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Elizabeth L. Crouch

University of South Carolina, crouchel@mailbox.sc.edu

Joni Nelson

Radhika Ranganathan

University of South Carolina, radclife@mailbox.sc.edu

Melinda A. Merrell

University of South Carolina, mmerrell@mailbox.sc.edu

Amy Martin

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ORIGINAL ARTICLE

Safe, supportive neighborhoods: Are they associated with childhood oral health?

Elizabeth Crouch PhD¹  | Joni Nelson PhD² | Elizabeth Radcliff PhD¹ |
Melinda A. Merrell PhD, MPH¹ | Amy Martin DrPH² 

¹Arnold School of Public Health, University of South Carolina, Columbia, South Carolina, USA

²Department of Stomatology, Division of Population Oral Health, Medical University of South Carolina, Charleston, South Carolina, USA

Correspondence

Elizabeth Crouch, Department of Health Services Policy & Management, University of South Carolina, Discovery Building Suite 345, 220 Stoneridge Drive, Suite 204, Columbia, SC, 29210, USA.
Email: crouchel@mailbox.sc.edu

Abstract

Objective: There has been limited examination of how community-level supports may influence oral health metrics among children. The purpose of our study is to examine the association between two types of community-level positive childhood experiences and oral healthcare and oral health outcomes among children ages 6 to 17 years of age.

Methods: This study uses a cross-sectional data set from the 2018–2019 National Survey of Children’s Health. Two oral health metrics were used: preventive dental care, measured as one or more preventive dental visits in the past 12 months, and tooth decay, measured as tooth decay or cavities in the last 12 months. To quantify living in safe, stable, equitable environments, questions on residing in a safe and supportive neighborhood were used. Descriptive statistics and bivariate analyses were used to calculate frequencies, proportions, and unadjusted associations for each variable ($n = 40,290$). Multivariable logistic regression models were used.

Results: In an adjusted analysis, children who lived in a supportive neighborhood had a higher likelihood of receiving a preventive dental visit than children who did not live in a supportive neighborhood (aOR 1.41; 95% CI 1.21–1.65). Children who lived in a safe neighborhood were less likely to have tooth decay than children who did not live in a safe neighborhood (aOR 0.75; 95% CI 0.65–0.86).

Conclusions: The findings from this study highlight the role of social structures in tightening the safety net for oral healthcare in children.

KEYWORDS

community support, dental caries, oral health, positive childhood experiences, risk factors

INTRODUCTION

The National Institutes of Dental and Craniofacial Research (NIDCR) recently released its seminal report, “Oral Health in America,” [1] in December 2021. It chronicles the significant achievements that have advanced oral health for the last 20 years but challenges remain. Despite improvements in clinical advancements, race-based oral health disparities persist [2, 3, 4]. For example, tooth decay and poorer oral health have been found at higher rates in children who live at or below the federal poverty level in the U.S. or are not insured [5, 6]. Tooth decay and poorer oral health have also been found

to be higher among children residing in rural areas, compared to their urban counterparts, possibly due to lower rates of dental providers in rural areas [7].

Related to this unequal distribution of tooth decay and poor oral health among children are a multitude of family, societal, and community inputs [8, 9]. At the family level, children with multiple adverse childhood experiences (ACEs) are more likely to have untreated oral health needs [10, 11]. ACEs include a range of emotional, physical, or sexual abuses, neglect, or household dysfunction [12]. In homes with certain dysfunctions or vulnerabilities, parents may be less likely to take their children to the dentist [13]. Prior research has examined the

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relationship between ACEs and preventive dental care, as well as tooth decay among children and adolescents, finding that children with exposure to higher numbers of ACEs are less likely to have preventive dental visits in the previous year and more likely to have tooth decay [14].

There has been limited examination, however, of how community-level supports may influence oral health indicators. In contrast to ACEs, which typically describe household or personal-level trauma, positive childhood experiences (PCEs) describe primarily community-level supports that improve the social and emotional development of children and potentially moderate, mitigate, or prevent a child's exposure to ACEs [15]. The Healthy Outcomes Positive Experiences (HOPE) framework categorizes PCEs into the following: [1] nurturing, supportive relationships, [2] living in safe, stable environments, [3] constructive social engagement opportunities, and [4] learning social and emotional competencies [15]. PCEs have previously been studied extensively, looking at a variety of outcomes, but to our knowledge, no studies have looked at PCEs and oral health metrics [16–18]. Yet, living in safe, stable environments in particular may be associated with oral health outcomes, as community and societal influences are well known to be influencers of oral health in children [8].

Therefore, the purpose of our study is to examine how neighborhood structure may influence oral health metrics, by examining the association between two types of community-level PCEs (safe neighborhood and supportive neighborhood) and oral healthcare and oral health outcomes (preventive dental visits and tooth decay) among children ages 6 to 17 years of age, using the 2018–2019 National Survey of Children's Health. We hypothesize that children who live in safe and supportive neighborhoods will have a higher likelihood of utilizing a preventive dental visit within the last year as well as a lower rate of tooth decay. The findings from this study will inform policymakers and program developers on how community context may be meaningful for children to access the oral healthcare that they need.

METHODS

Data source

This study uses a cross-sectional data set from the 2018–2019 National Survey of Children's Health (NSCH), a nationally representative survey of parents or caregivers residing in households with at least one child between the ages of 0–17. The NSCH software system randomly selects one child from the household to be the subject of the survey. The NSCH is administered by the Data Resource Center (DRC), using both mail in and online collection methods, with further information on selection and sampling methodology on the DRC website (childhealthdata.org).

There were 59,963 completed interviews in the 2018–2019 NSCH. The cohort was further delimited to children 6 years of age and older, who typically have transitional or permanent dentition ($n = 43,213$), as well as to children who also had complete data for positive childhood experiences and demographic information (with a final sample of $n = 40,290$).

Study outcomes

Two indicators were used to examine access to oral health services and oral health, our study outcomes. For access to oral health services, the NSCH asks the caregiver: “During the past 12 months, did this child see a dentist or other oral health provider for any kind of dental or oral health care?” Responses include saw a dentist, saw other oral health provider, or no dental or oral health visits. If the caregiver responded that the child saw a dentist or oral health provider, the caregiver was then asked “if yes, during the past 12 months, did this child see a dentist or other oral healthcare provider for preventive dental care, such as check-ups, dental cleanings, or fluoride treatments?” Possible responses for preventive dental care included no preventive visits in the past 12 months; yes, 1 visit; or yes, 2 or more visits. If the answer was a yes to 1 or 2 visits, then the child was coded as having received a preventive dental visit during the past 12 months. For oral health, the NSCH asks the caregiver: “During the past 12 months, has this child had frequent or chronic difficulty with any of the following?” One of the options includes if the child had decayed teeth or cavities (yes/no). If the response was a yes that the child had tooth decay, the child was coded as having tooth decay.

Exposure variables

Our exposure variables, PCEs, were measured using questions from the NSCH, based on prior research quantifying PCEs in the U.S. [16–18] To measure if a child's neighborhood is supportive, the following question was asked: “To what extent do you agree with these statements about your neighborhood or community... (1) people in this neighborhood help each other out, (2) we watch out for each other's children in this neighborhood, and (3) when we encounter difficulties, we know where to go for help in our community.” Response options were definitely agree, somewhat agree, somewhat disagree, or definitely disagree. If caregivers reported “definitely agree” to at least one of the items above and “somewhat agree” or “definitely agree” to the other two items, then the child was coded as living in a supportive neighborhood. To measure whether the child lived in a safe neighborhood, the following question was asked: “To what extent do you agree with these statements about your

TABLE 1 Characteristics of respondents to the 2018–2019 national survey of children’s health, in total and stratified by preventive dental care and tooth decay, $n = 40,290$

Characteristic	All (%)	Child had preventive dental care	Child did not have preventive dental care	<i>p</i> -value	Child had tooth decay	Child did not have tooth decay	<i>p</i> value
		%	%		%	%	
Characteristics of child		87.3	12.7		13.6	86.4	
Sex of child				0.0798			0.1467
Male	51.0	50.5	49.5		53.0	47.0	
Female	49.0	49.5	50.5		47.0	53.0	
Age of child			100	0.0020			<0.0001
6–12 years old	58.2	58.9	41.1		68.1	31.9	
13–17 years old	41.8	41.1	58.9		31.9	68.1	
Race/Ethnicity of child				<0.0001			<0.0001
Non-Hispanic white	44.8	52.9	47.1		44.8	55.2	
Non-Hispanic black	13.4	12.6	87.4		13.3	86.7	
Hispanic	25.3	24.2	75.8		31.5	68.5	
Non-Hispanic other	10.4	10.3	89.7		10.4	89.6	
Special health care needs				0.2955			<0.0001
Yes	23.2	23.4	76.6		28.9	71.1	
Characteristics of caregiver/household							
Primary language				0.5193			<0.0001
Not English	13.8	15.4	84.6		21.1	78.9	
Caregiver education			100	<0.0001		100	<0.0001
Less than high school or high school	29.1	25.9	74.1		27.8	72.2	
Some college or more	70.9	74.1	25.9		72.2	27.8	
Family structure				<0.0001			<0.0001
2 parents, currently married	63.8	66.0	34		57.8	42.2	
2 parents, not currently married	7.8	7.4	92.6		9.3	90.7	
Single parent	22.2	21.3	78.7		25.2	74.8	
Other	6.2	5.6	94.4		7.7	92.3	
FPL				<0.0001			<0.0001
0%–99% FPL	18.5	16.7	83.3		25.4	74.6	
100%–199% FPL	21.4	20.3	79.7		25.3	74.7	
200%–399% FPL	28.3	28.4	71.6		29.4	70.6	
400% FPL or above	31.8	34.7	65.3		19.9	80.1	
Health insurance				<0.0001			<0.0001
Public	28.3	27.1	72.9		39.7	60.3	
Private	59.0	61.2	38.8		42.7	57.3	
Public and private	4.2	4.2	95.8		6.5	93.5	
Not insured/unspecified	8.4	6.6	93.4		11.1	88.9	
Geographic location				0.0014			0.2598
Rural	7.6	7.3	92.7		8.5	91.5	
Urban	76.1	76.0	24		75.7	24.3	
Residence suppressed	16.3	16.6	83.4		15.8	84.2	

Note: Bold indicates statistically significant value ($p < 0.05$).

Abbreviation: FPL, federal poverty level.

neighborhood or community... the child is safe in our neighborhood.” If the caregiver responded with “definitely agree”, then the child was coded as living in a safe neighborhood.

Covariates that may be potential confounding variables were selected based on the Fisher-Owens conceptual model of oral health [8]. Demographic characteristics of the child included age, sex, race/ethnicity, and if the child had special

TABLE 2 PCEs reported by respondents to the 2018–2019 national survey of children's health, in total and stratified by preventive dental visit and tooth decay, $n = 40,290$

PCE types	Child had preventative dental visit		Child did not have preventative dental visit		Child had tooth decay		Child did not have tooth decay	
	All %	%	%	<i>p</i> -value	%	%	<i>p</i> -value	
Safe neighborhood ^a	64.9	65.8	34.2	<0.0001	56.2	43.8	0.0001	
Does not reside in a safe neighborhood	35.1	34.2	65.8		43.8	56.2		
Supportive neighborhood ^b	55.9	57.6	42.4	<0.0001	46.7	53.3	<0.0001	
Does not reside in a supportive neighborhood	44.1	42.4	57.6		53.3	46.7		

Note: Bold indicates statistically significant value ($p < 0.05$).

Abbreviation: PCE, positive childhood experience.

^aSafe neighborhood is defined as a “definitely agree” response to the following NSCH question: “To what extent do you agree with these statements about your neighborhood or community... the child is safe in our neighborhood.”

^bSupportive neighborhood is defined by a specific combination of positive responses to the following NSCH questions: (1) people in this neighborhood help each other out, (2) we watch out for each other's children in this neighborhood, and (3) when we encounter difficulties, we know where to go for help in our community.”

health care needs. Race/ethnicity was categorized as Non-Hispanic White, Non-Hispanic Black, Hispanic, and Non-Hispanic Other. To determine if the child has special health care needs, the NSCH special healthcare needs tool was used, which is a five-item indicator tool that ask about prescription medicine, use of services, functional mobility, therapy, and ongoing conditions (physical, emotional, developmental, and behavioral). Special healthcare needs were reported by the NSCH as a yes/no outcome.

We included the following family and caregiver characteristics as covariates: primary language spoken in the household, the highest level of educational attainment of a parent or guardian in the household, family structure, poverty/income status, health insurance status, and geographic residence. Primary language spoken in the home was categorized as English or not English. Educational attainment was grouped into less than or equal to a high school degree/GED or at least some college education or more. Family structure had four groups: two parents, currently married, two parents not currently married, single parent, and other. There were four poverty/income levels: 0%–99% of the federal poverty level (FPL in the U.S.), 100%–199% FPL, 200%–399% FPL, and 400% FPL or above. Health insurance was categorized into public, private, public and private, and not insured/unspecified. Geographic residence categories included rural, urban and residence unknown due to data suppression. The NSCH suppresses residence data when a state has a small number of responses in a given category, which may create disclosure issues.

Data analytic strategy

Descriptive statistics and bivariate analyses were used to calculate frequencies, proportions, and unadjusted associations for each variable. A p -value < 0.05 was deemed statistically significant. The results are discussed in terms of the child, as instructed in the NSCH guidelines. To examine the association between PCEs and oral health

indicators, multivariable logistic regression models were used, with all covariates discussed above included in the models. There were four models run, with two separate outcomes and two separate exposure variables. Collinearity of variables was tested before running the regression models. To ensure accurate model estimates, the appropriate survey sampling weights, cluster, and strata used by the NSCH were used in all analyses. Further information on the NSCH can be found on the DRC website (childhealthdata.org). SAS statistical software was used for all analyses (SAS, version 9.3; SAS Institute, Cary, NC). This study was approved as exempt by the [university concealed for review] institutional review board.

RESULTS

Survey participant characteristics

The majority of our cohort was male (51.0%) and 6–12 years of age (58.2%; Table 1). One-fourth were Hispanic children (25.3%). Less than a quarter had special healthcare needs (23.32%). Over 10% of children did not speak English as their primary language at home (13.8%). Nearly 70% lived with caregivers who had some college or more (70.9%), and over 60% lived with two parents, currently married (63.8%). Almost 20% of the cohort lived below the poverty line (18.5%), and 28.3% had public insurance. Approximately three-fourths of respondents (76.1%) reported living in an urban setting. Just over 87% of children (87.3%) had received a preventive dental visit during the past 12 months. Just over 13% (13.6%) had reported tooth decay.

Bivariate analyses

In bivariate analysis, both preventive dental care and tooth decay were associated with the age of the child, race/ethnicity of the child, caregiver education, family

structure, poverty level, and health insurance status (Table 1). Living in safe and supportive neighborhoods were significantly associated with our oral health outcomes ($p < 0.01$; Table 2). Among children who received a preventive dental visit, the majority reported living in a safe (65.8%) and a supportive neighborhood (57.6%). Among children with tooth decay, 56.2% lived in a safe neighborhood while less than half were residing in a supportive neighborhood (46.7%).

Multivariable analyses

In an adjusted analysis, including geographic residence, age, gender, race/ethnicity, if the child had special health care needs, primary language spoken in the household, the highest level of educational attainment of a parent or guardian in the household, family structure, poverty/income status, and health insurance status, children who lived in a supportive neighborhood had a higher likelihood of receiving a preventive dental visit than children who did not live in a supportive neighborhood (aOR 1.41; 95% CI 1.21–1.65; Table 4). A number of covariates were significant for predicting the likelihood of a preventive dental visit (models 1–2; Tables 3 and 4), including age of the child, caregiver education, poverty level, and no insurance. Children residing below the FPL were less likely to have a preventive dental visit, compared to children living at 400% or above the FPL (aOR 0.34; 95% CI 0.34–0.26–0.45; and aOR 0.35; 95% CI 0.27–0.46). Children with no health insurance had lower odds of receiving a preventive dental visit than children with private insurance (aOR 0.36; 95% CI 0.28–0.47; and aOR 0.36; 95% CI 0.28–0.47).

In adjusted analysis predicting tooth decay, children who lived in a safe neighborhood were less likely to have tooth decay than children who did not live in a safe neighborhood (aOR 0.75; 95% CI 0.65–0.86; models 1–2; Tables 5 and 6). Children who lived in a supportive neighborhood had a lower likelihood of having tooth decay than children who did not live in a supportive neighborhood (aOR 0.74; 95% CI 0.65–0.85). Across both models, children who had special healthcare needs had a higher likelihood of tooth decay, compared to children without special healthcare needs (aOR 1.41; 95% CI 1.23–1.61; and aOR 1.40; 95% CI 1.22–1.61). Children ages 13–17 years of age had a lower odds of tooth decay, compared to children who were 6–12 years of age. Children with public health insurance had a higher odds of tooth decay than children with private insurance. Children residing below the FPL had a higher likelihood of tooth decay than children residing at 400% or above the FPL. Finally, children whose primary language was not English had a higher odds of tooth decay than children whose primary language was English.

TABLE 3 Adjusted odds ratios and 95% Wald confidence intervals predicting that child had a preventive dental visit, by safe neighborhood, among respondents to 2018–2019 national survey of children's health survey, $n = 40,290$

Variable	Model 1 Preventive dental visit	
	PE	95% CI
PCE		
Did not experience safe neighborhood	1.08	0.92–1.28
Safe neighborhood	Referent	
Characteristics of the child		
Race/Ethnicity		
White, Non-Hispanic	Referent	
Black, Non-Hispanic	0.70	0.56–0.87
Hispanic	0.96	0.75–1.22
Other, Non-Hispanic	0.73	0.59–0.89
Sex		
Male	Referent	
Female	1.16	0.99–1.35
Age		
6 to 12 years old	Referent	
13 to 17 years old	0.82	0.70–0.95
Special healthcare needs		
Yes	1.05	0.88–1.28
Primary language		
Not English	0.82	0.62–1.08
Characteristics of caregiver/household		
Education		
High school diploma or less	0.59	0.49–0.70
Some college or more	Referent	
Family structure		
2 parents, currently married	Referent	
2 parents, not currently married	0.81	0.60–1.08
Single parent	0.90	0.74–1.09
Other	0.66	0.47–0.94
FPL		
0%–99% FPL	0.34	0.26–0.45
100%–199% FPL	0.37	0.29–0.46
200%–399% FPL	0.44	0.36–0.53
≥400% FPL	Referent	
Health insurance		
Public	1.01	0.80–1.28
Private	Referent	
Public and private	1.02	0.66–0.1.59
Not insured/unspecified	0.36	0.28–0.47
Geographic residence		
Rural	0.91	0.74–1.11
Urban	Referent	
Residence suppressed	1.10	0.95–1.27

Note: Bold indicates statistically significant value ($p < 0.05$).

Abbreviations: CI, confidence interval; FPL, federal poverty level; PCE, positive childhood experience; PE, point estimate.

TABLE 4 Adjusted odds ratios and 95% Wald confidence intervals predicting that child had a preventive dental visit, by supportive neighborhood, among respondents to 2018–2019 national survey of children's health survey, $n = 40,290$

Variable	Model 2 Preventive dental visit	
	PE	95% CI
PCE		
Did not experience supportive neighborhood	1.41	1.21–1.65
Supportive neighborhood	Referent	
Characteristics of the child		
Race/Ethnicity		
White, Non-Hispanic	Referent	
Black, Non-Hispanic	0.72	0.58–0.89
Hispanic	0.98	0.77–1.25
Other, Non-Hispanic	0.75	0.61–0.92
Sex		
Male	Referent	
Female	1.16	0.99–1.35
Age		
6 to 12 years old	Referent	
13 to 17 years old	0.82	0.70–0.96
Special healthcare needs		
Yes	1.08	0.90–1.30
Primary language		
Not English	0.81	0.62–1.07
Characteristics of caregiver/household		
Education		
High school diploma or less	0.59	0.49–0.71
Some college or more	Referent	
Family structure		
2 parents, currently married	Referent	
2 parents, not currently married	0.81	0.60–1.09
Single parent	0.92	0.76–1.11
Other	0.65	0.46–0.91
FPL		
0%–99% FPL	0.35	0.27–0.46
100%–199% FPL	0.38	0.30–0.48
200%–399% FPL	0.44	0.36–0.54
≥400% FPL	Referent	
Health insurance		
Public	1.02	0.80–1.29
Private	Referent	
Public and Private	1.04	0.67–1.62
Not insured/unspecified	0.36	0.28–0.47
Geographic residence		
Rural	0.90	0.73–1.10
Urban	Referent	
Residence suppressed	1.09	0.95–1.26

Note: Bold indicates statistically significant value ($p < 0.05$).
Abbreviations: CI, confidence interval; FPL, federal poverty level; PCE, positive childhood experience; PE, point estimate.

TABLE 5 Adjusted odds ratios and 95% Wald confidence intervals predicting that child had tooth decay, by safe neighborhood, among respondents to 2018–2019 national survey of children's health survey, $n = 40,290$

Variable	Model 1 Tooth decay	
	PE	95% CI
Positive childhood experience		
Did not experience safe neighborhood	0.75	0.65–0.86
Safe neighborhood	Referent	
Characteristics of the child		
Race/ethnicity		
White, Non-Hispanic	Referent	
Black, Non-Hispanic	0.84	0.68–1.04
Hispanic	0.99	0.80–1.22
Other, Non-Hispanic	1.01	0.84–1.22
Sex		
Male	Referent	
Female	0.93	0.82–1.06
Age		
6 to 12 years old	Referent	
13 to 17 years old	0.60	0.53–0.69
Special healthcare needs		
Yes	1.41	1.23–1.61
Primary language		
Not English	1.52	1.18–1.95
Characteristics of caregiver/household		
Education		
High school diploma or less	1.11	0.94–1.30
Some college or more	Referent	
Family structure		
2 parents, currently married	Referent	
2 parents, not currently married	1.04	0.79–1.37
Single parent	1.03	0.87–1.21
Other	1.07	0.82–1.39
FPL		
0%–99% FPL	1.36	1.07–1.73
100%–199% FPL	1.29	1.05–1.59
200%–399% FPL	1.48	1.26–1.73
≥400% FPL	Referent	
Health insurance		
Public	1.61	1.33–1.94
Private	Referent	
Public and private	1.90	1.44–2.50
Not insured/unspecified	1.67	1.28–2.18
Geographic residence		
Rural	1.07	0.88–1.30
Urban	Referent	
Residence suppressed	1.02	0.90–1.16

Note: Bold indicates statistically significant value ($p < 0.05$).
Abbreviations: CI, confidence interval; FPL, federal poverty level; PCE, positive childhood experience; PE, point estimate.

TABLE 6 Adjusted odds ratios and 95% Wald confidence intervals predicting that child had tooth decay, by supportive neighborhood, among respondents to 2018–2019 national survey of children’s health survey, $n = 40,290$

Variable	Model 2 Tooth decay	
	PE	95% CI
Positive childhood experience		
Did not experience supportive neighborhood	0.74	0.65–0.85
Supportive neighborhood	Referent	
Characteristics of the child		
Race/ethnicity		
White, Non-Hispanic	Referent	
Black, Non-Hispanic	0.84	0.68–1.03
Hispanic	0.99	0.80–1.22
Other, Non-Hispanic	1.01	0.84–1.22
Sex		
Male	Referent	
Female	0.93	0.82–1.07
Age		
6 to 12 years old	Referent	
13 to 17 years old	0.60	0.52–0.69
Special healthcare needs		
Yes	1.40	1.22–1.61
Primary language		
Not English	1.51	1.18–1.94
Characteristics of caregiver/household		
Education		
High school diploma or less	1.10	0.93–1.30
Some college or more	Referent	
Family structure		
2 parents, currently married	Referent	
2 parents, not currently married	1.03	0.78–1.36
Single parent	1.02	0.86–1.20
Other	1.09	0.84–1.42
FPL		
0%–99% FPL	1.37	1.07–1.74
100%–199% FPL	1.28	1.04–1.58
200%–399% FPL	1.48	1.26–1.74
≥400% FPL	Referent	
Health insurance		
Public	1.61	1.33–1.95
Private	Referent	
Public and private	1.88	1.42–2.49
Not insured/unspecified	1.67	1.28–2.17
Geographic residence		
Rural	1.06	0.87–1.29
Urban	Referent	
Residence suppressed	1.02	0.89–1.16

Note: Bold indicates statistically significant value ($p < 0.05$).

Abbreviations: CI, confidence interval; FPL, federal poverty level; PCE, positive childhood experience; PE, point estimate.

DISCUSSION

This study examines how community context may influence oral health metrics, by examining the association between safe neighborhoods and supportive neighborhoods and oral health outcomes among a national cohort of children. Prior research had found associations between ACEs and oral health outcomes and oral healthcare utilization but had not examined the association between community level PCEs and oral health status and oral healthcare [10, 11, 14]. We found that children residing in a supportive neighborhood were more likely to have a preventive dental visit. We also found that children who resided in a safe neighborhood and supportive neighborhood were less likely to have tooth decay.

Revisiting the HOPE framework previously described, there are considerations for addressing oral health at each of the four ecological levels of human development: child, family, community, and policy and culture [15, 19]. With regards to individual child-level risks, our findings corroborate previous studies synthesized in the NIDCR, “Oral Health in America: Advances and Challenges.” [1] The same report makes specific recommendations for identifying and managing clinical and social indicators for children with high-risk profiles for poor oral health. The incorporation of caries risk assessments has long been promoted as a standard of care [20]. While it remains unclear if such tools accurately predict future caries development, risk assessment tools can contribute to the amelioration of the inequities observed in our study and others.

At the family level, our study corroborates other studies that demonstrate socioeconomic status is positively correlated with oral health status, with a case to be made that children with poor oral health likely live in households where parents or caregivers also have poor oral health [21]. Children who have regular use of preventive dental services live in homes with parents who modeled the behavior and are equipped to navigate their children into care [22]. One mechanism for addressing the inequity is to focus on enabling services for higher-risk families. The American Dental Association’s Community Dental Health Coordinator (CDHC) program offers dental practices the opportunity to deploy case management to ensure comprehensive oral health needs are addressed. Evaluation data from a North Carolina model demonstrated cost savings and improved access for vulnerable children [23].

Identification of risks associated with social determinants of health (SDH), as well as clinical risks, is essential to optimize the role of the CDHC. A number of risk assessment tools for SDH are available to providers but they have been adopted to varying degrees mostly in primary care settings [24]. How SDH screening tools are used in dental practice, if at all, is not yet published. The American Dental Education Association however has been promoting the integration of SDH concepts into

dental education curricula for some time [25]. This reflects a more family-centered approach to care and potentially narrows the inequity observed in our study for those living in poverty.

The third ecology level of human development is the community. In the context of our study, available resources are essential to addressing the inequities observed in our study and others [7]. For example, community water fluoridation programs as an available resource to improve dental caries are essential to cost savings, as well as population-level risk reductions of caries [26]. Federally Qualified Health Centers (FQHCs) can be an essential resource for dental care in communities, with states that had stronger dental benefit structures for adults having greater utilization than those that did not [27]. The provision of insurance, such as Medicaid, has been demonstrated to have long lasting positive impacts on the oral health of children [28].

Our study elevates the value of neighborhood and community context as influencers of oral health status. Interventions that are based within neighborhoods or communities may be highly effective for children. We have also seen the utilization of community-based dental programs (i.e., school-based dental programs) to be supportive of improving dental care access, promoting collaborative referral management, and delivery of preventive dental care services [29]. Community level advocacy efforts are also needed. It is vital that we do not overlook safe and supportive neighborhoods as true determinants of health outcomes, specifically oral health.

Strengths and limitations

This study has many strengths, which includes the use of the most recent nationally representative database of children's health, which makes the findings relevant for current policy development, programming, and implementation. This is the first study, to our knowledge, to examine the association of PCEs and oral health indicators. Therefore, this study provides oral health professionals and other stakeholders with updated findings that can help to identify supportive factors for the use of oral health care and oral health.

There are also several limitations to this study, including the self-reporting of the data by the caregiver. The NSCH does not include data on dental insurance and diagnostic metrics are not in this data set. Therefore, we must rely on the caregiver reports of the child's oral health, while clinical metrics would be much more accurate than caregiver reporting for tooth decay [30]. Furthermore, caregivers may over report PCEs and their perceptions may differ from that of the child. The timing, duration, and frequency of PCEs are not known in this cross-sectional dataset.

Future directions and recommendations

As the perception of a safe neighborhood or a supportive neighborhood may differ between respondents, we are not able to discuss reasons why one may be protective for a preventive dental visit, but not the other. Further examination on social connectedness and community interaction could potentially explicate the differences. However, the findings from this study demonstrate an association between community attributes and select oral health metrics.

CONCLUSIONS

The findings from this study highlight the role of social structures, such as safe and supportive neighborhoods, in enhancing and strengthening community level interventions that support PCEs to support oral health in children [31]. The implementation of interventions in the community to build assets in order to improve population oral health metrics are needed. To ensure that children get the well care that they need, policymakers and program planners must take in account the social structures and community assets surrounding children.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

ORCID

Elizabeth Crouch  <https://orcid.org/0000-0002-5380-8391>

Amy Martin  <https://orcid.org/0000-0002-3949-2749>

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