

Distribution of Preventive Dental Care during Pregnancy in Rhode Island, 2012 to 2015

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ABSTRACT

AIMS: To examine the distribution of preventive dental care for pregnant women in Rhode Island.

METHODS: The data used were obtained from the 2012 to 2015 Rhode Island Pregnancy Risk Assessment Monitoring System (RIPRAMS). Statistical analyses were conducted for respondents who had valid information for both preventive dental care receipt and race/ethnicity to examine population differences in the receipt of preventive dental care.

RESULTS: Respondents who identified as Hispanic and had more than 12 years of education had higher odds for preventive dental care receipt in Rhode Island between 2012 to 2015 compared to non-Hispanic whites. Furthermore, respondents with lower household income were the least likely to have received preventive dental care. This was especially true for black and non-Hispanic women who reported being neither black nor white.

CONCLUSION: Preventive dental care in Rhode Island between 2012 and 2015 did not meet the perinatal and Infant Oral Health Quality Improvement (PIOHQI) target of 60% in minority populations.

KEYWORDS: PRAMS, Oral Health, Rhode Island, Logistic Models

INTRODUCTION

Gingival inflammation associated with increased plasma sex steroid hormone levels has been reported in pregnant women.¹⁻³ This is especially true for women who are members of ethnic minorities.⁴ Gingival inflammation is strongly associated with plaque during pregnancy, which can influence the onset, clinical presentation, and rate of periodontal disease progression.⁵ Risk factors include smoking, poor diet, alcohol use, genitourinary infections and stress.³

PURPOSE AND HYPOTHESIS

In this analysis, we examined the distribution of preventive dental care for pregnant women in Rhode Island using the 2012 to 2015 Pregnancy Risk Assessment Monitoring

System (PRAMS) database. We considered variables specifically pertaining to receipt of preventive dental care, including whether or not the participant went to a dental clinic for a problem, needed to see a dentist for a problem, received a dental talk about how to care about the teeth/gums, and had a pre-established appreciation of the importance of preventive oral health care. Our hypothesis was that people of ethnic and racial minorities had less favorable utilization than white Non-Hispanics.

METHODS

Description of the Data

The PRAMS is a joint surveillance program between state departments of health and the Centers for Disease Control and Prevention (CDC), Division of Reproductive Health.⁶ The Rhode Island (RI) PRAMS has collected state-specific, population-based data on maternal experiences and behaviors before, during, and shortly after their most recent pregnancy, since 2002. Collaborating with the CDC, Rhode Island designs the survey to gather perinatal information relevant to maternal and infant health. Each year, more than 15% of Rhode Island women who delivered a live infant are selected for participation in PRAMS. To ensure adequate data in the smaller but higher-risk populations, all Rhode Island mothers who delivered a low birth weight baby are invited to participate in the survey. The survey is completed by mail or phone interview 2–6 months postpartum and is available in both English and Spanish. Data are weighted to be statistically representative of all women who delivered a live birth in Rhode Island. Data collection follows a standardized process which allows for comparison among states.⁷

Analytical Sample

The Rhode Island PRAMS dataset for 2012 to 2015 included 4,687 participants. The dataset was weighted and the responses for the years 2012 to 2015 were combined and provided to us by the Rhode Island Department of Health. Only 4.5% of total participants did not provide responses for either their race/ethnicity or whether they got their teeth cleaned by a health care professional. Hence the total number of respondents in our study was 4477.

Classification of Ethnicity and Race

For this analysis, we chose to perform a cross tabulation of ethnicity and race in accordance with the Office of Management and Budget (OMB) strategy to limit disparities that exist between broad racial groups.⁸ Here, we combined the race and ethnicity variables to form four categories (Non-Hispanic White, Non-Hispanic Black, Hispanic, Non-Hispanic Other) that have been used in previous studies⁹.

Conceptual and Operational Definition of Confounders and Outcome

The outcome was whether the participant obtained preventive dental care during pregnancy, yes or no.

The ownership of dental insurance or financial assistance programs such as WIC has been proven to play a significant role in obtaining dental care.^{10,11} For this analysis, we stratified income into five categories to examine a wide range of income brackets. WIC assistance and the ownership of dental insurance during pregnancy was represented as binary “Yes/No” outcomes. We also considered the “Importance to Care for Teeth/Gum”, which was analyzed as a binary variable and maternal education and age, which were distributed as ordinal variables.

Statistical Analyses

We obtained the distribution of dental care and potential covariates by race/ethnicity of the mother using cross tabulations of the exposure, outcome and covariates as outlined in the STATA companion.¹² The data are representative of all women delivering in Rhode Island because of previously applied weighting. Each row in **Table 1** below has the proportion of the outcome or covariate by race/ethnicity for the state of Rhode Island. Each row in **Table 2** represents the odds for obtaining preventive dental care during pregnancy. The odds for obtaining dental care during pregnancy were obtained using logistic regression in Stata SE14.¹³

RESULTS

The outcome of the analysis showed that 58.3%, 55.5% and 41.6% of black Non-Hispanic, Non-Hispanics other and Hispanic women respectively reported not obtaining preventive dental care during pregnancy. Meanwhile among white non-Hispanic pregnant women, 36.1% reported not obtaining preventive dental care during pregnancy (**Table 1**).

Table 1. Characteristics of pregnant women by race/ethnicity in the Rhode Island PRAMS 2012–2015 Survey

	White, non-Hispanic 58.40% (n=2592) Weighted % Unweighted n	Black, non-Hispanic 7.05% (n = 313) Weighted % Unweighted n	Hispanic 24.65% (n = 1094) Weighted % Unweighted n	Other, non-Hispanic 9.9% (n = 439) Weighted % Unweighted n
Teeth Cleaned During Pregnancy (Outcome)				
Yes	(63.9%) 1684	(41.7%) 138	(58.4%) 644	(44.5%) 209
No	(36.1%) 926	(58.3%) 178	(41.6%) 465	(55.5%) 233
Dental Insurance (**47)				
Yes	(86%) 2247	(84.4%) 254	(86.6%) 942	(80.4%) 351
No	(14%) 342	(15.6%) 58	(13.4%) 148	(19.6%) 88
Maternal Age				
≤24 Years	(18%) 407	(28.7%) 86	(34.2%) 369	(21.2%) 85
25 – 29 Years	(27.8%) 691	(34%) 103	(27.6%) 296	(32.8%) 140
30 – 33 Years	(28.7%) 804	(20.1%) 65	(19.1%) 220	(23.5%) 115
>34 Years	(25.5%) 708	(17.2%) 62	(19.1%) 224	(22.5%) 102
Maternal Education				
< 12 Years	(4.66%) 115	(14.2%) 36	(26.3%) 278	(9.5%) 34
12 Years	(18.7%) 432	(26.3%) 89	(31.5%) 339	(22.8%) 90
> 12 Years	(76.6%) 2063	(59.5%) 191	(42.2%) 492	(67.7%) 318
Income				
≤ 15,000	(12.6%) 296	(37.6%) 111	(34.7%) 398	(21.6%) 96
15,001– 26,000	(11.6%) 269	(24.1%) 73	(24.9%) 262	(16.1%) 68
26,001– 37,000	(7.79%) 188	(9.74%) 32	(10.4%) 112	(11.8%) 48
37,001– 52,000	(10.1%) 254	(6.54%) 26	(5.55%) 62	(9.13%) 35
≥ 52,001	(57.9%) 1603	(22.1%) 74	(24.4%) 275	(41.4%) 195
WIC During Pregnancy (**16)				
Yes	(28%) 662	(76.6%) 239	(82.1%) 897	(51.4%) 208
No	(72%) 1942	(23.4%) 76	(17.9%) 204	(48.6%) 233
Important to Care for Teeth/Gum (**4)				
Yes	(91.5%) 2388	(84%) 267	(84.6%) 929	(82.5%) 371
No	(8.52%) 220	(16%) 49	(15.4%) 178	(17.5%) 71
Dental Talk about how to Care about Teeth/Gums (**15)				
Yes	(56.7%) 1512	(53.5%) 177	(54.3%) 610	(46%) 212
No	(43.3%) 1090	(46.5%) 139	(45.7%) 493	(54%) 229
Needed to see a Dentist for Problem (**42)				
Yes	(13.7%) 346	(19.4%) 62	(18.6%) 209	(20.9%) 80
No	(86.3%) 2240	(80.6%) 252	(81.4%) 886	(79.1%) 360
Went to a Dental Clinic for a Problem (**37)				
Yes	(12.4%) 316	(14.5%) 48	(16.7%) 188	(16.2%) 67
No	(87.6%) 2272	(85.5%) 267	(83.3%) 911	(83.8%) 371

** Refers to number of values that are missing from the analytical sample

Although the distribution for dental insurance was mainly the same across the various ethnic and racial groups, a slightly higher proportion (19.6%) of Non-Hispanic other participants had no insurance. Since worse oral health out-

Table 2. Adjusted Odds Ratio for Preventive Dental Care Receipt During Pregnancy Among Rhode Island Mothers, Rhode Island PRAMS 2012–2015 Survey

	Adjusted Odds Ratio (95% CI)
Maternal Race/Ethnicity	
White, non-Hispanic	(ref) 1.00
Black, non-Hispanic	0.55 (0.39 – 0.78)
Hispanic	1.38 (1.09 – 1.74)
Non-Hispanic other	0.59 (0.45 – 0.78)
Dental Insurance	
Yes	(ref) 1.00
No	0.21 (0.16 – 0.28)
Maternal Age	
≥ 34 Years	(ref) 1.00
30 – 33 Years	0.75 (0.60 – 0.95)
25 – 29 Years	0.60 (0.48 – 0.76)
≤ 24 Years	0.63 (0.48 – 0.83)
Maternal Education	
> 12 Years	(ref) 1.00
12 Years	0.76 (0.62 – 0.93)
< 12 Years	1.08 (0.78 – 1.49)
Income	
≥ 52,001	(ref) 1.00
37,001– 52,000	0.70 (0.52 – 0.95)
26,001– 37,000	0.72 (0.51 – 1.01)
15,001– 26,000	0.59 (0.43 – 0.80)
≤ 15,000	0.58 (0.42 – 0.81)
WIC During Pregnancy	
Yes	(ref) 1.00
No	1.83 (1.42 – 2.36)
Important to Care for Teeth/Gum	
Yes	(ref) 1.00
No	0.52 (0.39 – 0.69)
Dental Talk about how to Care about Teeth/Gums	
Yes	(ref) 1.00
No	0.09 (0.08 – 0.11)
Needed to see a Dentist for Problem	
Yes	(ref) 1.00
No	1.71 (1.13 – 2.61)
Went to a Dental Clinic for a Problem	
Yes	(ref) 1.00
No	0.21 (0.14 – 0.33)

comes have been reported for people in lower income brackets,¹⁴ we considered the importance of income. There was a disproportionately higher number (57.9%) of White, Non-Hispanics who earned \$52,001 or more compared to Hispanics (24.4%) or Black Non-Hispanic (22.1%). Of the participants who identified as Hispanic, 26.3% reported having less than 12 years of education. Meanwhile of participants who identified as White, Non-Hispanic, 4.7% identified having less than 12 years of education (**Table 1**).

Among those who identified as Hispanic, 82.1% said they had access to WIC during pregnancy meanwhile among those who identified as White, Non-Hispanics, only 28% said they had WIC coverage during pregnancy. A larger proportion of White, Non-Hispanics (72.1%) reported having greater than or equal to 12 prenatal care visits compared to those who identified as Hispanic (45.3%). Among those who identified as White, Non-Hispanic, 91.5% said it was important to care for your teeth during pregnancy compared to those who identified as Hispanic (84.6%).

When all the other covariates in the study were taken into account to isolate the impact of ethnicity and race independent of associated social factors (the adjusted model), the Hispanic population turn to have a higher likelihood for obtaining preventive dental care during pregnancy compared to the Non-Hispanic white population (adjusted OR=1.38, 95% CI: 1.09–1.74). However, the adjusted odds ratios were lower for the Non-Hispanic other (adjusted OR=0.59, 95% CI: 0.45–0.78) and Non-Hispanic black populations (adjusted OR=0.55, 95% CI: 0.39–0.78) compared to the Non-Hispanic white population.

Not receiving WIC during pregnancy (adjusted OR=1.83, 95% CI: 1.42–2.36) was also associated with increased odds for obtaining preventive dental care during pregnancy compared to participants who responded “Yes” to these questions.

DISCUSSION

Based on the findings of this study, we found that women who are white, older than 34 years of age, did not receive WIC and had a yearly income more than \$52,001 in the years 2012 to 2015 were more likely to receive preventive oral health care during pregnancy compared to women who did not have these characteristics. Furthermore, only white non-Hispanic women who were white, reached the Perinatal and Infant Oral Health Quality Improvement (PIOHQI) target of 60%, which is recommended by the oral health team in the Rhode Island Department of Health (RIDOH) as an applicable target for pregnant women, but Hispanic women came quite close to the 60% target.

According to the adjusted odds model, women who identified as Hispanic were more likely to receive preventive oral health care services during pregnancy compared to women who identified as white when covariates were accounted for, reflecting a higher tendency to obtain care relative to their

less favorable socioeconomic profile. This increase based on the adjusted odds ratios for the Hispanic population could be related to the receipt of incentives such as WIC.¹⁵ These results are meaningful since Hispanic women have been reported to have a lower receptiveness to preventive oral health during pregnancy compared to white women.⁴ In this previous study, multivariate logistic regression showed that Hispanic women had a 0.77 (95% CI: 0.64–0.91) odds of obtaining preventive dental care compared to Non-Hispanic white women, reflecting a different pattern from the one we observed using the Rhode Island PRAMS data. Targeted studies are recommended for women who either identified as Hispanic, Non-Hispanic other or Black Non-Hispanic.

To increase the number of women who receive preventive oral health during pregnancy, dental teams are encouraged to perform routine dental prophylaxis and care as required for oral health.¹⁶ Obstetricians could contribute by providing an oral health risk assessment for all pregnant women, review potential oral problems during pregnancy and after, related to teeth and inflamed periodontal tissue and recommend prevention strategies, for them and their babies.¹⁷

LIMITATIONS OF THE STUDY

The PRAMS database does not collect data on geographical locations so we could not examine the relationship between the locations of care providers and where the women lived. Additional research should focus on geographical locations to locate physical barriers that could be associated with certain zip codes, cities or the proximity of health care centers.

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