

## **Parental factors associated with routine dental visits in American children**

**Running head:** Parental factors and children visits to the dentist

**Authors:** Yepes JF, Gibson J, Nuñez-Castorena J, Eckert G, Maupomé G

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*Juan F Yepes*

Department of Pediatric Dentistry

Indiana University School of Dentistry and Riley Hospital for Children

705 Riley Hospital Drive, Room 4205,

Indianapolis, IN 46202

E-mail: [jfyepes@iupui.edu](mailto:jfyepes@iupui.edu)

*Joe Gibson*

Marion County Public Health Department

Department of Epidemiology

3901 Meadows Drive, Room H116

Indianapolis, IN 46205

E-Mail: [jgibson@marionhealth.org](mailto:jgibson@marionhealth.org)

*Jessica Nuñez-Castorena*

Marion County Public Health Department

Department of Epidemiology

3901 Meadows Drive, Room H116

Indianapolis, IN 46205

E-Mail: [JNunezCastorena@MarionHealth.org](mailto:JNunezCastorena@MarionHealth.org)

*George Eckert*

Department of Biostatistics

Indiana University School of Medicine 410 West 10<sup>th</sup> St., Suite 3000

Indianapolis, IN 46202

E-mail: [geckert@iu.edu](mailto:geckert@iu.edu)

*Gerardo Maupomé*

Department of Cariology, Operative Dentistry, and Dental Public Health

Indiana University School of Dentistry and Indiana University Network Science Institute

415 Lansing St., Indianapolis, IN 46077

E-mail: [gmaupome@iu.edu](mailto:gmaupome@iu.edu)

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## Abstract

**Background:** Different factors have been involved in having limited access to dental care for children, factors such as parents education, finances resources, lack of transportation, language and cultural barriers (however loosely conceptualized), and lack of perceived need of care. Recent study results showed that child lower health care utilization is associated parental factors including lower level of education, diet, smoking at home, lower income, lack of dental insurance, a rural residency, and cognitive impairment/disability. **Goal:** The objective of the present study was to identify and characterize the main parental factors related with children access to dental care in Marion County, Indianapolis, Indiana, USA, through secondary analysis of survey data. **Methods:** Secondary analyses of the survey data from the 2012 Marion County Health Department survey were done, with prior administrative authorization from the Marion County Health Department and Indiana University Institutional Review Board (IRB) approval. Multilevel logistic regression was used to assess the effect of individual and community variables on the probability of access to care for children. **Results:** After accounting for race and education, children from parents with a high level of education, who do not smoke in the home, and families who ate fast food less often in the past 7 days, were more likely to have a routine dental visit in the last 12 months. **Conclusions:** This study confirms the complexity of the interactions between parents factors and children oral health.

## Introduction

Dental caries is the most prevalent chronic infection disease among children and has been identified as the most prevalent unmet health need among children. (1) The last Indiana State Department of Health report (2013) showed that about half of Indiana's third grade children (51%) had a history of decay and about 17% had untreated dental caries. (2) During the past 50 years, successful intervention has led to a decrease in its prevalence, especially in middle-to-high income areas in the United States. (3) Oral health is also essential to general health and well-being among adults. (4) Poor oral health has been implicated with chronic health conditions such as diabetes, respiratory and cardiovascular diseases. (5) Furthermore, studies have showed that adults with poor oral health have a lower level of psychosocial well-being and life satisfaction. (6)

The American Dental Association (ADA) and the American Academy of Pediatric Dentistry (AAPD) recommend the first visit for children to occur at the eruption of the first tooth (around 6 months) or not later than 12 months of age. (7) However, little education is given to new parents in the importance of oral health and establishment of a dental home. For adults, the ADA recommends at least one visit to the dentist per year and depending of the necessities of each patient, twice a year or more.

There is an increasing attention to racial / ethnic disparities in health and health care. Only 45 % of adults 65 years or older had a dental visit in 2007. (5) Furthermore, using the data from the National Health Interview Survey, Wall and colleagues (8) showed that the utilization rate for adults has decreased in the last decade. A recent report on disparities by the Agency for Healthcare Research and Quality (9) concluded that there were > 3 times as many disparity measures for adults as there are for children; and only 15% of measures were children specific. Furthermore, in the Institute of Health comprehensive health disparities monograph, only 5% of studies addressed disparities in children (10).

Different factors have been involved in having limited access to dental care for children and adults, factors such as finances resources, lack of transportation, language and cultural barriers (however loosely conceptualized), and lack of perceived need of care. (11) Recent study results show that lower health care utilization is associated with being male, and of a minority race and

having a lower level of education, lower income, lack of dental insurance, a rural residency, and cognitive impairment/disability. (12) In addition to individual characteristics, the attributes of the community (environment) influence dental care among adults and children who reside in the community. The influence of community factors, such as neighborhood poverty, is also associated with dental care utilization. (13)

Marion County, Indiana, U.S., has a population of over 900,000, and contains the city of Indianapolis. (14) Approximately 70% of county population is White, 25% African American and approximately 4% Hispanic-Latino. There were approximately 3,760 licensed dentists in the state of Indiana in 2012. (15) About 15% of dentists in Indiana practice in Marion County. (15) Untreated dental caries is still a problem in Indiana. Data from 2010 showed that 68% of adult residents in Indiana visited the dentist within one year(3) below the national average of 70%. To our knowledge, there are not recent data about the utilization of dental services in Marion County. There are, however, recent data from non-representative populations groups in the state of Indiana that showed that some oral health disparities still exist in Indiana, with low-income children and Hispanic children having the highest prevalence of decay experience. (2)

The objective of the present study was to identify and characterize the main parental factors associated with children routine dental visits in an urban Midwest U.S, City.

## Method

From June 1 to September 12, 2012 the Marion County Public Health Department (Indianapolis) partnered with the Survey Research Center at IUPUI to conduct a 16-minute, random sample, landline and cell phone survey among residents 18 years of age and older. The goal of the survey was to assess community health needs, access to health care, and health risk factors among both adults and children residing in the county. A random sample of landline (n=24,119) and cell phone (n=26,981) numbers were purchased from Survey Sampling, Inc. The cell phone sample was drawn from cell phone billing addresses around the county, while county level landline numbers were prescreened for disconnected numbers and came with census block group identification attached to each sample. These two random samples were supplemented with a landline telephone oversample of likely Latinos (n=3,228). This sample was purchased from Geoscape® (Miami, Florida), a company that specializes in sampling racial/ethnic groups across the country. In each interview, the adult household member with the most recent birthday was selected to answer survey questions. From each household with children between the ages of 5 and 17, the child with the most recent birthday was selected and the adult respondent was given a series of questions to answer about that child.

The survey was developed by the Marion County Public Health Department in collaboration with the Community Health Assessment Steering Committee. A majority of the questions came from standard survey instruments including the Center for Disease Control (CDC) Behavioral Risk Factor Surveillance System and the National Health Interview Survey. Responses were weighted according to probabilities of being a cellphone, landline and Latino oversample sample frames. Even though response rates were not as high as desired, the sample statistics showed the group was a close representation of the population of Marion County.

We performed secondary analyses of the survey data, with prior administrative authorization from the Marion County Health Department, Indianapolis, Indiana. Institutional Review Board (IRB) authorization was obtained from Indiana University (IRB Study Number: 1205008764). Data have been entered, transformed, verified and cleaned by Marion County Health Department.

### *Statistical Analysis*

The associations between access to care among children and selected characteristics of individual and community variables were examined. Survey weights generated from the questionnaire were obtained. Univariate analyses were performed using SAS ® (Cary, North Carolina, USA). A bivariate analysis was performed first with the association of the outcomes with individual and community characteristics using  $\chi^2$ . Then, multilevel logistic regression was used to assess the effect of individual and community variables on the probability of access to care for children. For individual test statistics on the outcome variables, Rao-Scott chi-square test was used. Logistic regression model with proper weights and strata was used to model binary outcomes. Backward model selection methods were utilized and only the significant covariates were kept in the final model. Ethnicity and education level were adjusted in the logistic models. P-value 0.05 was considered significance level.

## Results.

There were a total of 54,328 telephone numbers that were dialed (including landline, cellphone and Latino oversample). Of those 54,328 phone numbers, the Survey Research Center was able to get 5,013 completed interviews.

Among the adults who answered the survey, the majority (31.5%) have a high school diploma [Figure 1]. Almost half of the respondents answered to the question about race / ethnicity that they belong to the category “white non-Latino” [Figure 2]. Among the adult individuals who answered that they have a children in the household, the majority (89.8%) reported that the child has a primary care physician (89.8%) [Figure 3], and health insurance (93.7%) [Figure 4]. Medicaid was the most common insurance among the children (51.7%) [Figure 5]. The majority of children had a routine dental visit in the last 12 months (83.2%) [Figure 6].

Bi-variable analysis using *Chi-square* showed with a level of significance, that the majority of children have a normal BMI, a primary health care provider, health coverage, and live in houses where nobody smokes at home. [Table 1] The analysis of continuous variables using T-test, revealed that the number of times that the child ate fast food days was negatively related with the child having a routine dental visit in the last 12 months ( $P < 0.024$ ). In other words, children who eat less fast food are more likely to visit the dentist. Furthermore, a negative relationship was found between the child screen time and having a routine dental visit in the last 12 months ( $P < 0.05$ ). [Table 2]

Finally, the logistic regression showed that after accounting for race and education, children from parents with some college level of education, who do not have smokers in the home, and children who ate fast food less often in the past 7 days were more likely to have a routine dental visit in the last 12 months. [Table 3]



## Discussion

Oral health has a significant impact on the quality of life, appearance, and self-esteem of the people. (16) There is an association between poor oral health status and perceived oral health among disadvantages minorities. (17) American children born into poverty are affected by caries more often than their more affluent peers and have likely had less access to oral health care. (18) In the last 20 years, several studies have identified associations between different factors and dental caries. Understanding the influence of these factors will contribute to the development of effective prevention programs.

It is recommended by the American Academy of Pediatric Dentistry (AAPD) to visit the dentist at least one every 12 months. The benefits of the visit are well supported by the literature. A direct relationship between access to oral health care and a decrease in the prevalence of dental caries exists. (19) We explored different parental factors and the relationship with the utilization of dental care services for the child at home.

The level of parent education and the impact over the oral health of the child has been explore in deep in the last 10 years with conflictive results. Three different studies published in the last 10 years did not find a correlation between the level of parent's education and children oral health quality of life. (20-22) However, the majority of studies agree that there is a correlation between the level of education of the parents and the children oral health.(23) Interestingly, two studies out of 22 that assessed the parent's education and the impact in the child oral health found that the level of education of the mother is more significantly related with the oral health of the child. (24, 25) In our study, we found that parents with a college degree are twice more likely to take the children to have a routine dental visit in a period of 12 months. At least one visit per year is recommended by the AAPD. Anticipatory guidance and early diagnosis are keys of having a good oral health and these two task are performed when parents actively take the children to the dentist for recall appointment.

The indirect role of parental smoking and child caries is also well known. Phillips eat al. examined the association between 2-6 year-olds' caries experience and parents general health related behaviors. They found that the caries experience is related with several factors including maternal

smoking. (26) In the same direction, several studies around the world, scrutinized the relationship between parents smoking and children oral health. The common denominator is the same: there is a relationship between the parent's lifestyle and dental caries. (27-29) In a different perspective and not well explored before, we found that no smoking at home is a protective parental factor associated with taking the children more often to see the dentist, after adjusting for race and education. The role of parental behaviors as a surrogate of the children oral health is again evident after the analysis of this survey. Visiting the dentist at least once in a 12 months period is associated with a better oral health as had been concluded by numerous studies in the past 30 years all summarized by the AAPD recommendations.

Diet plays an important role in the nutritional status and in the development of an individual. Unhealthy life styles, such as eating fast food, lead to nutritional deficiencies that can impact the overall health of the individual. (30) Children and adolescents are given preferences for fast food and beverages with a high content of carbohydrates. Punitha et al. analyzed the role of dietary habits in caries occurrence. They concluded that the frequent intake of carbohydrates and fast food is harmful to the oral health and eventually reflects in the systemic health. Furthermore, they found that a limited fast food intake is associated with a better oral health. (31) In the same direction, our study confirmed that families who do not consume often fast food are more likely to take the children to visit the dentist after adjusting for race and education. We found an indirect parental factor associated with visiting the dentist: families who eat fast food less often compared with families who eat often fast food.

## **Conclusions**

It is well known that different factors interact within a frame of complexity, in the conscious decision to take the child to see the dentist at least once a year. This study explored some of the parental factors. Interestingly, we found that the parent's level of education, living with smokers and eating fast food during the week are all variables that potentially can predict the final decision to take the child to the dentist.

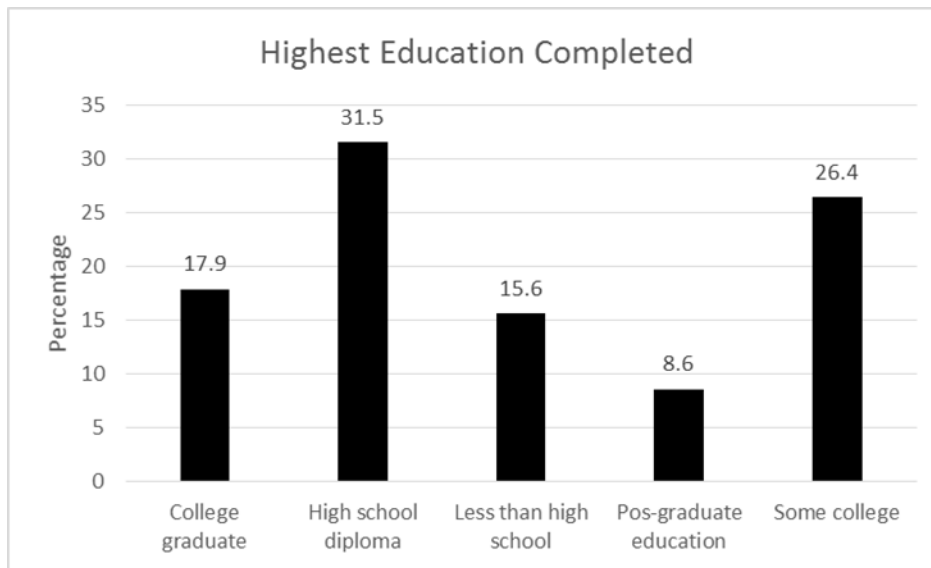
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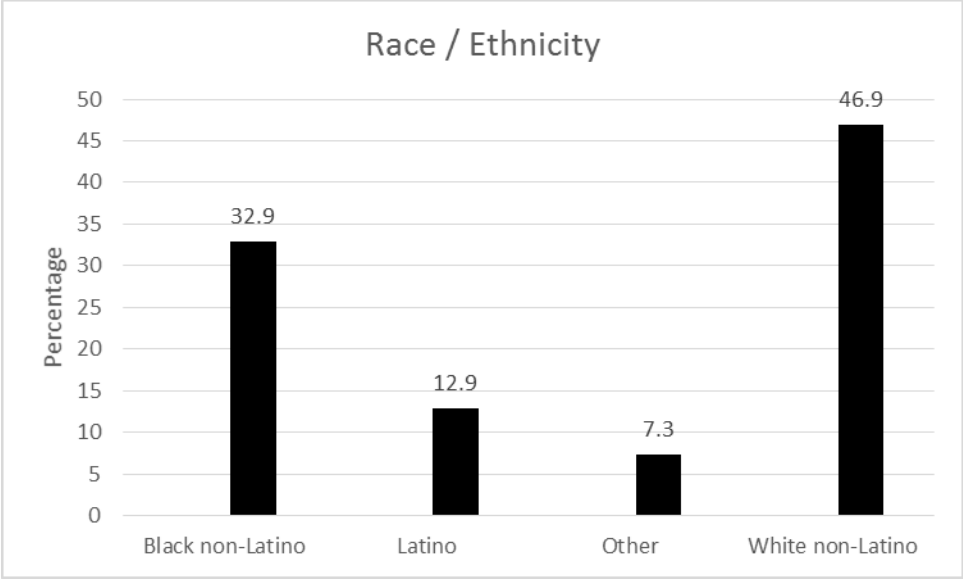
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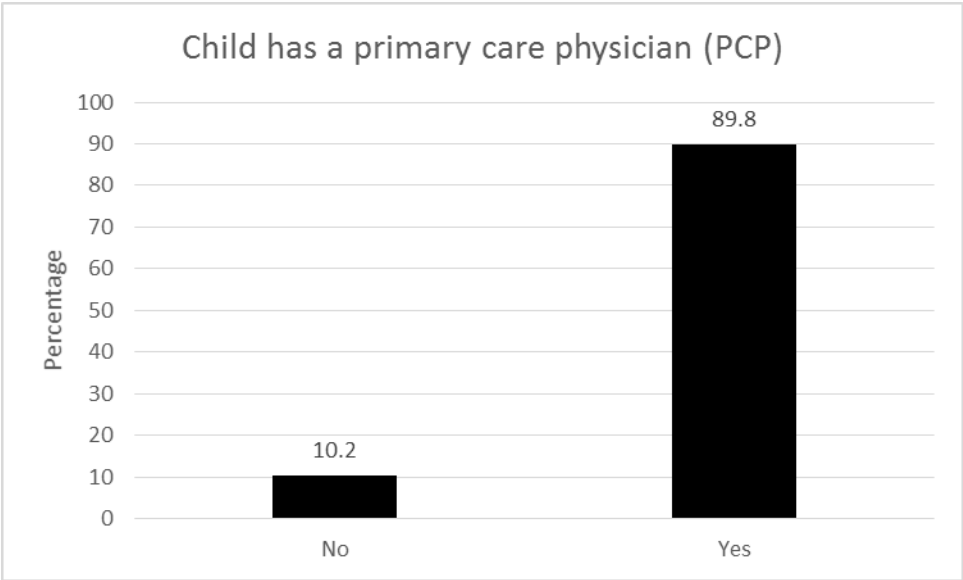
## Figures



**Figure 1.** Highest education completed

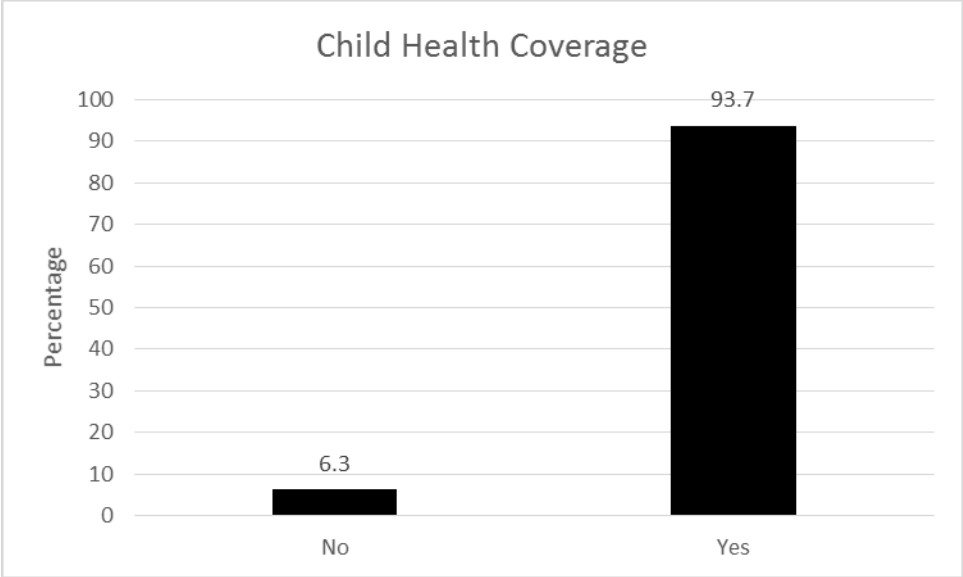


**Figure 2.** Race / ethnicity

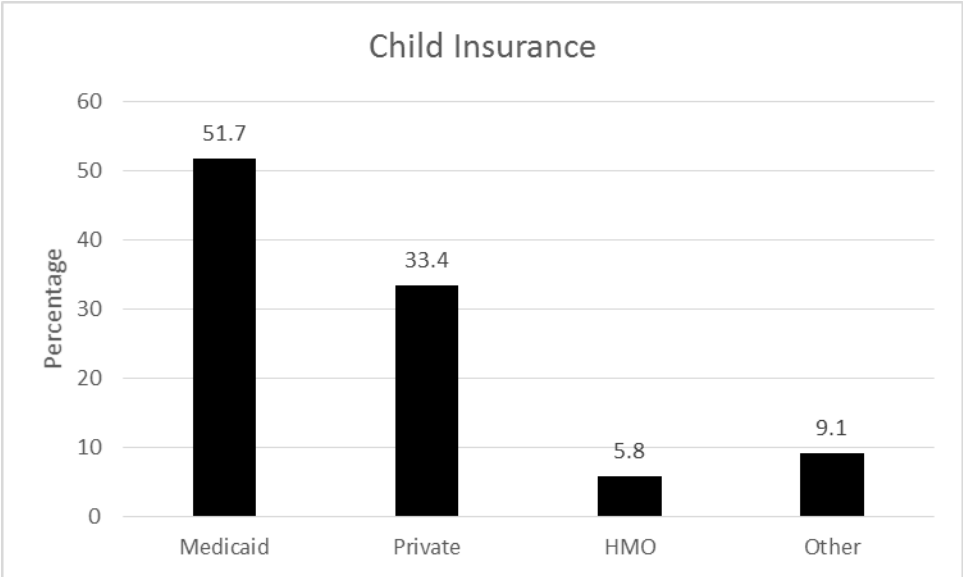


**Figure 3.** Child has a primary care physician

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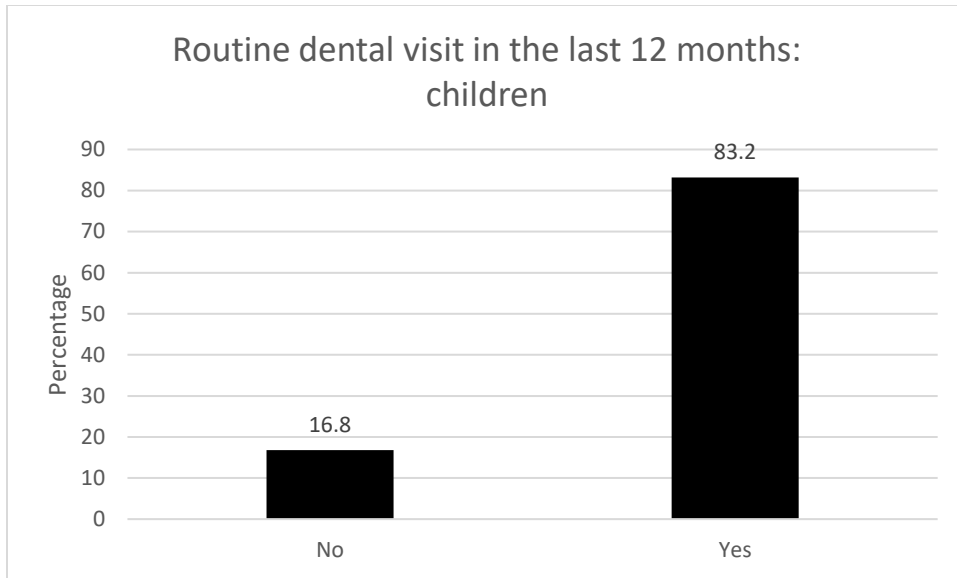


**Figure 4.** Child has health coverage



**Figure 5.** Child primary insurance





**Figure 6.** Routine dental visit in the last 12 months

### Tables

Variable		YES (%)	NO (%)	P-value
BMI	Child at risk of overweight	15.29	4.43	0.07
	Normal weight child	38.58	5.49	.
	Overweight child	27.52	3.29	.
	Underweight child	4.72	0.68	.
Child has 1 or more usual primary care provider	No	6.95	3.05	0.00
	Yes	77.23	12.77	.
Highest education completed	College graduate	13.24	2.01	0.07
	High School grad/GED	23.04	6.26	.
	Less Than High School	16.16	4.60	.

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Variable		YES (%)	NO (%)	P-value
	Post-grad education	7.43	0.60	.
	Some college or tech	23.24	3.41	.
Race/ethnicity	Black non-Latino	25.83	7.22	0.05
	Latino	10.34	2.56	.
	Other	6.01	1.37	.
	White non-Latino	40.98	5.69	.
Child Has Health Coverage (Yes/No)	HMO	5.40	0.49	0.00
	Medicaid	42.16	9.46	.
	Other health insurance	8.22	0.71	.
	Private insurance	30.89	2.68	.
Child lives with Smokers in home? (Yes/No)	No	71.70	11.71	0.00
	Yes	11.90	4.68	.

**Table 1. Bi-variable analysis**

Variable	P-value
Number of times ate fast food last 7 days: YES	0.0239
Total child TV/computer/game screen time: YES	0.0409

**Table 2. T-test for continuous variables-child data analyses (outcome variable ‘child routine dental visit last 12 months)**

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Odds Ratio Estimates			
Effect	Point Estimate	95% Wald Confidence Limits	
Education: Some college or tech vs High School grad/GED	2.048	1.110	3.778
Smokers in home Yes vs No	0.474	0.247	0.908
Number of times ate fast food last 7 days	0.877	0.788	0.975
Have health coverage Yes vs No	1.888	1.277	2.791

**Table 3. Logistic regression**

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