Child, caregiver, and family factors associated with child dental utilization among Mexican migrant families in California

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Objective: To identify associations between child, caregiver, and family-level factors and child dental utilization. ***Research design***: Cross-sectional oral health survey. ***Participants***: Caregivers and one study child (ages 0-17) from Mexican migrant families in northern San Diego county, CA (n=142). ***Methods:*** Caregivers reported on child's dental care utilization history and related factors, including: child (age, gender, dental insurance, source of care, believed to have cavities), caregiver (marital status, income, education, acculturation level, depressive symptoms), and family cohesion. Descriptive and logistic regression models identified predisposing, enabling, and need factors associated with child dental utilization during the past year. ***Results***: Most (76%) children had visited the dentist in the past year, while 8.6% had never been. Child factors (gender, insurance), caregiver factors (education, depressive symptoms), and family cohesion were each associated with child dental utilization in the bivariate analyses. In the final adjusted model, uninsured children were less likely to have a past year dental visit compared to insured children (Odds Ratio (OR) = 0.23, 95% Confidence Interval (CI) = 0.06-0.96). Children whose caregivers visited the dentist were 4.29 times more likely to visit the dentist in the past year (CI=1.36-13.61). Higher caregiver education was positively associated with child dental utilization (OR=4.50, CI=1.50-13.55). ***Conclusion***: Child age and dental insurance, and caregiver education and dental utilization history were associated with whether or not a child had a past year dental visit. Ensuring child dental coverage and caregiver access to dental care may promote regular dental utilization by children.

Key words: *Child oral health, dental insurance, dental utilization*

Introduction

A first dental visit is recommended for all children in the United States (US) beginning at first tooth eruption or by age one, followed by regular dental care, usually at six month intervals (American Academy of Pediatric Dentistry Clinical Affairs Committee, 2009). Annual dental visits are a Leading Health Indicator in the US. In 2013, just over half (54.6%) of 2-17 year olds visited a dental provider in the past 12 months (Office of Disease Prevention and Health Promotion, 2013). Regular dental attendance provides comprehensive oral health care for children, and anticipatory guidance for caregivers to help prevent dental caries, the most common childhood disease. If left untreated, caries can lead children to miss school, have pain or problems eating/speaking, and use emergency departments for non-traumatic dental issues (Casamassimo *et al.*, 2009).

Previous research indicates higher prevalence of tooth decay and unmet dental needs for children of Mexican-American migrant workers (Nurko *et al.*, 1998). Children in migrant farmworker families face extensive barriers to healthcare services that have been well-documented, including traditional factors related to low socioeconomic status, as well as cultural/ linguistic, structural, geographic, and in some cases, legal challenges (Arcury & Quandt, 2007). These children must overcome unique challenges to access healthcare and are at a higher risk for dental diseases. There is research on migrant farmworker populations, but there are fewer data about other types of migrant workers that share similar vulnerabilities.

Oral health research is beginning to account for broader psychosocial influences, such as caregiver mental health and family functioning. These are potential caregiver and family-level stressors and resources that may affect children's access to regular dental care. Traditional health service utilization factors that have been well-studied include income, education, and insurance coverage, which usually facilitate access (Gelberg *et al.*, 2000). Broader psychosocial factors have rarely been investigated, but could play an important role, especially for younger children. Caregivers schedule and transport them to dental appointments, and this process may be hindered if caregivers have mental health and/or other problems. Depression is a common psychosocial stressor among migrant farmworker families (Magaña & Hovey, 2003), and worth exploring as a potential determinant of healthcare utilization. Kruger *et al.*, (2015) found that children of caregivers with depressive symptoms were less likely to have a dental visit in the past year than those of caregivers without. The role of family functioning has been associated with utilization of other health services, but has not been explored for dental utilization. Latinos with high family conflict were more likely to utilize mental health services in a report based on a national dataset and adult sample (Chang *et al.*, 2013). There are different dimensions of family functioning, including positive aspects, like cohesion.

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This study is part of a community-based participatory research (CBPR) project to better understand, prioritize, and address unmet oral health needs identified by Mexican-migrant families in California; an underserved, vulnerable group (Finlayson *et al.*, 2017). A primary concern raised in the planning phase related to barriers to accessing dental services for women and their families (Velez *et al.*, 2017), thus examining access to dental care and utilization patterns became a project priority. A community health worker-led, family-oriented dental education program called Boca Sana, Cuerpo Sano (BSCS; translation: Healthy Mouth, Healthy Body) was developed.

The purpose of this analysis is to identify factors related to dental utilization in the past year among children in Mexican migrant families, accounting for understudied psychosocial caregiver and family factors. Data analysis was guided by the Andersen (1995) Behavioral Model of Health Services Utilization adapted for vulnerable populations (Gelberg *et al.*, 2000) and expanded to consider psychosocial factors (Riley *et al.*, 1993) beyond traditional predisposing, enabling and need factors. Predisposing factors usually include immutable socio-demographic characteristics (age, gender), and caregiver characteristics such as acculturation. Psychological factors of maternal depressive symptoms and family cohesion were considered here as well. Enabling factors are those that facilitate accessing services, such as having dental insurance coverage to pay for care. Need can include caregiver-perceived child oral health or clinically-determined need.

Methods

This is a cross-sectional analysis of survey data collected from a convenience sample of migrant worker families in northern San Diego County, CA.

Participants

BSCS relied on convenience sampling of migrant worker families in three selected study communities in northern San Diego County, CA through community leader announcements, word of mouth, flyer distribution in the community and at partner network sites and events. Participants had to be age 18 or older, self-identify as part of a migrant Mexican family, be a primary caregiver of at least one child under 18 years, plan to remain in the area for six months, and provide written informed consent in Spanish. At baseline, 147 caregivers were enrolled in BSCS in 2013-2014 and completed an interview about their oral health-related knowledge, attitudes, and behaviors and one child (child with next birthday).

Measures

The outcome was based on time since the child's last visit to a dentist or dental clinic, as reported by their caregiver. The outcome was dichotomized to reflect if the child had a past year dental visit.

Independent variables

Predisposing factors included the child's age and gender (male/female). Age was collected continuously then recoded into three categories for analysis, following approximate dentition patterns: 0-5, 6-11, 12-17 years. Four caregiver factors included marital status, education, past year dental visit, level of acculturation, and maternal depression. One family level factor was included: family cohesion. Marital status was dichotomized to married/cohabitating or single/divorced/widowed. Caregiver education was originally collected as highest grade level attained in foreign and US-based schools, then was combined and dichotomized into 6th grade and below, or 7th grade and above. Caregivers reported whether or not they had a dental visit in the past year. Caregiver acculturation was captured as a continuous variable using the reliable and validated Acculturation Rating Scale for Mexican Americans- II (ARSMA-II). ARSMA-II consists of two subscales: Anglo Orientation and Mexican Orientation and generates scores for each culture, independent of one another, with the difference yielding a score indicating a preferred Anglo (if positive score) versus Mexican (if negative score) orientation (Cuellar, Arnold, & Maldonado, 1995). A common screening tool in non-depression research studies, the eight-item version of the Patient Health Questionnaire (PHQ8) was employed (Kroenke *et al.*, 2009). Each item was scored 0 to 3, providing a 0 to 24 severity score, and the standard cutoff of 10 or higher (indicating moderate depressive symptomology) was applied ($\alpha=0.84$). The five-item Family Functioning Cohesion subscale (Bloom, 1985), derived from the Family Environment Scale (Moos & Moos, 1981), was included. Each item was scored on a 4-point scale, and higher mean scale scores reflected greater family cohesion ($\alpha=0.64$).

Enabling factors included child (usual source of dental care and dental insurance), caregiver (employment), and family level factors (monthly household income and family size). Caregivers reported whether or not the child had a usual source of dental care. Type of dental insurance was collected categorically then dichotomized as insured versus uninsured. Caregiver employment was dichotomized as employed or not. Monthly income was categorized as $1499 or below and $1500 or more. Household size was kept continuous. Finally, the need factor reflected the caregiver's belief that the study child currently had cavities.

Analysis

Five cases were excluded due to missing child data, yielding a final analytic sample of 142. Descriptive statistics and chi-square tests were performed to examine the distribution of variables and potential associations between the predisposing, enabling, and need factors and the outcome, child past year dental visit. Rates of missing data were very low, with most not missing any responses, or eight or fewer in some cases. Three variables (income, usual source of dental care for child, and whether the child had cavities), each had 10-14 missing responses. To maintain maximum sample size, missing data were imputed, which did not change the results, and final imputed results are presented.

Several access-related variables of interest were either highly correlated with other variables, or questions were only asked of a subset of children. These variables were not included in the final regression models, but are described below to provide supplemental information about access to dental care for this group of children. Logistic regression was conducted to identify associations between the predisposing, enabling and need factors and the outcome variable. No collinearity was identified in the final models. Data were analyzed using SPSS version 23 (SPSS Inc., Chicago, IL).

Results

Sample characteristics are summarized in Table 1. Most (76%) children had a past year dental visit. Children were evenly split by gender. Most had a usual source of dental care and dental insurance, primarily public insurance (Medicaid). The majority (90%) were US-born (not shown). Most caregivers were mothers with partners, and about two-thirds had no formal employment.

Table 1. Characteristics of 142 caregivers and children

Variables	%
Predisposing	
Child Age	
0-5 years	26.8
6-11 years	45.8
12-17 years	27.5
Child Gender	
Male	47.2
Female	52.8
Caregiver Marital Status	
Married/Cohabitating	84.5
Single/Divorced/Widowed	15.5
Caregiver Education	
Up to 6th Grade	47.2
7th Grade or higher	52.8
Caregiver Dental Visit Past Year	
Yes	40.8
No	59.2
Acculturation (ARSMA-II) - Mean (SD)	-2.69 (1.35)
Caregiver Depressive Symptoms (PHQ8)	
None	88.7
Moderate or Higher	11.3
Family Cohesion –Mean (SD)	3.28 (0.48)
Enabling	
Child Usual Source of Care	
Yes	81.7
No	14.7
Child Dental Insurance	
Yes	88.7
No	11.3
Caregiver Employed	
Yes	31.9
No	68.1
Monthly Household Income	
≤$1,499	54.2
≥$1,500	45.8
Household Family Size- Mean (SD)	4.85 (1.7)
Need	
Child Currently has Cavities	
Yes	27.5
No	72.5
Outcome	
Dental Visit in Past Year	
Yes	76.1
No	23.9

BSCS families were not all farmworkers, though it was reported that 37% of those that worked or had a spouse that worked were in agriculture, 20% in housekeeping or childcare, and many identified working in "other" day labor industries such as construction or gardening (not shown). About half reported household income under $1500/month to support a family of five.

Figure 1 displays the time since a child's last dental visit, by age. Notably, 8.6% had never been to a dentist, nearly all of whom were under age 3.

Additional information was available for the subset of 108 children with a dental visit. Most went for preventive services; 48% had an exam/check-up, and 36% cleaning. Very few (6.8%) went to the dentist due to toothache. Seven (5.4%) had a dental visit outside the US (all in Mexico) in the past year; most indicated doing so because they thought it cost less. Very few (4%) children missed school due to dental pain. Finally, about one-quarter (26%) of families reported experiencing barriers (such as: cost, scheduling difficulty, language issues) when attempting to access dental care in the past year. Table 2 displays children's age at their first dental visit. Almost two-thirds (64.6%) met recommended guidelines and had a first dental visit by age one.

Table 3 presents bivariate regression model estimates in the first column. Females were 2.57 times more likely to have a past year dental visit than males (95% Confidence Interval [CI] = 1.15-5.72). Children of caregivers with a dental visit in the past year were 2.8 times more likely to have a past year dental visit than children of parents who did not have a past year dental visit (CI = 1.16-6.74). Uninsured children were less likely to have a dental visit than insured children (Odds Ratio [OR] = 0.19, CI = 0.07-0.57). Children of caregivers with depressive symptoms were also less likely to have a dental visit (OR = 0.26, CI = 0.09-0.76). For each unit increase in family cohesion, children were 2.6 times more likely to have a past year dental visit (OR = 2.6, CI = 1.12-6.02). Children believed to have current cavities were less likely to have visited (OR = 0.43, CI = 0.19-0.97).

In the final fully-adjusted multivariate logistic regression model 3 (right column, Table 2), four predisposing factors (child age, gender and caregiver dental history and education) and one enabling factor (child dental insurance) predicted a visit in the previous year. Children aged 6-11 years were 3.79 times more likely than children ages 0-5 to have visited (CI = 1.22-11.71). Female were 3.47 times more likely to have visited than male children (CI = 1.24-9.71). The odds of a child having a past year dental visit increased if caregivers were more educated (OR = 4.50 times, CI = 1.50-13.55). Moreover, caregivers' past year dental utilization also increased the odds of their child utilization compared to children of caregivers without a recent visit (OR = 4.29, CI = 1.36-13.61). Children without dental insurance were less likely to have a past year dental visit than insured children (OR = 0.23, CI = 0.06-0.96).
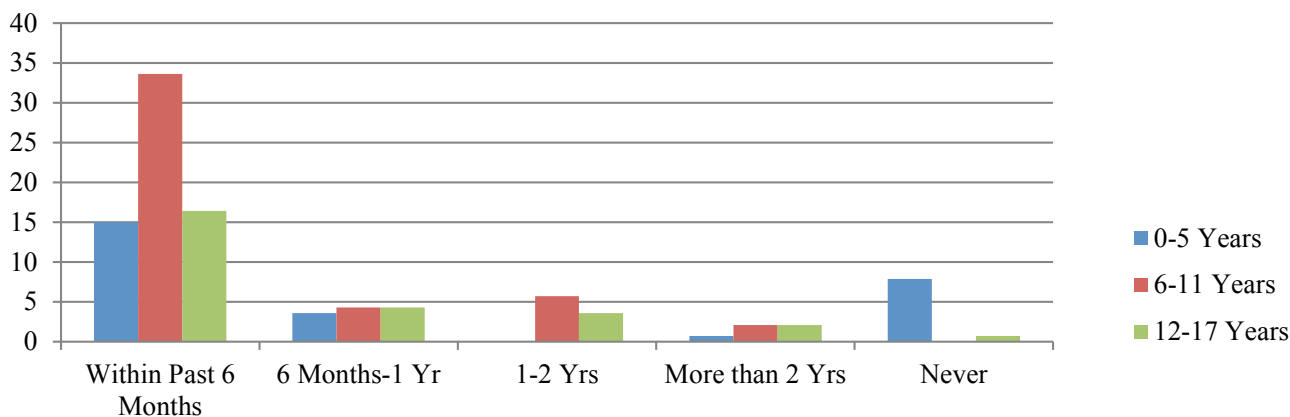
Figure 1. *Time since child's last dental visit by age*

Table 2. Child's Age at First Dental Visit* (n=108)

Age	%
Under 1 year	27.7
1 year old	36.9
2 years old	8.5
3 years old	6.9
4 years old	4.6
5 years or older	10.8

Note: Excludes children that have never been to the dentist

Discussion

This analysis was guided by the Andersen Behavioral Model of Health Services Utilization, of which there are several versions. As described by Andersen (1995), psychological characteristics are included as predisposing factors. This study showed that child and caregiver predisposing and enabling factors were significantly associated with child dental utilization. Most (76%) children had a past year dental visit, which is higher than the national child average. Many who have never visited a dentist were under age 3. It is noteworthy that many children did meet the age one first dental visit guideline. No comparable data are available about how many children meet the age one guideline, as this is not assessed in state or national data, though these numbers are encouraging. It was not surprising that female and older children were more likely to visit, as this is evident in recent national data for 0-21 year olds (Griffin *et al*., 2014). Our findings around dental insurance are also consistent with Griffin (2014) that uninsured children had lower past year utilization than insured children.

Additionally, caregivers' dental utilization and higher educational attainment were positively associated with a recent child dental visit. Coverage for dental care for children is a mandated, essential benefit for children as part of the public insurance program (Medicaid) through the Early, Periodic, Screening, Diagnosis and Treatment (EPSDT) component. It is possible that undocumented children may not be eligible for public insurance, but we did not collect that information in this study. There were a few non-US born children, and some had insurance, some did not. A few families reported seeking care outside the US. This study took place on the US-Mexico border. The families were economically vulnerable, and not all may have had the ability or resources to cross the border easily to access care.

These data emphasize the importance of caregivers' ability to access dental services regularly, which is similar to other reports (Finlayson *et al*., 2014; Riley *et al*., 1993). Primary caregivers set the example for their children, and also typically determine when a child will first visit a dentist. In this population, caregivers identified many barriers to accessing dental care for themselves, including expense, lack of coverage, long wait times, and discrimination (Velez *et al*., 2017). If caregivers cannot find a dentist for themselves, they may be discouraged and also encounter barriers to finding a provider for their child. Insurance and cost are commonly cited financial barriers to care, and were noted by some families in this study, but are likely not the only barriers to access.

Our results suggest the importance of psychosocial and family-level factors in child dental utilization, and warrant further investigation. Caregiver depressive symptoms and family cohesiveness were associated with child dental utilization in the bivariate analyses, but neither retained significance in the final adjusted models. Our bivariate findings are consistent with other reports indicating that preschool-aged children of mothers with depressive symptoms were less likely to have routine dental care in the past year (Kavanaugh *et al*., 2006). A study of the healthcare utilization and expenditures by chronically-ill and publicly-insured children found that children of mothers exhibiting depressive symptoms had lower dental care expenditures than mothers without depressive symptoms (Brooks, Beil, & Beeber, 2015). Associations between increased family conflict and depressive symptoms have also been documented among Latina farmworkers (Zapata Roblyer *et al*., 2016).

There are study limitations that must be considered. The cross-sectional design does not allow for cause-effect relationships to be established. Additionally, caregivers' self-reports may have been influenced by social desirability or recall biases, and no clinical assessments were conducted to determine accuracy of caregiver perceptions regarding the clinical status of their children. BSCS met its recruitment goal, however, our sample size is relatively small, and the lack of a sampling frame and collecting data for only one child per family restrict inferences about external validity. The study's clinic partner provides healthcare for migrant

Table 3. Regression Model Results (n=142)

	Crude Odds Ratio (OR)	95% CI	Model 1 OR	95% CI	Model 2 OR	95% CI	Model 3 OR	95% CI
Predisposing								
Child Age								
0-5 years	1.00							
6-11 years	1.77	0.80-3.93	2.79	0.96-8.08	3.10	1.05-9.20	3.78	1.22-11.71
12-17 years	0.88	0.38-2.07	2.53	0.77-8.30	2.79	0.78-10.06	3.54	0.91-13.79
Child Gender								
Male	1.00							
Female	2.57	1.15-5.72	2.81	1.13-7.02	3.28	1.2-9.02	3.47	1.24-9.71
Caregiver Marital Status								
Married/Cohabitating	1.00							
Single/Divorced/Widowed	1.08	0.37-3.91	0.47	0.13-1.70	0.52	0.13-2.10	0.48	0.11-2.02
Caregiver Education								
Up to 6th Grade	1.00							
7th Grade or higher	2.18	0.99-4.80	3.39	1.23-9.28	3.70	1.3-10.54	4.50	1.50-13.55
Caregiver Dental Visit Past Year								
Yes	2.80	1.16-6.74	3.49	1.25-9.72	3.74	1.26-11.13	4.29	1.36-13.61
No	1.00							
Acculturation (ARSMA-II)	0.96	0.73-1.28	0.86	0.61-1.21	0.83	0.56-1.23	0.81	0.54-1.21
Caregiver Depressive Symptoms (PHQ8)								
None	1.00							
Moderate or Higher	0.26	0.09-0.76	0.29	0.07-1.19	0.50	0.11-2.21	0.39	0.08-1.81
Family Cohesion	2.60	1.12-6.02	2.42	0.89-6.60	2.62	0.92-7.52	1.89	0.62-5.79
Enabling								
Child Usual Source of Care								
Yes	1.00							
No	0.64	0.22-1.83			1.60	0.40-6.39	1.62	0.39-6.78
Child Dental Insurance								
Yes	1.00							
No	0.19	0.07-0.57			0.19	0.05-0.75	0.23	0.06-0.96
Caregiver Employment								
Yes	1.00	0.44-2.29			1.86	0.54-6.40	1.96	0.54-7.15
No	1.00							
Monthly Household Income								
≤$1,499	1.00							
≥$1,500	1.28	0.59-2.79			1.54	0.58-4.08	1.76	0.64-4.88
Household Family Size	0.96	0.77-1.20			0.99	0.76-1.30	1.04	0.79-1.39
Need								
Child Currently has Cavities								
Yes	0.43	0.19-0.97					0.34	0.11-1.05
No	1.00							

farmworkers and their families in the region, and in 2016, they served 5,734 individuals from this population, 22% of whom were children and youth ages 0-17.

Despite these limitations, the strengths of the study are the inclusion of psychosocial variables, measured through validated scales, to assess the role of depressive symptoms and family cohesion, though these variables were not significant in the final adjusted model. The study contributes to the literature and calls for more caregiver and family-level factors to be examined. Finally, Mexican-migrant families are a diverse, unique, and understudied group. Historically, migrant farmworkers have been the focus of research; however, this research highlights the importance of studying the healthcare utilization for all types of migrant laborers.

Conclusion

Child age and dental insurance status, and caregiver education and dental utilization history were each associated with whether or not a child had a past year dental visit. Ensuring child dental coverage and caregiver access to dental care may promote regular dental utilization by children in Mexican-migrant families.

Acknowledgements

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