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Preventive Dental Care Use for Children with Special Health Care Needs in Washington's Access to Baby and Child Dentistry Program

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Abstract

Background.—Low-income, preschool-aged children with special health care needs (CSHCN) are at increased risk for poor oral health. The study goal was to assess preventive dental care use for Medicaid-enrolled CSHCN within Washington state's Access to Baby and Child Dentistry (ABCD) Program.

Methods.—We analyzed 2012 Medicaid eligibility and claims files for children under age 6 years in the ABCD Program (N=206,488). Medical diagnosis and eligibility data were used to identify each child's special needs status (no/yes). The outcome was preventive dental care use (no/yes). Modified Poisson regression models were used to estimate crude and covariate-adjusted prevalence rate ratios (PRR).

Results.—Of the 206,488 children in the study, 2.1% were CSHCN and 114,570 utilized preventive dental care (55.5%). CSHCN utilized preventive care at similar rates compared to children without SHCN (54.7% and 55.5%, respectively; $P=0.32$). After adjusting for confounders, CSHCN were significantly less likely to utilize preventive dental care than children without SHCN (PRR: 0.91; 95% CI: 0.88, 0.94; $P<0.001$). Older preschoolers were significantly

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Statement of Authors' Responsibilities

Maureen Craig was the main author of the paper. She analyzed the data and contributed to the initial and final drafts of the paper. JoAnna Scott managed datasets and contributed, oversaw the statistical analyses, and contribute to the initial and final drafts of the paper.

Rebecca Slayton helped interpret the study findings and contributed to the initial and final drafts of the paper.

Amy Walker helped interpret the study findings and contributed to the initial and final drafts of the paper.

Donald Chi was the senior author on the paper, obtained the dataset, conceptualized the study and analytic plan, wrote the initial draft of the paper, and finalized the paper.

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more likely to use preventive dental care than younger preschoolers. A significantly higher proportion of preventive medical care utilizers also utilized preventive dental care.

Conclusions.—Medicaid-enrolled CSHCN in Washington’s ABCD Program were less likely to utilize preventive dental care than Medicaid-enrolled children without SHCN.

Practical Implications.—Future intervention research should evaluate strategies to improve access to preventive dental care for CSHCN. Additional strategies may be needed to improve oral health behaviors for preschool-aged CSHCN in Medicaid.

Keywords

Medicaid; children with special health care needs; preventive dental care; utilization; health services research; pediatric dentistry; public health

The U.S. Maternal and Child Health Bureau (MCHB) defines children with special health care needs (CSHCN) as those “who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally.”¹ One of the well-recognized challenges in the field is operationalizing this definition. Based on the MCHB definition, national data using a screening tool found that about 9.3% of U.S. children ages 0-5 years have a special health care need (SHCN) and nearly half of these young children are low-income, defined as living in a household below 200% of the Federal Poverty Level (FPL).² Studies vary considerably in the way SHCN is defined, which affects estimated SHCN prevalence rates.

Younger CSHCN are more likely to experience tooth decay than healthy children and older CSHCN.³⁻⁴ Risk factors for dental disease include exposure to fermentable carbohydrates through sugary medications, preferences for soft foods due to sensory processing issues, and use of sweets by caregivers to promote weight gain or manage behaviors.⁵⁻⁷ Other risk factors include low exposure to fluoridated toothpaste, dental crowding, decreased salivary flow, and enamel defects.^{5, 8-9} Thus, young CSHCN are at increased risk for adverse outcomes associated with untreated tooth decay including pain, problems learning, systemic infections, and hospitalization.⁵ From an ethical and health equity perspective, it is important to develop programs and policies that protect the oral health of young CSHCN from low-income households.¹⁰

Preventive dental care is especially important for children at increased risk for tooth decay. Most adverse consequences of dental treatment affect young children.¹¹ Young CSHCN who utilize preventive dental care have fewer unmet preventive dental needs but many continue to have unmet dental care needs.¹²⁻¹³ In fact, less than 10% of all children under age 3 years have an annual preventive dental visit – comparable national-level data for young CSHCN do not exist.¹⁴ There are multiple barriers to care, including difficulties cooperating during dental appointments, oral aversions, competing medical care needs, and family financial strain.^{5, 15-19} Even when a family with a young CSHCN is motivated to seek dental care for their child, they often have difficulty finding a dentist willing to treat CSHCN and accept Medicaid.^{9, 15, 18}

The Access to Baby and Child Dentistry (ABCD) Program in Washington state is aimed at improving access to dental care for Medicaid-enrolled children under age 6 years. The program was rolled out county-by-county starting in 1995. ABCD offers enhanced services to beneficiaries (e.g., up to four checkups and fluoride treatments per year, and annual family oral health education), additional training for providers, increased reimbursement rates for ABCD-certified dentists, and support services to participating families.²⁰ Early evaluations indicated that children living in counties with an established ABCD Program were significantly more likely to use preventive dental care.²¹ In addition, an early evaluation of one ABCD county compared to a non-ABCD county found that tooth decay rates were significantly lower in the ABCD county.²² Despite the program's initial successes, published data indicate that only 21% of all Medicaid-enrolled children under age 3 years in Washington utilized preventive care.¹⁴ This raises specific concerns about vulnerable child subgroups within ABCD, like CSHCN, because of the potential for programs like ABCD to widen oral health inequalities.²³

No studies to date have assessed the ABCD Program with an emphasis on preventive dental care use for CSHCN. The goal of this study was to test the hypothesis that within the ABCD Program, CSHCN would utilize preventive dental care at lower rates than children without SHCN. This study is the first step in assessing the extent to which disparities in dental care use is a problem for young Medicaid-enrolled CSHCN, with the ultimate goal of improving programs like ABCD.

METHODS

Study Design and Data Sources.

This was a cross-sectional analysis of 2012 Medicaid data from Washington state. The data were obtained from the Washington State Health Care Authority and included both eligibility (demographic information) and claims files (billed medical, dental, institutional, hospital, and pharmacy services; provider). Demographic information consisted of date of birth, sex, race, ethnicity, county of residence, and Medicaid eligibility category. We also had information on provider type (e.g., dentist, physician). Each child had a unique identifier, which we used to link eligibility and claims files. Our study focused on children under age 6 years, calculated on December 31, 2012, to reflect the population eligible for participation in the ABCD Program (N=299,152). We further restricted the analyses to children enrolled in Medicaid for 11-12 months in 2012 (N=206,488). This study was approved by the Washington State Institutional Review Board.

Independent Variable.

The independent variable was whether the child had a special health care need (SHCN) (no/yes). We created two non-mutually exclusive SHCN indicators from the Medicaid eligibility and claims files based on previous studies: 1) Medicaid eligibility through the Supplemental Security Income (SSI) Program for 12 months²⁴; and 2) evidence of an intellectual and/or developmental disability (IDD) diagnosis (autism, cerebral palsy, spina bifida, trisomy 21, tuberous sclerosis, Fragile X syndrome, and fetal alcohol syndrome).²⁵ Children with any of these two indicators were classified as having a SHCN.

Outcome Variable.

The outcome was preventive dental care use (no/yes), based on previously published criteria using Current Dental Terminology (CDT) codes.²⁶

Model Confounders.

There were four variables conceptualized as model confounders: 1) age^{14, 27}; 2) race (an eight-category self-reported variable corresponding to the U.S. Census Bureau categories)²⁸; 3) ethnicity (non-Hispanic/Hispanic)²⁹; and 4) preventive medical care use (no/yes).^{24, 30}

Data Analyses.

The child was the unit of analysis. After generating descriptive statistics, we calculated preventive dental utilization rates. We compared utilization rates across the two SHCN subgroups and each model covariate using the chi-square test ($\alpha=0.05$). We ran an unadjusted modified Poisson regression model to generate prevalence rate ratios (PRR) and to test the hypothesis that CSHCN would be less likely to use preventive dental care than children without SHCN.³¹ Finally, we ran a covariate-adjusted Poisson regression model with the four confounders. All analyses were conducted using Stata 13 for Windows.³²

RESULTS

Study Population.

About 2.1% of children were identified with a SHCN (Table 1). With the exception of children under age 1 year, study participants were equally distributed across the age groups. One-in-three children were White and one-in-five children were Hispanic. Over 85% of children utilized preventive medical care.

Dental Care Utilization.

Of the 206,488 children under age 6 years, 114,570 children utilized preventive dental care (55.5%). CSHCN utilized preventive dental care at similar rates to children without SHCN (54.7% and 55.5%, respectively; $P=0.32$) (Table 1). Dental utilization increased with age and was highest for children of Asian and Hispanic descent. A significantly higher proportion of children who utilized preventive medical care also utilized preventive dental care.

Regression Analyses.

In the unadjusted regression model, there was no difference in preventive dental care utilization for CSHCN and those without SHCN (PRR: 0.99; 95% CI: 0.96, 1.01; $P=0.32$) (Table 2). However, after adjusting for confounders (age, race, ethnicity, preventive medical care), CSHCN were significantly less likely to utilize preventive dental care than children without SHCN (PRR: 0.91; 95% CI: 0.88, 0.94; $P<0.001$).

DISCUSSION

This is the first known study to evaluate an established Medicaid dental program with a focus on assessing preventive dental care utilization for young children with special health care needs (CSHCN). Within Washington state's Access to Baby and Child (ABCD)

Program, we found that CSHCN were significantly less likely to utilize preventive dental care than children without SHCN. This finding is inconsistent with studies reporting that young CSHCN are more or equally as likely to use preventive care than demographically similar children without SHCN.^{12-13, 25}

It is potentially worrisome that CSHCN in our study utilized preventive care at lower rates than children without SHCN, especially when even higher preventive care utilization rates may not be sufficient in meeting dental care needs and preventing dental disease in CSHCN.¹² Many CSHCN present with multiple risk factors for tooth decay, including higher carbohydrate intake and less frequent exposure to fluoride and oral hygiene compared to other children. Thus, more intensive preventive efforts may be required for CSHCN. One way to achieve this goal is to provide additional preventive benefits for CSHCN, which gives dentists additional opportunities to assess changes in risk, monitor disease, and use appropriate preventive care strategies, including sealants on primary molars, fluoride varnish, and silver diamine fluoride.³³⁻³⁴ Caregivers would also have opportunities to ask questions and identify strategies to improve home-based oral health behaviors. Increased exposure to the dental environment could also help to desensitize children and ease future dental visits.

One important observation is that there was a change in the statistical significance in the association between special needs status and preventive dental care use between the unadjusted (PRR= 0.99) and adjusted (PRR=0.91) models. A potential explanation for this change is differences in demographic characteristics for children with and without SHCN. For instance, larger proportions of CSHCN in our study were under age 2 years compared to the general study population. The negative effects of age on preventive care utilization likely accounts for the differential outcomes between the two models. These findings underscore the importance of conceptual models that include prespecified confounders, especially when conducting secondary data analyses on existing data. These models should be drawn a priori from the published scientific literature.

Our study findings have policy significance. The ABCD Program is associated with lower tooth decay rates and improved preventive dental care utilization rates for children under age 6 years.²¹⁻²² Under such circumstances, concerns have been raised about the potential for widening disparities associated with public health programs that are not tailored to high-risk subgroups like CSHCN.²³ The idea is that such programs “skim off the top” by benefitting individuals who are best positioned to take advantage of the program, leaving behind less advantaged program participants. The current data support the concept of widening disparities pertaining to CSHCN in the ABCD Program. Interventions are needed to address the needs of CSHCN who might benefit from tailored approaches incorporated into programs like ABCD.³⁵⁻³⁶ Particularly when faced with budgetary constraints, which is common at the state level in the current fiscal environment, Medicaid policymakers should consider focusing on tailored dental programs that address the needs of the highest risk enrollees.

There were five main study limitations. First, our study findings may not be applicable to other states that administer other types of dental care access programs. The ABCD Program

is one of the longest-standing dental Medicaid programs and has been in operating for nearly 25 years.^{22, 37} Other states with child dental Medicaid programs should devote resources for similar analyses to evaluate program outcomes and identify areas for program improvement.

Second, 2.1% of children in our study were identified with SHCN, which is lower than the national prevalence of 9.3%.² Because ABCD focuses on younger children, we adopted a conservative definition of SHCN that excluded children who may not yet have a formal diagnosis indicating special needs.²⁵ We were not able to administer the MCHB screening tool, which is considered the current standard in pediatric health services research. Thus, our case finding criteria may have underestimated the prevalence of CSHCN. However, we used published criteria. Future studies should continue to develop and refine methods of identifying young CSHCN from claims data.

Third, our analyses treated all CSHCN as a homogenous group even though there is likely to be heterogeneity within this broad population of children.³⁸ For instance, 90% of children with Fragile X syndrome utilized preventive dental care, which is higher than average utilization rates for CHSCN in our study.

Thus, despite our main regression model findings, within-group utilization is likely to vary. Future research should continue to identify high-risk CSHCN who continue to face barriers to preventive dental care so that appropriate resources can be devoted to these subgroups within Medicaid.

Fourth, our study was based on claims data and there were no available measures of unmet dental care need. This makes it difficult to assess the extent to which differences in preventive care use by SHCN status are clinically meaningful. Future work should include a population-based epidemiologic study that includes clinical assessments of Medicaid-enrolled CSHCN to assess the prevalence of unmet need and how preventive care use is related to unmet need and oral health status. Findings from such epidemiologic studies could help to inform the development of future interventions aimed at preventing dental disease in CSHCN.

Fifth, preventive dental care is important but it is not a panacea to prevent dental disease in CSHCN. Only one-in-two preschoolers in our study utilized preventive dental care, which is unlikely to increase significantly without concerted efforts to boost utilization rates. This underscores the added importance of identifying behavioral strategies to improve diet and fluoride exposure in CSHCN that can synergistically improve the effectiveness of professional preventive care. Such strategies need to go beyond health education, which is necessary but insufficient in sustained behavior change, and should be based on theories of health behavior change.

CONCLUSIONS

We found that Medicaid-enrolled preschoolers with SHCN in Washington state's Access to Baby and Child (ABCD) Program were significantly less likely to utilize preventive dental care than those without SHCN. Equally concerning is that nearly 50% of all preschoolers enrolled in Washington's Medicaid program failed to utilize preventive care, even though all

children in Medicaid are entitled to dental care under federal law. These findings underscore the importance of efforts to develop add-on interventions within Medicaid aimed at improving access to dental care for preschool-aged CSHCN.

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Description of study population of children under age 6 years enrolled in Washington Medicaid for 11 months in 2012, preventive dental use, and p-values from chi-square tests (N=206,488)

Table 1

Characteristic	Children who did not use preventive dental care (N=91,918)	Children who used preventive dental care (N=114,570)	Subgroup totals (N = 206,488)	Preventive Dental Care Utilization Rate	p-value
Any SHCN	N (%)	N (%)	N (%)	N (%)	
					0.319
No	89991 (97.9%)	112240 (98.0%)	202231 (97.9%)	112240/202231 (55.5%)	
Yes	1927 (2.1%)	2330 (2.0%)	4257 (2.1%)	2330/4257 (54.7%)	
SHCN Indicator 1: Medicaid Eligibility through SSI					0.577
No	90700 (98.7%)	113084 (98.7%)	203784 (98.7%)	113084/203784 (55.5%)	
Yes	1218 (1.3%)	1486 (1.3%)	2704 (1.3%)	1486/2705 (55.0%)	
SHCN Indicator 2: IDD Diagnosis					0.478
No	90892 (98.9%)	113253 (98.9%)	204145 (98.9%)	113253/204145 (55.5%)	
Yes	1026 (1.1%)	1317 (1.1%)	2343 (1.1%)	1317/2343 (56.2%)	
Age (years)					<0.001
0	5990 (6.5%)	647 (0.6%)	6637 (3.2%)	647/6637 (9.7%)	
1	25589 (27.8%)	13789 (12%)	39378 (19.1%)	13789/39378 (35.0%)	
2	18307 (19.9%)	20196 (17.6%)	38503 (18.6%)	20196/38503 (52.5%)	
3	16177 (17.6%)	24081 (21%)	40258 (19.5%)	24081/40258 (59.8%)	
4	13485 (14.7%)	27324 (23.8%)	40809 (19.8%)	27324/40809 (67.0%)	
5	12370 (13.5%)	28533 (24.9%)	40903 (19.8%)	28533/40903 (69.8%)	
Race					<0.001
White	34546 (37.6%)	35066 (30.6%)	69612 (33.7%)	35066/69612 (50.4%)	
Alaskan Native	37 (<1%)	29 (<1%)	66 (<1%)	29/66 (43.9%)	
American Indian	2531 (2.8%)	2007 (1.8%)	4538 (2.2%)	2007/4538 (44.2%)	
Asian	1833 (2%)	2433 (2.1%)	4266 (2.1%)	2433/4266 (57.0%)	

Characteristic	Children who did not use preventive dental care (N=91,918)	Children who used preventive dental care (N=114,570)	Subgroup totals (N = 206,488)	Preventive Dental Care Utilization Rate	p-value
	N (%)	N (%)	N (%)	N (%)	
Black	3888 (4.2%)	4226 (3.7%)	8114 (3.9%)	4226/8114 (52.1%)	
Hawaiian	211 (<1%)	193 (<1%)	404 (<1%)	193/404 (47.8%)	
Pacific Islander	1321 (1.4%)	1581 (1.4%)	2902 (1.4%)	1581/2902 (54.5%)	
Other	14456 (15.7%)	31868 (27.8%)	46324 (22.4%)	31868/46324 (68.8%)	
Missing	33095 (36%)	37167 (32.4%)	70262 (34%)	37167/70262 (52.9%)	
Ethnicity					<0.001
Non-Hispanic	59247 (64.5%)	61892 (54%)	121139 (58.7%)	61892/121139 (51.1%)	
Hispanic	13293 (14.5%)	31137 (27.2%)	44430 (21.5%)	31137/44430 (70.1%)	
Missing	19378 (21.1%)	21541 (18.8%)	40919 (19.8%)	21541/40919 (52.6%)	
Preventive Medical Care Use					<0.001
No	18264 (19.9%)	12321 (10.8%)	30585 (14.8%)	12321/30585 (40.3%)	
Yes	73654 (80.1%)	102249 (89.2%)	175903 (85.2%)	102249/175903 (58.1%)	

Unadjusted and adjusted regression analyses of preventive dental care utilization for children under age 6 years enrolled in Washington Medicaid for months in 2012 (N=206,488)

Table 2

	Unadjusted		Adjusted	
	Prevalence Rate Ratio (95% CI*)	p-value	Prevalence Rate Ratio (95% CI*)	p-value
Any SHCN				
No	Reference	-	Reference	-
Yes	0.99 (0.96, 1.01)	0.323	0.91 (0.88, 0.94)	<0.001
Age (years)				
0	0.14 (0.13, 0.15)	<0.001	0.14 (0.13, 0.15)	<0.001
1	0.50 (0.49, 0.51)	<0.001	0.48 (0.47, 0.49)	<0.001
2	0.75 (0.74, 0.76)	<0.001	0.73 (0.72, 0.74)	<0.001
3	0.86 (0.85, 0.87)	<0.001	0.85 (0.84, 0.86)	<0.001
4	0.96 (0.95, 0.97)	<0.001	0.95 (0.94, 0.96)	<0.001
5	Reference	-	Reference	-
Race				
White	Reference	<0.001	Reference	<0.001
Alaskan Native	0.87 (0.66, 1.15)	-	0.85 (0.65, 1.10)	-
American Indian	0.88 (0.85, 0.91)	0.326	0.90 (0.87, 0.93)	0.224
Asian	1.13 (1.10, 1.16)	<0.001	1.12 (1.09, 1.15)	<0.001
Black	1.03 (1.01, 1.06)	<0.001	1.03 (1.01, 1.06)	<0.001
Hawaiian	0.95 (0.86, 1.05)	0.003	1.02 (0.93, 1.12)	0.004
Pacific Islander	1.08 (1.05, 1.12)	0.309	1.04 (1.00, 1.07)	0.674
Other	1.37 (1.35, 1.38)	<0.001	1.18 (1.17, 1.19)	0.030
Missing	1.05 (1.04, 1.06)	<0.001	1.08 (1.07, 1.09)	<0.001
Ethnicity				
Non-Hispanic	Reference	-	Reference	-
Hispanic	1.37 (1.36, 1.38)	<0.001	1.20 (1.19, 1.21)	<0.001
Preventive Medical Care Use				

	Unadjusted		Adjusted	
	Prevalence Rate Ratio (95% CI*)	p-value	Prevalence Rate Ratio (95% CI*)	p-value
	Reference	-	Reference	-
	1.44 (1.42, 1.46)	<0.001	1.58 (1.55, 1.60)	<0.001