Differences between states were observed with respect to supervision of RDHs, delivery of restorative procedures in schools, the number of schools in the network, and the number of children seen. State workforce policy dictating RDH scope of practice plays a crucial role in access to oral health services and the capacity of SBOHPs. The degree of

RDH practice autonomy under the dental practice acts in Missouri and Kansas resulted in vastly different oral health delivery models. Greater RDH autonomy is essential for realizing the promise of dental public health.

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