



Consumer Survey Focused on Parents' Experiences Accessing Oral Health Services for Their Children



Center for Health Workforce Studies
School of Public Health
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PREFACE

The Oral Health Workforce Research Center (OHWRC) at the Center for Health Workforce Studies (CHWS) at the University at Albany's School of Public Health completed a study to evaluate factors identified by parents as impacting their children's access to oral health services and to explore differences in utilization of oral health services by demographically distinct population groups.

This report was prepared for OHWRC by Simona Surdu, Margaret Langelier, and Nubia Goodwin, with layout design by Leanne Keough. Qiushuang Li completed the data analyses.

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The mission of OHWRC is to provide accurate and policy-relevant research on the impact of the oral health workforce on oral health outcomes. The research conducted by OHWRC informs strategies designed to increase access to oral health services for vulnerable populations. OHWRC is based at CHWS at the School of Public Health, University at Albany, State University of New York (SUNY), and is the only HRSA-sponsored research center with a unique focus on the oral health workforce.

The views expressed in this report are those of OHWRC and do not necessarily represent positions or policies of the School of Public Health, University at Albany, SUNY.

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This material is based upon data provided by the AAMC. The views expressed herein are those of the authors and do not necessarily reflect positions or policies of the AAMC.

Institutional Review Board

The plan for this study was reviewed and designated exempt from further review by the Institutional Review Board of the New York State Department of Health (Study No. 1199770-1).

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EXECUTIVE SUMMARY

BACKGROUND

Despite efforts to improve access to oral health services in the US, oral health disparities persist for many population groups, including children. The oral health of children is a particular concern from a public health perspective because early, appropriate oral hygiene and access to a dental home are almost certainly predictive of oral health behaviors that affect oral health outcomes over a lifetime.

While several national surveys collect data on children's oral health status and utilization of oral health services, the small number and variable focus of survey questions in these instruments make it difficult to clearly identify detailed access-to-care issues from a patient/parental perspective. Specific information related to parents' oral health literacy, attitudes, and behaviors, as well as the usual sources of oral health care for their children, is either not collected or very limited in existing public data. Consequently, the Oral Health Workforce Research Center (OHWRC) collaborated with the Workforce Studies group at the Association of American Medical Colleges (AAMC) to include a series of questions for parents on children's access to oral health services in the AAMC's biannual Consumer Survey of Health Care Access.

The objectives of this study were to highlight unique access barriers for children, including specific barriers for underserved children living in rural or other underserved geographic areas, underrepresented minorities, and children with special health care needs. The ultimate goal of this research was to provide scientific evidence to support the development of effective policy strategies to address access barriers and oral health disparities among children.

METHODOLOGY

Data Source

The analytic data set was created by merging data from the January 2019 and June 2019 waves of the Consumer Survey of Health Care Access fielded by the AAMC. The survey is a cross-sectional online survey conducted biannually using a national panel of approximately 1.2

million adults aged 18 years and older. The June 2019 sample excluded respondents who had completed the previous survey in January 2019 to eliminate the possibility of duplication. In addition, the June survey oversampled for additional respondents from underserved population groups including racial/ethnic minorities, low-income persons, the uninsured, Medicaid beneficiaries, and individuals residing in rural areas. The oral health data were collected from parents and legal guardians of children under 18 years of age who were living in their households. The sample comprised 1,785 parent/legal guardian respondents with 3,070 children.

Survey Instrument

The oral health module consisted of skip-logic questions asking about respondents' ability to obtain needed oral health care for their children, perceived barriers to and facilitators of oral health care services, and oral health literacy, as well as questions asking about their children's oral health status, attitudes toward oral health, oral health behaviors, and other topics. In addition to the data on oral health, the survey collected extensive information on respondents' demographic characteristics, socioeconomic factors, and urban/rural location of their primary home.

Many of the survey questions about children's oral health were constructed based on questions from established surveys such as the National Survey of Children's Health, the National Health Interview Survey, and the National Health and Nutrition Examination Survey among others.

The research protocol and survey instrument were reviewed and approved by the Institutional Review Boards of the AAMC and the New York State Department of Health. A copy of the oral health survey module is included as an Appendix of this report.

Data Analysis

The characteristics of children who needed dental care and their access to and utilization of oral health care were evaluated using descriptive statistical analyses, including frequency distribution, cross tabulation, and chi-square test. Statistical analyses included potential factors that may influence children's access to dental

care such as demographic factors, urban/rural residence, insurance coverage, and oral health status, in addition to parental education level, employment status, annual household income, oral health literacy, care-seeking behaviors, and perceived barriers to and facilitators of oral health care services.

The survey data were weighted by age, gender, race/ethnicity, employment status, household income, educational attainment, and geographic region, in order to make the data more representative of the US adult population. All statistical data analyses were conducted using SAS v9.4.

KEY FINDINGS

Characteristics of Survey Respondents and Their Children

- The majority of respondents were between 35 and 64 years of age (60.8%), non-Hispanic white (52.3%), attended or graduated from college (49.7%), worked full time (63.1%), reported an annual household income of \$50,000 or more (64.9%), and resided in suburban areas (46.0%).
- The majority of respondents' children were between 6 and 18 years of age (69.3%), non-Hispanic white (48.3%), had dental insurance coverage (89.7%), had a particular dental professional from whom they usually received needed dental services (dental home) (70.5%), and were first seen by a dental professional when they were 3 years of age or younger (50.7%).

Parental Perceptions of Children's Oral Health Status and Oral Hygiene Behaviors

- According to their parents, the majority of the children enjoyed excellent or very good oral health (79.1%), exhibited no oral health symptoms (79.6%) or problems (66.5%), and had no cavities diagnosed by a dentist (58.4%) during the study period.

- The most commonly reported oral health symptom was bad breath (10.2%) and the most common oral health problems were toothache or sensitive teeth (15.6%) and crooked teeth (10.1%).
- About 16.2% of children had 1 cavity, 18.6% of children had 2 or more cavities, and 5.2% of children were rated by their parents as having fair or poor oral health status.
- More than half (60.0%) of the children in the care of survey respondents brushed their teeth at the recommended standard frequency of 2 or more times per day.
- In addition, 45.4% of these children flossed their teeth 1 or more times per day.

Parental Oral Health Knowledge

- Only 51.8% of parents correctly identified as true or false at least 6 of 10 statements about children's oral health.
- Parents expressed the most uncertainty about giving young children milk at bedtime and about the transmissibility of dental disease from caregivers to babies through use of common utensils.

Need for Dental Services Among Children in the Prior Year

- Surveyed parents reported that nearly two-thirds of children (63.5%) needed dental care during the previous 12 months.
- Parents were less likely to report a need for dental care for children between 1 and 5 years of age, children without dental insurance coverage, children without a dental home, or children without any special health care needs compared with other children.
- Parents with a high school education or less, without full-time employment, with an annual household income of less than \$100,000, and/or who resided in rural areas were significantly less likely to report a need for dental services for their children than other parents.

- Parents with lower oral health literacy scores were also less likely to report a need for dental services for their children than were parents with higher oral health literacy scores.
- Parents of children without any oral health issues were less likely to report that the child needed dental care in the past 12 months than were parents of children with one or more oral health symptoms, problems, or cavities.
- Excellent or very good oral health status was associated with a lower perceived need for dental care compared with other children.

Parents' Ability to Obtain Dental Care for Children when Needed in the Past Year

- Parents reported that the majority of children (91.0%) always received dental care as needed over the past 12 months. However, 7.8% of children only sometimes received the dental services that they required during the past year, while 1.2% of children did not receive any needed dental care in the past year.
- The majority of parents reported that they were able to schedule dental visits as soon as they wanted for children who needed dental care in the past 12 months (90.1%).
- Although parents of 75.4% of children in the study reported no difficulties obtaining dental care as often as needed, nearly 1 in 4 children experienced one or more barriers to care.
- The most commonly reported difficulties were related to finding dental providers who accepted the child's dental insurance (5.1%), lack of insurance (5.0%), insurance not paying for the services needed (5.0%), children's dental anxiety (3.9%), cost of dental care (3.5%), and problems getting an appointment when needed (2.9%).

Factors Associated with Ability to Obtain Dental Care for Children in the Past Year

- Children without dental insurance, without a dental home, and with special health care needs were less likely to always receive oral health care when needed over the past 12 months compared with other children.
- Children whose parents were from underrepresented minorities and/or reported some college education or less, not having full time employment, having an annual household income of less than \$100,000, and residing in rural or urban areas were significantly less likely to always receive dental care when needed in the past 12 months than were other children.
- Children whose parents were unable to schedule dental visits as soon as needed, had to travel 30 minutes or more to a dental provider, and had difficulties in seeing a dental professional as often as needed were less likely to always obtain dental care when needed compared with others.
- Children's utilization of dental services over the past 12 months was lowest among those who experienced the following parent-reported barriers: issues related to cost, transportation barriers, inconvenient dental practice hours, and lack of dental insurance.



DISCUSSION

The findings from this study were consistent with much of the current literature discussing the influence of parents' perceptions, behaviors, and roles on children's need and utilization of oral health services. This study found that many of the children in the households of survey respondents had desirable oral health status and regular access to oral health services. More than three-quarters of children of survey respondents (79.1%) were described as having very good or excellent oral health by their parents or legal guardians, and 70.5% of these children had a usual source of care for dental services. Nevertheless, about 3 in 10 children did not have a dental home.

The characteristics of parent respondents were significantly associated with their perceptions of the need for dental services among their children during the previous year. Nearly two-thirds of children (63.5%) in our survey were identified by their parents as needing dental services over the prior year. Our study found that parents with lower levels of educational attainment, less than full-time employment, lower household income, living in a rural area, and lower levels of oral health literacy were less likely to report a need for dental services for the children in their care than were others. Children without oral health symptoms, problems, or cavities were significantly less likely to be identified as needing oral health services in the prior 12 months than were children identified as having one or more dental symptoms, problems, or cavities. These findings are somewhat problematic when considered in the context of oral health literacy and recommended guidelines for care. According to accepted guidance and Medicaid periodicity schedules, children should receive preventive oral health services at least annually or biannually, suggesting that all children "need" preventive dental services within the period of a year.

Levels of oral health literacy among parents were relatively low. About half of survey respondents (51.8%) were able to correctly identify as true or false at least 6 of 10 statements about children's oral health. No single statement among the 10 was correctly identified by more than 70.0% of parent respondents. More than one-third (35.3%) of parents identified as false the statement that dental disease can be transmitted

through shared eating utensils, while another third (34.0%) did not know whether it was true or false. Only 53.7% of parents understood that children should visit a dentist within 6 months of the first tooth erupting. These findings suggest the importance of continued efforts to increase oral health literacy through the education of parents.

While half of the children (50.7%) described by parents in survey responses had first seen a dentist at 3 years of age or younger, only a small percentage of children (16.4%) received dental services at 1 year of age or earlier, as recommended under current anticipatory guidance for the first dental visit. In addition, parents of toddlers and preschoolers were significantly less likely to identify a need for dental care among those children than were parents of older children, a finding consistent with the lack of awareness among survey respondents of the need for early and routine care. One possible explanation is that, although the American Academy of Pediatric Dentistry has recommended an infant oral evaluation within 6 months of tooth eruption since the 1990s, this guideline has only recently received broader public attention. This finding reinforces the need for education of new parents regarding the oral health of their infants and toddlers.

The majority of respondents' children (91.0%) always received dental care as needed over the prior 12 months. However, nearly 1 in 10 children only sometimes received needed dental services, and a small proportion did not receive any needed dental care during the previous year. Utilization of dental services was significantly lower among children whose parents were from underrepresented minorities, reported lower levels of education attainment, not having full-time employment, having a lower household income, and living in rural or urban areas.

Parents who reported difficulty scheduling dental visits as soon as needed were also less likely than parents without such difficulties to always obtain dental services for their children. When travel time to a dentist was 30 minutes or more, children were less likely to always get needed dental services compared with those with less travel time. Parents who reported one or more difficulties in seeing a dentist as often as their child needed were significantly more likely to report that they were not always able to obtain dental services

for their children when needed. Structural barriers to services—including dental practice hours, distance to providers, and limited participation by dentists in public insurance programs—must be considered in any policies or program initiatives with the objective of improving access to dental care.

STUDY LIMITATIONS

Findings in this report are subject to several limitations. First, respondents to this survey may differ from the general population in that the current consumer survey included only people with access to computers. The potential limitations of consumer data collection were addressed by weighting the survey sample to achieve a representative profile of the national population as measured by the US Census Bureau.

Another limitation is possible differential parental recall and report of information related to the need and utilization of oral health services among children. The effect of this bias on the study findings were minimized by using standardized questions and relatively

short reporting periods (mostly less than or up to 12 months). Finally, the cross-sectional design precludes any causal inferences between individual characteristics and access to oral health care for children.

CONCLUSIONS

This study corroborates previous findings in the literature related to the impact of familial demographics, geographies, and socioeconomic status on the oral health of children. The survey found that low-income families were more likely to experience barriers to establishing a dental home and to have greater difficulty obtaining dental services for their children when needed. The findings from this survey suggest that current efforts to mediate structural barriers should be amplified to target the populations of children who are most at risk for lack of access to services. The survey also found a need to improve the oral health literacy of parents, especially as it relates to children's oral health. Literature suggests that higher levels of parental oral health literacy are associated with improved oral hygiene and regular dental visits among their children.





TECHNICAL REPORT

BACKGROUND

Despite efforts to improve access to oral health services in the US, oral health disparities persist for many population groups, including children. Children are especially susceptible to failure to receive health or oral health services because they are dependent on others to arrange appointments and provide transportation to services. Vulnerable and underserved children include those living in poverty and in rural areas, as well as those with special health care needs. The oral health of children is a particular concern from a public health perspective because early, appropriate oral hygiene and access to a dental home are almost certainly predictive of oral health behaviors that affect oral health outcomes over a lifetime.

Dental caries is preventable but remains one of the most common chronic diseases of childhood in the US.¹ Untreated cavities can cause pain, difficulty eating, school absenteeism, and impaired quality of life. According to the 2015–2016 National Health and Nutrition Examination Survey² and the 2016 National Survey of Children's Health,³ about 13% of children had untreated dental caries or oral health problems. In the 2014 National Health Interview Survey, approximately 4% of children needed oral health care but did not get it because their family could not afford it.³

Children from underrepresented racial/ethnic groups, low-income families, and those without dental insurance have a higher prevalence of oral health concerns than other children, creating striking oral health disparities.^{2,3} Other factors that influence access to dental care include geographic location, health status, availability of dental providers, and oral health literacy.^{4,5}

While several national surveys collect data on children's oral health status and utilization of oral health services, the small number and variable focus of survey questions in these instruments make it difficult to clearly identify detailed access-to-care issues from a patient/parental perspective. Specific information related to parents' oral health literacy, attitudes, and behaviors, as well as the usual sources of oral health care for their children, is either not collected or very limited in existing public data. Consequently, the Oral Health Workforce Research Center (OHWRRC) collaborated with the Health Workforce group at the Association of

American Medical Colleges (AAMC) to include a series of questions for parents on children's access to oral health services in the AAMC's biannual Consumer Survey of Health Care Access.

The objectives of this study were to highlight unique access barriers for children, including specific barriers for underserved children living in rural or other underserved geographic areas, underrepresented minorities, and children with special health care needs. The ultimate goal of this research was to provide scientific evidence to support the development of effective policy strategies to address access barriers and oral health disparities among children.

METHODOLOGY

Data Source

The analytic data set was created by merging data from the January 2019 and June 2019 waves of the Consumer Survey of Health Care Access fielded by the AAMC. The survey is a cross-sectional online survey conducted biannually using a national panel of approximately 1.2 million adults aged 18 years and older. The June 2018 sample excluded respondents who had completed the previous survey in January 2019 to eliminate the possibility of duplication. In addition, the June survey oversampled for additional respondents from underserved population groups including racial/ethnic minorities, low-income persons, the uninsured, Medicaid beneficiaries, and individuals residing in rural areas. The oral health data were collected from parents/legal guardians of children under 18 years of age who were living in their households. The sample comprised 1,785 parent/legal guardian respondents with 3,070 children, including 1,925 children who needed oral health care in the past 12 months.

Researchers from the OHWRRC also conducted a literature review of federal surveillance efforts and other research studies published in peer-reviewed journals or research reports to provide an in-depth understanding of issues related to access to oral health care for children as described by parents.

Survey Instrument

The oral health module, which was part of a larger survey on need for medical services, consisted of skip-logic questions asking about respondents' ability to obtain needed oral health care for their children, perceived barriers to and facilitators of oral health care services, and oral health literacy, as well as questions asking about their children's oral health status, attitudes toward oral health, oral health behaviors, and other topics. In addition to the data on oral health, the survey collected extensive information on respondents' demographic characteristics, socioeconomic factors, and urban/rural location of their primary home.

Many of the survey questions about children's oral health were constructed based on questions from established surveys such as the National Survey of Children's Health (NSCH), Department of Health and Human Services, Maternal and Child Health Bureau (MCHB) of the Health Resources and Services Administration (HRSA); the National Health Interview Survey (NHIS), the National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention (CDC); the National Health and Nutrition Examination Survey (NHANES), NCHS, CDC; and the Children's Oral Health Survey, Delta Dental Plans Association.

The research protocol and survey instrument were reviewed and approved by the Institutional Review Boards of the AAMC and the New York State Department of Health. A copy of the oral health survey module is included in as an appendix of this report.

Data Analysis

The characteristics of children who needed dental care and their access to and utilization of oral health care were evaluated using descriptive statistical analyses, including frequency distribution, cross tabulation, and chi-square test. Statistical analyses included potential factors that may influence children's access to dental care such as demographic factors, urban/rural residence, insurance coverage, and oral health status, in addition to parental education level, employment status, annual household income, oral health literacy, care-seeking behaviors, and perceived barriers to and facilitators of oral health care services.

The survey data were weighted by age, gender, race/ethnicity, employment status, household income, educational attainment, and geographic region, in order to make the data more representative of the US adult population. All statistical data analyses were conducted using SAS v9.4.

FINDINGS FROM THE LITERATURE REVIEW

The protocol for this literature review included an extensive search for peer-reviewed literature on the topic of consumers' access to oral health care services. Researchers used the PubMed search engine almost exclusively, using the following search terms: oral healthcare AND access AND children AND survey, oral health AND children, parental AND perceptions AND oral health, and parental AND access AND oral health. Researchers uncovered additional literature through review of citations/references in the discovered literature. In total, 18 relevant documents published between 2005 and 2018 were selected, 15 of which were peer-reviewed journal articles. One of these studies was conceptual/theoretical in nature. The other 3 documents comprised a summary report on a community-level oral health survey completed by the National Indian Health Board, a survey protocol from the 2009 New Zealand Oral Health Survey Child Questionnaire, and a survey conducted by the Agency for Healthcare Research and Quality (AHRQ) to understand patients' experiences with their dental plans.

The oral health of children is a particular concern because early, appropriate oral hygiene and access to a dental home affect oral health behaviors and outcomes over a lifetime.

Methods

Primary Data Collection

The examined studies investigating children's access to oral health care services used different approaches to gather data. Five studies collected primary data through surveys of parents.

A 2012 CHIPRA-mandated evaluation of the federal Children's Health Insurance Program (CHIP) (Clemans-Cope et al, 2015) used a telephone interview survey of 12,197 parents of children who either were currently enrolled or had been enrolled in a CHIP benefit program for specific time periods.⁶

Butani et al (2009) used a self-administered survey of parents of children in 34 special education programs and 16 mainstream public elementary school classes in San Mateo, California, to compare parents' perceptions of their children's oral health status.⁷ The study compared the responses of parents of children in special education programs to those of parents with children in corresponding grade levels in mainstream education.

Lenčová et al (2008) used a mixed-methods approach to answer their research question.⁸ The authors enrolled 285 preschool children and their parents in 31 localities in the Czech Republic to participate in a cross-sectional study. The research protocol included a parental questionnaire coupled with a clinical dental examination of each child to understand how a parent's attitudes and beliefs about the determinants of oral health status (fate/luck vs health behaviors) affected the actual oral health status of the child.

Heaton et al (2017) used a staff-administered survey of a convenience sample of 53 mothers of young children from 3 tribal communities in California.⁹ The study collected data to evaluate whether the oral health beliefs and knowledge of parents and their perceived barriers to oral health services correlated with demographic characteristics and oral health behaviors in families.

The National Indian Health Board used a Web-based survey containing both defined-response and open-ended narrative questions.¹⁰ The survey was fielded to 6,700 people to understand unmet need for dental

services and receptivity to dental health aide therapists in tribal communities. The survey generated 1,000 responses from 38 states and 12 Indian Health Service areas.

Analyses of Secondary Data

Four of the studies examined secondary data. Researchers drew from the following surveys and records.

Dye et al (2011) used data from the third National Health and Nutrition Examination Survey (NHANES) to examine the relationship between the oral health status of mothers and that of their children.¹¹ NHANES collects data through home interviews of adults, who also report on children in the household. The interviews are followed by a dental examination of both the mother and the child to provide supporting clinical data.

Talekar et al (2005) used the same series of NHANES data describing 3,424 children between 2 and 5 years of age to ascertain the relationship of their parents' perceptions of their children's oral health status to the characteristics of the parents.¹²

Guarnizo-Herreño and Wehby (2014) used the 2007 National Survey of Children's Health (NSCH) to estimate the impact of the supply of dentists on children's oral health while controlling for a variety of confounders, including personal and population-level characteristics.¹³

Fernandez de Grado et al (2018) used data acquired in France in 2010 from the Health Behavior in School-Aged Children study.¹⁴ The study was part of a larger effort of the World Health Organization, which collaborates with 44 countries in Europe and North America every 4 years to collect data on youth well-being and behaviors. The sample in France included 11,337 students between the ages of 10 and 16 years in 347 schools.

Use of Mixed Methods

Six other studies used mixed methods, including qualitative techniques such as interviews and focus groups.

Kelly et al (2005) conducted 8 focus groups comprising 76 parents/caregivers of Medicaid-enrolled children between 4 and 12 years of age in Kentucky.¹⁵ The objectives of the study were to understand barriers to oral health care, to compare the experience of those who were able to access oral health services for their child with those who were not, and to explore caregivers' perspectives on oral health.

Maida et al (2018) used focus groups that included 29 parents or guardians of 8- to 17-year-old children to develop survey items for a questionnaire.¹⁶ The resulting questions were then fielded to 32 parents or guardians of same-age children during face-to-face cognitive interviews in a field test survey in the Los Angeles, California area. The objective was to develop questions that would help in accurately estimating clinical measures of oral health status.

The objective of a study by Pahel et al (2007) was to build an instrument to measure parental perceptions of oral health needs in their children and to evaluate the impacts of dental disease on quality of life among preschool children and their parents.¹⁷ The study used a mixed-methods approach to develop the final questionnaire and test the validity of the instrument. These methods included focus groups, interviews, and surveys. In the development stage, 45 question items were selected from previous studies found in the subject literature; these items were then reviewed by a convenience sample of 22 health professionals who routinely treated young children. Subsequently, the number of items for survey inclusion was reduced to 36. A convenience sample of 30 parents or caregivers was then asked to respond to the smaller questionnaire and to rate the relevance of the questions to their children. Each of these parents was then interviewed to ascertain any difficulty understanding the questions and to obtain insights into other questions that should be included. The number of items was again reduced, resulting in a modified questionnaire tool with 13 questions. Pretesting of the survey, called the Parental Caregiver Perceptions Questionnaire, was accomplished by 6 parents of preschool children. Validity was ascertained using a convenience sample of 295 parents or caregivers of 5-year-old children with varying dental treatment needs.

Siegel et al (2005) also used a mixed-methods approach to describe access to oral health services for Ohio Head Start children.¹⁸ The study used clinical screenings of 2,555 children enrolled in Head Start, a 6-item questionnaire completed by their parents or caregivers, 60 structured telephone interviews of Head Start staff, structured telephone interviews with 15 parents/caregivers, and questionnaires of a random sample of 4,984 dentists to describe oral health care needs, dental capacity to treat young children, and barriers to access to services.

Yaghoubi et al (2017) developed a telephone interview survey and tested its validity using a mixed-methods approach.¹⁹ The purpose of the survey was to evaluate perceived oral health care needs and barriers to oral health services in Iran. The methods included qualitative evaluation of a draft interview protocol by 7 experts and subsequent pilot testing with 10 people. The survey was then modified, and 5 others were asked to review and provide input. Once the content was refined, the reliability of the questionnaire was tested using a random sample of 70 people, 29 of whom completed telephone interviews in the reliability-checking phase of the project. Nineteen respondents completed the questionnaire a second time after modifications to the instrument were effected.

Finally, Bracksley et al (2013) used semi-structured in-depth interviews and thematic analysis to describe the impact of mothers' attitudes towards their children's oral health on the children's oral hygiene status.²⁰ The sample included 7 mothers in Victoria, Australia, with pre-school aged children.

Response Rates

Survey response rates varied, but none of the reviewed studies mentioned low response rates as a limitation. One in-person survey had an overall response rate of 58.8% (Butani et al, 2009).⁷ Another study reported an 84% response rate (320 out of the 380 families that participated in the study) (Lenčová et al, 2008).⁸ A study that surveyed dentists reported a 63.2% response rate (Siegal et al, 2005).¹⁸ The study that recruited a stratified panel of 53 mothers of young children (Heaton et al, 2017) did not report a response rate.⁴

Findings

Fisher-Owens et al (2007) created a conceptual model examining the complex and interactive causes of children's oral health problems.²¹ The researchers drew on existing literature to identify more than 20 child-level, family-level, and community-level factors influencing children's oral health. Among the child-level factors influencing oral health were physical and demographic attributes, use of dental care, and health behaviors and practices. Family-level factors included the health status of parents, socioeconomic status, culture, coping skills of families, health behaviors, and physical safety. Community-level factors included social capital, physical environment, and characteristics of health care and dental care systems. Researchers concluded that any study of children's oral health requires a multidimensional approach that considers numerous biologic, environmental, and social factors.²¹

Researchers who evaluated the relationship between state-level dentist supply and the oral health status of children living in urban settings found that the supply of dentists was significantly related to better oral health outcomes among children aged 1 to 10 years.¹³ The odds of a child having bleeding gums or tooth decay decreased by 80% and 50%, respectively, with an additional dentist per 1,000 population. Additionally, the odds of a worse maternal rating of their child's oral health (on a 5-point progressive scale from poor to excellent) were reduced by 50% for each additional dentist per 1,000 population. The study concluded that dentist supply was positively associated with improved oral health for younger children in urban settings.¹³

Several of the peer-reviewed studies focused on parental perceptions and attitudes about oral health and the impact on children's oral health status. Bracksley et al (2013) found that a mother's perceptions about her children's dental health (eg, the perception that some dental diseases were unavoidable) influenced children's oral health practices and ultimately their oral health outcomes. The authors concluded that mothers play an important role in encouraging their children's oral hygiene practices and that changing maternal perceptions and increasing their knowledge would likely improve children's oral health behaviors.²⁰ Talekar et al (2005) examined parental perceptions of their children's oral health status in conjunction with

coincidental clinical examinations and found that parental perceptions of poor oral health status were highly correlated with actual disease in the child.¹²

Another study examined differences in perceptions of their children's oral health between parents of students enrolled in special education programs and those in mainstream education.⁷ Parents of students enrolled in special education programs were significantly more likely to report poor oral health status for their children, missed school days because of a dental problem, or the lack of a dental visit in the prior year than were parents of children in mainstream classrooms. Students enrolled in mainstream primary education classes were almost always or always able to obtain needed dental services more often than parents of special education students (86% to 78%).⁷

Similarly, Heaton et al (2017) used a convenience sample of American Indian and Alaska Native (AIAN) mothers to compare perceptions of their children's oral health status with maternal oral health-related knowledge, barriers to oral health services, and oral hygiene behaviors.⁹ The authors found a significant relationship between the number of identified barriers to oral health services and low scores for oral health behavior. In addition, the authors found that the factors associated with oral health behaviors in the specific population of AIAN mothers in the study were consistent with those found in other populations identified as also experiencing oral health disparities.⁹

Other reviewed studies specifically evaluated parental perceptions on access to oral health care for children. Siegal et al (2005) described disparities in access for low-income parents of Head Start children in Ohio.¹⁸ The authors found that access was limited due to cost of care or lack of dental insurance and the child's age. They also found that Head Start programs facilitated access to oral health care for young children in the program.¹⁸

Dentist supply was positively associated with improved oral health for younger children in urban settings.

Clemans-Cope et al (2015) evaluated parental perspectives on access to oral health care for children insured by CHIP.⁶ They found that most CHIP enrollees received dental services and that parents were knowledgeable about dental benefits; nevertheless, 12% of CHIP-enrolled children had unmet dental care needs. CHIP-enrolled children (defined as enrollees established in the CHIP program for more than 12 months) were more likely even than previously privately insured children to have a regular source of dental care and to have had a dental checkup in the previous year, but they were also more likely to have greater difficulty finding a dentist to provide care. Parents of CHIP-enrolled children were less likely than parents of previously privately insured children to evaluate their child's teeth as being in excellent or very good condition. The study concluded that enrolling eligible uninsured children in CHIP led to improvements in their access to preventive dental care, as well as reductions in their unmet dental care needs.⁶

Other studies examined parental and lifestyle influences on the oral health of children. Dye et al (2011) used NHANES data in their research to pair women respondents with their children aged 2 through 6 years.¹¹ The authors found that a mother's oral health status was a strong predictor of the oral health status of her children. Children of mothers with high levels of untreated caries were more than 3 times as likely to have higher levels of caries experience compared with children whose mothers had no untreated caries.¹¹

Lenčová et al (2008) also recognized the importance of parental influence on the oral health behaviors of the child.⁸ The authors found a highly statistically significant linear relationship between increased parental locus of control (defined as recognizing that health status is determined in part by one's behaviors) and a higher probability of their children being free from untreated caries, independent of the effect of other sociodemographic variables of children and parents. The study included a survey of parents and clinical examination of children (aged 3 to 5 years) whose parents had also completed a questionnaire.⁸

Fernandez de Grado et al (2018) studied socioeconomic and behavioral influences on the frequency of toothbrushing among children in France.¹⁴ The study determined that healthy eating, gender, and promo-

Enrolling uninsured children in CHIP led to improvements in their access to preventive dental care, as well as reductions in their unmet dental care needs.

tion of oral health at school were strongly associated with brushing teeth at least twice a day. More girls than boys brushed twice a day, which was attributed by the authors to the girls' greater maturity than same-age boys and perhaps to an earlier interest in hygiene and appearance. The authors concluded that health promotion campaigns should especially target the most disadvantaged populations in the school or community. They commented that because early adolescent oral health status is predictive of adult oral health, the population of adolescents should be of special interest in designing health promotion messaging.¹⁴

Methodological Approaches

The methodological approaches used in particular research in the literature varied. One study examined Medicaid utilization records in Kentucky to identify, recruit, and assemble 8 focus groups of parents to evaluate access to oral health care for children in low-income families.¹⁵ Parents reported multiple barriers to access. The authors found that beliefs, perceptions, and normative behaviors of parents and caregivers, along with other structural barriers like transportation, school absence policies, discriminatory treatment, and difficulty locating providers who accept Medicaid, obstruct access to oral health care.¹⁵

Multiple peer-reviewed studies evaluated methods of accurately assessing parental perceptions, knowledge, and attitudes related to the oral health status of their children and their access to oral health services. These studies were useful in survey development for this project. Yaghoubi et al (2017) sought to develop a standardized, validated questionnaire to assess perceived need for oral health services and to identify barriers to

those services.¹⁹ The authors' methodological approach included identifying content domains, preparing questions, checking question validity using a panel of experts, and performing quantitative evaluation using the content validity index and ratio, while validating reliability through telephone interviews with individuals who completed the questionnaire 2 times in a 2-week period.¹⁹

Another study (Pahel et al, 2007) had as its objective the creation of the Early Childhood Oral Health Impact Scale (ECOHIS), intended as a tool to describe parental perceptions of oral health and its association with quality of life.¹⁷ Researchers staged development, beginning with generating a pool of items for inclusion in the scale, using health professionals and parents/caregivers to reduce the number of items, pretesting and testing, and assessing content validity and reliability. The final scale consisted of 13 items in 2 sections, one on child impact and the other on family impact. The authors concluded that the ECOHIS effectively captures the impact of children's oral health problems on quality of life.¹⁷

In their article on qualitative methods of research, Maida et al (2018) conducted focus groups and cognitive interviews to assist with survey development.¹⁶ Their study makes a case for using qualitative methods in a natural environment (dental practices at which children were receiving services) to obtain parents' and children's perceptions of the children's oral health status and input on items for inclusion in a survey questionnaire. Researchers arranged 4 focus groups comprising 29 parents or guardians of children aged 8 to 17 years in the Los Angeles area who visited one or another of 7 dental practices to elicit opinions and attitudes about their children's oral health. The draft questionnaire was administered during cognitive interviews with parents/guardians. The initial draft of items for inclusion was then reviewed and revised by an expert panel. Parental perceptions were also compared with dental clinical examination data for the children.¹⁶

Other Reviewed Literature

Three sources were not peer reviewed but served as examples of relevant questionnaires. Researchers with the Ministry of Health of New Zealand (2009) conducted a parent survey to determine oral health status,

hygiene practices, and oral health attitudes of parents and children. The survey is publicly available as a Microsoft Word document.²² Similarly, researchers with the National Indian Health Board (2016) developed, distributed, and analyzed the results of a community-level Oral Health Survey to understand the extent of oral health care disparities in Indian Country and to gauge Tribal familiarity and interest in the dental therapist model.¹⁰ The Consumer Assessment of Healthcare Providers and Systems (CAHPS) is a set of surveys fielded to assess patients' experiences with receiving health services.²³ The surveys are sponsored by AHRQ. One of the CAHPS surveys focuses on enrollee experience with their dental plan.

Limitations

Several limitations were discussed in the peer-reviewed literature. Some studies used limited or non-representative population samples, affecting the generalizability of findings.^{6,7,9,15,16,18,20} The authors of one study indicated that the cross-sectional data limited inferences of causality and that the self-reported responses to the questions may have resulted in overestimation of good behavior due to social desirability factors.¹⁴ Other studies cited response bias or recall bias as limitations.^{6,14} Two studies noted the inability to establish a temporal relationship, once again limiting the findings related to causality.^{11,12}

Three of the studies discussed in this review were conducted abroad and, therefore, may not be generalizable to US parents and children.^{8,14,20} Studies conducted for specific communities or regions within the US also may not be generalizable to all US parents and children.^{7,17} Other studies commented on potential nonresponse bias.^{11,20} A specific limitation of another study discussing questionnaire development was a failure to evaluate construct validity.¹⁴ Finally, 3 articles were not peer reviewed.^{10,22,23}

Conclusions

The objectives of several of these studies differed somewhat from the objectives of our research study, which focused primarily on parental perceptions of barriers to and facilitators of access to oral health care for their children. However, these studies informed the construction of our questions on access to services.

These studies generally provided evidence of the accuracy of parental perceptions of their children's oral health status; several validated parental judgments of oral health status with clinical examinations of their children. These articles also support the rationale for and validity of using a questionnaire to obtain information on parental perceptions. In addition, these studies provided important information on barriers to access to oral health care for low-income families.

RESULTS FROM THE RESEARCH STUDY

Demographic Characteristics of Parent/Legal Guardian Respondents and Their Children

The oral health data were accrued from 1,785 parent/legal guardian respondents with 3,070 children under 18 years of age living in their households.

The majority of parents/legal guardians were biological parents (80.8%); 13.1% of respondents indicated that they were step-parents or grandparents (Table 1).

TABLE 1. Relationship of Survey Respondents to the Children Under 18 Living in Their Household, 2019

Relationship to the Children	n ^a	%
Biological parent	2465	80.8%
Step-parent	194	6.4%
Grandparent	204	6.7%
Adoptive parent	61	2.0%
Foster parent	22	0.7%
Other	106	3.5%
All	3052	100.0%

^a Totals may vary due to missing responses.

Parents/legal guardians who responded to the survey were primarily female (55.0%) and between 35 and 64 years of age (60.8%) (Table 2). A small percentage of respondents (2.2%) were aged 65 years or older, suggesting that some respondents were grandparents with legal guardianship of their grandchildren. About 1 in 5 (21.4%) indicated Hispanic/Latino ethnicity; just over half (52.3%) reported being non-Hispanic white, with the remainder indicating other races.

Parents/legal guardians reported on more than 3,000 children in their care. A slight majority of these children were male (51.4%). Nearly one-third (30.7%) of

TABLE 2. Demographic Characteristics of Survey Parents/Legal Guardians and Children, 2019

Demographics		Parents/Legal Guardians		Children	
		n ^a	%	n ^a	%
Gender					
Male		804	45.1%	1554	51.4%
Female		981	55.0%	1453	48.1%
Intersex		0	0.0%	16	0.5%
All		1785	100.0%	3023	100.0%
Age groups					
Parents	Children				
18–34 years	Toddlers (1–2 years)	660	37.0%	442	14.4%
35–64 years	Preschoolers (3–5 years)	1086	60.8%	502	16.3%
≥65 years	Middle childhood (6–8 years)	39	2.2%	484	15.8%
	Middle childhood (9–11 years)			504	16.4%
	Young teens (12–14 years)			555	18.1%
	Teenagers (15–18 years)			583	19.0%
All		1785	100.0%	3070	100.0%
Race/ethnicity					
Asian		105	5.9%	27	0.9%
Black or African American		252	14.1%	132	4.3%
Hispanic, Latino, or of Spanish origin		382	21.4%	468	15.3%
Multiracial		83	4.7%	379	12.4%
White		934	52.3%	1474	48.3%
Other		29	1.6%	572	18.7%
All		1785	100.0%	3053	100.0%

^a Totals may vary due to missing responses.

children were toddlers or preschoolers; the remainder were school aged. Children varied demographically from their parents/legal guardians; fewer were non-Hispanic white (48.3% vs 52.3%), fewer were of Hispanic ethnicity (15.3% vs 21.4%), and more were multiracial (12.4% vs 4.7%).

Social Characteristics of Parent/Legal Guardian Respondents

The majority of parents/legal guardians (63.9%) were married and living together; 24.4% reported being single, never married (Table 3). Half of survey respondents (52.5%) indicated that there was a single child under 18 years of age in their household; 32.3% indicated 2 minor children in their care; and 15.3% indicated 3 or more children under 18 years of age in their household.

TABLE 3. Social Characteristics of Survey Parents/Legal Guardians, 2019

Social Characteristics	n ^a	%
Marital status		
Married, living together	1140	63.9%
Single, never married	436	24.4%
Divorced	130	7.3%
Separated	46	2.6%
Widowed	33	1.8%
All	1785	100.0%
Number of children under the age of 18 living in the household		
1	937	52.5%
2	577	32.3%
3	169	9.5%
≥4	103	5.8%
All	1785	100.0%
^a Totals may vary due to missing responses.		

Socioeconomic and Geographic Characteristics of Parent/Legal Guardian Respondents

The majority of parents/legal guardians (61.3%) had attended or graduated from college (49.7%) or had completed postgraduate education (11.6%) (Table 4). More than half of respondents worked full time (63.1%) and reported an annual household income of \$50,000 or more (64.9%). More than one-third (36.3%) indicated residence in an urban area, while 37.8% resided in the South region. The South region contains the largest number of states of any census region.

TABLE 4. Socioeconomic and Geographic Characteristics of Survey Parents/Legal Guardians, 2019

Socioeconomic and Geographic Characteristics	n ^a	%
Education level		
Less than or high school graduate	687	38.7%
Some college	512	28.8%
College graduate	370	20.9%
Postgraduate	206	11.6%
All	1776	100.0%
Employment status		
Full-time	1126	63.1%
Part-time	252	14.1%
Homemaker	189	10.6%
Unemployed	119	6.6%
Student	41	2.3%
Retired	59	3.3%
All	1785	100.0%
Annual household income		
<\$25,000	236	13.3%
\$25,000–49,999	388	21.9%
\$50,000–74,999	353	19.9%
\$75,000–99,999	291	16.4%
\$100,000–124,999	212	12.0%
\$125,000–149,999	90	5.1%
>\$150,000	204	11.5%
All	1773	100.0%
Self-reported area of residence		
Urban	647	36.3%
Suburban	821	46.0%
Rural	317	17.7%
All	1785	100.0%
Census region of residence		
Northeast	286	16.0%
Midwest	395	22.1%
South	674	37.8%
West	430	24.1%
All	1785	100.0%
^a Totals may vary due to missing responses.		

Characteristics of Children’s Access to Dental Care

The majority of children (89.7%) had dental insurance coverage (Table 5). Dental benefits were mainly sponsored by a parent’s employer (41.2%) or by Medicaid or CHIP (37.5%). However, more than 1 in 10 children (10.3%) did not have dental insurance coverage at the time of survey completion as reported by their parents/legal guardians. The majority of children (70.5%) had a particular dentist or other dental professional from whom they usually received needed dental services (ie, a dental home). In contrast, nearly 3 in 10 children (29.5%) did not have a dental home. About half of the children (50.7%) were first seen by a dentist or other dental professional when they were 3 years of age or younger.

TABLE 5. Dental Insurance Coverage, Dental Home, and Age at First Dental Visit for Children as Reported by Their Parents/Legal Guardians, 2019

Characteristics of Children’s Access to Dental Care	n ^a	%
Dental insurance coverage		
Insurance sponsored by an employer	1254	41.2%
Medicaid or Children’s Health Insurance Program (CHIP)	1141	37.5%
Through a health insurance marketplace or exchange	172	5.6%
Directly from an insurance company, not through the marketplace	144	4.7%
Other	21	0.7%
No dental insurance	314	10.3%
All	3047	100.0%
Dental home		
Yes	2121	70.5%
No	886	29.5%
All	3006	100.0%
Age at first dental visit		
≤1 year old	499	16.4%
2 years old	608	20.0%
3 years old	433	14.3%
4–6 years old	651	21.4%
>6 years old	464	15.3%
Don’t know	134	4.4%
Never seen by a dentist or other dental professional	251	8.3%
All	3040	100.0%
^a Totals may vary due to missing responses.		

Nearly half of the children were first seen by a dentist or other dental professional when they were 3 years of age or younger.

Children With Special Health Care Needs

About 1 in 4 children (26.1%) in the survey sample had a diagnosed emotional, developmental, or behavioral health condition requiring treatment or counseling, as reported by their parents/legal guardians (Table 6). The most commonly reported conditions were behavioral or conduct problems (13.1%), followed by learning disability (6.8%), speech or other language disorder (5.9%), and developmental delay (5.6%).

TABLE 6. Children With a Diagnosed Emotional, Developmental, or Behavioral Condition That Needs Treatment or Counseling as Reported by Their Parents/Legal Guardians, 2019 (n=2909)

Special Health Care Needs ^a	n	%
None	2149	73.9%
Behavioral or conduct problems	403	13.1%
Learning disability	208	6.8%
Speech or other language disorder	180	5.9%
Developmental delay	173	5.6%
Intellectual disability	91	3.0%
Other	79	2.6%

^a Respondents were permitted to select more than one response option; therefore, total response percentages exceed 100%.

Parental Perceptions of Their Children’s Oral Health Status

According to their parents/legal guardians, 79.6% of children exhibited no oral health symptoms in the 6 months prior to survey completion (Table 7). The most commonly reported oral health symptom was bad breath (10.2%). About 15.8% of children had 1 oral health symptom and a small percentage (4.6%) exhibited 2 or more oral health symptoms (data not shown).

Parents were also asked to describe any oral health problems experienced by their children in the previous 6 months. Nearly two-thirds (66.5%) indicated that their children did not exhibit any oral health problems during that period. The most commonly reported oral health problems were toothache or sensitive teeth (15.6%) and crooked teeth (10.1%). About 24.6% of children had 1 oral health problem and 9.0% had 2 or more oral health problems (data not shown).

More than half of children (58.4%) had no cavities diagnosed by a dentist during the previous 12 months. However, 16.2% of children had 1 cavity and 18.6% of children had 2 or more cavities during this time period.

More than three-quarters (79.1%) of parents/legal guardians reported that their children enjoyed excellent or very good oral health.

TABLE 7. Oral Health Status of Children as Reported by Their Parents/Legal Guardians, 2019

Children's Oral Health Status	n ^a	%
Oral health symptoms in the last 6 months^b		
None	2443	79.6%
Bad breath	313	10.2%
Dry mouth	154	5.0%
Difficulty eating or chewing	152	4.9%
Jaw pain	111	3.6%
Sores in mouth	76	2.5%
Oral health problems in the last 6 months^b		
None	2040	66.5%
Toothache or sensitive teeth	477	15.6%
Crooked teeth	310	10.1%
Stained or discolored teeth	246	8.0%
Bleeding gums	146	4.8%
Broken or missing fillings	125	4.1%
Loose or broken teeth due to injury	95	3.1%
Cavities diagnosed by a dentist in the last 12 months		
None	1626	58.4%
1	452	16.2%
2	313	11.2%
≥3	206	7.4%
Haven't seen a dentist during the past 12 months	190	6.8%
All	2787	100.0%
Overall oral health status		
Excellent	1404	46.2%
Very good	1000	32.9%
Good	477	15.7%
Fair	126	4.1%
Poor	34	1.1%
All	3040	100.0%
<p>^a Totals may vary due to missing responses.</p> <p>^b Respondents were permitted to select more than one response option; therefore, total response percentages exceed 100%.</p>		

Children’s Oral Health Behaviors

More than half (60.0%) of children in the care of survey respondents brushed their teeth at the recommended standard frequency of 2 or more times per day (Table 8). In addition, 45.4% of these children flossed their teeth 1 or more times per day.

TABLE 8. Oral Hygiene Behaviors of Children as Reported by Their Parents/Legal Guardians, 2019

Oral Health Behaviors	n	%
Toothbrushing frequency		
Twice or more times a day	1715	60.0%
Once a day	665	23.3%
2 to 6 times a week	185	6.5%
At most, once a week	295	10.3%
All	2861	100.0%
Dental floss use		
Twice or more times a day	543	19.6%
Once a day	713	25.8%
2 to 6 times a week	426	15.4%
At most, once a week	624	22.5%
Never	461	16.7%
All	2767	100.0%

^a Totals may vary due to missing responses.

Oral Health Knowledge of Parent/Legal Guardian Respondents

Parents/legal guardians were asked to indicate whether 10 statements about children’s oral health were true or false. Parents expressed the most uncertainty about giving young children milk at bedtime and about the transmissibility of dental disease from caregivers to babies through use of common utensils (Table 9). Over one-fifth (23.4%) correctly identified 8 or more of the statements as true or false. Half of the respondents (50.1%) marked 5 to 7 statements correctly, while about 1 in 4 (26.6%) marked fewer than 5 statements correctly.

More than half of children brushed their teeth at the recommended standard frequency of 2 or more times per day.

TABLE 9. Oral Health Knowledge of Survey Parents/Legal Guardians, 2019

Oral Health Knowledge Statements ^a	Correct Answer		Incorrect Answer		Don't Know	
	n	%	n	%	n	%
Giving a young child fruit juice in a bottle at bedtime or naptime cannot cause tooth decay [false]	1063	59.6%	458	25.7%	261	14.7%
Thumb sucking can cause problems with the development of a child's teeth and jaws [true]	1222	69.0%	263	14.9%	285	16.1%
Giving a young child milk in a bottle at bedtime or naptime cannot cause tooth decay [false]	828	46.8%	539	30.5%	403	22.8%
It is not important to clean a baby's gums with a soft cloth even before the baby's teeth surface [false]	846	47.8%	547	30.9%	376	21.3%
A child should go to the dentist by age 1 or within 6 months after the first tooth erupts [true]	950	53.7%	285	16.1%	533	30.2%
Oral health does not affect overall health [false]	1205	68.5%	328	18.7%	225	12.8%
There is a strong relationship between what children eat and their dental health [true]	1234	69.6%	231	13.1%	307	17.3%
Cavities are nearly 100% preventable [true]	1014	57.6%	310	17.6%	438	24.9%
Dental disease cannot be passed from a caregiver to a baby by sharing utensils [false]	545	30.7%	625	35.3%	602	34.0%
If a child has been sick, you should replace the child's toothbrush once the child is well [true]	1128	63.7%	223	12.6%	419	23.7%
Total number of correct answers	n		%			
≥8	417		23.4%			
6-7	507		28.4%			
5	386		21.7%			
<5	474		26.6%			
All	1785		100.0%			
^a Respondents were permitted to select more than one response option; therefore, total response percentages exceed 100%.						

Parental Perceptions of Their Children's Oral Health and Need for Dental Services

Parents/legal guardians reported that nearly two-thirds of children (63.5%) needed dental care during the previous 12 months (Table 10).

TABLE 10. Children's Dental Care Need in the Past 12 Months as Reported by Their Parents/Legal Guardians, 2019

Children's Need for Dental Care in the Past 12 Months	n	%
Yes	1925	63.5%
No	1105	36.5%
All	3030	100.0%

Characteristics Associated With Parental Perceptions of Their Children’s Need for Dental Care

A lower proportion of female than male children were identified as needing dental care during the previous year (61.0% vs 65.7%; $P=.0020$) by their parent/legal guardian (Table 11). Parents less often reported a need for dental services among toddlers and preschoolers compared with school-aged children (42.2% and 59.7%, respectively, vs 66.3%–71.5%; $P<.0001$). Children’s race/ethnicity was not associated with their need for dental services.

Parents of uninsured children were less likely to report a need for dental care relative to parents of children with dental insurance coverage (48.0% vs 65.4%; $P<.0001$). Parents were also less likely to report a need for dental care for children who did not have a usual dentist or other dental professional to perform needed dental services compared with children who had a dental home (35.3% vs 74.8%; $P<.0001$). Parents were more likely to report a need for dental care for children with special health care needs than for children without such needs (73.0% vs 60.4%; $P<.0001$).

TABLE 11. Association Between Children’s Characteristics and Parental Perceptions of Their Children’s Need for Dental Care in the Past 12 Months, 2019

Characteristics of Children	Children’s Need for Dental Care in the Past 12 Months				P
	Yes		No		
	n ^a	%	n ^a	%	
Gender					0.0020
Male	1011	65.7%	528	34.3%	
Female	882	61.0%	564	39.0%	
Age group					<.0001
Toddlers (1–2 years)	183	42.2%	252	57.8%	
Preschoolers (3–5 years)	295	59.7%	199	40.3%	
Middle childhood (6–8 years)	324	68.0%	152	32.0%	
Middle childhood (9–11 years)	347	69.7%	151	30.3%	
Young teens (12–14 years)	394	71.5%	157	28.5%	
Teenagers (15–18 years)	382	66.3%	194	33.7%	
Dental insurance coverage					<.0001
Yes	1773	65.4%	940	34.7%	
No	149	48.0%	162	52.0%	
Dental home					<.0001
Yes	1577	74.8%	532	25.2%	
No	311	35.3%	569	64.7%	
Special health care needs					<.0001
Yes	551	73.0%	204	27.1%	
No	1281	60.0%	854	40.0%	

^a Totals may vary due to missing responses.

Parents with a high school education or less (56.5%), without full-time employment (60.0%), and/or with an annual household income of less than \$50,000 (60.6%) or between \$50,000 and \$99,999 (61.2%) were significantly less likely to report a need for dental services during the previous year for their children than parents who attended or graduated from college or completed postgraduate education (65.1%–72.0%; $P<.0001$), parents with full-time employment (65.6%; $P=.0022$), and parents who had an annual household income of \$100,000 or more (70.2%; $P<.0001$) (Table 12). Parental demographic characteristics were not associated with their perceptions of their children’s need for dental services.

Children who resided in rural (54.7%) areas and/or lived in the Midwest region (58.8%) were less likely to have a parent-reported need for dental services over the past year than children residing in urban and suburban areas (65.1% and 65.9%, respectively; $P < .0001$) and in other geographic regions (63.2%–68.7%; $P = .0019$).

Parents with lower oral health literacy scores were less likely to report a need for dental services for their children than were parents with higher oral health literacy scores (59.6% vs 65.0%; $P = .0064$).

TABLE 12. Association Between Parental Characteristics and Perceptions of Their Children’s Need for Dental Care in the Past 12 Months, 2019

Characteristics of Parents/Legal Guardians	Children’s Need for Dental Care in the Past 12 Months				P
	Yes		No		
	n ^a	%	n ^a	%	
Education					<.0001
Less than or high school graduate	678	56.5%	523	43.6%	
Some college	551	65.1%	295	34.9%	
College graduate	447	71.0%	183	29.0%	
Postgraduate	245	72.0%	95	28.0%	
Full-time employment status					0.0022
Yes	1251	65.6%	657	34.4%	
No	674	60.0%	449	40.0%	
Annual household income					<.0001
<\$50,000	637	60.6%	414	39.4%	
\$50,000–99,999	636	61.2%	404	38.8%	
≥\$100,000	645	70.2%	274	29.9%	
Area of residence					<.0001
Urban	722	65.1%	386	34.9%	
Suburban	891	65.9%	461	34.1%	
Rural	312	54.7%	258	45.3%	
Census region of residence					0.0019
Northeast	310	63.9%	175	36.2%	
Midwest	421	58.8%	295	41.2%	
South	712	63.2%	416	36.9%	
West	482	68.7%	220	31.3%	
Oral health knowledge					0.0064
<5 correct answers	486	59.6%	330	40.0%	
≥5 correct answers	1438	65.0%	776	35.0%	

^a Totals may vary due to missing responses.

Children’s oral health status was associated with parental perceptions of need for dental care for their children ($P < .0001$) (Table 13). Parents of children without any oral health oral health symptoms (59.1%), problems (54.1%), or cavities (62.1%) were less likely to report that the child needed dental care in the past 12 months than were parents of children with one (76.2%–81.3%) or more (81.5%–85.1%) oral health issues. Excellent or very good oral health status (62.4%) was also associated with a lower perceived need for dental care compared with children reported as having good or fair/poor oral health

status (65.6% and 73.0%, respectively; $P=0.0171$). Children's oral hygiene behaviors were not associated with parental perceptions of need for dental care for their children.

TABLE 13. Association Between Children's Oral Health Status and Hygiene Behaviors and Parental Perceptions of Their Children's Need for Dental Care in the Past 12 Months, 2019

Characteristics of Children	Children's Need for Dental Care in the Past 12 Months				P
	Yes		No		
	n	%	n	%	
Oral health symptoms					<.0001
None	1424	59.1%	987	40.9%	
1	386	80.7%	92	19.3%	
≥2	114	81.5%	26	18.5%	
Oral health problems					<.0001
None	1086	54.1%	922	45.9%	
1	608	81.3%	140	18.7%	
≥2	230	84.1%	44	15.9%	
Number of cavities					<.0001
None	1003	62.1%	612	37.9%	
1	344	76.2%	107	23.8%	
≥2	438	85.1%	76	14.9%	
Overall oral health status					0.0171
Excellent or very good	1492	62.4%	898	37.6%	
Good	310	65.6%	162	34.4%	
Fair or poor	115	73.0%	43	27.1%	
Toothbrushing frequency					0.0812
Once or more times a day	1533	64.7%	836	35.3%	
Less than once a day	329	68.9%	149	31.1%	
^a Totals may vary due to missing responses.					

Utilization of Dental Services Among Children With a Reported Need for Dental Care

Parents/legal guardians reported that the majority of children (91.0%) always received dental care as needed over the past 12 months (Table 14). However, nearly 1 in 10 children (7.8%) only sometimes received the dental services that they required during the past year, while a small proportion of children (1.2%) did not receive any needed dental care in the past year.

TABLE 14. Utilization of Dental Care Services in the Past 12 Months Among Children Who Needed Dental Care in the Past 12 Months as Reported by Their Parents/Legal Guardians, 2019

Received Dental Care From a Dentist or Other Dental Professional	n	%
Always	1737	91.0%
Sometimes	149	7.8%
Never	23	1.2%
All	1910	100.0%

Potential Barriers to Receiving Needed Dental Care Among Children in the Study

Parents/legal guardians were asked about their experiences with obtaining dental care for their children. The majority of parents/legal guardians reported that they were able to schedule dental visits as soon as they wanted for children who needed dental care in the past 12 months (90.1%) (Table 15). Travel time to the dental provider was less than 30 minutes for more than two-thirds of the children (68.4%); however, about 1 in 4 children (26.4%) had to travel 30 to 60 minutes, and 4.9% of children had to travel more than an hour to receive needed dental services.

Survey respondents were also asked about any major difficulties their children experienced with seeing a dentist or other dental professional as often as needed. Although parents/legal guardians of 75.4% of children in the study had no difficulties obtaining dental care as often as needed, nearly 1 in 4 children experienced one or more barriers to needed dental care. The most commonly reported difficulties were related to lack of dental insurance (5.0%), finding dental providers who accepted the child's dental insurance (5.1%), and/or dental insurance not paying for the services needed (5.0%). Other important barriers identified by respondents were children's dental anxiety (3.9%), cost of dental care (3.5%), and problems getting an appointment when needed (2.9%).

TABLE 15. Potential Barriers to Receiving Dental Service Among Children Who Needed Dental Care in the Past 12 Months as Reported by Their Parents/Legal Guardians, 2019

Barriers to Dental Care for Children	n	%
Ability to schedule dental visits as soon as needed		
Yes	1654	90.1%
No	183	10.0%
All	1836	100.0%
Travel time to dental provider		
<30 minutes	1277	68.4%
30–60 minutes	494	26.4%
>60 minutes	92	4.9%
Other (eg, visit at school)	4	0.2%
All	1867	100.0%
Perceived difficulties in obtaining dental care for their children^a		
No difficulties	2243	75.9%
Hard to find dentists who accept the insurance	151	5.1%
Lack of insurance	148	5.0%
The child was afraid of going to the dentist	115	3.9%
There were issues related to cost	104	3.5%
There were problems getting an appointment when the child needed care	85	2.9%
No one was available to take the child to the dentist during dentist's office hours	73	2.5%
The services the child needs were not available in the area	59	2.0%
There were problems with getting transportation	48	1.6%
The office was not open when the child needed dental care	40	1.4%
^a Respondents were permitted to select more than one response option; therefore, total response percentages exceed 100%.		

Factors Associated With Children’s Utilization of Dental Services in the Past Year

Uninsured children (79.5%), females (89.1%), and children without a dental home (77.7%) were less likely to always receive dental care when needed compared with children who had dental insurance coverage (92.0%; $P<.0001$), males (92.5%, $P=.0103$), and those who had a dental home (93.5%; $P<.0001$) (Table 16). Children with special health care needs were also proportionally less likely to have received needed dental services in the past year compared with children without such needs (87.4% vs 92.8%; $P=.0002$). Other children’s demographic characteristics were not associated with their utilization of dental services.

TABLE 16. Association Between Children’s Characteristics and Their Utilization of Needed Dental Services in the Past 12 Months as Reported by Their Parents/Legal Guardians, 2019

Characteristics of Children	Children’s Utilization of Needed Dental Services in the Past 12 Months				P
	Always		Sometimes/Never		
	n ^a	%	n ^a	%	
Dental insurance coverage					<.0001
Yes	1618	92.0%	140	8.0%	
No	119	79.5%	31	20.5%	
Dental home					<.0001
Yes	1471	93.5%	103	6.5%	
No	237	77.7%	68	22.3%	
Special health care needs					0.0002
Yes	479	87.4%	69	12.6%	
No	1188	92.8%	92	7.2%	

^a Totals may vary due to missing responses.

Parents from underrepresented minority groups (87.1%-89.3%) were significantly less likely to report their children always received dental services when needed than were parents from other racial/ethnic groups (91.6%-97.9%; $P=.0070$) (Table 17). Children whose parents/legal guardians reported not having full-time employment (88.9%) and/or having an annual household income of less than \$100,000 (87.8%) were significantly less likely to always receive dental care when needed in the past 12 months than children of survey respondents who had full-time employment (92.1%; $P=.0200$) and an annual household income of \$100,000 or more (97.0%; $P<.0001$). Parents who resided in urban (88.9%) and rural (89.0%) areas were also significantly less likely to report their children always received dental services when needed than parents living in suburban areas (93.3%; $P=.0041$). Parents’ geographic region of residence, oral health literacy, and other parental factors were not associated with reported utilization of dental services by their children.

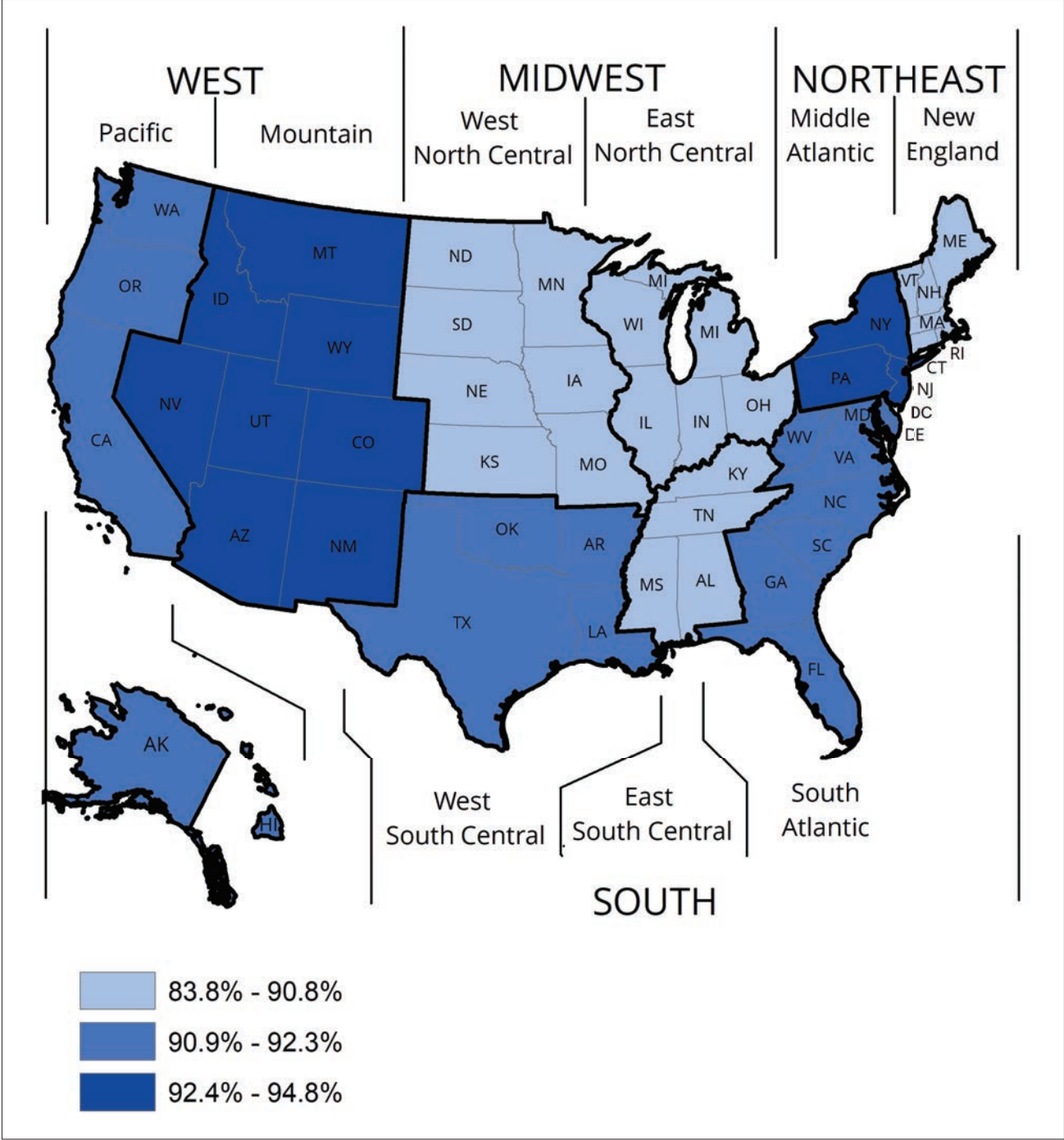
TABLE 17. Association Between Parental Characteristics and Their Children’s Utilization of Needed Dental Services in the Past 12 Months, 2019

Characteristics of Parents/Legal Guardians	Children’s Utilization of Needed Dental Services in the Past 12 Months				P
	Always		Sometimes/Never		
	n ^a	%	n ^a	%	
Race/ethnicity					0.0070
Asian	97	97.9%	2	2.1%	
Black or African American	237	87.1%	35	12.9%	
Hispanic, Latino/Spanish	359	89.3%	43	10.7%	
White	921	91.6%	85	8.5%	
Education level					0.0003
Less than or high school graduate	606	91.0%	60	9.0%	
Some college	481	87.4%	69	12.6%	
College graduate	410	92.1%	35	7.9%	
Postgraduate	237	96.8%	8	3.2%	
Full-time employment status					0.0200
Yes	1147	92.1%	99	7.9%	
No	590	88.9%	74	11.1%	
Annual household income					<.0001
<\$50,000	552	87.8%	77	12.2%	
\$50,000–99,999	553	87.8%	77	12.2%	
≥\$100,000	626	97.0%	19	3.0%	
Self-reported area of residence					0.0041
Urban	633	88.9%	79	11.1%	
Suburban	826	93.3%	59	6.7%	
Rural	277	89.0%	34	11.0%	
Census region of residence					0.0694
Northeast	286	92.2%	24	7.8%	
Midwest	369	88.0%	50	12.0%	
South	637	90.9%	64	9.1%	
West	445	92.8%	34	7.2%	
Oral health literacy					0.0836
<5 correct answers	422	89.0%	52	11.0%	
≥5 correct answers	1315	91.6%	120	8.4%	

^a Totals may vary due to missing responses.

A significantly lower proportion of children residing in the Midwest region and East South Central division in the South region (83.8%–90.8%) were reported to have always received dental care when needed in the previous year compared with children living in other regions of the US (90.9%–94.8%; $P=.0361$) (Figure 1).

FIGURE 1. Percentage of Children Who Received Dental Care Always When Needed in the Past 12 Months as Reported by Their Parents/Legal Guardians Across Residence Regions, 2019



Parents/legal guardians who reported being unable to schedule dental visits as soon as needed were less likely to always obtain dental care for their children when needed compared with parents who were able to schedule dental visits in a timely manner (73.3% vs 94.7%; $P < .0001$) (Table 18). Children who had to travel 30 minutes or more to a dental provider were also less likely to always receive needed dental care compared with children whose travel time to a dental provider was less than 30 minutes (89.7% vs 93.3%; $P = .0078$).

Parents/legal guardians who reported having difficulties in seeing a dentist or other dental professional as often as their children needed were more likely to also report not being able to always obtain dental services for their children when

needed compared with parents/legal guardians who did not experience any such difficulties (73.5% vs 96.5%; $P<.0001$).

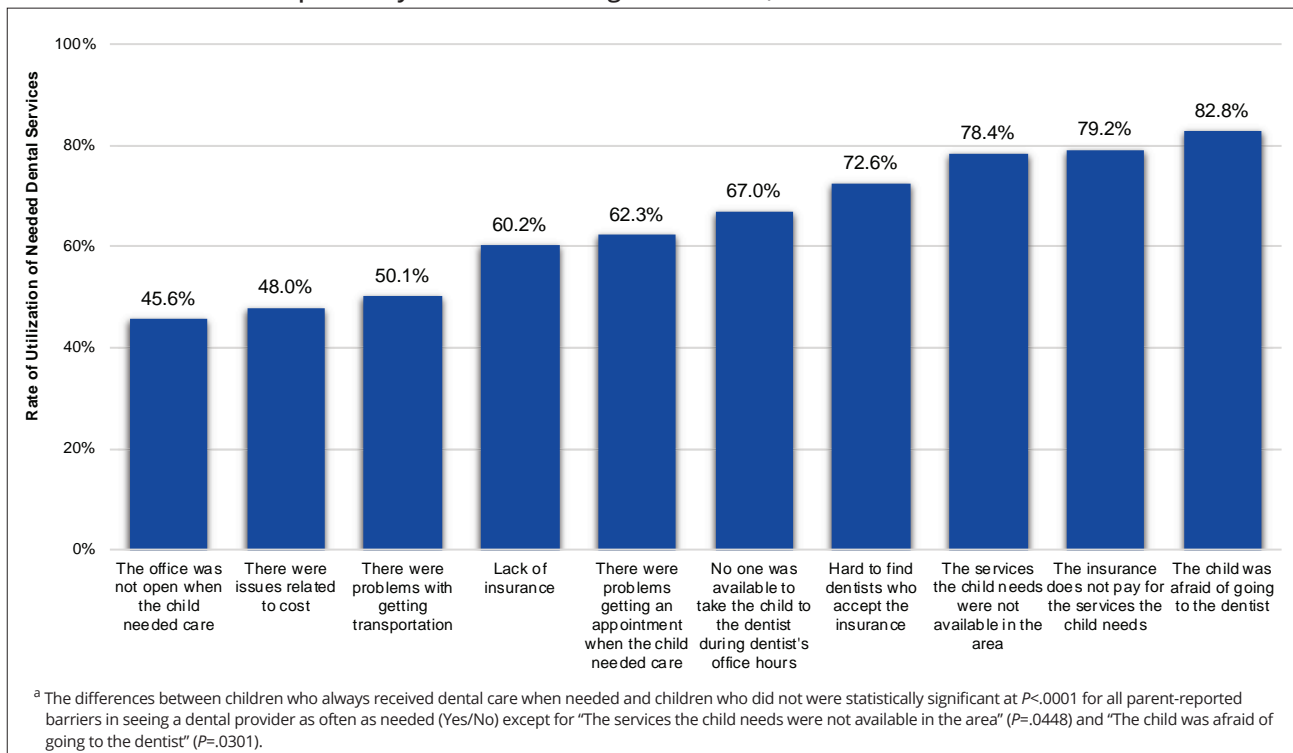
TABLE 18. Association Between Potential Access Barriers and Children’s Utilization of Needed Dental Services in the Past 12 Months as Reported by Their Parents/Legal Guardians, 2019

Characteristics of Children’s Access to Dental Care	Children’s Utilization of Needed Dental Services in the Past 12 Months				P
	Always		Sometimes/Never		
	n ^a	%	n ^a	%	
Ability to schedule dental visits as soon as needed					<.0001
Yes	1566	94.7%	87	5.3%	
No	134	73.3%	49	26.7%	
Travel time to dental provider					0.0078
<30 minutes	1191	93.3%	86	6.7%	
≥30 minutes	529	89.7%	61	10.3%	
Difficulties in seeing dental provider					<.0001
No	1359	96.5%	49	3.5%	
Yes	322	73.5%	116	26.5%	

^a Totals may vary due to missing responses.

Children’s utilization of dental services over the past 12 months was lowest among those who experienced the following parent-reported barriers: inconvenient dental practice hours (45.6%), issues related to cost (48.0%), transportation barriers (50.1%), and lack of dental insurance (60.2%) (Figure 2). Other access barriers identified by parent respondents were also associated with a low utilization of dental care among children, including problems getting an appointment when needed (62.3%), difficulty getting to the dentist during dental office hours (67.0%), difficulty finding a dentist who accepted their child’s insurance (72.6%), and insurance not paying for dental care needs (79.2%).

FIGURE 2. Association Between Perceived Barriers to Care and Children’s Utilization of Needed Dental Services in the Past 12 Months as Reported by Their Parents/Legal Guardians, 2019^a



DISCUSSION

This study found that many of the children in the households of survey respondents had desirable oral health status and regular access to oral health services. More than three-quarters of children of survey respondents (79.1%) were described as having very good or excellent oral health by their parents or legal guardians, and 70.5% of these children had a usual source of care for dental services. Nevertheless, about 3 in 10 children did not have a dental home.

Need for Dental Services

Nearly two-thirds of children (63.5%) in our survey were identified by their parents or guardians as needing dental services over the course of the year prior to survey completion. The findings from this study were consistent with much of the current literature discussing the influence of parents' perceptions, behaviors, and roles on children's need and utilization of oral health services.

Fisher-Owens' and colleagues' conceptual model of individual-, family-, and community-level factors that interact with children's oral health status and affect outcomes addresses the impact of familial demographic and socioeconomic factors on the oral health of children.²¹ Our study found that parents with lower levels of educational attainment, less than full-time employment, lower household income, living in a rural area, and lower levels of oral health literacy were less likely to report a need for dental services for the children in their care than were others.

Excellent or very good health status was also associated with a lower perception of need for dental services. Rates of compliance with recommended daily hygiene practices were high, especially with regard to toothbrushing. The majority of children (83.3%) were reported to brush at least once a day, with more than half (60.0%) brushing at the recommended frequency of at least twice a day. However, about 1 in 5 children brushed less than once a day. Nearly half of children (45.4%) flossed once, twice, or more times daily. Fernandez de Grado et al found that the frequency of toothbrushing among adolescents was strongly associated with healthy eating, gender, and promotion of oral health at school.¹⁴

Parental characteristics were significantly associated with their perceptions of the need for dental services among their children during the previous year. Talekar and coauthors found that parental perceptions of poor oral health in their children were highly correlated with the existence of dental disease in the children.¹² Children without oral health symptoms, problems, or cavities were significantly less likely to be identified as needing oral health services in the prior 12 months than were children identified as having one or more dental symptoms, problems, or cavities. While these findings are generally positive, they are somewhat problematic when considered in the context of oral health literacy and recommended guidelines for care.

Oral Health Literacy

According to accepted guidance and Medicaid periodicity schedules, children should receive preventive oral health services at least annually or biannually, suggesting that all children "need" preventive dental services within the period of a year. Although the survey question included an instruction to include check-ups, it is not possible to definitively ascertain whether respondents' appraisals of "need" for dental services included the need for periodic preventive services such as examinations and prophylaxis. Parents may identify "need for services" only in relation to a dental problem. The survey results suggest that at least some parents associated need with routine care, as 79.6% of children were described as having no oral health symptoms and 66.5% no oral health problems in the prior 6 months. These data, coupled with the finding that 63.5% of children of survey respondents needed dental care during the previous year, suggest that at least some of the children identified as needing services were symptom and problem free; thus, the need for care would be preventive. Nevertheless, improved parental knowledge of the importance of routine preventive services might influence some parents' perception of need for services and ultimately raise utilization rates of oral health services.

Parents of children without an established dental home were more likely to indicate that their child did not need a dental visit in the last year. Nearly three-quarters of parents (74.8%) whose children had an established dental provider indicated that their child needed dental services during the previous 12 months, suggesting that these parents were more knowledge-

able than others about the importance of regular dental visits. Furthermore, parents of children with special health care needs were significantly more likely than parents of children without such needs to report that their child needed oral health services in the prior year.

Levels of oral health literacy among parents and legal guardians were relatively low. More than half of survey respondents (51.8%) were able to correctly identify as true or false only up to 5 of 10 statements about children's oral health. More than one-third (35.3%) of parents or guardians identified as false the statement that dental disease can be transmitted through shared eating utensils, while another third (34.0%) did not know whether it was true or false. Only 53.7% of parents understood that children should visit a dentist within 6 months of the first tooth eruption. No single statement among the 10 was correctly identified by more than 70.0% of parent/guardian respondents.

These findings suggest the importance of continued efforts to increase oral health literacy through the education of children and their parents, guardians, and caregivers. Bracksley and coauthors concluded that changing mothers' perceptions about oral health and increasing their knowledge would have an impact on oral health practices and outcomes.²⁰ Lenčová et al found that parents of young children (3 to 5 years of age) who recognized that oral health status was determined at least in part by behaviors had a higher probability of having children who were free from untreated caries, independent of the effect of other sociodemographic factors.⁸

First Dental Visit

While half of the children (50.7%) described by parents and legal guardians in survey responses had first seen a dentist at 3 years of age or younger, only a small percentage of children (16.4%) received dental services at 1 year of age or earlier, as is recommended under current anticipatory guidance for the first dental visit. It is difficult to ascertain the reasons for the low level of parental compliance with this guideline.

Just over one-fifth (21.4%) of children described by survey respondents had their first dental examination between the ages of 4 and 6 years, which coincides with entry into preschool or kindergarten; 8.3% of children

had never been seen by a dentist or other dental professional. In addition, parents of toddlers and preschoolers were significantly less likely to identify a need for dental care among those children than were parents of older children, a finding consistent with the lack of awareness among survey respondents of the need for a dental visit within 6 months of tooth eruption. One possible explanation is that, although the American Academy of Pediatric Dentistry has recommended an infant oral evaluation within 6 months of tooth eruption since the 1990s,²⁴ this guideline has only recently received broader public attention. Parents of older children who responded to the survey may not have been aware of the importance of early examination when their children were younger. This finding reinforces the need for education of new parents regarding the oral health of their infants and toddlers.

Utilization of Dental Services and Barriers to Care

The majority of respondents' children (91.0%) *always* received dental care as needed over the prior 12 months. However, nearly 1 in 10 children only *sometimes* received needed dental services, and a small proportion did not receive any needed dental care during the previous year. Utilization of dental services was significantly lower among children whose parents or legal guardians were from underrepresented minorities (87.1%-89.3%), reported lower levels of education attainment (87.4-91.0%), not having full-time employment (88.9%), having an annual household income of less than \$100,000 (87.8%), and living in rural (89.0%) or urban (88.9%) areas compared with other children.

This study also collected data on barriers encountered by parents and guardians in obtaining oral health services for their children. The majority of respondents (75.9%) indicated no difficulties in obtaining dental care for their children. However, utilization of dental services by children was lowest among those whose parents identified issues related to cost (48.0%), transportation barriers (50.1%), inconvenient dental practice hours (67.0%), and lack of dental insurance (60.2%) as barriers to care. In a study evaluating barriers to oral health services encountered by Head Start parents, Siegal and colleagues found that access to oral health services by children in Head Start programs was

limited by the cost of care and/or the lack of dental insurance.¹⁸ Clemans-Cope and co-authors found that enrolling eligible uninsured children in CHIP led to improvements in access to dental services and reduced the level of unmet dental need.⁶ Parents' identification of barriers related to cost and insurance status suggest the importance of policy initiatives to reduce financial barriers to dental services.

Most parents were able to schedule dental visits as soon as needed (90.1%) and traveled less than 30 minutes to a dental provider (68.4%). The utilization of dental services by children was lowest among those whose parents were unable to schedule dental visits as soon as needed (73.3%), had to travel 30 minutes or more to a dental provider (89.7%), and reported one or more difficulties in seeing a dental provider (73.5%). Parents who reported difficulty scheduling dental visits as soon as needed were less likely than parents without such difficulties to always obtain dental services for their children. When travel time to a dentist was 30 minutes or more, children were less likely to always get needed dental services compared with those with less travel time. Parents who reported one or more difficulties in seeing a dentist as often as their child needed were significantly more likely to report that they were not always able to obtain dental services for their children when needed. In a study of American Indian and Alaska Native mothers, Heaton et al found a significant relationship between the number of barriers to oral health services encountered by these families and low scores for oral health behaviors,⁹ suggesting that families who encounter multiple barriers may be at risk for poorer oral health than those for whom oral health services are more easily obtained. Structural barriers to services—including dental practice hours, distance to providers, and limited participation by dentists in public insurance programs—must be considered in any policies or program initiatives with the objective of improving access to dental care.

STUDY LIMITATIONS

Findings in this report are subject to several limitations. First, respondents to this survey may differ from the general population in that the current consumer survey included only people with access to computers. The potential limitations of consumer data collection were addressed by weighting the survey sample to achieve a representative profile of the national population as measured by the US Census Bureau.

Second, another limitation is possible differential parental recall and report of information related to the need and utilization of oral health services among children. The effect of this bias on the study findings were minimized by using standardized questions and relatively short reporting periods (mostly up to 12 months). Finally, the cross-sectional design precludes any causal inferences between individual characteristics and access to oral health care for children.

CONCLUSIONS

Overall, our survey found that many children in the cohort described by responding parents and legal guardians were experiencing good overall oral health and were routinely brushing their teeth and seeing dental providers. However, children in some families were not receiving services or practicing oral hygiene at suggested levels. The survey also found a need to improve the oral health literacy of parents and guardians, especially as it relates to children's oral health. Literature suggests that higher levels of parental oral health literacy are associated with improved oral hygiene and regular dental visits among their children.

This study corroborates previous findings in the literature related to the impact of familial demographics, geographies, and socioeconomic status on the oral health of children. The survey found that low-income families were more likely to experience barriers to establishing a dental home and to have greater difficulty obtaining dental services for their children when needed. The findings from this survey suggest that current efforts to mediate structural barriers should be amplified to target the populations of children who are most at risk for lack of access to services.



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APPENDIX

SURVEY INSTRUMENT

1. What is your relationship to the children under 18 in your household for whom you are a parent or guardian?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Biological parent
- Step-parent
- Adoptive parent
- Foster parent
- Grandparent
- Other [PLEASE SPECIFY: _____]

2. Please indicate the sex assigned at birth of each child under 18 in your household for whom you are a parent or guardian.

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Male
- Female
- Intersex

3. What is the race/ethnicity of each child under 18 in your household for whom you are a parent or guardian? *Please check all that apply.*

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Hispanic, Latino, or of Spanish origin
- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or other Pacific Islander
- White
- Other [PLEASE SPECIFY: _____]

4. Do any children under 18 in your household for whom you are a parent or guardian have a diagnosed emotional, developmental, or behavioral condition that needs treatment or counseling?
Please check all that apply.

1st oldest child 2nd oldest child 3rd oldest child ...6th oldest child

- Behavioral or conduct problems
- Developmental delay
- Intellectual disability
- Speech or other language disorder
- Learning disability
- Other [PLEASE SPECIFY: _____]
- None

5. **In the last 12 months**, did you or a health care professional believe any of the children under 18 in your household for whom you are a parent or guardian needed any dental or oral health care (including check-ups)?

1st oldest child 2nd oldest child 3rd oldest child ...6th oldest child

- Yes
- No

6. Thinking about the times the children under 18 in your household for whom you are a parent or guardian needed dental or oral health care **in the last 12 months**, how often were you able to get it?

1st oldest child 2nd oldest child 3rd oldest child ...6th oldest child

- Always able to get it
- Only able to get it some of the time (could not always get it)
- Never able to get it

7. How many times did the children under 18 in your household for whom you are a parent or guardian see a dentist or other dental professional **in the last 12 months**?

1st oldest child 2nd oldest child 3rd oldest child ...6th oldest child

- Once
- Twice
- Three times
- Four or more times
- Don't know

8. You indicated that at least once in the last 12 months some of the children under 18 in your household for whom you are a parent or guardian needed dental care but were unable to get it. What type of dental care did you think they needed but were unable to get? *Please check all that apply.*

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Teeth filled or replaced (for example, fillings, crowns, and/or bridges)
- Teeth pulled/extracted
- Relief of pain
- Work to improve appearance (for example, braces or bonding)
- Preventive work (for example, check-ups, dental cleanings, dental sealants, fluoride treatments)
- Other [PLEASE SPECIFY: _____]

9. Where did the children under 18 in your household for whom you are a parent or guardian **last** receive dental care?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Office of a dental practice
- Community health center clinic
- Mobile clinic
- Urgent care center
- Hospital emergency room
- Hospital outpatient clinic
- School
- Other [PLEASE SPECIFY: _____]

10. Thinking about their **last** dental care visit, which provider(s) did the children under 18 in your household for whom you are a parent or guardian see? *Please check all that apply.*

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- A general dentist
- A dental hygienist
- A pediatric dentist
- An orthodontist
- An oral surgeon
- A pediatrician/family medicine physician
- Other [PLEASE SPECIFY: _____]

11. What service(s) did the children under 18 in your household for whom you are a parent or guardian receive at their **last** dental care visit? *Please check all that apply.*

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
------------------	------------------	------------------	---------------------

- Teeth filled or replaced (for example, fillings, crowns, and/or bridges)
- Teeth pulled/extracted
- Relief of pain
- Work to improve appearance (for example, braces or bonding)
- Preventive work (for example, check-ups, dental cleanings, dental sealants, fluoride treatments)
- Other [PLEASE SPECIFY: _____]

12. Thinking about the **last** dental care visits for the children under 18 in your household for whom you are a parent or guardian, were you able to schedule the visits as soon as you wanted them?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Yes
- No
- Don't know

13. Thinking about the **last** dental care visits for the children under 18 in your household for whom you are a parent or guardian, how long did it take to travel to see the provider?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Less than 30 minutes
- 30 to 60 minutes
- More than an hour
- Other (for example, visit at school) [PLEASE SPECIFY: _____]
- Don't know

14. Is there a particular dentist or other dental professional who the children under 18 in your household for whom you are a parent or guardian usually see if they need dental care or dental advice?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Yes
- No

15. How old were the children under 18 in your household for whom you are a parent or guardian when they were first seen by a dentist or other dental professional?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Less than or 1 year old
- 2 years old
- 3 years old
- 4 to 6 years old
- More than 6 years old
- Don't know
- Never seen by a dentist or other dental professional

16. About how long has it been since the children under 18 in your household for whom you are a parent or guardian (who did not get dental care in the last 12 months) last saw a dentist or other dental professional?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- 1 to 2 years
- 3 to 5 years
- More than 5 years
- Never seen by a dentist or other dental professional

17. During the past 6 months, have the children under 18 in your household for whom you are a parent or guardian had any of the following problems? *Please check all that apply.*

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
---------------------	---------------------	---------------------	------------------------

- Toothache or sensitive teeth
- Stained or discolored teeth
- Crooked teeth
- Bleeding gums
- Broken or missing fillings
- Loose or broken teeth due to injury
- None of these

18. During the past 6 months, have the children under 18 in your household for whom you are a parent or guardian had any of the following problems that lasted more than a day? *Please check all that apply.*

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Bad breath
- Dry mouth
- Difficulty eating or chewing
- Jaw pain
- Sores in their mouth
- None of these

19. How many cavities were diagnosed by the dentist in the children under 18 in your household for whom you are a parent or guardian in the last 12 months?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
---------------------	---------------------	---------------------	------------------------

- None
- 1
- 2
- 3
- 4 or more
- Haven't seen a dentist during the past 12 months
- Don't know

20. In general, would you say the oral health of the children under 18 in your household for whom you are a parent or guardian is:

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
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- Excellent
- Very good
- Good
- Fair
- Poor

21. Do the children under 18 in your household for whom you are a parent or guardian **currently** have dental insurance coverage?

1st oldest child 2nd oldest child 3rd oldest child ...6th oldest child

- No dental insurance
- Insurance sponsored by an employer (for example, parent/guardian's)
- Through a health insurance marketplace or exchange
- Directly from an insurance company, not through the marketplace
- Medicaid or Children's Health Insurance Program (CHIP)
- Other [PLEASE SPECIFY: _____]

22. What are the major difficulties the children under 18 in your household for whom you are a parent or guardian experience with seeing a dentist or other dental professional as often as needed? *Please check all that apply.*

1st oldest child 2nd oldest child 3rd oldest child ...6th oldest child

- No difficulties
- Lack of insurance
- The insurance does not pay for the services the child needs
- Hard to find dentists who accept the insurance
- The services the child needs were not available in the area
- There were problems getting an appointment when the child needed care
- There were problems with getting transportation
- The office was not open when the child needed care
- There were issues related to cost
- The child was afraid of going to the dentist
- No one was available to take the child to the dentist during dentist's office hours
- Other [PLEASE SPECIFY: _____]

23. How strongly do you **agree** or **disagree** with the following statements?

[Strongly disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree, Strongly agree, Don't know]

- Giving a young child fruit juice in a bottle at bedtime or naptime cannot cause tooth decay
- Thumb sucking can cause problems with the development of a child's teeth and jaws
- Giving a young child milk in a bottle at bedtime or naptime cannot cause tooth decay
- It is not important to clean a baby's gums with a soft cloth even before the baby's teeth surface
- A child should go to the dentist by age 1 or within 6 months after the first tooth erupts
- Oral health does not affect overall health
- There is a strong relationship between what children eat and their dental health
- Cavities are nearly 100% preventable
- Dental disease cannot be passed from a caregiver to a baby by sharing utensils
- If a child has been sick, you should replace the child's toothbrush once the child is well

24. How often do the children under 18 in your household for whom you are a parent or guardian brush their teeth or have their teeth brushed for them?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
---------------------	---------------------	---------------------	------------------------

- Less than once a week
- Once a week
- 2 to 6 times a week
- Once a day
- Twice or more times a day
- Not applicable (no teeth)
- Don't know

25. How often do the children under 18 in your household for whom you are a parent or guardian clean between their teeth or have it done for them (eg, using dental floss, dental tape, or water flosser)?

1st oldest child	2nd oldest child	3rd oldest child	...6th oldest child
---------------------	---------------------	---------------------	------------------------

- Never
- Less than once a week
- Once a week
- 2 to 6 times a week
- Once a day
- Twice or more times a day
- Not applicable (no teeth)
- Don't know



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With a background as a medical doctor and 15 years of experience in health sciences, Dr. Surdu has contributed to the development and implementation of epidemiologic studies supported by the US National Institute of Health (NIH), the European Union (EU), the World Health Organization (WHO), among others. Dr. Surdu has worked for the Center for Health Workforce Studies (CHWS) for the past 5 years and her current research involves comprehensive studies of oral health in various states, including the evaluation of oral health needs, delivery of oral health services, and access and utilization of oral health services, particularly for underserved populations.



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