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Knowledge and beliefs regarding oral health among pregnant women

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Abstract

Background—Racial or ethnic and economic disparities exist in terms of oral diseases among pregnant women and children. The authors hypothesized that women of a racial or ethnic minority have less oral health knowledge than do women not of a racial or ethnic minority. Therefore, the authors conducted a study to assess and compare maternal oral health knowledge and beliefs and to determine if maternal race and ethnicity or other maternal factors contributed to women's knowledge or beliefs.

Methods—The authors administered a written oral health questionnaire to pregnant women. The authors calculated the participants' knowledge and belief scores on the basis of correct answers or answers supporting positive oral health behaviors. They conducted multivariable analysis of variance to assess associations between oral health knowledge and belief scores and characteristics.

Results—The authors enrolled 615 women in the study, and 599 (97.4 percent) completed the questionnaire. Of 599 participants, 573 (95.7 percent) knew that sugar intake is associated with caries. Almost one-half (295 participants [49.2 percent]) did not know that caries and periodontal

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disease are oral infections. Median (interquartile range) knowledge and belief scores were 6.0 (5.5–7.0) and 6.0 (5.0–7.0), respectively. Hispanic women had median (interquartile range) knowledge and belief scores significantly lower than those of white or African American women (6.0 [4.0–7.0] versus 7.0 [6.0–7.0] versus 7.0 [6.0–7.0], respectively [$P < .001$]; and 5.0 [4.0–6.0] versus 6.0 [5.0–7.0] versus 6.0 [5.0–7.0], respectively [$P < .001$]). Multivariable analysis of variance results showed that being of Hispanic ethnicity was associated significantly with a lower knowledge score, and that an education level of eighth grade or less was associated significantly with a lower belief score.

Conclusions—Pregnant women have some oral health knowledge. Knowledge varied according to maternal race or ethnicity, and beliefs varied according to maternal education. Including oral health education as a part of prenatal care may improve knowledge regarding the importance of oral health among vulnerable pregnant women, thereby improving their oral health and that of their children.

Clinical Implications—Including oral health education as a part of prenatal care should be considered.

Keywords

Oral health knowledge; pregnancy

Improving oral health and reducing the negative impact of oral disease on overall health and well-being are major health priorities.^{1,2} Oral diseases such as dental caries, gingivitis and periodontal disease are prevalent conditions that affect oral health and can lead to tooth loss. In addition, periodontal disease has been associated with other health problems such as cardiovascular disease, diabetes and preterm birth.³

Both childhood caries and adult gingivitis and periodontal infection are preventable and treatable. Maternal periodontal infection, however, remains prevalent, particularly among racial or ethnic minorities and those with low socioeconomic status.^{4–6} The reasons for this likely are multifactorial and include inadequate oral hygiene, limited access to oral health resources, medical comorbidities that increase oral disease risk, and limited knowledge of the relationship between oral and general health among prenatal care providers and their patients.^{7,8}

Pregnancy provides an ideal opportunity to improve women's health practices. Prenatal care entails regular and frequent medical visits, so that women are or can be motivated to improve their health for the benefit of the developing fetus. Since maternal oral flora and oral hygiene practices are predictors of the oral flora and oral health of infants and children,^{9,10} a pregnant woman's knowledge and actions concerning her oral health are critical to the oral health of her child or children and may be a key to childhood caries prevention.

Because of the racial and ethnic disparities in oral disease among pregnant women,¹¹ we hypothesized that women of a racial or an ethnic minority and those with economic disadvantages would have less oral health knowledge than do women not of a racial or ethnic minority and those not at an economic disadvantage. To identify groups of women in

need of oral health education, we conducted a study to assess and compare oral health knowledge and beliefs among pregnant women and to determine if maternal race or ethnicity or other maternal factors contributed to their knowledge or beliefs.

METHODS

The University of North Carolina (UNC) at Chapel Hill Biomedical Institutional Review Board approved the conduct of this study, and the participants provided written informed consent in their native languages. During the study, we recruited women 18 years and older who were visiting the UNC Women's Clinic Ultrasound Unit for clinically indicated prenatal ultrasonography (for example, for documentation of gestational dating; documentation of viability and number of fetuses; limited or detailed evaluation of fetal anatomy; evaluation for evidence of fetal disease including, but not limited to, aneuploidy, nonimmune hydrops fetalis or in utero infection; or examination for fetal growth and well-being) and asked them to complete a self-administered questionnaire. We did not record the indication for ultrasonography, because most women who receive prenatal care in North Carolina undergo ultrasonography at least once during the course of pregnancy.

Some of the primary investigators (K.A.B., M.-K.M., D.M.U.) developed the questionnaire, which consisted of 39 questions designed to assess the participants' maternal knowledge, beliefs and health practices regarding oral health for themselves and their children. We performed cognitive testing of the questions to determine participants' comprehension with 10 women (five who spoke English and five who spoke Spanish) and modified the questionnaire on the basis of the findings. We performed a second round of cognitive testing by using the modified questionnaire with 10 women (five who spoke English and five who spoke Spanish) to develop the final questionnaire. The final questionnaire was available in both English and Spanish, and bilingual study staff members were available to read the questionnaire to women who were illiterate. We excluded from the study women who were not pregnant, who were younger than 18 years or who spoke a language other than English or Spanish.

We collected data regarding the participants' characteristics, including age, race or ethnicity, level of education, annual household income and insurance coverage. We collected participants' pregnancy data such as gestational age of the fetus and planned place of delivery. To assess oral health knowledge, we asked participants about practices that promote or prevent dental caries. We assessed oral health knowledge by asking questions that could be answered "true," "false" or "not sure." We assessed beliefs such as the importance and safety of oral health care during pregnancy and the need for oral hygiene by using a five-point scale ("strongly agree," "agree," "disagree," "strongly disagree" or "don't know"). Table 1 shows survey questions included in our analysis and what we determined to be the correct answers.

We counted responses to knowledge questions that participants answered correctly; we also counted beliefs that promoted positive oral health behaviors on the basis of the context of the question and the degree of the response. We excluded nonresponses from the analysis; we considered questions that were answered "don't know" to be incorrect. We calculated

percentages of women who answered individual knowledge questions correctly and had the beliefs that promoted positive oral health behaviors.

We developed a “knowledge score,” which we calculated by assigning one point for each correctly answered knowledge question (lowest possible score, 0; highest possible score, 8). We also developed a belief score, which we calculated by assigning one point for each question answered in favor of a positive health belief as determined according to the context of the question (lowest possible score, 0; highest possible score, 8). We used analysis of variance (ANOVA) to test the association between knowledge or belief and maternal variables. We performed post hoc analyses for pairwise comparisons using the Tukey post hoc test for categorical variables or Scheffé correction for continuous variables if ANOVA analysis results were significant. After performing ANOVA, we created a multiple linear regression model to analyze the significance of all variables as predictors of oral health knowledge or belief scores. We included all variables collected in the model: age, race or ethnicity, marital status, country of origin, highest level of education attained, annual household income and source of payment for dental care. We conducted a partial *F* test for interactions among variables within the model. When results from this test were not significant ($P > .05$), we removed the interaction terms from the model. To test for significance of categorical predictors in the model with more than two levels (for example, race or ethnicity), we first conducted multiple *df* partial *F* tests of an overall effect. When results from these tests were significant ($P > .05$), we conducted no further tests. However, when the partial *F* test for overall effect was significant ($P < .05$), we conducted further pairwise tests to determine which elements among the group were different. We examined collinearity to determine the validity of including all variables within the model. We used statistical software (Statistical Analysis Software, Version 9.2, SAS Institute, Cary, N.C.) to perform statistical analyses.

RESULTS

From April 1, 2008, through July 31, 2008, we asked 701 women to participate in the study. Eighty-six women declined to participate. We enrolled the remaining 615 (87.7 percent) women. We excluded 16 of these women because they no longer met the eligibility criteria, had agreed to participate but had already participated or were unable to complete the questionnaire; thus, we evaluated 599 completed surveys for our analysis. Of the 599 participants, 253 (42.2 percent) were white, 194 (32.4 percent) were Hispanic, 126 (21.0 percent) were African American, 18 (3.0 percent) were Asian, seven (1.2 percent) reported being of “other” race, and one (0.1 percent) did not report her race or ethnicity. We combined into one category called “other” the data for Asian participants and participants who reported “other” as their race or ethnicity. Twenty of 599 (3.3 percent) participants reported belonging to more than one racial or ethnic group. A total of 582 of 599 (97.2 percent) questionnaires were self-administered; 442 (73.8 percent) were in English, and 157 (26.2 percent) were in Spanish. Table 2 shows the participants’ characteristics, according to race or ethnicity. We found that Hispanic women were more likely to have an education level of eighth grade or less and to pay by using cash, check or credit card than were women in the white, black or “other” groups.

Overall, 352 of the 599 (58.8 percent) women rated the health of their teeth and gingivae as excellent or good, 246 (41.1 percent) reported having fair or poor oral health, and one (0.1 percent) did not rate her oral health. The results of ANOVA showed significant differences among race or ethnicity groups in the percentage of women who rated the health of their teeth and gingivae as excellent or good: Hispanic, 62 of 194 (32.0 percent); white, 195 of 253 (77.1 percent); and black, 79 of 126 (62.7 percent) ($P < .001$). Results of the Tukey post hoc comparisons indicated that Hispanic women were significantly less likely to rate the health of their teeth and gingivae as excellent or good than were either white or black women, and black women were less likely to rate the health of their teeth and gingivae as excellent or good than were white women ($P < .001$). We did not report findings from the “other” category because the number of participants was too small. Data regarding the responses to the knowledge and belief questions are shown in Tables 3 and 4, respectively. A majority (95.7 percent) of women knew that high sugar intake promotes dental caries. A little more than one-half (50.8 percent) of the women knew that dental caries and periodontal disease are oral infections, and most (88.1 percent) also knew that if untreated, periodontal disease can lead to tooth loss. A little more than one-half (50.1 percent) of the women thought that fluoride is a water disinfectant, but 520 of 599 participants (86.8 percent) knew that fluoride helps prevent caries. Results of the Tukey post hoc test showed that Hispanic women were more likely than white or black women to believe that routine dental care is unsafe during pregnancy (47 of 186 [25.3 percent] versus 13 of 251 [5.2 percent] versus 12 of 124 [9.7 percent], respectively; $P < .001$) and more likely than white women to believe that it is normal to lose a tooth during pregnancy (54 of 187 [28.9 percent] versus 27 of 251 [10.8 percent]; $P < .001$). We did not report findings from the “other” category because the number of participants was too small.

With regard to oral health knowledge of the care of baby teeth, 524 (87.5 percent) women knew that a baby should not be allowed to sleep with a bottle of milk. However, only 324 (54.1 percent) knew that it is important to wipe the gingivae after an infant drinks from the breast or bottle; fewer Hispanic women than white or black women demonstrated knowledge of this fact (81 of 186 [43.5 percent] versus 144 of 251 [57.4 percent] versus 79 of 123 [64.2 percent], respectively; $P = .022$).

We found that the mean (standard deviation) and median (interquartile range) knowledge and belief scores, stratified according to race or ethnicity, were significantly different among groups (Table 5). For both knowledge and belief scores, results of the post hoc comparisons with the Scheffé correction showed that Hispanic women had significantly lower scores at the level of .05 level than did white or black women. We did not report findings from the “other” category because the number of participants was too small. The results of the multivariable linear regression model we conducted to assess the significance of variables as predictors of knowledge or belief scores are shown in Table 6. We found that being of Hispanic ethnicity was associated significantly negatively with knowledge scores; Hispanic women scored -0.82 (-1.26 to -0.38) points lower on average on the knowledge score than did women in the reference group (white women). Having an educational level of eighth grade or less was associated significantly negatively with belief score; women with an educational level of eighth grade or less scored on average -0.77 (-1.24 to -0.30) points

lower on the belief score than did women in the reference group (college graduate). The participants' country of origin was associated significantly with belief score; women born in Mexico had significantly lower scores than did women born in the United States ($P = .081$). Our use of partial F tests for the significance of the interactions among variables within the model resulted in a P value of .486 for the knowledge score regression model and .510 for the belief score regression model. These results indicate that there is no significant interaction between race or ethnicity and education, race or ethnicity and income, or education and income. In addition, we found no evidence of collinearity when we used a tolerance or variance inflation factor in either the knowledge or belief model.

DISCUSSION

We found that pregnant women had some oral health knowledge, although substantial gaps exist. Women are aware of the relationship between sugar intake and dental caries, and they said they believe it is important to care for the teeth. Many, however, did not know that it is safe to receive dental care during pregnancy; Hispanic women were more likely than white or black women to believe it is unsafe for pregnant women to go to the dentist for routine health care and that tooth loss occurs because of pregnancy. Also, 54.1 percent of the participants did not know that it is important to wipe infants' gingivae after they drink from a breast or bottle; Hispanic women were the least likely to know this. In addition, we found significant disparities in overall knowledge and beliefs. In particular, Hispanic women had less overall knowledge than did white or black women. We did not report findings from the "other" category because the number of participants was too small. Being of Hispanic ethnicity also was associated with having beliefs that do not promote good oral health, but being of Hispanic ethnicity did not remain significant in the results of the multivariable model. These findings lead to questions regarding the impact of racial or ethnic differences in maternal knowledge about oral health behaviors when promoting oral health education as a part of pre-natal care.

As many as 50 percent of pregnant women have gingivitis, and 40 percent have periodontal infection.¹¹ Significant disparities exist, with black and Hispanic women and children bearing a greater burden of oral diseases.^{4,5,11} Gingivitis and periodontal infection are two to three times more prevalent among racial or ethnic minorities, and blacks and Hispanics of both sexes are more likely to have untreated diseases.^{4,5} The reasons for these disparities are complex and multifactorial, and they may reflect a combination of limited knowledge regarding the importance of oral health and hygiene, inadequate oral hygiene or lack of access to preventive oral health care. Our data support our hypothesis that racial or ethnic minority women and those with economic disadvantages have less oral health knowledge than do women not of a racial or ethnic minority or those with an economic disadvantage. This finding is important because lack of knowledge is an area of potential intervention and improvement.

Maternal oral diseases such as gingivitis, caries and periodontal infection affect a woman's oral health and the oral health of her child or children. Targeting pregnant women to increase their oral health knowledge may improve their oral health and, thus, the oral health of their children. Maternal oral flora and oral health are one of the greatest predictors of

childhood oral flora and oral health. If a mother has caries, her child or children are at an increased risk of developing caries.¹² The relationship between maternal oral flora and health and child oral health is thought to be caused by the transmission of *Streptococcus mutans* from mother to child.^{9,10} Maternal behaviors, including attention to oral hygiene and dietary practice, also may influence this risk. Because maternal gingivitis and periodontal infection are modifiable and preventable conditions, it is important for dentists to identify women with limited knowledge regarding oral health.

The characteristics of our study cohort reflect those of women who seek prenatal care at UNC at Chapel Hill and its outlying clinics, health departments and community health centers, including a high proportion of women of a racial or ethnic minority and women who are economically disadvantaged. Our data may not be generalizable to other study populations, but our 97.4 percent response rate supports generalizability at least among women who receive prenatal care in North Carolina. In addition, our data are comparable with those from other studies. In a study of 111 pregnant adolescents, investigators asked two questions to assess maternal oral health knowledge.¹³ Forty to 50 percent of these young women answered the questions correctly, which emphasized the gaps in maternal knowledge regarding oral health. In a cross-sectional study of 275 pregnant women conducted in Jordan, Alwaeli and Al-Jundi¹⁴ found that a minority of pregnant women had knowledge regarding dental plaque, and this knowledge varied according to the women's education. They concluded that knowledge and awareness of oral health among their cohort was poor and suggested that oral health education programs be provided to women before and during pregnancy. Thomas and colleagues¹⁵ conducted a survey of 445 postpartum women in Australia. They had an 87 percent response rate among the primarily white group. Similar to what we found in our study, they found that most women knew that sugar intake was related to dental caries. However, unlike what we found in our study, they found that almost all the women also knew that dental problems could lead to other health problems. This difference may be due to economic or educational differences.

Our study had limitations. We did not assess the presence or lack of knowledge with the presence or absence of oral disease, and we did not assess knowledge in conjunction with behaviors or dental care use. In a previous study, we found that maternal oral hygiene practices were associated with routine dental care use in pregnancy.¹⁶ Al Habashneh and colleagues¹⁷ found that among a high-income population of 625 pregnant women, oral health knowledge predicted use of dental services. However, it is difficult to determine the relative contributions of lack of knowledge and lack of access to care to oral health and disease.

Despite these limitations, our study findings are a first step toward developing educational interventions aimed at increasing awareness and understanding of this health care issue and, ultimately, affecting patients' behaviors and outcomes. The theory of self-efficacy in health behavior assumes that people adopt self-care practices if they perceive that these practices make a difference.¹⁸ Self-efficacy is promoted by providing clear instructions and information, providing opportunity for skill development and modeling the desired behavior.¹⁸ Education programs targeting pregnant women have the potential to inform and motivate women to maintain good oral hygiene. Once interventions such as oral health

education programs are developed, it will be imperative to evaluate their effectiveness regarding both awareness of oral disease-associated health risks and how pregnant women respond to this information. It is not clear whether improving knowledge among pregnant women will lead to behavior changes that affect their oral health or that of their children, but our data suggest that pregnant women could benefit from oral health education.

CONCLUSIONS

We found that pregnant women have some oral health knowledge, which varied according to maternal race or ethnicity. Their beliefs varied according to their education levels. Including oral health education as a part of prenatal care may improve knowledge regarding the importance of oral health among vulnerable pregnant women, thereby, improving their oral health and that of their children.

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ABBREVIATION KEY

UNC University of North Carolina

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TABLE 1

Survey questions regarding maternal oral health knowledge and beliefs.

QUESTION	CORRECT ANSWER FOR KNOWLEDGE OR BELIEF QUESTIONS THAT PROMOTE POSITIVE ORAL HEALTH
Knowledge*	
Sugary foods and drinks may cause cavities	True
Cavities and gum disease are caused by an infection in the mouth	True
Fluoride disinfects water and makes it safe to drink	False
Gum disease that is not treated can cause teeth to fall out	True
Fluoride helps prevent cavities	True
It is important to wipe a baby's gums after he or she drinks from the breast or bottle	True
It is OK to let a baby sleep with a bottle of milk	False
Cleaning baby teeth is not important because they fall out anyway	False
Belief†	
It is important for adults to go to the dentist, even when they do not have problems with their teeth	Strongly agree/Agree
It is not safe for pregnant women to get routine dental care such as checkups and cleanings	Disagree/Strongly disagree
It is important to brush your child's teeth as soon as the teeth come in	Strongly agree/Agree
Cavities in a child's teeth can lead to other	Strongly agree/Agree
Keeping my child's teeth healthy is important to me	Strongly agree/Agree
A cavity in a baby tooth does not need to be filled unless it hurts	Disagree/Strongly agree
It is important to take a child to the dentist when the first tooth comes in	Strongly agree/Agree
A woman can lose a tooth just because she is pregnant	Disagree/Strongly disagree

* Response choices: "True," "false" or "not sure."

† Response choices: "Strongly agree," "agree," "disagree," "strongly disagree" or "don't know."

TABLE 2

Participants' characteristics, according to race or ethnicity.

CHARACTERISTIC*	TOTAL COHORT (N = 599)	WHITE (n = 253)	AFRICAN AMERICAN (n = 126)	HISPANIC (n = 194)	OTHER (n = 25)†	P VALUE
Age (Mean ± SD [Years]) (n = 594)	28.9 ± 6.0	30.2 ± 6.0	27.0 ± 5.5	27.9 ± 5.9	31.7 ± 4.9	< .001‡
Marital Status (n [%]) (n = 574)						< .001§
Married or living with partner	493 (85.9)	235 (94.4)	82 (69.5)	153 (84.1)	23 (92.0)	
In a relationship	45 (7.8)	11 (4.4)	20 (17.0)	13 (7.1)	1 (4.0)	
Not in a relationship	36 (6.3)	3 (1.2)	16 (13.6)	16 (8.8)	1 (4.0)	
Country of Origin (n [%]) (n = 586)						< .001§
United States	388 (66.2)	241 (96.0)	117 (94.4)	24 (12.8)	6 (25.0)	
Mexico	124 (21.2)	0 (0.0)	0 (0.0)	124 (66.3)	0 (0.0)	
Other	74 (12.6)	10 (4.0)	7 (5.6)	39 (20.9)	18 (75.0)	
Educational Attainment (n [%]) (n = 587)						< .001§
Eighth grade or less	94 (16.0)	1 (0.4)	0 (0.0)	93 (49.7)	0 (0.0)	
Some high school	58 (9.9)	14 (5.6)	11 (8.9)	32 (17.1)	1 (4.0)	
High school graduate	89 (15.2)	30 (12.0)	25 (20.2)	31 (16.6)	3 (12.0)	
Some college	115 (19.6)	45 (17.9)	54 (43.5)	15 (8.0)	1 (4.0)	
College graduate	231 (39.4)	161 (64.1)	34 (27.4)	16 (8.6)	20 (80.0)	
Annual Household Income Level (\$) (n [%]) (n = 494)						< .001§
10,000 or less	73 (14.8)	20 (8.4)	25 (25.8)	26 (18.4)	2 (11.1)	
10,001–30,000	180 (36.4)	47 (19.7)	38 (39.2)	92 (65.2)	3 (16.7)	
30,001–60,000	90 (18.2)	48 (20.2)	22 (22.7)	16 (11.3)	4 (22.2)	
60,001–80,000	49 (9.9)	40 (16.8)	5 (5.2)	2 (1.4)	2 (11.1)	
More than 80,000	102 (20.6)	83 (34.9)	7 (7.2)	5 (3.5)	7 (38.9)	
Source of Payment for Dental Care (n [%]) (n = 491)						< .001§
Private insurance	209 (42.6)	133 (55.4)	35 (31.5)	28 (23.5)	13 (61.9)	
Medicaid	120 (24.4)	41 (17.1)	60 (54.1)	16 (13.4)	3 (14.3)	

CHARACTERISTIC*	TOTAL COHORT (N = 599)	WHITE (n = 253)	AFRICAN AMERICAN (n = 126)	HISPANIC (n = 194)	OTHER (n = 25) [‡]	P VALUE
Cash, check or credit card	142 (28.9)	61 (25.4)	14 (12.6)	63 (52.9)	4 (19.0)	
Other	20 (4.1)	5 (2.1)	2 (1.8)	12 (10.1)	1 (4.8)	

* Because of missing data, the numbers in the rows may not equal 599.

[‡] In this category, 18 participants were Asian and seven were of "other" race or ethnicity. One participant did not respond to this question.

[‡] Analysis of variance (*F* value = 12.783, 590).

[§] Fisher exact test.

TABLE 3

Responses to knowledge questions.

KNOWLEDGE QUESTION	TRUE (NO. [%])	FALSE (NO. [%])	NOT SURE OR MISSING (NO. [%])
Sugary foods and drinks may cause cavities	573 (95.7)	6 (1.0)	20 (3.3)
Cavities and gum disease are caused by an infection in the mouth	304 (50.8)	135 (22.5)	160 (26.7)
Fluoride disinfects water and makes it safe to drink	110 (18.4)	300 (50.1)	189 (31.6)
Gum disease that is not treated can cause teeth to fall out	527 (88.1)	8 (1.3)	64 (10.7)
Fluoride helps prevent cavities	520 (86.8)	14 (2.3)	65 (10.9)
It is important to wipe a baby's gums after he or she drinks from the breast or bottle	324 (54.1)	65 (10.9)	210 (35.1)
It is OK to let a baby sleep with a bottle of milk	25 (4.2)	524 (87.5)	50 (8.3)
Cleaning baby teeth is not important because they fall out anyway	36 (6.0)	523 (87.3)	40 (6.7)

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TABLE 4

Responses to belief questions.

BELIEF QUESTION	STRONGLY AGREE (NO. [%])	AGREE (NO. [%])	DISAGREE (NO. [%])	STRONGLY AGREE (NO. [%])	DON'T KNOW OR MISSING (NO. [%])
It is important for adults to go to the dentist, even when they do not have problems with their teeth	396 (66.1)	181 (30.2)	7 (1.2)	14 (2.3)	1 (0.2)
It is not safe for pregnant women to get routine dental care such as checkups and cleanings	29 (4.8)	47 (7.8)	212 (35.4)	92 (15.4)	219 (36.6)
It is important to brush your child's teeth as soon as the teeth come in	324 (54.1)	194 (32.4)	20 (3.3)	55 (9.2)	6 (1.0)
Cavities in a child's teeth can lead to other health problems	274 (45.7)	195 (32.6)	27 (4.5)	101 (16.9)	2 (0.3)
Keeping my child's teeth healthy is important to me	495 (82.6)	90 (15.0)	0 (0.0)	12 (2.0)	2 (0.3)
A cavity in a baby tooth does not need to be filled unless it hurts	32 (5.3)	62 (10.4)	156 (26.0)	168 (28.0)	181 (30.2)
It is important to take a child to the dentist when the first tooth comes in	126 (21.0)	137 (22.9)	145 (24.2)	162 (27.0)	29 (4.8)
A woman can lose a tooth just because she is pregnant	53 (8.8)	59 (9.8)	134 (22.4)	298 (49.7)	55 (9.2)

TABLE 5

Knowledge and belief scores, according to race or ethnicity.

SCORE	TOTAL COHORT (N = 599)		WHITE (n = 253)		AFRICAN AMERICAN (n = 126)		HISPANIC (n = 194)		OTHER* (n = 25)		F VALUE (df)	P VALUE
	Mean (SD) [†]	Median (IQR) [‡]	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)		
Knowledge	6.11 (1.36)	6.0 (5.5–7.0)	6.57 (1.11)	7.0 (6.0–7.0)	6.34 (1.13)	7.0 (6.0–7.0)	5.27 (1.46)	6.0 (4.0–7.0)	6.72 (0.98)	7.0 (6.0–7.0)	44.06 _{3, 583}	< .001
Belief	5.74 (1.36)	6.0 (5.0–7.0)	6.09 (1.18)	6.0 (5.0–7.0)	5.99 (1.22)	6.0 (5.0–7.0)	5.06 (1.48)	5.0 (4.0–6.0)	5.96 (1.01)	6.0 (6.0–7.0)	25.35 _{3, 582}	< .001

* In this category, 18 participants were Asian and seven were of “other” race or ethnicity. One participant did not respond to this question.

[†] SD: Standard deviation.

[‡] IQR: Interquartile range.

TABLE 6

Regression beta coefficients* and corresponding 95 percent confidence interval (CI) estimates from regression model to predict knowledge or belief scores.

VARIABLE	KNOWLEDGE SCORE [†] [95% CI]	BELIEF SCORE [‡] [95% CI]
Age (Years)	0.03 (0.01 to 0.05)	0.01 (-0.01 to 0.03)
Race or Ethnicity		
White	Reference	Reference
Black	-0.07 (-0.36 to 0.22)	-0.10 (-0.40 to 0.20)
Hispanic	-0.82 (-1.26 to -0.38)	-0.10 (-0.55 to 0.35)
Other	0.34 (-0.25 to 0.93)	0.03 (-0.58 to 0.64)
Marital Status		
Married or living with partner	Reference	Reference
In a relationship	-0.18 (-0.57 to 0.21)	0.23 (-0.17 to 0.63)
Not in a relationship	-0.38 (-0.81 to 0.05)	-0.13 (-0.58 to 0.32)
Country of Origin		
United States	Reference	Reference
Mexico	-0.33 (-0.82 to 0.16)	-0.66 (-1.17 to -0.15)
Other	-0.25 (-0.67 to 0.17)	-0.33 (-0.77 to 0.11)
Educational Attainment		
Eighth grade or less	-0.31 (-0.77 to 0.15)	-0.77 (-1.24 to -0.30)
Some high school	0.06 (-0.38 to 0.50)	-0.11 (-0.57 to 0.34)
High school graduate	0.17 (-0.21 to 0.55)	-0.03 (-0.42 to 0.36)
Some college	-0.01 (-0.32 to 0.30)	0.18 (-0.14 to 0.50)
College graduate	Reference	Reference
Annual Household Income Level (\$)		
10,000 or less	0.15 (-0.21 to 0.51)	-0.10 (-0.47 to 0.27)
10,001-30,000	0.26 (-0.01 to 0.53)	0.03 (-0.25 to 0.31)
30,001-60,000	0.17 (-0.14 to 0.48)	-0.12 (-0.44 to 0.20)
60,001-80,000	0.27 (-0.12 to 0.68)	-0.07 (-0.48 to 0.34)
More than 80,000	Reference	Reference
Source of Payment for Dental Care		
Private insurance	Reference	Reference
Medicaid	-0.06 (-0.38 to 0.26)	-0.09 (-0.42 to 0.24)
Cash, check or credit card	0.00 (-0.25 to 0.25)	-0.15 (-0.41 to 0.11)
Other	-0.63 (-1.23 to -0.03)	0.09 (-0.53 to 0.71)

* The beta coefficient is the increase in knowledge or belief score coming from a one-unit increase in the predictor for age or for difference in knowledge or belief score compared with the reference group.

[†]The sum of the items in Table 3.

[†]The sum of the items in Table 4.

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