Racial Differences in Baseline Treatment Preference as Predictors of Receiving a Dental Extraction Versus Root Canal Therapy During 48 Months of Follow-Up

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Abstract

Objective: *This study aimed to test hypotheses that: a) treatment preference as stated at baseline predicts subsequent receipt of extraction (EXT) versus root canal treatment; and b) racial differences in treatment preference at baseline account for racial differences in receipt of these treatments during follow-up.* ***Methods:*** *Data were taken from the Florida Dental Care Study. This stratified random sample included at baseline 873 subjects, all of whom were 45 years old or older, reported race as non-Hispanic African American or non-Hispanic white, and had at least one tooth. At baseline, participants were asked about past dental care characteristics, history of or current presence of various dental diseases and conditions, and socio-demographic circumstance. An EXT/root canal treatment "CHOICE" scenario was also queried at baseline. Predisposing, enabling, and need factors were tested as predictors of EXT/root canal treatment received during follow-up. Bivariate multivariable logistic regression analyses quantified associations between the outcomes (EXT/root canal) and the predictors.* ***Results:*** *Receipt of EXT or root canal treatment during follow-up was strongly related to race even after people with mobile teeth at baseline were excluded from the analysis. Certain baseline factors (tooth mobility, periodontal attachment level, and ability to pay an unexpected dental bill) strongly predicted EXT/root canal treatment receipt during follow-up, although significant race effects remained; however, including "CHOICE" removed the race effect.* ***Conclusions:*** *Baseline treatment preference strongly predicts subsequent receipt of EXT versus root canal treatment. Racial differences in treatment received during follow-up were explained by baseline racial differences in treatment preference, tooth mobility, and periodontal status.*

Key Words: race, treatment preference, root canal therapy, dental extraction

Introduction

Because tooth loss can have a substantial impact on oral health, and because consensus among clinicians is that root canal therapy (RCT) is advisable over extraction (EXT) when RCT is a feasible treatment option and/or when the number of occluding units would not be suitable otherwise (1-3), it is important to identify factors that may contribute to the decision to extract or retain a tooth. To our knowledge, no previous studies have investigated whether treatment preference as expressed by patients in a hypothetical scenario during a baseline interview predicts subsequent receipt of EXT versus RCT. Such analyses should help elucidate the role that patients' preferences for certain types of treatment have on subsequent receipt of that treatment.

Treatment preferences may also play a role in understanding racial differences in oral health. The substantial racial differences in oral health observed in epidemiologic studies (4,5) may be influenced by racial differences in these treatment preferences. However, to our knowledge, no previous studies have investigated the relationship between these factors and subsequent treatment receipt as a possible cause of racial differences in oral health.

Analyses from the Florida Dental Care Study (FDCS), a longitudinal observational cohort study of dental health and dental care, have shown that, when compared to their high socioeconomic status (SES) and non-Hispanic white (NHW) counterparts, low-SES persons and African Americans (AAs) have more negative attitudes toward dental care, worse dental health, and more tooth loss, and are less likely to know what a root canal procedure in dentistry is (5-8). A recent study of military veterans observed significant racial differences in receipt of RCT and preventive treatment (9). The authors speculated that racial differences in treatment receipt were at least in part because of racial differences in treatment preferences. To investigate this hypothesis, we recently conducted an analysis using FDCS baseline data and determined that substantial racial differences in treatment preference between EXT and RCT do indeed exist, with AAs being much more likely to prefer EXT over RCT in a hypothetical scenario (10). A key advantage of this hypothetical scenario was that racial differences in

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patient–provider interactions and clinical factors could not come into play, and therefore, could not confound the analysis. Having demonstrated these racial differences in a hypothetical baseline scenario, the question then arose whether or not these racial differences in treatment preference might explain the racial differences in receipt of EXT and RCT that we also observed during longitudinal follow-up from this sample (8).

Therefore, the objective of this report was to test: a) hypothesis 1 – that treatment preference as stated at baseline predicts subsequent receipt of EXT versus root canal treatment; and b) hypothesis 2 – that racial differences in treatment preference at baseline account for racial differences in receipt of these treatments during follow-up, once racial differences in SES and periodontal status have been taken into account.

Methods

Study Design. A stratified random probability sample was utilized. Details of sampling methodology and selection are provided in an earlier publication (11). The 873 subjects who participated at baseline resulted in a representative sample of the population of interest. Participants were persons 45 years old or older, who had a telephone, did not reside in an institutional setting, resided in one of four counties in north Florida, could engage in a coherent telephone conversation, reported race as non-Hispanic AA or NHW, and had at least one tooth. This sample had a baseline dental care recency that was very similar to National Health Interview Survey data, and conclusions regarding sociodemographic determinants of dental care recency were the same (11,12). Additionally, the percentage of the sample that had one or more dental visits in the first 2 years of the FDCS, 77 percent, was very similar to the figure, 75 percent, among the comparable group of National Health Interview Survey respondents (11,12).

An in-person interview was conducted at baseline, which was immediately followed by a clinical dental examination. The baseline interview and clinical examination were followed by telephone interviews at 6, 12, 18, 30, 36, and 42 months following baseline. At 24 and 48 months, the interviews were done in-person and were followed immediately by a clinical examination. During the 24-month interview, we asked participants for written permission to review and abstract information from their dental records. Of the 764 persons who participated for the 24-month interview, all but four gave us that permission. For the 48-month time point, the mean [standard deviation (SD)] number of months that the interview/examination actually took place was 48.3 (0.8).

Dental Chart Data Collection Methods. Following a pilot study and training to achieve high inter-rater reliability, dental hygienist research assistants abstracted from each chart the dates of visit, teeth/areas treated, and American Dental Association procedure codes (13).

Of the 286 practices named by FDCS subjects, all but 10 practices participated. Of the 764 persons who participated for the 24-month interview, 677 (86 percent) ultimately reported at least one dental visit during the first 48 months of the study. Of those 677, we located dental records of 619 individuals. A total of 618 had a documented dental visit during their 48 months of follow-up. Charts varied in comprehensiveness, but in conjunction with office staff consultation, all practices had adequate records of what procedures were performed.

Results were weighted using the sampling proportions in order to reflect the population in the counties studied, using an algorithm that minimized the variance inflation from sample design effects (11). The only instance where unweighted numbers are used in this report relates to calculating attrition rates. The sample was weighted at baseline such that the weighted and unweighted sample sizes were both 873. With attrition in the sample longitudinally, the weighted and unweighted sample sizes gradually differed because attrition rates differed by race, age group, sex, and household income. This is because different race, age, sex, and income groups had different sampling weights owing to the fact that certain high-risk groups (AAs, poor persons, rural persons) were sampled at higher rates to increase the precision of estimation in these smaller subgroups of the population.

A Model of Health Services Utilization. We used the behavioral model of Andersen (14) to guide questionnaire content, data collection, and data analysis. In this model, health care utilization is the result of characteristics of the population and the health care delivery system. Patient-level characteristics can be summarized as predisposing, enabling, and need characteristics. *Predisposing* characteristics are those that exist prior to disease (Table 1). Treatment preference is an example of a predisposing characteristic.

Table 1
Baseline Factors Tested as Predictors of Extraction/Root Canal Therapy (RCT) During Follow-Up

Predisposing characteristics	Enabling characteristics
Race	Poverty status
Age	Ability to pay an unexpected $500 dental bill
Gender	Dental insurance
Level of formal education	
Area of residence (rural/urban)	Need characteristics
Approach to dental care	Periodontal attachment level
Knowledge/Experience with RCT	Severely mobile teeth
CHOICE scenario	Number of teeth present

Response categories for all the variables in Table 1 are included in Table 2.

Enabling characteristics are resources, such as household income or health insurance (Table 1), that affect one's ability to access the health care system and obtain specific treatment procedures. *Need* variables reflect illness that requires service use; examples are the oral health measures listed in Table 1. Our analytic steps were guided by the theory in this model of health care behavior, as well as by clinical realities that guided our understanding of treatment and its etiology. Therefore, some analyses only included persons who received an EXT and/or RCT treatment. Other analyses excluded certain persons for whom an RCT was not a feasible treatment alternative (e.g., persons who had a severely mobile tooth). In this manner, theory drives the analytic method, such that the putative role of treatment preference can be investigated with the etiology of treatment receipt in mind.

Data Gathering Stages. Although the study began at baseline with 873 participants, by 48 months 85 percent (weighted $n = 743$; unweighted $n = 714$) remained in the study. Reasons for nonparticipation through 48 months included death ($n = 55$), refusal ($n = 35$), loss to follow-up ($n = 34$), and medical inability ($n = 7$). The issue of bias in the sample because of attrition was assessed by comparing characteristics of those who participated at 48 months for an interview with those who did not for any reason. Persons who participated were more likely to have been white, have graduated high school, were above the 100 percent poverty threshold, free of severe loss of periodontal (gum) attachment at baseline, free of root fragments at baseline, free of loose teeth at baseline, able to pay an unexpected $500 dental bill as reported at baseline, and to have had a household income at or above USD $20,000 (Pearson and Mantel–Haenszel χ^2 tests, $P < 0.05$). No differences in participation were observed with respect to age group, sex, rural or urban area of residence, whether or not the participant was above the 150 percent poverty threshold, present financial situation (income meets expenses), presence of active dental caries at baseline, or whether or not they had dental insurance.

As examples of the typical magnitude of this bias because of attrition, of the persons at baseline ($n = 873$), 47 percent reported that they had been to a dentist in the previous 6 months. If the baseline had only included persons who ultimately participated for the 48-month clinical examination, then that figure would have been 49 percent. The mean (SD) number of teeth present at baseline among the persons who participated through 48 months was 22.2 (7.0); for the nonparticipants, it was 21.3 (7.5). This difference was not statistically significant ($P > 0.05$).

In the process to evaluate the choice between EXT and RCT, we judge that it is important only to include persons who actually faced an EXT/RCT choice. Because of this, we excluded from analysis all persons who did not have an RCT and/or EXT during follow-up, as well as persons for whom an EXT was most likely the only treatment possibility (i.e., persons with severely loose tooth at baseline).

Questionnaire Content. At baseline, participants were asked about past dental care utilization behavior, dental attitudes, oral hygiene habits, history of or current presence of various dental diseases and conditions, and sociodemographic circumstance. Questionnaire content and test–retest reliability of questions have been described previously (5,8,10,15). Table 1 lists factors that were tested for their association with receipt of EXT or RCT during follow-up. The wording of all FDCS questionnaire items can be viewed at the Internet site listed in the Acknowledgments section, but two in particular warrant discussion here.

The participants were asked to describe their "approach to dental care" as: a) "I never go to a dentist"; b) "I go to a dentist when I have a problem or when I know that I need to get something fixed"; c) "I go to a dentist occasionally, whether or not I have a problem"; or d) "I go to a dentist regularly." For the purpose of this report, persons who responded "a)" or "b)" were classified as "problem-oriented attenders," and those who responded "c)" or "d)" were classified as "regular attenders."

An EXT/RCT "CHOICE" scenario was queried at baseline:

- Suppose you had a toothache in a lower back tooth, and the dentist told you that you could save the tooth instead of pulling it. However, to save the tooth, you would need to have a root canal and a cap or crown. What would you do?
  a. Get the root canal and cap or crown.
  b. Get the tooth removed.
  c. I do not know.
- Suppose the bad tooth could be pulled in one visit for $40. The root canal and cap would take five visits and cost $950. Knowing all this, what would you do?
  a. Have the tooth extracted.
  b. Get the root canal and cap.
  c. I do not know.

These responses were then summarized as: a) extract the tooth before even knowing the cost of treatments; b) extract, but after knowing the cost of all treatments; or c) have RCT or "do not know" despite knowing costs.

Clinical Examination Methods. Worst attachment level was recorded for each tooth at baseline, 24, and 48 months on persons for whom there was no refusal or medical contraindication to doing so. For attachment level relative to the cemento–enamel junction (CEJ), the worst site per tooth was recorded, although six sites around each tooth were measured. Attachment level was calculated by subtracting the gingival recession measurement from the pocket depth measurement. For pocket depth, measurement was made from the crest of the gingival margin to the base of the sulcus or pocket. For recession, measurement was made from the CEJ to the crest of the gingival margin. If the crest was coronal to the CEJ, it was recorded as a positive number. If the crest was apical to the CEJ, recession

was recorded as a negative number. Teeth were considered severely mobile if they had nonphysiologic occluso-apical movement or more than 2 mm bucco-lingual movement.

Statistical Methods. All analyses were done using SAS software version 9.1 (16). The Pearson χ^2 test was used for analyses in Table 2.

Because persons could and did in some instances receive both an EXT and RCT during follow-up, statistical tests incorporating correlation between the two service types (EXT, RCT) and factors associated with it (e.g., race, ability to pay, baseline treatment preference, etc.) were done using generalized estimating equations (GENMOD procedure in SAS). Statistical testing utilized single simultaneous regression equations for the two binary outcomes (EXT, RCT) implemented with a bivariate (two outcomes) multivariable (multiple explanatory covariates) logistic regression model. Because a single factor could influence receipt of both an EXT and RCT, valid statistical testing required that the two service types be tested simultaneously. This is in contrast to performing separate statistical tests (i.e., logistic regressions) for each of the two service types, which would preclude direct comparison of parameter estimate magnitudes and statistical testing results. We used accepted procedures to assess model diagnostics, goodness of fit, and multicollinearity (17).

A note regarding the stepwise nature of our modeling technique is warranted. We adopted a stepwise technique because of our interest in specifically testing effects because of race and because we had multiple measures of predisposing, enabling, and need characteristics. Evaluation of the final models (models 1 and 2 in Table 3) utilized $P < 0.05$ as the criterion for statistical significance. Because of an expected and a confirmed amount of redundancy and multicollinearity among the multiple enabling characteristics listed in Table 1, only "ability to pay" was retained because it had the largest standardized estimate. Need characteristics were tested as a group, and

Table 2
Percent of Persons Who Received an Extraction (EXT), Root Canal Therapy (RCT), or Both During 48 Months of Follow-Up, by Baseline Characteristic and After Excluding the 67 Persons Who Had a Severely Mobile Tooth at Baseline

Baseline characteristic (*n*)	EXT only (*n* = 101)	RCT only (*n* = 60)	Both (*n* = 26)
Sociodemographic			
Race*			
African American	75	15	11
Non-Hispanic White	49	36	15
Age†			
45-64	54	33	14
65 or older	55	31	14
Gender†			
Male	56	36	8
Female	52	29	18
Education (high school graduate)*			
Yes	50	34	16
No	77	19	4
Area†			
Rural	60	26	14
Urban	48	39	14
Approach to dental care*			
Problem-oriented attender	67	22	11
Regular attender	45	39	16
Knowledge and experience with RCT			
Do you know what an RCT is?*			
Yes	48	36	16
No	76	20	4
Has a dentist ever recommended an RCT?*			
Yes	42	40	17
No	72	19	9
Have you ever had an RCT?*			
Yes	43	42	15
No	68	20	12
Response to "CHOICE" variable*			
EXT before knowing cost	71	7	23
EXT after knowing cost	67	29	5
Do not know/get RCT	43	41	16
Income level			
Below 100% poverty level*			
Yes	84	14	3
No	48	36	16
Ability to pay an unexpected $500 bill*			
Able to pay comfortably	42	39	19
Able to pay, but with difficulty	62	30	8
Not able to pay	77	10	13
Covered by any type of dental insurance†			
Yes	54	35	11
No	54	31	15
Worst attachment level (mm)*			
2-5	40	43	17
6-9	64	22	14
9+	85	5	10
Number of teeth present*			
1-8	66	0	34
9-16	83	13	4
17-24	45	41	14
25-32	54	31	15

* The association between the baseline characteristic and incident receipt of EXT/RCT is statistically significant, $P < 0.05$ (Pearson χ^2 test).
† Not statistically significant.
This table excludes the 67 persons who had a severely mobile tooth at baseline.

Table 3
Two Bivariate Multivariable Logistic Regressions of Whether Extraction (EXT) or Root Canal Therapy (RCT) Was Received During Follow-Up, Showing Effects as Odds Ratios

Covariate(s)	Point estimate of odds ratios (95% CI)	
	EXT	RCT
Model 1		
Race*	***3.07 (1.01, 9.38)***	0.39 (0.14, 1.07)
Able to pay, but with difficulty†	1.49 (0.61, 3.66)	***0.41 (0.17, 0.99)***
Not able to pay†	5.99 (0.94, 38.15)	***0.19 (0.06, 0.65)***
Worst attachment level 6-8 mm‡	2.35 (0.94, 5.86)	***0.36 (0.15, 0.82)***
Worst attachment level 9+ mm‡	***11.31 (1.25, 102.34)***	***0.14 (0.03, 0.76)***
Model 2		
Race*	2.02 (0.65, 6.28)	0.48 (0.15, 1.53)
Able to pay, but with difficulty†	1.33 (0.50, 3.53)	0.44 (0.17, 1.17)
Not able to pay†	1.65 (0.28, 9.57)	0.32 (0.06, 1.73)
Worst attachment level 6-8 mm‡	2.03 (0.80, 5.16)	***0.34 (0.14, 0.83)***
Worst attachment level 9+ mm‡	11.78 (0.89, 155.32)	***0.15 (0.03, 0.79)***
EXT after knowing the cost¶	6.10 (0.53, 68.99)	1.77 (0.42, 7.42)
EXT before knowing cost¶	***12.84 (1.15, 143.70)***	0.71 (0.37, 5.48)

* Race: 0 = non-Hispanic white; 1 = African American.
† The reference group is composed of persons who are able to pay comfortably.
‡ The reference group comprised persons whose worst attachment level at baseline was 0-5 mm.
¶ The reference group is composed of persons who said in the CHOICE scenario at baseline that they would choose to get the root canal and cap despite knowing the costs or do not know after hearing the costs.
Statistically significant ($P < 0.05$) odds ratios are shown in bold italic font.

only "worst attachment level" was retained because it was statistically significant.

Results

Analyses to Confirm That Racial Differences in Receipt of EXT/RCT Treatment During Follow-Up Existed in This Sample. Because of our interest in the effects of race and ability to pay on EXT and/or RCT during follow-up, we performed analyses to reveal their associations (results not shown in tabular form). A total of 41 percent ($n = 254$) of the 618 participants who had documented dental visits during the 48 months of follow-up had either an EXT, RCT, or both. Receipt of at least one of these services was strongly associated with race (53 percent of AAs, compared to 38 percent of NHWs; χ^2 test, $P < 0.005$) and ability to pay an unexpected $500 dental bill (34 percent of persons who were able to pay comfortably, compared to 46 percent of persons who were able to pay but with difficulty, and 64 percent of persons who were not able to pay; χ^2 test, $P < 0.001$). These results confirmed that race and ability to pay at baseline did indeed significantly predict receipt of EXT/RCT treatment during the subsequent 48 months of follow-up in this sample.

Racial Differences in Receipt of EXT/RCT Treatment During Follow-Up Were Evident Even After Limiting the Sample to Persons Who Had at Least One of These Treatments. Next, we limited analyses to persons who received one or both of these EXT or RCT treatments ($n = 254$). This was warranted because treatment preferences are most relevant when a person actually faces a circumstance in which treatment preference can be manifested, that is, only if a person has a need for this treatment and actually receives that treatment (EXT and/or RCT in this case).

Limited in this manner, the analysis continued to reveal significant racial differences and, in fact, the magnitude of the racial differences was larger. A total of 84 percent of AAs received EXT compared to 58 percent of NHWs; 6 percent of AAs received both an EXT and an RCT, compared to 13 percent of NHWs; 10 percent of AAs received RCT, compared to 29 percent for NHWs (χ^2 test, $P < 0.001$).

Analyses That Justified Removing "Presence of Severely Mobile Tooth at Baseline" from Further Analyses. One indicator of need for EXT is the presence of a severely mobile tooth. Preliminary analyses demonstrated that the presence of a severely mobile tooth at baseline was exceptionally associated with whether a person received an EXT: 99 percent of persons with a loose tooth at baseline ($n = 67$; based on direct clinical examination) received one or more EXTs during follow-up. Additionally, there were prominent racial differences in the prevalence of this condition (43 percent of AAs had one or more severely mobile teeth at baseline, compared to 21 percent of NHWs; χ^2 test, $P < 0.01$). Therefore, to eliminate this strong indicator of need for EXT from influencing subsequent analyses, the 67 persons with this condition at baseline were excluded from the remaining analyses. This was done to prevent this variable from biasing all subsequent analyses.

As shown in Table 2, once these persons had been excluded, a total of 75 percent of AAs received EXT compared to 49 percent of NHWs; 11 percent of AAs received both an EXT and an RCT, compared to 15 percent of NHWs; 15 percent of AAs received RCT, compared to 36 percent for NHWs (χ^2 test, $P < 0.05$).

Factors Associated with EXT/RCT Treatment. After the analysis was limited to persons who had EXT and/or RCT, and who did not have a severely mobile tooth at baseline, we tested whether other predisposing, enabling, and need factors were associated with receipt of EXT/RCT. These variables are listed in Table 1.

Table 2 reveals the predisposing variables that were associated with EXT/RCT receipt. Note that response to the CHOICE variable was strongly predictive, consistent with hypothesis 1. Each of the enabling factors was associated with EXT/RCT receipt except for the dental insurance variable.

Worst periodontal attachment level and number of teeth present were the only baseline need variables listed in Table 2 that were associated with EXT/RCT receipt, although "presence of severely mobile tooth at baseline" (not shown in Table 2) was in all cases associated with severe periodontal attachment loss.

Bivariate Multivariable Logistic Regression Analysis. Table 3 shows the results of bivariate (two outcomes modeled simultaneously: EXT and RCT) multivariable (multiple predictors) logistic regressions of receipt of EXT or RCT during follow-up. Because of the interest in testing hypothesis 2, we first developed a regression that included enabling and need characteristics in addition to race. "Ability to pay" was used as the measure of enabling characteristics because preliminary analyses suggested that its association with EXT/RCT was the strongest among the enabling characteristics. Need characteristics were tested as a group, and only "worst attachment level" was retained because it was statistically significant, such that the regression with race and the enabling and need characteristics are shown as "model 1" in Table 3.

Preliminary analyses tested the remaining predisposing variables as a group. Only the CHOICE variable was retained because only it was statistically significant when the remainder of the predisposing group was tested. Hypothesis 2 was tested using "model 2" in Table 3. The race variable was no longer statistically significant in model 2 – consistent with the conclusion that racial differences in treatment preferences at baseline accounted for racial differences in receipt of these treatments during follow-up.

For the sake of parsimony, a regression with only two predictor variables (located at http://nersp.nerdc.ufl.edu/~gilbert/supplemental.html) was also tested, which only included the "worst attachment level" and CHOICE variables. The model fits of model 2 and this parsimonious model were not significantly different.

Discussion

As with any hypothetical clinical scenario, no single, easy-to-understand scenario that participants would tolerate in a research interview context can encompass all clinically relevant circumstances that might occur post-baseline. For example, the CHOICE variable did not require that participants state whether they would replace the extracted tooth, and if so, whether they would choose to do so using a removable prosthesis or a fixed prosthesis. Nonetheless, at least for the circumstances that occurred post-baseline in the FDCS sample, the predictive validity of this hypothetical scenario was high. To our knowledge, this is the first report in the literature to demonstrate that response to a hypothetical clinical scenario at baseline is an excellent predictor of subsequent EXT or RCT receipt. This finding is consistent with a conclusion that treatment preferences play a significant role in predicting treatment receipt in population-based studies of oral health, and therefore, that their inclusion is important.

The CHOICE scenario measured patient preferences; it was not designed to also include dentist preferences and the role of characteristics of the dental practice that is attended. Some dentists may place less emphasis on preservation of all teeth, and instead place more emphasis on the patient having a sufficient number of occluding pairs (3). Previous work from the FDCS has demonstrated that which dentist and which dental practice is attended also influence receipt of specific treatment procedures (5,8,18,19). The current analysis and the previous work from the FDCS provide a sequence of analyses that suggests that receipt of these treatments is the result of a series of influences, beginning with incidence of disease and its determinants, a patient's decision to enter the dental care system, and then once there, an interplay between patient's treatment preferences, clinical circumstance, and characteristics of the practice and dentist from which that patient happens to seek treatment.

Although we have demonstrated that this sample had much in common with what would have been derived from a comparable national study (11,12), we remind the reader that generalization is with regard to the defined population of interest, and studies from other AA and NHW populations are advisable. A key strength of this study is that it was derived from a population-based sample without regard to past dental care use or current access to the dental care system. Also, loss because of attrition was low and dental care was delivered in representative dental care environments. However, there was differential attrition across subgroups of the sample, and this could have affected conclusions from the study.

Receipt of EXT or RCT within this study population was strongly related to race. Whether or not the subject had a tooth with severe mobility at baseline strongly predicted EXT versus RCT, as did worst baseline attachment level; nonetheless, a significant race effect remained. Our findings demonstrate that AAs are less likely to receive an RCT compared to NHWs. This is in agreement with a study that examined whether racial differences existed in a population of Veterans Affairs patients; AAs and those of unknown race were less likely overall to have received RCT than NHWs (9). Our FDCS findings improved our understanding of why this could be the case, because we were able to go past the factors commonly adjusted for in the literature to date (namely, income, education, age). These racial differences were explained by racial differences in baseline treatment preference, baseline tooth mobility, and baseline periodontal attachment level.

Some investigators have speculated that patient refusal may contribute to racial differences in care received, noting that AA patients may be more likely to refuse certain types of treatment (20-24). Other studies found no racial differences in rates of

refusal of recommended procedures, or found that patient refusal does not fully account for differences in receipt of care (25,26). Our findings are consistent with the conclusion that race is strongly associated with treatment receipt, but that racial differences in treatment preference, ability to afford treatment, and clinical disease statistically account for these racial differences in treatment receipt. Associations between patient preferences and treatment acceptability have been evident within the oral health context (27,28). It has been hypothesized that these patient factors may be the driving force in the racial differences seen in the lower receipt of some medical procedures (29,30).

Oral health is an important component of health through its impact on quality of life and its contributions to certain medical conditions. These findings from the FDCS help elucidate the complex interactions and pathways that ultimately lead to racial differences in oral health (5), differences that have a substantial impact on public health (4). Additional research is needed to better understand the possible roles that treatment preferences and patient–provider interactions may play as contributors to racial differences in health.

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