

Original Contributions

Trends in annual dental visits among US dentate adults with and without self-reported diabetes and prediabetes, 2004-2014

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ABSTRACT

Background. The authors assessed the trends of annual dental visits in dentate adults with diabetes or prediabetes or no diabetes, and assessed whether the racial and ethnic disparities in dental visits changed from 2004 through 2014.

Methods. Data for this analysis came from the Behavioral Risk Factor Surveillance System, a US health survey that looks at behavioral risk factors that was developed by the Centers for Disease Control and Prevention in cooperation with state health departments. Respondents indicated whether they had a dental visit in the past 12 months. Weighted proportions were calculated for annual dental visits in adults by diabetes status, and trends were assessed by racial and ethnic groups.

Results. From 2004 through 2014, the proportion of annual dental visits declined from 66.1% to 61.4% (trend $P = .02$) in the diabetes group, 71.9% to 66.5% (trend $P = .01$) in the no diabetes group, and 66.0% to 64.9% (trend $P = .33$) in the prediabetes group. Age, income, and health insurance were moderators of the association between diabetes status and dental visits. Overall, the racial and ethnic disparity in dental visits did not change significantly during the period.

Conclusions. Dental visits and services were less frequent in people with diabetes and prediabetes. Racial and ethnic disparities in use of dental services persisted during the observed period.

Practical Implications. All patients, especially those with diabetes, are encouraged to visit a dentist at least annually. It is important for health care providers, such as primary care physicians and dental care and public health professionals, to make concerted efforts to promote oral health care in diabetes management. Improving access to dental services is vital to achieving this goal.

Key Words. Dental visits; diabetes; racial disparity.

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D iabetes is a chronic disease that contributes to many complications including heart disease, stroke, blindness, kidney disease, and periodontal disease.¹ In 2015, an estimated 30.3 million people in the United States (9.4% of the population) had diabetes; an additional 84.1 million (33.9%) had prediabetes, putting them at high risk of developing diabetes.² By 2050, it is expected that approximately 48.3 million adults will have diabetes.³ The prevalence of diabetes is higher in minority populations: 13.4% in those who are non-Hispanic black and 11.9% in those who are Hispanic compared with 7.3% in those who are non-Hispanic white.²

Numerous studies show a bidirectional relationship between diabetes and periodontal disease; diabetes has an adverse effect on periodontal health, whereas periodontal infection has an adverse effect on glycemic control and diabetes complications.^{4,5} Regular dental visits provide opportunities for prevention, early detection, and treatment of periodontal disease among dentate adults, which would have a potential positive effect on the management of diabetes and prevention of diabetes complications.⁶

A few cross-sectional studies have shown that people with diabetes had fewer dental visits than those without diabetes.⁷⁻¹⁰ There were also significant racial and ethnic and socioeconomic disparities in dental care among this population. These studies used data collected in 2004 or earlier. Newer data on dental care visits among those with diabetes have not been published. Furthermore, to our knowledge, no research has been conducted to assess the trends of dental care visits in

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populations with diabetes, prediabetes, and no diabetes or the trend of racial and ethnic disparities in dental visits. Thus, it is important to examine dental care visits and trends using recent national data.

The objectives of this study were to assess the trends and compare the proportions of annual dental visits among dentate adults (those having at least 1 natural tooth) across 3 groups: those with self-reported diabetes, those with prediabetes, and those with no diabetes. In addition, the study assessed whether the racial and ethnic disparities in dental visits in these populations changed from 2004 through 2014.

METHODS

Data

We used data for this analysis from the Behavioral Risk Factor Surveillance System (BRFSS), an annual state-based, random-digit–dialed telephone survey of the noninstitutionalized, US civilian adult population. The survey, developed by the Centers for Disease Control and Prevention in cooperation with state health departments, collects health information including health-related behavior risk factors, preventive health practices, health care access, and chronic conditions. The BRFSS questionnaire consists of 3 sections: a core survey, optional modules, and state-added questions.¹¹ In the core questionnaire, respondents were asked whether they had ever been told by a physician that they had diabetes. A prediabetes answer option was included in 2004. Oral health questions were first included in the Core Questionnaire in 1999 and have been in even-numbered years since 2002.¹² This analysis included data from 2004—the earliest time in which prediabetes data were collected—through 2014—the latest year for which BRFSS data were available at the time of this analysis. Patients who had no teeth were excluded because the dental care pattern would be different between those with and without natural teeth.¹³ The study sample included 2,500,257 dentate respondents 21 years and older, including 248,203 with diabetes, 30,520 with prediabetes, and 2,221,534 with no diabetes, who participated in the even-year surveys (that is, 2004, 2006, 2008, 2010, 2012, and 2014).

Measures

Dental Visits

The main outcome variable for this study was having a dental visit in the past year. Respondents were asked, “How long has it been since you last visited a dentist or a dental clinic for any reason?” In this analysis, respondents were classified as having had a dental visit in the past year if they indicated they had a dental visit either in the last 6 months or more than 6 months ago but not more than 1 year ago. Thus, the variable was coded as a binary outcome (yes or no).

Diabetes Status

Respondents were asked, “Have you ever been told by a doctor that you have diabetes?” The response options were “Yes”; “Yes, but [female] told only during pregnancy”; “No”; “No, prediabetes or borderline diabetes”.

Based on their responses to the question, respondents were classified into 3 groups: diabetes, prediabetes, and no diabetes (including those who were told that they had gestational diabetes).

Dentate Status

In the BRFSS oral health module, respondents were asked, “How many of your permanent teeth have been removed because of tooth decay or gum disease?” The response options included “1-5,” “6 or more, but not all,” “All,” and “None.” Respondents were classified as edentulous if they answered that they had lost all permanent teeth and were excluded from analysis ($n = 234,209$). Missing 6 or more teeth is considered to be significant tooth loss.¹⁴ Dentate respondents (that is, those who did not lose all of their teeth) were classified into 3 groups: no missing teeth, 1 to 5 teeth missing, and 6 or more missing teeth, but not all.

Covariates

Demographic and socioeconomic status (SES) characteristics were considered as potential covariates. Demographic variables included age (21-44, 45-54, 55-64, 65-74, and 75+ years), sex (female = 1), race and ethnicity (non-Hispanic white [whites], non-Hispanic black [blacks], Hispanics, and other race), and marital status (married or living with partner versus others). SES

ABBREVIATION KEY

BRFSS: Behavioral Risk Factor Surveillance System.

NS: Not significant.

SES: Socioeconomic status.

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