

Running the Numbers

*A Periodic Feature to Inform North Carolina Health Care Professionals
About Current Topics in Health Statistics*

Utilization of Dental Health Care Services Among Pregnant Women in North Carolina

Approximately 1 in 5 adults in the US suffer from periodontal disease, which is a chronic, destructive infection of the gums and supporting tooth structures [1]. Due to normal physiologic changes like hormone fluctuations, pregnancy places women at even higher risk for diseases of the oral cavity including periodontal disease, dental caries, and gingivitis [2]. For example, gingivitis, an inflammatory response to increased intraoral plaque that can develop into more severe periodontitis, has been shown to affect up to 100% of pregnant women. In addition, up to 10% of pregnant women may experience pyogenic granulomas, which are painless “pregnancy tumors” along the gum line [2].

Maternal oral health has significant health implications for both mothers and their infants. Oral disease in women is associated with other adverse health conditions like cardiovascular disease and diabetes, and may interfere with adequate nutritional intake during pregnancy. A growing body of epidemiologic research has also demonstrated an association between maternal periodontal disease and adverse birth outcomes including preeclampsia, low infant birth weight, and preterm birth [3, 4]. Recent evidence suggests that periodontal disease triggers a systemic inflammatory response, as measured by increased C-reactive protein levels in maternal plasma, which may induce preterm labor [5]. Further, bacteria from the maternal oral cavity have been found to cross the placental barrier and impact placental function as well as the fetal lungs, brain, and circulation [5].

Because of the importance of maintaining good oral health before and during pregnancy, monitoring the utilization of dental health care among pregnant women provides data needed by public health dental programs to plan, implement, and evaluate services and interventions. This article presents data on oral health from the 2009 North

Carolina Pregnancy Risk Assessment Monitoring System (PRAMS).

Methods

The PRAMS survey is an ongoing, population-based surveillance system funded by the Centers for Disease Control and Prevention (CDC) and maintained by the North Carolina State Center for Health Statistics (SCHS). Its purpose is to monitor health behaviors and risk factors among pregnant women living in North Carolina. Each year, a random sample of resident women who had a live birth are selected from birth certificate records and asked to complete the survey. The North Carolina PRAMS survey added questions related to oral health beginning in 2004, and the questions were revised slightly in 2009. More information about North Carolina PRAMS, including quantitative survey results, can be accessed at www.schs.state.nc.us/SCHS/prams.

Results

According to the survey, 50% of women who delivered a baby in 2009 had their teeth cleaned by a dentist or dental hygienist sometime during the 12 months before they became pregnant (Table 1). The percentage of women who reported having had their teeth cleaned increased with increasing age and level of education. There was little difference between racial groups, although Hispanic women had a significantly lower rate of dental cleanings compared to non-Hispanic women (23.4% vs. 67.5%). Women who were married were more

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Dr. Tania A. Desrosiers, Department of Epidemiology, CB #7435, University of North Carolina-Chapel Hill, Chapel Hill, NC 27599 (ta_desrosiers@unc.edu).

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TABLE 1.
Oral Health Care Services Received By Women in the Year Before and During
Pregnancy, North Carolina Pregnancy Risk Assessment Monitoring System, 2009

	Had teeth cleaned by dentist or hygienist within 12 months prior to becoming pregnant (N = 1,159)		Went to dentist or dental clinic sometime during most recent pregnancy (N = 1,151)	
	N ^a (%) ^b	95% CI	N ^a (%) ^b	95% CI
Total	580 (50.0)	46.6, 53.3	511 (44.4)	41.2, 47.8
Age (years)				
< 20	39 (34.1)	24.6, 45.1	35 (32.6)	23.2, 43.7
20-24	99 (36.8)	30.3, 43.8	89 (31.1)	24.9, 37.9
25-34	317 (54.5)	49.8, 59.0	279 (49.1)	44.5, 53.7
≥ 35	125 (70.7)	62.2, 77.9	108 (61.5)	52.9, 69.4
Race				
White	433 (49.6)	45.8, 53.5	387 (45.2)	41.4, 49.0
Black	118 (50.1)	42.6, 57.6	99 (40.7)	33.5, 48.4
Other	29 (54.6)	38.8, 69.6	25 (53.4)	38.0, 68.2
Hispanic				
Yes	34 (23.4)	16.6, 32.0	37 (26.4)	19.1, 35.2
No	546 (54.8)	51.1, 58.4	474 (47.7)	44.1, 51.3
Education				
< High School	45 (22.6)	16.4, 30.5	47 (26.1)	19.3, 34.3
High School	114 (38.4)	32.3, 44.8	111 (34.4)	28.5, 40.7
> High School	418 (67.5)	63.2, 71.5	350 (57.3)	52.9, 61.6
Marital status				
Married	430 (59.2)	55.0, 63.3	369 (51.8)	47.6, 55.9
Not Married	150 (37.4)	32.2, 43.0	142 (34.4)	29.3, 40.0
Family income				
< \$15,000	73 (37.1)	29.5, 45.4	65 (32.9)	25.7, 41.1
\$15,000-\$24,999	81 (31.4)	25.4, 38.0	80 (31.2)	25.2, 37.9
\$25,000-\$49,999	110 (47.7)	40.3, 55.2	99 (41.6)	34.4, 49.1
≥ \$50,000	287 (77.5)	72.5, 81.9	245 (67.2)	61.7, 72.3
WIC recipient				
No	393 (64.7)	60.2, 68.9	336 (56.1)	51.6, 60.5
Yes	186 (35.6)	30.9, 40.5	175 (33.0)	28.4, 37.9
Medicaid recipient				
No	396 (69.4)	64.9, 73.5	335 (60.1)	55.5, 64.5
Yes	184 (33.3)	28.9, 38.1	176 (30.8)	26.4, 35.5
Infant's birth weight				
< 2,500 grams	173 (40.9)	36.2, 45.7	150 (36.6)	32.0, 41.4
2,500+ grams	407 (50.8)	47.1, 54.4	361 (45.2)	41.6, 48.8
Infant's gestational age				
≤32 weeks	51 (45.3)	36.3, 54.6	41 (36.6)	28.2, 46.0
33-36 weeks	86 (49.5)	39.7, 59.4	74 (39.7)	30.4, 49.8
≥ 37 weeks	443 (50.1)	46.5, 53.7	396 (45.0)	41.5, 48.7

95% CI = 95% Confidence Interval.

^aColumn totals may not add to 580 women due to missing values for demographic or clinical characteristics.

^bPercentages are weighted to reflect the entire population of North Carolina women who had a live birth in 2009.

likely to receive a dental cleaning, as were women with family incomes of \$50,000 or more, and who were not receiving WIC or Medicaid. Women who delivered a normal weight infant ($\geq 2,500$ grams) were more like to have had their teeth cleaned in the year prior to pregnancy, but there was no appreciable difference by gestational age.

An estimated 44.5% of women went to a dentist or dental clinic during pregnancy, and the demographic patterns were generally similar to those who had a dental cleaning in the year before pregnancy. Women with one or more of the following characteristics were less likely (than women with none of these characteristics) to have been to the dentist during pregnancy: Hispanic ethnicity, less than a high school education, non-married, family income less than \$50,000, or receiving WIC or Medicaid.

Discussion

These results suggest that utilization of dental health services among North Carolina women before and during pregnancy is a concern, particularly among disadvantaged mothers. Women with lower family incomes, who were younger, had less education, were unmarried, or received WIC or Medicaid were each less likely to receive dental care compared to other women. These findings are consistent with national PRAMS data. Data from 10 PRAMS states (excluding North Carolina) between 2004 and 2006 found that, although 95% of the study population had ever had a teeth cleaning, only 40% had a cleaning sometime during pregnancy [6]. Of the women who reported having a specific problem with their teeth during pregnancy (26%), less than half (44%) sought dental care for the problem. In this study, mothers who did not receive dental care or did not have a teeth cleaning during pregnancy were about 20% more likely to have a preterm delivery.

As with many other health conditions, poor oral health and inadequate access to dental care disproportionately affect minority racial/ethnic groups and women with lower socioeconomic status. In the 10-state PRAMS study, black women were more likely to have a dental problem and less likely to seek dental care for it during pregnancy than non-Hispanic white women [7]. Similarly, black and Hispanic women were less likely to have a teeth cleaning before or during pregnancy than

non-Hispanic white women. Mothers with late entry into prenatal care and those with Medicaid were also less likely to seek care for dental problems experienced during pregnancy [8].

Unfortunately, numerous barriers to obtaining proper dental care during pregnancy persist [4-6]. Access to providers and payment is an issue; many private health insurance plans do not cover dental care, and coverage of dental services by Medicaid varies by state. In a recent study of barriers to receiving dental care during pregnancy, women with low income or of a minority race/ethnicity reported the following reasons for not seeking care: employment situation, time constraints, ability to pay for care, personal perception of dental experience, and perceived attitudes of dental providers and office staff toward clients from minority populations [9]. Pregnancy symptoms such as nausea and vomiting, gum sensitivity, and odor/taste aversions, can also both increase the risk of oral problems and discourage women from seeking dental care due to discomfort.

Among the most critical barriers is a gap in general knowledge and practice among both pregnant women and their prenatal care providers regarding oral health during pregnancy. A series of research surveys was recently conducted in North Carolina to further evaluate such gaps in knowledge and practice in the state [10-12]. Half of the surveyed pregnant women did not know it was safe to receive routine dental care like check-ups and cleanings during pregnancy [10]. Many women also believed that tooth loss is a normal occurrence during pregnancy. Misconceptions about oral health during pregnancy were more common among black and Hispanic women, as well as women with fewer years of education. Though obstetricians surveyed recommended childbirth classes (100%), breastfeeding consultations (89%), and genetic screening (69%) to their patients, only 51% recommended any dental exams [11]. Only half of obstetricians reported ever looking into their patients' mouths during routine prenatal exams. Among the surveyed nurse practitioners and certified nurse midwives, the majority (87%) agreed that periodontal disease is a risk factor for adverse pregnancy outcomes [12]. However, less than half of these providers reported ever being trained to provide an oral health exam, and 20% indicated that providing an oral exam was the responsibility of dental professionals. These

studies and others suggest that primary care providers do not routinely address the importance of oral care during pregnancy. In a collaborative effort to promote the importance and safety of dental care during pregnancy, and in an effort to assist health professionals in providing oral health services to pregnant women and their children, the California Dental Association Foundation and District IX of the American College of Obstetricians and Gynecologists (ACOG) recently developed comprehensive, evidence-based guidelines for practitioners [13]. These guidelines can be found online at http://www.cdafoundation.org/Portals/0/pdfs/poh_guidelines.pdf.

Fortunately, most of the barriers to improving the oral health of women during pregnancy can be addressed with coordinated effort from public health professionals, dental health practitioners, and prenatal care providers. Oral health promotion should incorporate education for women and health care providers alike about the particular importance of seeking dental care and treatment during pregnancy. In fact, pregnancy may be an optimal time to encourage oral hygiene and regular dental care, since expectant mothers may be more receptive to making positive long-term changes in their health behaviors. This effort presents a real opportunity to improve oral health, perinatal outcomes, and the overall health of both mothers and children in North Carolina. **NCMJ**

Tania A. Desrosiers, PhD, MPH epidemiologist, North Carolina Center for Birth Defects Research and Prevention, Department of Epidemiology, Gillings School of Global Public Health, University of North Carolina-Chapel Hill

Robert E. Meyer, PhD, MPH director, North Carolina Birth Defects Monitoring Program, State Center for Health Statistics, Division of Public Health, North Carolina Department of Health and Human Services, Raleigh, North Carolina, and adjunct professor, Department of Maternal and Child Health, Gillings School of Global Public Health, University of North Carolina-Chapel Hill.

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