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Dental service utilization among children in the child welfare system

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Abstract

Objective—To examine predisposing, enabling, and need-related factors associated with dental utilization by children involved with the child welfare system (CWS).

Methods—Data were analyzed from the National Survey of Child and Adolescent Well-Being (NSCAW; Wave II), a national probability sample of children (2-17 years) following a welfare assessment during 2008-2009 (n=2806). Caregiver-reported child receipt of dental services in the past year was the outcome in weighted logistic regression models.

Results—Two-thirds of children had a recent dental visit. Older children (OR 2.95, 95% CI 2.06,4.21 for ages 6-11; OR 2.47, CI 1.82,3.37 for ages 12-17, compared to ages 2-5) were more likely to have visited the dentist, as were children of more educated caregivers (OR 1.68; CI 1.20,2.36 for high school, OR 2.45; CI 1.71,3.52 for more than high school). Children without a usual source of care (OR 0.50; CI 0.27,0.94) and those living with non-biological parents had lower odds of a recent visit (OR 0.64; CI 0.43,0.97). Children with dental problems were twice as likely to have a recent visit (OR 2.02; CI 1.21,3.38), while children with unmet needs who could not afford care had lower odds of utilizing services (OR 0.28; CI 0.16,0.46).

Conclusions for Practice—Many children in the CWS, especially younger children (ages 2-5), did not have a reported dental visit in the past year. Cost was a barrier, and caregiver status was

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associated with the likelihood of obtaining dental care. Health and social service providers should refer these children for dental care.

Keywords

Oral health; utilization; children; child welfare

INTRODUCTION

In 2012, U.S. Child Protective Services (CPS) agencies investigated or assessed 2.1 million reports of child maltreatment. Approximately one-fifth of children involved were determined to be victims of child abuse or neglect (U.S. Department of Health and Human Services, 2013). Children involved with the child welfare system (CWS) are a vulnerable group, susceptible to health-risk behaviors (Leslie et al., 2010) and poor health outcomes (Horwitz et al., 2012). Most (79%) children involved with the CWS continue living at home with their biological parents, but some are removed and placed in foster care (U.S. Department of Health and Human Services, 2013). The physical, behavioral, and developmental needs of children in foster care, one subset of children in the CWS, are well-documented (Leve et al., 2012). The American Academy of Pediatrics (AAP) (American Academy of Pediatrics, 2007) and others have long advocated that children entering foster care receive comprehensive medical and dental examinations to identify and address any urgent developmental, health, or mental health needs. However, there is variation in state laws regarding health screenings for children in foster care. In 2010, only 38 states explicitly required oral health screenings as part of the initial health assessments conducted when children are removed from homes (Allen, 2010).

Recently, a growing number of experts suggest that all children investigated or assessed for child maltreatment should receive comprehensive health screenings (Landsverk, Garland, & Leslie, 2002). National data support this recommendation by documenting the physical, mental health, and service needs of these children (Horwitz et al., 2012; Ringeisen, Casanueva, Urato, & Cross, 2008). One national study found that children involved with the CWS were also more likely to have special health care needs than those in the general population, regardless of their placement status or whether the maltreatment allegation was substantiated (Ringeisen, Casanueva, Urato, & Cross, 2008).

Oral health screenings should be part of every comprehensive health assessment for all children. Oral health is vital for overall health and well-being at all ages, but is often overlooked. The AAP recommends an initial dental visit by age one, followed by regular exams at least every six months (American Academy of Pediatrics, 2007). Annual dental visits are also a national goal for all children and a Healthy People 2020 Leading Health Indicator (Objective OH-7).

Yet little is known about the current dental service utilization patterns of all children in contact with the CWS, and this has never been investigated in a national sample. Prior studies that include oral health status or dental utilization information have been conducted with foster care children only (rather than all children in the CWS), and suggest that foster children have more dental problems than other children (Dale Jr., Kendall, & Schultz, 1999;

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Fortin, 2010). Older data suggest that 20-40% of children in child welfare receive no preventive health or dental care (Kortenkamp & Macomber Ehrle, 2002). Most children in the CWS are Medicaid-eligible (Center for Health Care Strategies, 2013), and dental coverage is included as part of Medicaid's Early Periodic Screening Diagnosis and Testing (EPSDT) component. Thus, most children in the CWS would be expected to receive annual dental exams.

Regular dental exams can provide important information about potential abuse or neglect. In the most recent third edition of "Child Neglect: A Guide for Prevention, Assessment, and Intervention," issued by the U.S. Office of Child Abuse and Neglect, many forms and signs of neglect are outlined. The denial or delay of appropriate dental care for children, including preventive care, falls under the category of medical neglect. Visible warning signs of possible child neglect noted in the report include unmet dental needs, poor hygiene, and having "dirty and decaying teeth" (p. 22, DePanfilis, 2006). Depending on the form of maltreatment, it is not uncommon for injuries to be sustained in the face, mouth, and jaw, and a comprehensive exam of the craniofacial complex should be assessed by a dentist.

This study uses data from a national probability sample to examine the prevalence and correlates of past-year dental utilization among all children in the CWS. Andersen's Behavioral Model of Health Services Utilization is the guiding conceptual framework for this study (Andersen, 1995), and assumes that utilization depends fundamentally on child and family predisposing, enabling, and need characteristics. Multiple challenges in adequate access of needed health services have been shown for foster children (Combs-Orme, Chernoff, & Kager, 1991). Important predisposing factors include sociodemographic characteristics of children and their caregivers. Enabling factors, such as family income, may affect ability to seek care. Need relates to perceived unmet health needs and is often an important factor in the decision to seek dental care. We also include children's health, mental health and maltreatment experiences related to their CWS involvement in the model.

METHODS

Data and Sample

The current study utilized data from the second cohort of families in the National Survey of Child and Adolescent Well-Being (NSCAW-II) (Dowd et al., 2010). NSCAW is the only national, longitudinal study of families that were subjects of child abuse or neglect investigations or assessments conducted by U.S. Child Protective Service agencies. NSCAW was funded by the Administration for Children and Families within the U.S. Department of Health and Human services, with field data collection carried out by RTI International (Dowd et al., 2010). NSCAW-II employed two-stage random sampling. States requiring that the CPS agency first contact participants were excluded from the sampling frame. In NSCAW-II, in the first stage, 82 primary sampling units (PSUs) were randomly sampled from 30 states, each corresponding to the geographic area served by a single CPS agency. Within these PSUs, children were then sampled from all child welfare investigations or assessments that closed between February 2008 and April 2009.

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Detailed retrospective assessments of family context and well-being were collected through face-to-face interviews with current primary caregivers (permanent or foster), children, and their investigative caseworkers. The initial NSCAW-II sample consisted of 3,264 children aged 2 years or older at the time of investigation who were initially placed in-home following the close of the child welfare investigation or assessment. The sample for this analysis included only children whose permanent, primary caregivers and caseworkers were interviewed about the child's health and dental utilization (n=2,817 children).

Sampling weights within NSCAW-II account for differential selection probabilities as well as potential bias resulting from survey non-response (Dowd et al., 2010). As a result, they yield estimates that are nationally representative of families subject to child maltreatment investigations or assessments conducted by CPS and living in states not requiring CPS agency first contact of sample members. However, these weights do not account for item non-response. Missing data on individual items was generally quite low and did not exceed 4% for any variable. However, listwise deletion reduced the sample from 2817 to 2575 children. To preserve the full sample size, multiple imputation using the multivariate normal imputation method within the Stata 12.0 MI module was employed to handle these missing data. Cases with imputed values for the dependent variable were excluded from the final analysis, yielding a final analytic sample of 2806. No significant differences were found between imputed and unimputed results, and final imputed results are reported below.

Measures

The dependent variable in this study was past-year dental utilization, operationalized as a dichotomous variable set equal to 1 if the child's current caregiver indicated that the child had "gone to a dentist or dental hygienist for a cleaning or check-up in the last 12 months."

Predisposing factors included the following sociodemographic characteristics: child gender (male or female); child age (categorical: 2-5 years, 6-11 years, 12 years or older); and child race/ethnicity (White, African-American, Hispanic, or other). Child emotional or behavioral problems were assessed using the Child Behavior Checklist (CBCL), a widely used and psychometrically established measure (Achenbach, 1991). A score ≥ 64 on either the internalizing or externalizing behavior scales was used to assess the presence of clinically meaningful emotional or behavioral problems in the child. Additional predisposing factors included the most serious type of maltreatment experienced by the child (neglect, physical abuse, sexual abuse, substance abuse, or other type of maltreatment); a 3-point global measure of cumulative family risk, with values ranging from 1 = "low family risk" to 3 = "high family risk," based on investigative caseworkers' assessment of the presence of 21 risks to child safety and well-being (McCrae & Barth, 2008; Mersky, Berger, Reynolds, & Gromoske, 2009); the number of other children living in the same household; the current caregiver's relationship to the child (biological mother, biological father, or other); and whether the child was living in a metropolitan area (yes/no).

Enabling factors included the following resources that might affect the child's ability to access care successfully: child insurance status (Medicaid or state health plan, private insurance, or other); whether the family's annual household income was ≤ $35,000/year; current caregiver's highest level of education completed (less than high school, high school,

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or more than high school); and current caregiver's employment status (full-time, part-time, or other/unemployed). The child's current usual source of care was also included: doctor's office or HMO, clinic, or other.

Need factors included the following variables based on responses by current caregivers: whether the child currently had dental problems (yes/no) and whether in the last 12 months "your child needed dental care, including check-ups, but couldn't get it because you couldn't afford it" (yes/no).

Analysis

NSCAW-II data embody a hierarchical structure, with families and caseworkers nested within child welfare agencies. However, in initial analyses, a fully unconditional random effects model indicated an intraclass correlation coefficient of only 3%, suggesting insignificant variation across child welfare agencies in children's past-year dental use. Consequently, we conducted a single-level multivariable logistic regression model using the Stata 12.0 –svy-module, which accounts for the complex survey design of the data, accommodating probability weights and stratification as well as correlations in outcomes across families served by the same child welfare agencies (DeLeeuw & Meijer, 2008). Adjusted odds ratios and confidence intervals were estimated. This secondary data analysis was approved by the Institutional Review Boards at the authors' institutions.

RESULTS

Sample Characteristics

Table 1 summarizes variables in the analysis. Caregiver reports indicated that 66% of children had a past-year dental visit. Dental utilization was lowest among children ages 2-5 years (52%) and higher for older children, 75% for children ages 6-11 years and 71% for children ages 12 and over. Children in the sample were evenly distributed by gender and age, and 44% were White. The most serious type of alleged maltreatment was neglect (33%). For most children (76%), their permanent, primary caregiver was their biological mother. Most children (75%) lived in metropolitan areas. One-quarter of children (24%) had a clinical CBCL score indicating emotional or behavioral problems.

Most (75%) children were covered by Medicaid or another state health plan, and 70% of children lived in households with an annual family income ≤$35,000. The majority of caregivers (73%) had at least a high school education, and half reported being employed (full or part-time). Only 4% of caregivers did not have a usual source of care. Approximately 10% of children had a current dental problem, and 8% had unmet dental needs due to not being able to afford care.

Factors associated with child dental visits in the past year

Regression results identified several predisposing, enabling, and need factors significantly associated with children's past-year dental service utilization (Table 2). Children age six years and older had higher odds of a past-year dental visit than those aged 2-5 years (Odds Ratio [OR]=2.95, 95% Confidence Interval [CI]=2.06-4.21 for children 6-11 years old;

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OR=2.47 CI=1.82 -3.37 for 12-17 years old). Children whose primary caregivers were not biological parents (e.g., foster parents, grandparents) had lower odds (OR=0.64, CI=0.43-0.97) of a past-year dental visit than those with a biological mother or father. Child race/ethnicity was not significantly associated with dental utilization after controlling for other factors in the model.

Among enabling characteristics, children without a usual source of care had significantly lower odds of receiving a past-year dental visit (OR=0.50, CI=0.27-0.94). Children with high school educated caregivers were more likely (OR=1.68, CI=1.20-2.36) to have a past-year dental visit than if caregivers had not graduated high school. Children with caregivers reporting at least some college education had even greater odds of receiving past-year dental services (OR=2.45, CI=1.71-3.52).

Need factors were strongly associated with dental utilization. Odds of past-year dental utilization were two times higher for children with current dental problems than those without (OR=2.02, CI=1.21-3.38). Children who needed but could not afford dental care had 72% lower odds of using dental services than children whose caregivers did not report these financial barriers (OR=0.28, CI=0.16-0.46).

DISCUSSION

This study examined dental utilization among all children aged 2-17 years involved in the CWS using current national data. Approximately two-thirds (66%) of children in the CWS visited a dentist in the previous year. The National Health and Nutrition Examination Survey 2014 estimate for dental utilization among children ages 2-17 years was 83% (Health, U.S. 2015). This study's overall estimate is lower than 83%, but within the range of recent reported national estimates of child dental utilization ranging 46%-83%, based on claims or self-report data using different national health datasets for children in the general population (Isong et al., 2012; Romaire, Bell, & Huebner, 2012)(Vujicic & Nasseh, 2016) and with special healthcare needs (Beil, Mayer & Rozier, 2009). A consistent finding is that socioeconomic disparities in children's dental utilization (Isong et al., 2012; Romaire et al., 2012). Child age, caregiver education, and reported child need (dental problems) were each positively associated with a child's dental visit in the prior year. In contrast, children with no usual source of care, those living with non-biological parent caregivers, and those reporting being unable to afford needed care were less likely to utilize dental services. These findings identify which children in the CWS are most at-risk for low dental utilization and have policy and practice implications for primary care providers, social workers, and others in regular contact with these children and families to promote oral health and access to dental services.

Child age was strongly associated with dental utilization. Most children ages 6-17 had a dental visit in the past year. The youngest children (ages 2-5) were less likely than older children involved with the CWS to have a past-year dental visit. Age of first dental visit is not known for children in this sample. Our estimate of 52% may be capturing some first visits in this age group. This is consistent with national 2009 Medical Expenditure Panel data indicating less than half (43%) of children ages 3-5 had a past-year dental visit (Griffin

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et al., 2014). Young children have low dental utilization and many do not meet recommended guidelines for the age one first dental visit. This suggests the opportunity to improve screening for Early Childhood Caries (ECC) thereby increasing these children's quality of life, behavior, and school performance (Casamassimo, Thikkurissy, Edelstein, & Maiorini, 2009).

Pediatricians have frequent contact with children in the first five years for well-visits, and then at least annually as children grow. In this sample, the majority (88%) of children had a well-visit in the last year, and nearly all (94%) saw a physician or other health provider in the last year for a well or sick visit. Well-child visits provide opportunities to discuss and screen for oral health. In one Medicaid study, children with more well-child visits between ages 1-3 were more likely to have an earlier first dental exam (Chi et al., 2013). For high-risk children in the CWS, especially those without a usual source of care, a pediatric visit may be their only contact with any health provider. Basic oral screenings should be part of all pediatric visits, with dentist referral if needed. Pediatricians have reported seeing dental problems frequently, but lack formal dental training (Lewis, Grossman, Domoto, & Deyo, 2000). The AAP Section on Pediatric Dentistry and Oral Health promotes preventive oral health intervention by pediatricians (Section on Pediatric Dentistry and Oral, 2008), and dental trainings and resources to support integrating oral health assessments into regular pediatric practice are available.

Study results indicated that caregiver relationship and educational attainment were each associated with whether or not the child visited a dentist. Children in the CWS living with non-biological parent caregivers were less likely to obtain dental care. These caregivers may need additional support, education, and outreach efforts to bring the child to the dentist. Pediatricians and other non-dental health providers, social workers, and others working with children in the CWS can promote annual utilization and also educate caregivers about oral health. It is possible that caregivers may not be aware of a child's oral health needs unless it is evident the child is in pain or there some other visible symptoms or problems. Caregivers play a major role in deciding when to bring children in for care, particularly for younger children's first entry into the dental system (Divaris et al., 2014). Establishing regular dental visits in early childhood emphasizes prevention and regular care-seeking behavior into adulthood, and studies have shown that preventive visits at earlier ages for young children on Medicaid were associated with lower dental care costs later (Savage, Lee, Kotch, & Vann, 2004). Seeking dental services only when there is a problem is more costly and painful to treat; early preventive dental care is associated with future visits for prevention (Bhaskar, McGraw, & Divaris, 2014). This study also found that children with dental problems were twice as likely to visit the dentist as those without problems. Problem-driven care-seeking is not ideal for the child, or health system. Historically, dental care has been separate from the rest of the healthcare delivery system. There is movement toward greater care coordination and medical-dental integration (Mouradian, Lewis, & Berg, 2014) to improve quality of care and outcomes, particularly for individuals with special health needs. Under the Affordable Care Act, dental is an essential health benefit for children, but access to dental care is still challenging for many. In this study, 8% of caregivers reported that their children needed dental care but they could not afford it, and the need for dental care was negatively correlated with utilization if there were financial barriers. Insurance often enables utilization,

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but may not cover all costs. Few dentists accept Medicaid, and less than half participate in most states (U.S. Government Accountability Office, 2010). The nation's poorest children on Medicaid have very low dental utilization rates, with less than half obtaining care (Hakim, Babish, & Davis, 2012). Additional access barriers such as transportation, or competing needs, may make obtaining dental services in a timely manner difficult for children in the CWS. Since most children in the CWS have Medicaid, increasing the Medicaid dental provider network may help improve access, but the impact will vary by state and require Medicaid policy changes.

Study findings support policy change at the federal and state levels. Federal law should be clarified across states and better enforced, so states uniformly deliver comprehensive needed dental services to all children in the CWS. States should be required to complete initial comprehensive oral health assessments (not just screenings) beginning at age one for all children in the CWS. States should also be required to monitor dental referrals and treatment plans, and follow-up on the status of those children so they do not fall through the cracks. Treatment should be completed within a reasonable timeframe, followed by regular preventive care on at least an annual basis. Children in the Medicaid program and involved in the CWS are considered "high risk," and should ideally be seen by a dentist more often than once per year (American Academy of Pediatric Dentistry, 2013).

If caregivers repeatedly fail to attend to a child's oral health needs and follow recommended dental care, and if access barriers have been removed, then neglect may be an issue (Welbury, 2016). The current definition of "dental neglect" by the American Academy of Pediatric Dentistry is the "willful failure of parent or guardian to seek and follow through with treatment necessary to ensure a level of oral health essential for adequate function and freedom from pain and infection" (2010, p 7). This definition assumes caregivers are fully informed about oral health needs, and professional recommendations about dental care do not differ between pediatricians, pediatric or general dentists or other health providers, which may not always be the case. It is not possible from the data available in this study to identify children involved in the CWS due to dental neglect specifically, or to definitively conclude that lack of a dental visit in the prior year is evidence of dental neglect. Few studies explore dental neglect among children, whether they are involved in the CWS or not, but this is a needed direction for future research.

This study is the first to explore caregiver-reported child dental utilization in the prior year among children ages 2-17 involved in the CWS. This sample is representative of all children investigated for alleged abuse or neglect of any kind. The cross-sectional analysis was based on a recent, large, national probability sample, and accounted for multiple child, caregiver, and family factors using robust child emotional and behavioral measures. Child-level factors related to being in the CWS were not statistically significant in this model, but were relevant to consider for health service utilization. For example, child behavioral problems were identified in a recent qualitative study as a factor impeding foster children's access to dental services (Melbye, Huebner, Chi, Hinderberger, & Milgrom, 2013). Study limitations should also be considered when interpreting findings. The NSCAW-II dataset does not provide detailed information about the type of dental visit or treatments received, so reasons for dental visits are not known. The study is cross-sectional, and no causal relationships can be

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inferred. Caregiver reports could have been inaccurate or biased. It is possible that our estimates may be over or underestimations. Future studies should examine the dental needs and the unique access barriers encountered by children in the CWS in more depth.

Conclusions

Based on caregiver report, one-third of children in the CWS did not visit a dentist in the prior year, and two-thirds did. Pediatricians, social workers, and other social service providers can play an important role in promoting oral health and ensuring that all children in the CWS are referred to and receive dental care, especially for younger children under five. All providers in contact with children in the CWS should promote oral health, check for potential neglect, and refer children for dental care if needed. Educating caregivers, particularly non-biological parent caregivers, about the importance of seeking dental care, and policy changes to reduce financial barriers to care will increase utilization of dental services and improve the oral health of children in the CWS.

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Significance

Children involved with the child welfare system (CWS) are a diverse, vulnerable group at increased risk for health problems and conditions requiring extensive health and related services. However, little is known about factors associated with their dental service utilization. Children with no usual source of care, living with non-biological parent caregivers, or unable to afford needed care were less likely to obtain care. Results identified potentially modifiable child- and caregiver-level factors associated with utilization. There are policy and practice implications for health and social service providers in regular contact with CWS children and families to promote access to dental services.

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Table 1

Sample Characteristics (n=2806)

	Mean (%)
Dependent Variable	
Past-year dental use	66%
Predisposing Characteristics	
Child Male Gender	51%
Child's Age (years)	
2-5	35%
6-11	39%
12-17	26%
Child's race/ethnicity	
White	44%
Black	21%
Hispanic	28%
Other[1]	7%
Maltreatment	
Neglect	33%
Physical abuse	23%
Sexual abuse	9%
Substance abuse	12%
Other[2]	23%
Cumulative family risk	1.54
Number other children	3.17
Caregiver relationship	
Biological mom	76%
Biological dad	9%
Other[3]	15%
Located in a metropolitan area	75%
Child has emotional or behavioral problem	24%
Enabling Characteristics	
Child-level factors Child's insurance	
Medicaid or state health plan	75%
Private	17%
Any other[4]	8%
Primary usual source of care	
Doctor's office or HMO	69%
Clinic	27%
None[5]	4%

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	Mean (%)
Caregiver-level factors	
Total family income	
>$35,000/year	30%
≤ $35,000/year	70%
Caregiver education	
< High school	27%
High school	43%
> High school	30%
Caregiver employment	
Full-time	35%
Part-time	15%
Other/unemployed	50%
Need-related Characteristics	
Child has dental problems	
Yes	10%
No	90%
Child needed dental care, but couldn't afford	
Yes	8%
No	92%

[1]Other includes Asian, Native Hawaiian or Pacific Islander, American Indian, and 'other' (unspecified)

[2]Other includes many possible categories, such as domestic violence, voluntary relinquishment, children in need of services, investigation only way to get services, moral/legal maltreatment, educational maltreatment.

[3]Other includes 47 categories, such as step-parent, adoptive parent, foster parent, siblings, aunts and uncles, cousins, grandparents, etc.

[4]Other includes military health insurance (CHAMPUS/CHAMP-VA/TRI-CARE), Indian Health Services, or another type of health insurance (unspecified)

[5]Other includes no usual source of care, or some other specified location like an emergency room

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Table 2

Logistic Regression Model Results (N=2806)

	Odds Ratio (OR)	95% Confidence Interval (CI)
Predisposing Characteristics		
Child Male Gender	0.89	0.71–1.12
Child Female Gender	1.00	Reference
Child's Age (years)		
2-5	1.00	Reference
6-11	2.95 ***	2.06–4.21
12-17	2.47 ***	1.82–3.37
Child's race/ethnicity		
White	1.00	Reference
Black	0.97	0.67–1.40
Hispanic	1.24	0.87–1.76
Other	0.72	0.42–1.24
Maltreatment		
Neglect	1.00	Reference
Physical abuse	1.07	0.73–1.57
Sexual abuse	0.98	0.60–1.60
Substance abuse	0.90	0.60–1.36
Other	1.31	0.95–1.79
Cumulative family risk	1.02	0.84–1.23
Number of children	1.06	0.96–1.17
Caregiver relationship		
Biological mom	1.00	Reference
Biological dad	0.92	0.53–1.59
Other	0.64 *	0.43–0.97
Located in a metropolitan area	1.12	0.80–1.56
Child has emotional or behavioral problem	0.95	0.65–1.38
Enabling Characteristics		
Child's insurance		
Medicaid or state health plan	1.00	Reference
Private	1.16	0.79–1.69
Other	1.33	0.90–1.96
Primary usual source of care		
Doctor's office or HMO	1.00	Reference
Clinic	0.85	0.59–1.20
None	0.50 *	0.27–0.94
Total family income		
≤$35,000/year	1.00	Reference

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	Odds Ratio (OR)	95% Confidence Interval (CI)
>$35,000/year	0.94	0.65–1.34
Caregiver education		
< High school	1.00	Reference
High school	1.68 **	1.20–2.36
> High school	2.45 **	1.71–3.52
Caregiver employment		
Full-time	1.00	Reference
Part-time	1.04	0.69–1.58
Other/Unemployed	1.04	0.76–1.41
Need-related Characteristics		
Child has dental problems	2.02 **	1.21–3.38
No dental problems	1.00	Reference
Needed dental but couldn't afford	0.28 **	0.16–0.46
Needed dental but could afford	1.00	Reference

Dep. var. = child received a dental cleaning or checkup within last 12 months. Average Relative Variance Increase (RVI) = 0.01

* p<0.05,

** p<0.01,

*** p<0.001