



Published in final edited form as:

J Am Dent Assoc. 2020 July ; 151(7): 527–535. doi:10.1016/j.adaj.2020.04.013.

Oral Health Related Quality of Life and Unmet Dental Needs among Women Living with HIV

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Disclosure. None of the authors reported any disclosures.

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Abstract

Introduction: Oral health related quality of life (OHRQOL) is a multidimensional, perception-based measure of how oral health impacts social and physical functioning and self-image.

OHRQOL is important to assess among women living with HIV (WLWH) who may have unmet dental needs and experience disparities that impact dental care accessibility.

Methods: In 2016, we conducted an assessment of OHRQOL among a national sample of 1,526 WLWH in the Women's Interagency HIV Study using the Oral Health Impact Profile (OHIP-14) instrument, which assesses the frequency of 14 oral impact items. OHRQOL was measured using multivariable linear regression with a negative binomial distribution to assess the association between report of a recent unmet dental need and OHRQOL.

Results: "Fair/poor" oral health condition was reported by 37.8% (N= 576) of WLWH. Multivariable linear regression showed that unmet dental needs, compared to not having unmet needs, had the strongest positive association with poor OHRQOL (difference in OHIP mean=2.675; $p < 0.001$). Frequency of dental care utilization was not associated with higher OHRQOL. Older age, fair/poor dental condition, smoking, symptoms of anxiety and loneliness, and poor overall health-related QOL were also associated with worse OHRQOL.

Conclusion: Self-perceived impact of oral health on social and physical function and self-image, as measured by OHRQOL, may be an easily assessable but under-recognized aspect of overall health related quality of life, particularly among women aging with HIV.

Practical Implications: Dentists should implement OHRQOL assessments in their management of patients with HIV to identify those who do have significant oral health impacts.

Introduction:

Health-related quality of life (HRQOL) is instrumental in assessing how a person's health and disease status affects functioning and overall quality of life (QOL).¹ Using a multidimensional approach, HRQOL instruments account for symptoms and functioning across social, mental, and physical domains based on the World Health Organization (WHO)'s 1948 definition of health as "a complete state of physical, mental, and social well-being and not just the absence of disease and infirmity."² Subsequent proposed definitions

have advocated for viewing health as the ability to manage daily life and achieve environmental balance and equilibrium, even in the presence of disease and its demands.³⁻⁵

HRQOL models for oral health were developed to assess oral health related quality of life (OHRQOL).⁶ Locker's 1998 OHRQOL model demonstrated the progression of dental disease into symptoms that inhibit physical and social functioning and promote negative perceptions of oral health, overall health, and general QOL.⁷ In 2000, the first and only current Surgeon General report on oral health acknowledged the significant role that oral health plays in overall HRQOL,⁸ noting that oral disease has the potential to "undermine self-image and self-esteem, discourage normal social interaction, and lead to chronic stress and depression."

The Oral Health Impact Profile (OHIP)⁹ is a well-validated, frequently utilized instrument to assess OHRQOL, consisting of seven conceptually identified subscales (functional limitations, physical pain, psychological discomfort, physical disability, psychological disability, social disability, handicap) based on Locker's model.⁷ Epidemiological studies using the OHIP have reported associations between lower OHRQOL with low socioeconomic status, smoking, and HIV.¹⁰⁻¹² OHIP studies also show that OHRQOL is adversely affected by aging and with experiencing an unmet dental need, such as need for receipt of removable appliances to restore function and the relief of dental pain or xerostomia.¹³

Oral health problems and unmet dental needs are common among people living with HIV (PLWH); aside from common dental diseases like caries and periodontitis, HIV-related oral lesions, such as oral human papilloma virus and opportunistic infections, are present in approximately one-third to over one-half of PLWH and can serve as early signs of HIV-infection.¹⁴⁻¹⁸ Additionally, PLWH who chronically take highly active anti-retroviral therapy are more likely to experience diminished salivary flow, which affects chewing, swallowing, and the ability to take medication.^{19,20} Study findings assessing unmet dental needs of PLWH in comparison to other healthcare treatment needs²¹⁻²⁶ have shown that unmet dental needs are twice as common compared to unmet medical needs,^{27,28} especially without dental insurance.²⁸⁻³⁰ PLWH encounter unique challenges for oral health disparities on account of hormonal changes, as well as barriers such as care-giving responsibilities, eclipsing medical needs, out-of-pocket expenses, and transportation difficulties that impede routine, preventive care.³¹⁻³⁴ Meanwhile, progress in HIV treatment has made it a chronic and manageable health condition, but recent studies in HIV-related HRQOL research have been limited to male populations.^{35,36} With oral health as a top unmet need in HIV, its potential to impact OHRQOL is significant.

The Women's Interagency HIV study (WIHS) initiated enrollment in 1994, with expansions in 2001, 2011, and 2015, and is the largest prospective cohort study of WLWH and at risk for HIV infection in the United States (U.S.). Between 1995 – 2005, a longitudinal WIHS oral health substudy was conducted,^{37,38} and beginning in 1998, a subset of WIHS participants at four sites participated in an OHRQOL study over eleven study visits. Median OHIP values for WLWH ranged from 27.5 – 28.4 (out of a possible range of 0 – 56), and untreated dental disease, poor oral health conditions, and smoking were consistently

associated with poorer OHRQOL.³⁸ As oral health data had not been collected in WIHS since the end of that substudy, an oral health questionnaire, including the OHIP-14, was administered in 2016 to collect current data of the cohort's oral health and OHRQOL. Therefore, the objective of this study was to examine how having unmet dental needs, as well as other demographic, behavioral, and clinical variables, affects the OHRQOL of women living with HIV (WLWH).

Methods:

Semiannual WIHS visits consist of a physical examination and extensive questionnaire after informed consent is given to ascertain sociodemographics, behavioral, and medical history.^{39,40} An oral health questionnaire was interviewer-administered during a 2016 follow-up visit at all sites (Chicago, IL; Bronx, Brooklyn, NY; Washington DC; San Francisco, CA; Atlanta, GA; Chapel Hill, NC; Birmingham, AL/Jackson, MS; Miami, FL) after Institutional Review Board approval. All women in WIHS were eligible for inclusion.

The primary dependent variable was OHRQOL assessed using the OHIP-14, which queries about the frequency of 14 oral impact items measured using a 5-item Likert scale with a numeric score ("Never (0)," "Hardly Ever (1)," "Occasionally (2)," "Fairly often (3)," "Very often (4)"). The 14 items were summed to calculate an overall score [range 0 – 56] where 0 indicates the best OHRQOL. The primary independent variable was participant's report of having an unmet dental problem during the prior six months that she did not see a dentist to address (yes/no).

Several demographic, dental, risk behavior, psychosocial, and health-related factors that may confound the association between self-reported unmet dental needs and OHRQOL were considered as covariates in the analysis. Demographic variables included age, race/ethnicity, and annual income. Self-reported oral health condition was assessed via Likert scale ["excellent," "very good," "good," "fair," or "poor"] then dichotomized as "good/very good/excellent oral health" and "fair/poor oral health." Typical frequency of dental care utilization was assessed by asking, "How often do you usually go to the dentist to have your teeth and/or mouth checked?" ["More than once/year," "Once/year," "Once/two years," or "Less than once/two years" then dichotomized to "At least once a year" and "Less than once per year"]. Risk behaviors included smoking history (current, former, never), and recent stimulant drug use (i.e., any use of crack, cocaine, or methamphetamine in the prior six months). Food security – the state of having reliable, available access to nutritious foods – was assessed using the U.S. Department of Agriculture's Household Food Security Survey Module, then dichotomized to "high/marginal food security" and "low/very low food security."⁴¹ Psychosocial factors included clinically relevant depressive symptom burden (i.e., 16 on the Center for Epidemiologic Studies – Depression (CES-D)),⁴² subjective loneliness experience (assessed by the 3-Item Loneliness Scale),⁴³ clinically relevant symptoms of anxiety (i.e., 10 on the Generalized Anxiety Disorder 7-Item (GAD-7) scale),⁴⁴ and social support (using the brief Sarason Social Support Questionnaire).⁴⁵ General health was assessed by participant rating of her perceived overall health using a 5-point Likert scale (dichotomized as "Excellent/Very good/good" or "Fair/Poor").⁴⁶ HRQOL – which reflects only health-related factors affecting QOL⁴⁷ – was calculated based on a

health index scale accounting for physical function, pain, emotion, social, role function and energy/fatigue domains, then dichotomized by median split into “Low” or “High.” Overall QOL – a concept inclusive of several factors affecting one’s life, such as material and spiritual influences⁴⁷ – was evaluated based on women’s rating between 0 – 10, and then dichotomized by median split into “Low” or “High.”

Statistical Analysis:

Data analysis was restricted to WLWH in WIHS. For descriptive statistics, overall frequencies of each independent variable and the dependent variable were calculated. In bivariate analysis, OHIP score was modeled against each independent variable to calculate the mean predicted OHIP score, mean probability of achieving a total mean OHIP score of zero, and expected number of OHIP scores equal to zero. Multivariable linear regression was conducted, with the final model including all covariates. Interaction terms were tested but lacked significance in the multivariate model. The analysis was conducted using SAS© Version 9.4.

Results:

Of the 2,156 women who completed the oral health questionnaire, 1,526 were WLWH and included in the analysis. Descriptive characteristics showed that over half of women (N=803, 52.6%) were over age 50 years, and almost three-quarters (N=1115, 73.1%) were Black/African-American (Table 1). Over one-third (N=576, 37.8%) reported “fair/poor” oral health conditions, and 70.9% (N=1079) reported annual dental care utilization.

The group means for each of the 14 OHIP items were all less than 1 (hardly ever; range 0 – 4), and highest for items assessing the presence of painful aching in the mouth (mean = 0.52, SD = 0.03), discomfort while eating (mean = 0.62, SD = 1.14), and feeling self-conscious about dental problems (mean = 0.67, SD = 1.26). The overall mean of summed OHIP-14 scores [range 0 – 56] was 5.12 (SD 9.21). The overall median was 0, and the median of non-zero scores (N=688) was 8.0. The score distribution showed an asymmetric, unimodal distribution skewed to the right and centered around 0 as 54.1% (N= 838) of scores were zero. Due to this distribution, bivariate analysis was conducted using a negative binomial (NB) distribution and chi-square test for significance to calculate the mean predicted OHIP score, mean probability of an OHIP score =0, and expected number of OHIP scores =0 for each variable. A zero-inflated NB distribution was tested, but due to minimal statistical improvement, the NB distribution was used.

Having an unmet dental need was associated with a higher mean predicted OHIP (mean=12.22) and lower mean probability of a zero score (probability=0.419) than not having an unmet need (mean=3.45, probability=0.544, $p < .001$). Mean predicted OHIP scores were higher for women over, versus less than, age 50 (mean=6.02 vs. 4.13, $p = 0.001$) and with annual incomes less than versus more than \$12,000 (mean = 6.55 vs. 3.65, $p < .001$). Both self-reported “poor/fair” oral health condition (mean=9.30) and less-than-annual dental care utilization (mean= 6.50) were associated with higher mean OHIP scores compared to “good/excellent” oral health conditions (mean=2.59, $p<.001$) and annual dental care utilization (mean=4.57, $p=0.007$). Several risk behaviors were associated with higher

mean OHIP scores: low versus high food security (mean=8.60 vs. 4.17, $p<.001$), recent versus no recent stimulant drug use (mean=6.58 vs. 5.01, $p<.001$), former (mean=5.05) versus current (6.83, $p=0.003$) versus never smoker (3.20, $p<.001$). Mean OHIP summary scores were higher for each psychosocial variable: increased report versus no report of depressive symptoms (mean=9.65 vs 3.12, $p<.001$), increased report versus no report of anxiety symptoms (mean=10.73 vs. 3.88, $p<.001$), report versus no report of experiencing loneliness (mean=7.37 vs. 2.89, $p<.001$), and low versus high social support (mean=7.21 vs. 3.67, $p<.001$). Finally, variables reflecting poor general health were significantly associated with higher OHIP mean scores than those reflecting better general health [CD4 count below versus above 200 cells/m³ (mean=6.24 vs. 5.08, $p<.001$; low versus high overall QOL (mean=5.17 vs. 5.09, $p<.001$), poor/fair versus good/excellent perceived overall health (mean=7.86 vs. 4.50, $p<.001$), low versus high HRQOL: mean=7.92 vs. 2.35, $p<.001$].

Multivariable linear regression analyses showed that having an unmet dental need had the strongest association with impaired OHRQOL (Table 2). The predicted OHIP score changed by a factor of 2.68 ($p<.001$) when an unmet dental need was reported, when controlling for other variables. Age was the only sociodemographic variable that maintained its significance in the final model. Women older than age 50 years had a higher predicted mean OHIP score (parameter estimate (PE) = 0.44, standard error (SE) = 0.11, $p <.001$) than women 50 years or younger. While annual dental care utilization was not associated with mean OHIP score in adjusted models, poor perceived dental condition was associated with an increase in mean predicted OHIP score by 2.58 ($p<.001$). The only health risk behavior associated with mean predicted OHIP score in adjusted models was smoking status; former or current smokers evidenced higher mean predicted OHIP scores by a factor of 1.34 ($p=0.037$) and 1.40 ($p=0.015$), respectively. Both clinically relevant anxiety symptom burden and loneliness experience retained significant associations with higher mean OHIP score (PE = 0.40, SE = 0.16, $p = 0.011$; PE = 0.29, SE = 13, $p = 0.025$, respectively). Finally, higher HRQOL was related to lower mean OHIP score and better OHRQOL (PE = -0.54, SE = 0.13, $p<.001$).

Discussion:

Given the instrumental role that oral health plays in everyday function and socialization, it is important to understand how oral health influences the QOL of WLWH – a population particularly susceptible to dental diseases and social stigma. Our results provide a greater understanding of the functional and psychosocial impacts of unmet dental needs on the OHRQOL of WLWH in the WIHS cohort, which is representative of women living and aging with HIV nationally.⁴⁸ In comparing OHIP-14 scores in our 2016 WIHS study to those who participated in the smaller oral health substudy prior to 2005, a survivor effect should be considered given that the most vulnerable enrollees died during the early years of the cohort.⁴⁹ In addition, only a small subset of WIHS women at specific sites participated in the earlier OHRQOL assessment, while the 2016 cohort is larger and more expansive, including WLWH representing the South. Still, it is apparent that OHRQOL within the WIHS has improved over time. Over half of the current cohort had an OHIP score of zero, and the median score among WLWH with a non-zero OHIP score was 8, a figure much lower than the median OHIP score in the original OHRQOL study (range 27.5 – 28.4). This may be reflective of positive changes in oral health access and coverage over time.⁵⁰ Also,

given the stigma and discrimination historically associated with HIV, results may reflect a decrease in stigma and greater willingness of dental practitioners to provide dental care since the origins of the cohort.⁵¹⁻⁵³

Consistent with the literature are the findings that perceived unmet dental needs and poor oral health are associated with impaired OHRQOL.¹³ However, the relationship between annual dental care utilization and OHRQOL was not significant after controlling for unmet dental needs. Dental care utilization is not only preventive but also reactive; more frequent utilization at any time point may be a reaction to inadequate prior utilization leading to poor oral health needs that necessitate multiple treatments. As such, these findings underscore the importance of not just relying on objective data to analyze health status, but also querying about patient-based measures to amass a more substantive understanding of one's oral health.⁵⁴ Understanding the factors that affect OHRQOL, especially those related to experiencing pain, have critical clinical implications when evaluating unmet health needs and their influence on care delivery.

Oral health disparities are associated with low socioeconomic status and specific racial subgroups,⁵⁵ yet our analysis is similar to a prior OHIP-14 validation study⁵⁶ in that it did not show a significant relationship between race or income and OHRQOL, aside from marginal significance for the Hispanic subgroup. Even though we know that there are racial and ethnic disparities in oral health, the lack of a difference in OHIP score in WIHS suggests that the disparity among WLWH as compared to those without HIV is a stronger effect than racial and ethnic disparities. This may also be a result of increased public insurance availability through the Affordable Care Act and Medicaid expansion in many states, as well as federal entities like the Ryan White HIV/AIDS Program that include dental care. However, our study finding related to the effect of age was consistent with other studies examining how increasing age is associated with worsening OHRQOL.⁵⁷ Since it is common to experience dental problems with age, especially ones that limit chewing and esthetics, higher importance should be placed on early preventive dental care in older PLWH, even when competing with eclipsing medical needs.⁵⁸

As demonstrated previously,¹⁰ smoking status had a negative impact on OHRQOL, since both current and former smokers had significantly higher OHIP-14 mean scores than never smokers. This is likely related to the direct dental problems attributed to smoking (e.g., tooth loss, mucosal inflammation). On the other hand, food security did not have a significant independent association with OHRQOL. Research has shown a relationship between food insecurity and reduced overall QOL, attributed to food insecurity impacting overall physical functioning,⁵⁹ and poor dental outcomes (e.g., caries⁶⁰). In this study, the insignificant association between food security and OHRQOL after adjusting for socioeconomics may be due to poor food security causing systemic limitations. Future research may want to include nutritional assessments that include food frequency questionnaires, which may be better estimates of nutrition and have a more direct relationship to oral health status.

Our study findings also highlight the importance of self-reported anxiety symptoms and loneliness as correlates of worse OHRQOL. Anxiety is often associated with dental fear and avoidance, leading to suboptimal dental care seeking-behaviors and neglected oral health

conditions, as well as impaired OHRQOL.⁶¹ The literature assessing loneliness and dental outcomes is sparse and limited to elderly populations given the higher risk of isolation and edentulism that comes with increasing age.⁶² Still, this available evidence has documented the role of OHRQOL as a predictor of loneliness, attributed to how oral impacts – poor eating function, speech, esthetics – can induce social isolation and embarrassment.⁶² In this study, two of the OHIP-14 items with the highest means involved feeling embarrassed and self-conscious because of dental-related problems, and we also identified a significant association between reporting loneliness experiences and worsened OHRQOL in the regression models. Our findings underscore the importance of viewing oral health in the context of its role in activities of daily living, from the way dentition affects chewing to its impact on socialization and social wellness.

Our study has several limitations. First, since the questionnaire was based on self-report and interviewer-administered, data may be subject to recall and social desirability biases. Second, given the cross-sectional methodology, inferences cannot be made about the directionality of the noted associations. OHRQOL may also be susceptible to change over time, especially relative to the timing of dental utilization. Third, there are alternative OHRQOL scales. The OHIP-14 was selected because of its short form (minimizing burden while maintaining validity and reliability).⁶³ Fourth, the few studies investigating the minimal important difference values for comparing OHRQOL measures to establish clinically meaningful differences have been limited to small samples and different instruments.⁶⁴ Finally, the inherent nature of longitudinal cohort studies with high retention rates lends itself to selection bias in that cohort participants receive assessments and referrals that may facilitate dental care.

Our study is especially timely given the upcoming 2020 Surgeon General’s Report on Oral Health,⁶⁵ which was commissioned to discuss emerging oral health challenges since the first report.⁸ Coinciding with the report’s theme that “oral health means much more than healthy teeth,” our study results are relevant in showing that the fulfillment of dental needs can have a positive impact on the OHRQOL of WLWH. Other aspects of general health, such as smoking and aging, are also related to OHRQOL and important to consider in dentistry. As such, OHIP-14 is worth administering in dental settings as well as HIV clinic settings to identify those with significant oral health impacts. Understanding the bi-directionality between dental impacts, OHRQOL, and other indices of HIV and general health is worth examining longitudinally.

Acknowledgements:

Data in this manuscript were collected by the Women’s Interagency HIV Study (WIHS). The contents of this publication are solely the responsibility of the authors and do not represent the official views of the National Institutes of Health (NIH). WIHS (Principal Investigators): UAB-MS WIHS (Mirjam-Colette Kempf and Deborah Konkle-Parker), U01-AI-103401; Atlanta WIHS (Ighovwerha Ofotokun, Anandi Sheth, and Gina Wingood), U01-AI-103408; Bronx WIHS (Kathryn Anastos and Anjali Sharma), U01-AI-035004; Brooklyn WIHS (Deborah Gustafson and Tracey Wilson), U01-AI-031834; Chicago WIHS (Mardge Cohen and Audrey French), U01-AI-034993; Metropolitan Washington WIHS (Seble Kassaye and Daniel Merenstein), U01-AI-034994; Miami WIHS (Maria Alcaide, Margaret Fischl, and Deborah Jones), U01-AI-103397; UNC WIHS (Adaora Adimora), U01-AI-103390; Connie Wofsy Women’s HIV Study, Northern California (Bradley Aouizerat and Phyllis Tien), U01-AI-034989; WIHS Data Management and Analysis Center (Stephen Gange and Elizabeth Golub), U01-AI-042590; Southern California WIHS (Joel Milam), U01-HD-032632 (WIHS I – WIHS IV). The WIHS is funded primarily by the National Institute of Allergy and Infectious Diseases (NIAID), with additional co-funding from the

Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), the National Cancer Institute (NCI), the National Institute on Drug Abuse (NIDA), and the National Institute on Mental Health (NIMH). Targeted supplemental funding for specific projects is also provided by the National Institute of Dental and Craniofacial Research (NIDCR), the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute on Deafness and other Communication Disorders (NIDCD), and the NIH Office of Research on Women's Health. WIHS data collection is also supported by UL1-TR000004 (UCSF CTSA), P30-AI-050409 (Atlanta CFAR), P30-AI-050410 (UNC CFAR), and P30-AI-027767 (UAB CFAR).

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Table 1.

Descriptive Statistics of the WIHS Cohort (N=1526), by N (%), Predicted Mean OHIP score, Predicted Probability/Expected Number of OHIP=0

	N (%)	Mean Predicted OHIP Value	Mean Probability =0	Expected # OHIP = 0	p-value
Sociodemographics					
Age					
<i>Under 50</i>	723 (47.4%)	4.13	0.547	395	0.001
<i>50 and over</i>	803 (52.6%)	6.02	0.509	409	Ref
Race/Ethnicity					
<i>White</i>	158 (10.4%)	6.93	0.497	79	Ref
<i>Hispanic</i>	209 (13.7%)	4.35	0.543	113	0.057
<i>Black/African-American</i>	1115 (73.1%)	5.00	0.529	590	0.095
<i>Other</i>	44 (2.9%)	5.48	0.520	23	0.550
Annual Income <\$12,000 (N=1490)					
No	711 (47.7%)	3.65	0.557	396	<.001
Yes	779 (52.3%)	6.55	0.498	388	Ref
Oral Health Variables					
Reported Unmet Dental Problem					
<i>No</i>	1235 (80.9%)	3.45	0.544	672	<.001
<i>Yes</i>	291 (19.1%)	12.22	0.419	122	Ref
Perceived Oral Health Condition					
<i>Good</i>	950 (62.3%)	2.59	0.570	541	<.001
<i>Poor</i>	576 (37.8%)	9.30	0.435	250	Ref
Annual Dental Care Utilization (N=1522)					
<i>No</i>	443 (29.1%)	6.50	0.503	223	0.007
<i>Yes</i>	1079 (70.9%)	4.57	0.537	580	Ref
Risk Behaviors					
Food Security (N=1466)					
<i>High</i>	1138 (77.6%)	4.17	0.541	615	<.001
<i>Low</i>	328 (22.4%)	8.60	0.470	154	Ref
Recent stimulant drug use (N=1524)					
<i>No</i>	1424 (93.4%)	5.01	0.530	755	<.001
<i>Yes</i>	100 (6.6%)	6.58	0.504	658	Ref
Smoking Category					
<i>Former</i>	422 (27.7%)	5.05	0.521	220	0.003
<i>Current</i>	593 (38.9%)	6.83	0.492	292	<.001
<i>Never</i>	511 (33.5%)	3.20	0.568	290	Ref
Psychosocial Variables					
Depressive symptom assessment, CES-D 16 (N=1521)					

	N (%)	Mean Predicted OHIP Value	Mean Probability =0	Expected # OHIP = 0	p-value
<i>No</i>	1055 (69.4%)	3.12	0.556	586	<.001
<i>Yes</i>	466 (30.6%)	9.65	0.441	205	Ref
Anxiety symptom assessment, GAD 10 (N=1522)					
<i>No</i>	1244 (81.7%)	3.88	0.541	673	<.001
<i>Yes</i>	278 (18.3%)	10.73	0.442	123	Ref
Subjective Loneliness Experience					
<i>No</i>	765 (50.1%)	2.89	0.571	437	<.001
<i>Yes</i>	761 (49.9%)	7.37	0.475	361	Ref
Social Support (N=1522)					
<i>No</i>	628 (41.3%)	7.21	0.485	305	<.001
<i>Yes</i>	894 (58.7%)	3.67	0.553	494	Ref
General Health					
CD4 Count, cells/m ³ (N=1505)					
<i>Below 200</i>	95 (6.3%)	6.24	0.507	48	<.001
<i>200 or greater</i>	1410 (93.7%)	5.08	0.527	743	Ref
Overall Quality of Life (N = 1521)					
<i>Low</i>	625 (41.1%)	5.17	0.526	329	<.001
<i>High</i>	896 (58.9%)	5.09	0.528	473	Ref
Perceived Overall Health					
<i>Poor to Fair</i>	284 (18.6%)	7.86	0.482	137	<.001
<i>Good to Excellent</i>	1242 (81.4%)	4.50	0.536	666	Ref
Health Related Quality of Life (N=1520)					
<i>Low</i>	760 (50.0%)	7.92	0.455	346	<.001
<i>High</i>	760 (50.0%)	2.35	0.584	444	Ref

Table 2.

Negative binomial regression model for parameter estimates and changes in OHIP mean by participant characteristic

	Parameter Estimate	Standard Error	Change in OHIP mean	p-value
Intercept	0.57	0.29	1.78	0.050
<i>Sociodemographics</i>				
Over age 50	0.44	0.11	1.55	<.001
Race/Ethnicity				0.084
<i>White</i>	Ref	Ref	Ref	Ref
<i>Hispanic</i>	-0.21	0.22	0.81	0.338
<i>Black/African-American</i>	-0.31	0.18	0.74	0.084
<i>Other</i>	-0.21	0.35	0.82	0.554
Annual Income <\$12,000	0.12	0.12	1.13	0.289
<i>Oral Health Variables</i>				
Unmet Dental Problem	0.99	0.14	2.68	<.001
Poor Perceived Dental Condition	0.95	0.11	2.58	<.001
Annual Dental Care Use	0.02	0.12	1.02	0.844
<i>Risk Behaviors</i>				
Food Security	-0.16	0.13	0.85	0.227
Recent Stimulant Drug Use	-0.09	0.22	0.91	0.674
Smoking Category				
<i>Former</i>	0.29	0.14	1.34	0.037
<i>Current</i>	0.34	0.14	1.40	0.015
<i>Never</i>	Ref	Ref	Ref	
<i>Psychosocial Factors</i>				
Depressive symptom assessment, CES-D 16	0.17	0.15	1.18	0.250
Anxiety symptom assessment, GAD 10	0.40	0.16	1.49	0.011
Subjective Loneliness Experience	0.29	0.13	1.34	0.025
Social Support	-0.01	0.13	0.99	0.931
<i>General Health</i>				
CD4 below 200	0.14	0.22	1.15	0.543
Quality of Life	-0.24	0.12	0.79	0.055
Poor Perceived General Health	-0.02	0.14	0.98	0.880
Health Related Quality of Life	-0.54	0.13	0.58	<.001