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Disparities in the Quality of Pediatric Dental Care: New Research and Needed Changes

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ABSTRACT

In the United States, there are significant disparities in the oral health of children from families with high and low socioeconomic status and between majority and minority children. Extant research on these health differences has focused predominately on caregiver knowledge, beliefs, and practices as well as structural barriers such as Medicaid coverage, dentist availability, and transportation issues. Little attention has been paid to the quality of care families experience when taking their child to the dentist or the ways in which dental schools train their students to work with young children. This policy report describes some of the experiences of low-income and ethnically diverse young children and their parents in dental clinics and highlights some of the weaknesses of dental training. We contend that increasing the standards for dental training and practice are necessary for improving young children's oral health and reducing these disparities.

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FROM THE EDITOR

In almost every medical discipline, it is widely accepted that treating children is fundamentally different, and requires different training, than treating adults. Yet, as this *Social Policy Report* points out, 80% of Medicaid children in the United States are treated by general dentists, who are not, by law, required to have any actual pediatric training. Cultural and linguistic barriers combine with this lack of pediatric training to result in shockingly poor quality of dental care for many families in this country.

In this SPR, authors Stephanie Reich, Guadalupe Díaz, Wendy Ochoa, and Amy Ganoa of the UC Irvine School of Education, and Kristin Hoeft, of UC San Francisco's Center for Disparities in Children's Oral Health, shed light on an important disparity that affects the healthy development of children nationwide. The authors point out that dental caries, i.e., tooth decay, are the most prevalent chronic condition in young children. Not only are these issues related to larger health outcomes, but poor oral health is also related to missed school and poor academic performance throughout childhood.

Though disparities in dental care for children under age five is certainly not a new topic, the authors explain that prior research has tended to focus on differences in access and parental knowledge—in essence putting the blame on parents, while rarely acknowledging the role that dental care providers might play in these disparities. The authors have conducted focus group and survey research to better understand the barriers to dental care that exist for low-income parents and children. The primary reason reported by parents was past negative experiences at the dentist, including lack of explanation of treatment, inappropriate use of medication and anesthesia, inappropriate physical restraint of children, extracting teeth without parent-perceived consent, and an overall feeling that the dentist did not know how to work with children. Often these negative experiences were so traumatic for the child and for the parent that the parent had not brought their child to the dentist since. These negative experiences at the dentist were far more likely to occur for low-income families and families where English is not the primary language. Though cultural competency training programs for practicing dentists do exist, there is little evidence these resources are widely used.

Clearly, increased pediatric and cultural competency training for dental care personnel is needed to address the disparities in children's dental health care identified in this report. Degree-granting dental schools should provide cultural competency training and opportunities for practice in community clinics that care for diverse populations. And importantly, communication strategies used by pediatric practitioners must be culturally and linguistically appropriate.

Disparities in the Quality of Pediatric Dental Care: New Research and Needed Changes

Ample research has documented disparities in oral health among low-income and higher income children and majority and minority children (Dye, Mitnik, Iafolla, & Vargas, 2017; Flores & Lin, 2013; Flores & Tomany-Korman, 2008a, 2008b). Numerous reasons have been proposed for these differences, ranging from differential access to dental providers to parents' lack of oral health care knowledge (Fisher-Owens et al., 2013; Mouradian, Wehr, & Crall, 2000; Telleen et al., 2012; Weatherwax, Bray, Williams, & Gadbury-Amyot, 2015). This policy report focuses on another possible contributor that has received very little attention, the inequitable quality of care that families with young children (less than 6 years) experience at the dentist. We argue that research on oral health disparities for children needs to be expanded to include the potential role of dentists in socioeconomic, ethnic, and racial differences in pediatric oral health. Furthermore, we propose higher standards for pediatric and cultural sensitivity training for dentists, if we hope to reduce these disparities among young children.

Pediatric Dental Disease

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Since U.S. Surgeon General Satcher's 2000 report, *Oral Health In America*, disparities in dental disease and care have persisted, even with efforts to increase young children's access to dental care and their caregivers' oral health literacy (Mouradian et al., 2000; Satcher & Nottingham, 2017). Although the amount of dental information and referrals from pediatric primary care providers has increased, dental caries and disease are still the most prevalent chronic infectious disease for children, affecting over one quarter of U.S. children under 5 years of age (CDC, 2007; Dye et al., 2017; Mattos-Graner, Klein, & Smith, 2014; Satcher & Nottingham, 2017).

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Although many preventative practices (e.g., fluoride varnishes applied in primary care), recommended dental home by age one year (AAP, 2014; AAPD, 2014) and early intervention efforts (e.g., use of fluoride toothpaste for preschoolers; Santos, Nadanovsky, & Oliveira, 2013) are in place, large differences in children's oral health persist. These differences are most pronounced between children from high and low socioeconomic status (SES), particularly when the children from low-SES families are also non-White (Dye et al., 2017; Flores & Tomany-Korman, 2008a,b; Yu et al., 2002). Such health disparities are important, as oral health is a key component of school readiness and academic performance (Blumenshine, Vann, Gizlice, & Lee, 2007; Jackson, Vann, Koch, Pahel, & Lee, 2011).

Importance for School Readiness and Academic Success

Extensive research has documented the links between untreated health conditions such as dental pain and children's ability to perform in school (Currie, 2005; Gracy et al., 2018). Untreated dental pain and poor oral health have been associated with missed school and poor academic performance (Blumenshine et al., 2007; Jackson et al., 2011). For example, dental caries (tooth decay), which is the most common childhood chronic condition (Mattos-Graner et al., 2014), can affect children's cognitive skills, behavior, and engagement (Altarum Institute, 2007; Currie, 2005). Additionally, dental pain is associated with nearly 51 million school hours lost each year (Altarum Institute, 2007). As economic, racial, and ethnic disparities exist in school readiness (Duncan et al., 2007), low-income and ethnic minority children are disproportionately affected by poor oral health (Fisher-Owens et al., 2013; Grembowski, Spiekerman, & Milgrom, 2012). In the U.S., African American and Hispanic children have a higher percentage of untreated dental caries (14.4% of Caucasian children compared to 25.1% of African American children and 34.9% of Hispanic children; Currie, 2005). Given the potential effects of poor oral health on children's school readiness and academic achievement, oral health has been made a component of school readiness (National Research Council, 2001). As a result, efforts have been made to promote oral health care in young children, such as comprehensive dental health care education for parents and children, as well as exploring the potential benefits of state mandated comprehensive dental screenings at school entry (Gracy et al., 2018; Shariff & Edelstein, 2016).

Disparities by Income, Ethnicity, and Language

Health disparities are defined by the Center for Disease Control as "differences in health outcomes and their determinants between segments of the population, as defined by social, demographic, environmental, and geographic attributes" (Truman et al., 2011, p. 1). In the United States, pronounced differences in oral health can be found between children from low-income homes and their more affluent peers (Capurro, Iafolla, Kingman, Chattopadhyay, & Garcia, 2015; Mouradian et al., 2000). Additionally, differences have also been found by race and ethnicity, with disparities being more marked for children from particular ethnic groups. For example, according to the National Survey of Children's Health (NSCH) a higher percentage (75%) of White and Asian/Pacific Islander parents report that their children have teeth that are in excellent or very good condition compared to 67% of African American and 50% of Latino parents (Flores & Tomany-Korman, 2008a, 2008b). Latino parents are more likely to report that their children have teeth in fair or poor condition than parents from other ethnic groups (Flores & Tomany-Korman, 2008a, 2008b). Furthermore, within minority groups, children from immigrant families report having worse dental care and oral health than Caucasian and U.S. born children (Flores & Lin, 2013; Flores & Tomany-Korman, 2008a, 2008b). Additionally, language is another predictor of oral health disparities, with non-English-speaking families having children with worse oral health than those from English-speaking families (Patrick et al., 2006; Reza et al., 2016). However, language is difficult to disentangle from ethnicity, income, and culture.

Potential Sources of Disparities

The extant literature on pediatric oral health disparities focuses on structural barriers, attitudinal and knowledge challenges, and behavioral contributors (Hilton, Stephen, Barker, & Weintraub, 2007; Kelly, Binkley, Neace, & Gale, 2005; Telleen et al., 2012).

Structural barriers describe obstacles to finding, paying for, or getting to a dentist. For instance, some geographic regions have few dentists or lack dentists that are affordable, accepting of Medicaid and/or Medicaid reimbursement rates for payment, or willing to treat children under 6 years of age (Chalmers & Compton, 2017; Mofidi, Rozier, & King, 2002; Seale & Casamassimo, 2003a; Sohn, Ismail, Amaya, & Lepkowski, 2007; Wehby et al., 2017). Transportation is another structural barrier, with some families lacking a way to get to the dentist (Flores & Tomany-Korman, 2008a, 2008b; Greenberg, Kumar, & Stevenson, 2008) and others lacking knowledge about how to find a dentist that is accessible by public transportation (Flores & Vega, 1998; Kelly et al., 2005). Time constraints serve as a structural barrier when parents may not be able to take their child to the dentist due to financial needs that prohibit missing work or low job security that will not allow for absenteeism (Edelstein, 2002; Kelly et al., 2005). Additionally, fewer dentists (including pediatric dentists) accept Medicaid than private insurance (GAO, 2000, 2012; Tsai, Wides, & Mertz, 2014), and those that do sometimes have limited appointment times for Medicaid patients, which must be available and align with work, transportation, and other family constraints (Flores & Vega, 1998; Kelly et al., 2005; Siegal, Marx, & Cole, 2005).

Communication challenges between dentists and caregivers highlight a key structural barrier that can contribute to oral health disparities. Communication between dental providers and parents has been associated with positive outcomes such as better oral health and motivation and compliance with healthy behaviors (Flores et al., 2002; Rozier, Horowitz, & Podschum, 2011). Although dentist–parent communication has been recognized as a key aspect of oral health and care, there is still a lack of implementation of effective communication strategies. For example, a national survey conducted by the American Dental Association Survey Center found that routine use of communication was low among dentists, even among techniques thought to be most effective with patients with low literacy skills such as speaking slowly, using videos, or having parents repeat what they were told (Rozier et al., 2011). The lack of effective communication has been documented to disproportionally affect the oral health care of low-income, non-English speaking, and ethnic minority children (Flores & Tomany-Korman, 2008a, 2008b; Rozier, Slade, Zeldin, & Wang, 2005). For example, children who lived in households where English was not the primary language were less likely to have seen a dentist or have routine dental visits (Flores & Tomany-Korman, 2008a, 2008b). Additionally, Hispanic and Asian parents who reported having poor communication with their children's dentists were more likely to have children who suffered from poor oral health and made fewer follow-up dental visits for their children (Rozier et al., 2005). Based on previous research highlighting the importance of communication and its potential contribution to oral health disparities experienced by low-income and ethnic minority children, it is imperative that communication strategies that are culturally and linguistically appropriate are implemented.

In addition to structural barriers, knowledge and attitudes can also serve as challenges to oral health. For example, parents may not know when to take a child for a dental check up, how to care for teeth, or which foods are best for healthy teeth and gums (Castilho, Mialhe, Barbosa, & Puppin-Rontani, 2013; Kumar, Tadakamadla, Kroon, & Johnson, 2016; Weatherwax et al., 2015). Furthermore, attitudes about oral health can impact care, such as viewing baby teeth as unimportant, dental costs as not worth it, or home remedies as better than formal care (Hilton et al., 2007; Kim, 2005). Parental fears

of the dentist are also related to children's dental fears and oral health care (Gatchel, 1989; Jana Olak et al., 2013; Milgrom, Manci, King, & Weinstein, 1995; Themessl-Huber, Freeman, Humphris, MacGillivray, & Terzi, 2010).

Lastly, behavioral contributors to poor dental care are typically attributed to family activities such as feeding practices like parents' giving a bottle at night or feeding their child high sugar-content foods and drinks (Burt et al., 1988; Reisine & Litt, 1993), and dental hygiene such as not brushing teeth regularly or brushing ineffectively (Adair, Pine, et al., 2004; Adair, Schafer, Rockman, & Waller, 2004). Largely lacking from the literature on social determinants of oral health are the experiences that the families have with the dentist, especially as these experiences may differ by family income, ethnicity, and/or English skills. Rarely considered in the extant literature is how well-equipped dentists are to work with young and diverse pediatric patients.

Overcoming Typical Barriers and Contributors

Structural. Among low-income children, Medicaid and Children's Health Insurance Program (CHIP) coverage have greatly increased, allowing for greater access to dental care for low-income families. However, this increased access has not improved children's oral health outcomes (Fisher & Mascarenhas, 2007; Shariff & Edelstein, 2016). Access to providers and higher reimbursement rates are important for increasing dental care for low-income children (Chalmers & Compton, 2017), but are not sufficient for alleviating disparities.

Extant research finds that Medicaid enrollment alone is not adequate for up-to-date dental care and that experiences with providers can influence utilization of dental services for children (Kelly et al., 2005). For instance, African American parents who utilize Medicaid dental services describe being treated well by Medicaid providers, while African American parents who no longer utilize services report more instances of being discriminated against (Kelly et al., 2005). This same study found that rescheduling appointments and long wait times were frustrating for all low-income parents, especially when needing to use public transportation or having to schedule time off work for the appointment.

Dental provider characteristics. Dental provider attitudes, knowledge, and behaviors, and their influence on oral health disparities have been studied much less than those of patients. Provider age, gender, ethnicity, and clinic size and busyness are related to providing care to publically insured patients (Pourat, Andersen, & Marcus, 2014). Discrimination and poor cultural competency are factors that negatively influence patient experience (Horowitz & Kleinman, 2012; Mofidi et al., 2002), while dentists' perspective of poverty (individualistic-deficit vs. socio-life course) may contribute to their willingness to accept public insurance and capacity to provide more empathetic care (Loignon, Landry, Allison, Richard, & Bedos, 2012; Loignon et al., 2010). Including cultural competency and community clinic training in dental schools is one potential way to better prepare graduates to effectively serve the changing demographics of the country (Albino, Inglehart, & Tedesco, 2012; Behar-Horenstein, Warren, Dodd, & Catalanotto, 2017; Rowland, Bean, & Casamassimo, 2006), and there are cultural competency training resources for practicing dentists, but little is reported on the prevalence or effectiveness of their use (Cadoret & Garcia, 2014). Discussions with low-income, Medicaid-enrolled

parents find that negative experiences at the dentist reduced the likelihood of parents utilizing dental services for their children (Mofidi et al., 2002).

Parental attitudes, knowledge, and behaviors. Interventions have targeted parental knowledge and attitudes about oral health and dental care practices at home to help promote up-to-date dental care for children (Ballard & Hoeft, 2019; Albino & Tiwari, 2015). In a recent review of educational interventions, Gao, Lo, Kot, Wai, and Chan (2014) found small to no effects on children's oral health from conventional education strategies such as discussions with providers, videos, and printed materials. Weatherwax et al.'s (2015) study of dental caries (non-cavitated lesions, cavitated lesions, missing due to caries, and filled surfaces) found parental/caregiver knowledge and attitudes about oral health to not be significant contributors to children's oral health status, while low education and Hispanic ethnicity were.

Family demographic contributors. Across numerous studies, parental demographic characteristics are significantly related to children's oral health and dental care utilization, often more than knowledge, attitudes, or behaviors (Gao et al., 2014; Hooley, Skouteris, Boganin, Satur, & Kilpatrick, 2012). For instance, in a survey of parents with children 6 years and under, literacy skills were related to children's oral health, but not knowledge of oral health or dental practices (Miller, Lee, DeWalt, & Vann, 2010). Furthermore, in a recent review of 48 studies, Kumar et al. (2016) found parental education to be the greatest predictor of pediatric dental caries (i.e., cavities). Although dental knowledge and oral health practices at home contribute to children's oral health (Collett et al., 2016; Finlayson, Siefert, Ismail, & Sohn, 2007), income, education, and ethnicity appear to be important contributors as well (Finlayson et al., 2007; Fisher-Owens et al., 2013; Flores & Lin, 2013; Flores & Tomany-Korman, 2008a, 2008b; Kumar et al., 2016). Thus, home and family factors may influence such things as health literacy, diet, and home oral hygiene, but health care disparities are also related to communication with health care providers (Cooper-Patrick et al., 1999; Johnson, Roter, Powe, & Cooper, 2004; Verlinde, De Laender, De Maesschalck, Deveugele, & Willems, 2012), treatment by providers (Burgess, Fu, & van Ryn, 2004; Burgess, van Ryn, Crowley-Matoka, & Malat, 2006; Nelson, 2002), and agency/participation in treatment decisions (Cooper-Patrick et al., 1999; Ngui & Flores, 2006).

Experiences as potential barriers. The barriers described above (structures, attitudes, knowledge, and behaviors) have been well studied, with national and local surveys consistently including items on these topics (e.g., National Survey of Children's Health; Data Resource Center for Child & Adolescent Health, 2018, American Medical Association Masterfile; AMA, 2018, and National Health and Nutrition Examination Survey; CDC, 2018, just to name a few). Importantly, these barriers are largely structured around deficits of the family, such as a lack of knowledge about how to care for teeth, poor diet, lack of transportation, not being able to find or pay for dental care, or being unable to communicate in English. Rarely included in this inquiry is the potential role that dental providers might play through the way they

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Exploratory studies in California. In an effort to explore potential barriers to oral health for low-income children, we conducted focus groups in four cities in Southern California (Reich et al., 2019). These were done in groups with 6–8 very low-income caregivers (no incomes above 130% the poverty line) of preschool-aged children in English and Spanish. The groups focused on caregivers' perceived facilitators and barriers to dental care for their children. Questions about traditionally identified barriers were asked as well as additional potential contributors or obstacles to care.

Many caregivers described the helpless feeling of hearing their child scream through the walls while they sat in the waiting room and how scared their child appeared when tied down, held down, or strapped to a dental chair.

In these focus groups, caregivers did not endorse the typically identified barriers. They were knowledgeable about healthy brushing and eating habits, had access to transportation (on a bus line, owned car), had already enrolled their children in Medicaid and knew how to find a dentist under that coverage. Instead, caregivers identified a host of negative experiences that served as barriers to care and positive experiences that facilitated continued care. Sources of negative experiences included lack of explanation of treatment, separation from their child, inappropriate use of medication (ranging from none at all to overuse), restraining their child (typically without parent consent), extracting teeth without parent-perceived consent, and the impression that the dentist did not know how to work with children. Many caregivers described the helpless feeling of hearing their child scream through the walls while they sat in the waiting room and how scared their child appeared when tied down, held down, or strapped to a dental chair. Many caregivers expressed frustration that the dentist did not explain what was happening directly to their child, especially when the child was clearly distressed. Although this study involved parents' report of their experience, many recalled not having given consent. This is important since dental providers are required to obtain parental consent prior to treatment, in a way that involves true consent (not a technical form or instructions in a language the parents do not speak). Several mothers stated that the experience was upsetting enough that they had not taken their child to a dentist since, even though treatment was needed. Three mothers described removing the child from the dental chair prior to the end of treatment and never returning. Other caregivers described how their child was traumatized and subsequently fearful to return to the dentist—due to their fear of separation, restraint, or pain from fillings and extractions without anesthesia. As a mother of a 3-year-old described, "she had a bad experience . . . she doesn't want to go [to the dentist]. But I have to take [her], she won't go. She starts crying and the whole time yelling." Such experiences were much more common in our focus groups with Spanish-speaking than English-speaking caregivers.

In these focus groups, caregivers also described positive experiences such as the dentist talking to the child and parent/grandparent and explaining the dental procedures, using appropriate doses of anesthesia, including caregivers in the exam room and treatment decisions, having a child-friendly environment, and giving children toys or stickers.

Overwhelmingly, the caregivers who had positive experiences had taken their child to a pediatric-trained, rather than general, dentist. These parents expressed no reservations about taking their child to the dentist and some stated that their child was excited to go to the dentist. As one mother of preschool-aged daughters summarized, "You know, I love her dentists. All the girls love the dentists there because it's a children's dentist."

Similar themes were also found in studies using individual interviews and focus groups in community settings or participants' homes with low-income Spanish-speaking parents of young children in Northern California (Barker & Horton, 2008; Chang et al., 2018). Positive dental encounters involved step-by-step diagnosis and treatment explanations to both parents and children in their preferred language, oral health concepts taught in a positive and supportive manner with opportunity for demonstration or skill building, time for parents to ask questions, and child-specific decorations, toys, and stickers. Negative experiences resulted when parents felt blamed or shamed for their child's oral health status, did not understand the treatment, experienced treatments as being different than what parents had expected, negative sedation experiences, and when children displayed distress but dentists continued with procedures anyway. Negative experiences often resulted in parents switching providers or stopping to bring their child in for any dental treatment. As one mother described, "[the dentist] was on a schedule and he only gives two minutes and leaves and he didn't pay attention to me because I was asking and asking and he didn't seem to like that. Towards the end, I didn't like the way he was responding to me. That's why I haven't taken [my son] back to the dentist."

Surveying parents. In order to assess whether these positive and negative experiences described in our qualitative studies applied to others in California and if the experiences differed by income or ethnicity, we created a dental experience survey, administered as a one-on-one interview, based on the topics identified in these focus groups and found that low-income, Latino and Asian families, especially Spanish-speaking and Vietnamese-speaking families, received lower quality dental care than higher income and White families. From our 1,184 surveys (about half in English and half in Spanish or Vietnamese) of parents of young children, ranging in annual income from less than $12,000 to more than $75,000 per year, we have found that in general, dentists do not involve caregivers in their child's care, with 66% of parents reporting that they are not allowed in the exam room with their child, 27% reporting that no one explained what was happening to their child, 25% not being asked to help calm their child, and 8% not being asked permission prior to administering medications. Such experiences were more common for lower income families (less than $50,000) and far less frequent for incomes above $75,000. Although 18% of caregivers reported hearing their child scream from the waiting room, this was twice as likely if the family spoke Vietnamese and almost three times as likely if the family spoke Spanish. A quarter of parents reported that their child was restrained at the dentist and this was more common for low-income children as compared to higher income children (OR = 1.66). Hispanic children were also more likely to be restrained (with professional restraints, other objects such as pillowcases, or people holding them down or sitting on them) than Caucasian children (OR = 1.89). Low-income and Hispanic parents reported their child being medicated at higher rates at the dentist (OR = 1.93 low-income, OR = 1.54 Hispanic) and frequently removed the child from the office while s/he was still heavily

medicated. Eight percent of caregivers reported their child being given medication without permission and this was almost five times more likely for Asian than Caucasian families. Low-income and Hispanic caregivers most frequently reported having negative experiences that made them not want to come back and 3% reported the experience as so bad that they left before treatment was complete. Although, both higher and low-income families reported receiving toys/stickers at the dentist and most (76% low-income, 91% higher income) noted that positive experiences made them eager to bring their child back to the dentist, the quality of experience at the dentist varied greatly by income, race/ethnicity, and language (Reich et al., 2019).

Research on barriers and facilitators to oral health care has consistently assessed the same constructs (structural barriers, attitudes, beliefs, and caregiver practices). We propose other contributors, based on the quality of care provided while in (and sometimes tied to) the dentist chair. Researchers focused on pediatric oral health disparities need to consider the impact that upsetting experiences in dental clinics can have on continued care and oral health. Furthermore, dentists must be held accountable to use best practices, regardless of families' income, ethnicity, or English language skills.

A central component to parental report of both positive and negative experiences is communication. Given the differences in quality of care by ethnicity and language, exploration into communication strategies is essential. Parents in both the focus groups (Reich et al., 2019) and one-on-one interviews Masterson et al., (2019) who had treatments and procedures fully explained to them expressed much more satisfaction with their encounter, even if the treatment involved stressful experiences like protective stabilization (i.e., restraint or sedation). A parent explained the difference in how two clinics differed in interacting with her child, even while doing the same treatment, "They tied her down there [prior clinic] too, but I liked it more [here at this clinic]. [Here] they explained everything and they encouraged them [children] to cooperate with the cleaning. . . . It's much better than the other place. I wanted to go to [this clinic here] because they [the children] are encouraged here and they [the dentists] give them advice. They [dentists] explain what they are going to do." In the interviews, most parents reported that dentists or their bilingual staff gave some explanation of planned treatment. However, many reported being surprised at what actually happened during treatment, including unanticipated extractions, more fillings or crowns placed than expected, higher levels or different type of sedation use with greater after-effects, and marks on their child's face. This indicates that parents often are not fully informed about what treatment will occur or do not have a clear understanding of the treatment to which they consented. One mother explained, "They [the dentist] only said that they were going to tie him down. That's all they said . . . they tied everything . . . They tied his hands, his feet, everything. I had never seen something like that before. . . . They didn't tell me that they were going to tie him down [completely]. Since we didn't know, we said they could. When we saw how it really was, we didn't like it." Clearly, dentists and their staff need to do a better job explaining the procedures and potential outcomes, as well as confirming that the parent has understood the explanation.

Talking with general dentists. In another study, we interviewed general dentists who accept Denti-Cal patients (California's Medicaid dental program) to learn their perspectives on treating young children in their clinic (Masterson, Hoeft, Horton, & Barker,

2018). Dentists reported having to navigate a difficult space in which there are many young children in need of dental care, but not feeling optimally equipped to provide that care. As such, dentists had very wide-ranging approaches to treating young children, aged 5 and under, from not accepting them at all, to offering only cleaning and prevention procedures (e.g., exams, cleaning, or fluoride varnish but no restorative treatment), to doing treatment only on cooperative children (described as able to "sit still"), to offering advanced management techniques (e.g., protective stabilization [tying them down], oral conscious sedation, and/or nitrous oxide) to help provide treatment to uncooperative children. Dentists described lacking time to spend on the extra interactions required for such cases and lacking specialty training or equipment as reasons they did not provide treatment to young children. As one dentist explained, "In the beginning I attempted to treat them [young children] . . . And then I found out it's difficult, it took a long time, patients were waiting. So, we just found it easier to, if you see a lot of decay, just refer them out. Because, the pedodontists, they're pretty fast and they can do more treatments in one session." However, general dentists were more likely to try to treat young patients if they knew that pediatric dental specialists were difficult to access for their patients, "We do our best to see every single child and complete their treatment onboard our dental unit. But there's always an exception where the child just cannot be seen, whether because we have a lack of equipment or whether we don't do the services that a pediatric specialist does. Occasionally we refer them out, but not often . . . we always try our best to work on these children, because we know that the family members don't have anywhere else to go."

Dentists as Pediatric Professionals

Most striking from these studies in California are parents' perceptions of dentists' competence for working with children, ability to communicate clearly, and inclusion of children and parents in treatment decisions. As one mother described, "The dentist makes a difference. If you go to one that is a pediatric than a general one. Everything is decorated for kids, it calls their attention, how they are treated. And then they give them a reinforcement." Such sentiments lead to questions about how dentists, who are licensed to work with children, are trained to work with young children, especially economically and ethnically diverse children.

General dentistry training. When general dentists graduate dental school, they are licensed to treat adults and children of all ages. However, clinical training in dental school may not have included pediatric clinical experiences, especially with young children and infants. The Commission on Dental Accreditation (CODA) does not specify training in pediatric dental care, however, "Graduates must be competent in providing oral health care within the scope of general dentistry to patients in all stages of life" (CODA, 2018, p. 29). Oral health care includes "restoration of teeth," "recognizing when referral is indicated," as well as "local anesthesia, and pain and anxiety control" (p. 30). Pediatric practicums and clinics are at the discretion of each dental program and there is no mandate to have clinical experience with young patients in accredited programs. This is important as older children and adults are often well behaved with fewer oral health issues than younger patients (Seale & Casamassimo, 2003b). Such variability in training might produce dentists that are insufficiently prepared to provide the best treatment to young children, especially those with severe dental disease.

Two thirds of U.S. dental schools recently reported insufficient pediatric patient pools to train their students, and increasing reliance on community rotations for exposure to pediatric patients (Casamassimo & Seale, 2014, 2015). Knowledge about child development and behavior, along with direct experience working with children, are important for knowing how to interact with these young patients in developmentally appropriate and culturally sensitive ways, as well as how best to treat their oral health needs. In considering treatment, dental schools are required to train their students in "restoration of teeth" but it is up to individual schools to determine what is covered and in what depth. For example, for decay in primary molars (i.e., baby teeth in the back), stainless steel crowns have better performance than fillings (Seale & Randall, 2015). Yet, dental students may graduate without ever having placed one, leaving them unable to optimally treat children without additional training (Stewart & Sanger, 2014). In a recent survey, over a third of dental schools felt their graduating general dentists were not ready to conduct infant oral exams, place stainless steel crowns, or provide nitrous oxide analgesia to pediatric patients in independent practice (Casamassimo & Seale, 2015). Furthermore, a study of dental school curricula and training on infant oral health found that only 50% of dental schools offer clinical experience with infants and some provide as little as 15 minutes of classroom education (McWhorter, Seale, & King, 2001).

General dentists corroborate these concerns about dental training in several survey studies. For example, Rich, Straffon, and Inglehart (2006) found that 85% of 500 general U.S. dentists did not feel well prepared to treat children under the age of 3 years with the education they received during dental school. Furthermore, general dentists who received pediatric training during dental school were more likely to report feeling comfortable treating young children, and having staff members that were more knowledgeable and comfortable treating young children than general dentists who reported not being well trained in pediatric dentistry (Rich et al., 2006). The inconsistent quality in pediatric dentistry training might be due to a lack of pediatric dentists nationwide, as one in three dental programs use general dentists to teach dental students about pediatric dentistry (Seale & Casamassimo, 2003a).

. . . extant requirements for dental school accreditation are vague with great latitude provided to individual dental programs as to how students are trained (or not) to care for children.

This insufficiency in training has been previously recognized, and programs such as Pediatric Oral Health Access Program (POHAP) (Stewart & Sanger, 2014), Treating Young Kids Every Day (TYKES; CDA), and Access for Baby & Child Dentistry (ABCD, 2018) have been developed to improve general dentists' competency post graduation. Nonetheless, extant requirements for dental school accreditation are vague with great latitude provided to individual dental programs as to how students are trained (or not) to care for children.

As mentioned earlier, there is a recommendation by both the American Academy of Pediatrics and the American Academy of Pediatric Dentistry for children to have a dental home and first dental visit by 1 year of age. This recent push for younger first dental visits is associated with a reduction in untreated caries at young ages (Dye et al., 2017), but is resulting in more general dentists seeing more increasingly younger children.

Currently, dentistry sedation and anesthesia licenses differ by state, resulting in very disparate training and safety requirements across the country. Many states allow general dentists to engage in a range of pediatric medical intervention that other pediatric health providers cannot. For instance, in some states general dentists can provide oral conscious sedation of children in their dental office without monitoring and, in many states, alone, while physicians are required to have a second person to monitor the child's breathing while treating the child's medical issue (Coté & Wilson, 2006; Kauffman et al., 1992). Despite the American Academy of Pediatrics and American Academy of Pediatric Dentistry guidelines recommending that a person, other than the dentist, be dedicated to monitoring and administering moderate sedation or general anesthesia, a 2016 review of pediatric dental sedation policies notes that it is not required by any states (Dental Board of California, 2016, p. 1.).

Furthermore, pediatricians are required to be certified in Pediatric Advanced Life Support (PALS) and have emergency medical equipment in case of sedation complications (Coté & Wilson, 2006). This is because sedation of children is associated with serious risks (e.g., hypoventilation, airway obstruction, laryngospasm, apnea, cardiopulmonary impairment) (Coté & Wilson, 2006). Currently, only 20 states require PALS certification for general dentists conducting sedation with children (Dental Board of California, 2016). In one review of adverse events following pediatric sedation, more deaths and complications were reported when sedation was done by a dentist than a physician (Coté, Notterman, Karl, Weinberg, & McCloskey, 2000). Another review that examined studies of dental sedation deaths published since 1955 noted 218 deaths during dental sedation and that hypoxia (deprivation of oxygen) was the most common reason (Mortazavi, Baharvand, & Safi, 2017). It is important to note that of deaths that occur during dental sedation, young children are the most common victim (Lee, Milgrom, Starks, & Burke, 2013; Mortazavi et al., 2017; Saint Louis, 2017). However, among dentists, the fewest complications from sedation resulted from sedation by pediatric-trained dentists, who are trained to follow the American Academy of Pediatric Dentistry guidelines, which are often stricter than individual state requirements.

Increasingly, states are implementing additional training requirements for dentists to engage in sedation of children, such as pediatric dentistry residency or a certification of oral conscious sedation for minors training (Dental Board of California, 2016). However, there is no nationwide required training for sedation of children, especially those 5 years and younger, who are at the greatest risk for sedation complications (Lee et al., 2013). (See http://www.sedationregulations.com for regulations by state.)

Pediatric Providers Should Have *Pediatric* Training

Unlike other pediatric health professions, general dentistry lacks many of the requirements and restrictions that other pediatric specialties experience.

Unlike other pediatric health professions, general dentistry lacks many of the requirements and restrictions that other pediatric specialties experience. For instance, training in other medical specialties that work with children such as medicine, nursing, physical therapy, and occupational therapy require all students to have practicums with children, thus guaranteeing that

their graduates have minimum experience in working with young patients and their families. As noted above, general dentistry does not have this requirement and seeing pediatric patients is at the discretion of each dental school. This is problematic since the majority of children using Medicaid services is treated by general dentists (DHHS, 2004), and caring for children is different than caring for adults.

As all pediatric providers, developmental scientists, and parents know, children are not small adults. They have unique developmental capacities, that vary by age, and influence how they can comprehend, respond, comply, and participate in their own care, including dental care, which requires cooperative behavior for dentists to complete exams and treatment (AAPD, 2017a, 2017b; Green & Palfrey, 2002; WHO, 2017). Additionally, health care, for children should involve a family perspective, and include caregivers in treatment. This is important for understanding context, identifying family strengths and challenges, promoting optimal decision-making, and improving care. This is explicit in the American Academy of Pediatrics Task Force on the Family Pediatrician's statement on family involvement, "First, children's outcomes—their physical and emotional health and their cognitive and social functioning—are strongly influenced by how well their families function. Second, there is much that practicing pediatricians can do to help nurture and support families and, thus, promote optimal family functioning and children's outcomes" (AAP, 2003, p. 1542). Unfortunately, inclusion of families in pediatric dental care is not a requirement for all dental programs.

The American Academy of Pediatric Dentistry, focused on specialized dental training for children, expressed the need for dentists to have formal training and education to cultivate the knowledge and skills to "manage the various physical challenges, cognitive capacities, and age-defining traits of their patients" (AAPD, 2017a, 2017b, p. 260). The AAPD has also noted the lack of this level of experience in predoctoral dental programs. For instance, a survey of 48 dental schools found that most students spent less than five hours of instruction on behavior guidance/management and almost half reported that only one in four of their students received clinical experience involving pediatric behavior guidance (Adair, Pine, et al., 2004).

. . . providers that treat children should be trained to work with children.

Unequivocally, providers that treat children should be trained to work with children. Developmentally inappropriate practice could, and likely does, increase barriers to pediatric oral health. For instance, when a dental provider, who is unfamiliar with the importance of toddler–parent attachment quality (De Wolff & van IJzendoorn, 1997; John, 1969), separates a toddler from a caregiver, the child is likely to become upset, noncompliant, or defiant. When the provider does not know basic behavioral guidance techniques, such as how to talk with or calm the child, that provider is more likely to restrain the child, in order to complete the exam. Now the child is experiencing separation distress (Ainsworth, 1979) as well as a lack of mobility and autonomy, which further increases his/her distress (Edwards & Liu, 2005). Even before the dentist has looked into that child's mouth, s/he is cultivating fear of the dentist (Chapman & Kirby-Turner, 1999) and if the caregiver is listening to the screams, that upsetting experience could additionally reduce the likelihood that he or she will return to the dentist with this child or other siblings. Furthermore, if the dentist is culturally

insensitive and/or lacks the ability to communicate effectively with the child's family, these challenges could be magnified.

Dentists Should Be Trained to Work With Diverse Families

Commission on Dental Accreditation requirements for dental schools state that "graduates must be competent in managing a diverse patient population and have the interpersonal and communications skills to function successfully in a multicultural work environment" (CODA, 2018, p. 27, standard 2-16). However, how this cultural competency is taught is at the discretion of the dental school, with no specific requirement for training about cultural diversity for pediatric patients and their families. In a survey of dental schools, less than 18% reported having a specific course on cultural competency (Rowland et al., 2006). Individual programs have demonstrated how case management, coursework, and clinical experiences can improve cultural competency (Alriq, Scott, & Mascerenhas, 2015; Broder & Janal, 2006; Classe-Cutrone, McCan, Campbell, DeWald, & Schneiderman, 2017); yet, none of these efforts have been formalized into CODA requirements.

There are grave pediatric oral health disparities in the United States (Capurro et al., 2015; Mouradian et al., 2000), with low-income, non-White, and Spanish-speaking children having worse care and health than their more affluent, Caucasian, and English-speaking peers (Flores & Lin, 2013; Flores & Tomany-Korman, 2008a, 2008b; Patrick et al., 2006; Reza et al., 2016). Although not well studied in dentistry, implicit bias, stereotypes, and lack of cultural competence are contributors to similar disparities in medicine (Institute of Medicine, 2002). As such, explicit definitions and training requirements have been enacted in medical schools and residency programs. Dental educators have attempted to connect medical cultural competence issues to dentistry (Formicola, Stavisky, & Lewy, 2003; Mouradian, Berg, & Somerman, 2003). Such efforts are important since "disadvantaged families accessing dental care report experiencing judgmental, disrespectful, and discriminatory behavior from staff and providers because of their race and public assistance status" (Mofidi et al., 2002, p. 53).

. . . effective communication principles and strategies for parents and children need to be taught and practiced in dental training and reinforced throughout a dentist's career.

Finally, effective communication principles and strategies for parents and children need to be taught and practiced in dental training and reinforced throughout a dentist's career. All clinical encounters should begin with establishing rapport with the family (Lowe, 2013), and our studies indicate that parents respond positively to dentists who do this effectively with them and their children. Communication is not merely the dentist bestowing knowledge on the parent, but rather an exchange of information in both directions. Our studies suggest that complete transfer of information is not occurring, and dentists should utilize more communication techniques to check in with parents, such as asking questions and inviting parents to teach back what they have been told to ensure understanding (Chang et al., 2018; Horowitz et al., 2014), or utilize motivational interviewing (Borelli, Tooley, & Scott-Sheldon, 2015). Health literacy has gotten recent attention in oral health and low health literacy of parents has been associated with poorer oral health status (Divaris, Lee, Baker, & Vann, 2011; Miller et al., 2010). However, the role and responsibility of providers

in improving health literacy of their patients/parents needs further examination, and tools and training in this area are needed (Horowitz & Kleinman, 2012; Rudd, 2012). Furthermore, without effective, bidirectional, and culturally sensitive communication, families will be less likely to want to take their children to the dentist, value the information provided by the dentist, or identify dental care plans that are best for children.

Conclusion

Findings from our work suggest the possible existence of a two-tiered care system that is traumatizing and alienating caregivers from the dental care system, especially among those groups at higher risk for dental disease and its complications. This is alarming, given the prioritization of reducing health disparities at a national level (NIDCR, 2018), as well as the American Dental Association's endorsement of respect for diversity of patient age, language skills, race, ethnicity, and income in the operationalization of their five pillars of principles of ethics and code of professional conduct which include Justice, Non-malevolence, Patient autonomy, Veracity, and Beneficence (American Dental Association Council on Ethics, Bylaws, and Judicial Affairs, 2018). Despite the goals to provide the highest quality of care to everyone regardless of their income, ethnicity, or language skills, the findings summarized here do not reflect that as the current reality for patients. Continued changes are needed in the training of dentists and regulations are needed to hold family dentistry accountable to the same high standard as other pediatric professions. We support previous calls for additions to CODA that specify predoctoral curricula include treatment of pediatric populations, especially diverse populations, and programs that encourage pediatric dentists to accept public insurance (Seale, McWhorter, & Mouradian, 2009).

Extant research on barriers and facilitators to pediatric oral health has focused almost exclusively on structures, knowledge, attitudes, and family behaviors. However, a focus on dental providers must be included. Dental training needs to include pediatric courses and clinical experiences focused on developmental processes, behavior guidance, including advanced techniques such as nitrous oxide analgesia, early prevention and disease management, family partnership, and cultural diversity. More resources are needed to support pediatric dental fellowships and continuing education opportunities, ensuring that more general dentists know how to work with and best treat their youngest patients. For instance, the Accreditation Standards for Advanced Specialty Education Programs in Pediatric Dentistry involve 2–3 years of training on how to provide best oral health care for children, including how to manage children's behavior and create an environment that is nonthreatening for children of all ages. This training typically includes hands-on experience in dealing with extreme dental cases and communicating with and educating parents and caregivers. Importantly, pediatric dentists learn about oral health disparities and cultural issues, and are encouraged to be advocates for the oral health of children (CODA, 2017).

The causes of oral health disparities are multifaceted with many contributors. We propose that dentists can be important contributors to these inequalities or valuable remedies to overcoming these differences. Studies should consider the role of dentists in diverse children's care and higher standards for the training of dental providers, especially for treating young children, should be enacted. With the American Academy

of Pediatrics (2014) recently joining the American Academy of Pediatrics Dentistry in recommending that children have a dental home and first exam by 1 year of age, younger children are finding their way into the dental exam room. However, not all dentists are trained to treat children that young. Policies and practices aimed at reducing oral health disparities should work toward increasing the number of developmentally appropriate and culturally and linguistically sensitive providers.

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