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Marital Status as a Predictor of Dental Service Utilization

Brandon McDonald
Department of Public Health
University of Rochester
252 Elmwood Ave
Rochester, NY 14627

Faculty Advisor: Dr. Dorothy Gaboda

Abstract

Objectives: The purpose of this study is to analyze the effect of marital status, gender and other demographics on the utilization of dental services by non-elderly adults in New Jersey. *Methods:* The New Jersey Family Health Survey is a cross-sectional telephone survey conducted to provide population-based estimates of health care coverage, access, use, and other health topics important for policy formulation and evaluation in New Jersey households. Low-income families (<200% FPL; n= 570) were oversampled to ensure sufficient cases for sampling. The sample was restricted to adults aged 19-64, a total of 4,827 individuals. Nested multivariate logistic regressions were conducted to predict which socio-demographic factors impacted having a dental visit in the past 12 months. *Results:* When controlling for socio-demographic factors, specifically health insurance and dental coverage, marital status was not a significant predictor of having a dental visit in the past 12 months. Insurance status and dental coverage were associated with visiting the dentist. Minorities and low-income individuals had the lowest odds of visiting the dentist. The analysis also found that females have greater odds of visiting the dentist than males. *Conclusion*s: Lack of health insurance is a substantial barrier to utilization of dental care. The incorporation of public policies that assist low-income individuals financially will help remove the one of the many barriers to access of care. These policies can be used as a building block towards utilization of dental services and raise awareness to the importance of oral exams for adults as well as children.

Keywords: Dental Care, Health Insurance, Marital Status

1. Introduction

Oral health has become a crucial aspect of overall health in today's society, whether rich or poor, black or white. Untreated oral health conditions can cause unnecessary decay of teeth, gum disease, among other inflammatory diseases such as periodontal disease[1]. Although most dental diseases are preventable, many Americans lack access to affordable dental health services[10]. A thorough oral examination can detect signs of nutritional deficiencies as well as a number of systemic diseases, including microbial infections, immune disorders, injuries, and some cancer[10]. Even with this information, approximately forty percent of adults aged 18 to 64 went without a dental visit in 2010[3].

Literature shows that the four main factors that pertain to the use of dental services are race, income, educational status and marital status[9]. Oral health disparity is very prominent among low-income populations; we have seen that both dental coverage and access to care are limited. Studies by Seirawan found those who attained more than a high school degree and high-income have the greatest odds of visiting the dentist than those of lower educational attainment and income. These findings help raise awareness for the vulnerable populations within the United States; however, Sierawan never assessed the different race/ethnicities that exist beyond non-whites. Chattopadhyay found the same strong correlation between Sierawan's four variables and dental service utilization among the minority population of New York City[2]. Additionally, among minority populations, dental insurance is a huge factor that

impacts utilization of dental services. Furthermore, Chattopadhyay also found that married individuals are positively associated with better oral health, health seeking behavior and dental insurance coverage. Research has also shown that gender is a strong predictor of utilization of other health services. Among those that are married, men have been seen to acquire better health benefits from marriage than women[6]. Unfortunately, the current research does not investigate in great detail the impact of marital status on dental utilization.

The association between marriage and health outcomes suggests married individuals have better health experiences in terms of psychological and physical diseases like ulcers, arthritis, cardiovascular disease and periodontal disease. This is evident, not only in the United States, but cross culturally as well. An international study found that single status was positively associated with increased mortality risks from all cancers among men and women[8]. Furthermore, we see divorce or separation was positively associated with increased mortality risks from all causes among men and women. We also find that marriage is one factor that can increase access to dental care.

The effect of marital status with different socio-demographic factors opens a new field of research in access to dental care. This new approach will further explain the reasons and factors that influence the utilization of dental services. Using recent data and the New Jersey Family Health Survey this study examines the association between marital status and dental service utilization. We expect to find that married individuals utilize the dentist at greater odds than those who are unmarried.

2. Data and Methods

The New Jersey Family Health Survey (NJFHS) was funded by the Robert Wood Johnson Foundation and approved by Rutgers IRB. The study was designed by the Rutgers Center for State Health Policy (CSHP) and fielded between November 3rd, 2008 and November 5th, 2009. The survey provides precise population-based estimates of health care coverage, access, use, and other health topics important for policy formulation and evaluation in New Jersey. Furthermore, the survey provides trend information on important health care indicators due to the two time points the survey was conducted, in comparison to 2001 NJFHS.

The survey was conducted through a random-digit-dialed telephone survey of 2,100 families with landlines and 400 families with cell phones, covering 7,336 individuals. These data represent New Jersey households by dividing the state into 5 geographically contiguous areas. The overall response rate was 45.4%; landline response rate was 61.7% and the cell phone response rate was 26%. Low-income families (<200% FPL; n= 570) were oversampled to ensure sufficient cases for sampling. Interviews were conducted with the person who was most knowledgeable about the health and healthcare needs of the family.

For the purposes of this study, we restricted the data sample to non-elderly adults (ages 19 to 64), a total of 4,827 individuals. The study does not assess the elderly due to the complications of their insurance coverage, whether Medicare or private. Furthermore, the removal of children allows for a more specific data set to assess married and unmarried individuals.

2.1 Dependent Variables

In order to examine dental health service utilization, the categorical variable, *Did you have a dental visit in the past 12 months?*, was considered as our dependent variable. The categorical variable was dichotomous with 'yes' and 'no' options.

2.2 Independent Variable

The primary independent variable utilized in this study was marital status. "What is your marital status" was asked for each individual in the family with the following optional responses: 'married', 'living with a partner', 'single and never married', 'divorced', 'separated' and 'widowed'. Marital status has been recoded into a dichotomous variable for this analysis, with 'married' encompassing both 'married' and 'living with a partner', and all other responses classified as 'not married'. Dental health service utilization was measured by the question "During the past 12 months did you see a dentist?" with a 'yes' or 'no' as answer options.

2.3 Other Key Variables

Other variables were used as controls or mediators to further explain the relationship between marital status and dental service utilization. The survey asked about the Hispanic ethnicity and race, the gender, and age in years for each individual in the family. Race/ethnicity was classified into four categories such that Hispanic or Latino ethnicity takes precedence over race, yielding 'non-Hispanic white', 'non-Hispanic black', 'Hispanic' and 'other'. In order to understand if sex plays a key role in dental utilization, gender is included in the analyses. The continuous variable age was divided into two approximately equal groups of 19-40 and 41-64. Whether an individual had dental coverage was assessed by asking, "At this time, are you covered by a plan that helps pay for dental expenses?" Yes or no answers were provided. Self-rated dental health status was assessed using the question "Would you say your Dental Health is" with the options: 'excellent', 'very good', 'good', 'fair' and 'poor'. For the purposes of our study the variable was recoded to 3 categories: 'excellent/very good', 'good', and 'fair/ poor'.

The socioeconomic characteristics that were used as independent variables were educational attainment level, income level, employment status, citizenship status and insurance type. To assess level of education, respondents were asked "what is the highest grade or level of school that have/has been completed?" Respondents had the choice of 'eighth grade or less', 'ninth grade through eleventh grade', 'twelfth grade or GED or high school diploma', 'Some voc/tech/business', 'Some voc/tech/business certificate or diploma', 'Some college/no degree', 'Associate's degree', 'Bachelor's degree', 'Some graduate/professional school/no degree' or 'Graduate/professional degree (MA;MS;PHD;EDD;MD;DDS;JJ/LLB, ETC)'. For the purposes of this study we collapsed the education variable into 3 categories, 'less than high school', 'high school' and 'more than high school'. Respondents were asked the following about family income "During 2008, what was (your/ your family's) total income from all sources, before taxes and other deductions?" Family income was then converted to Federal Poverty Level (FPL) and categorized as '<100% FPL', '101-200% FPL', '201-350% FPL' and '>350% FPL'. Federal Poverty Level is a measure of federal poverty that is issued each year by the Department of Health and Human Services[10].

Immigration status was constructed from two questions asking about whether an individual was born outside the U.S. and whether the person was a citizen. The resulting variable had the following categories: 'born in the United States', 'not born in United States, but have United States citizenship' and 'neither born in the United States, nor a citizen of the United States'. Health insurance coverage for each individual in the family was assessed by a series of questions asking if family members were covered by various sources such as Medicare, Medicaid, employer-sponsored insurance, etc. The responses were recoded into categories of 'employer-based', 'Medicaid/ CHIP', 'Other public', 'Private', 'Covered, but type unknown', 'uninsured' and 'unknown if covered'. For this study, these categories were collapsed into 'private' (including Employer-based and Private), 'Public' (including Medicaid/ NJFC (New jersey Family Care), Other public) and 'Uninsured'. 'Covered, but type unknown' and 'unknown if covered' were defined as 'Missing'.

2.4 Analytic Plan

In order to understand the distribution of the data, frequencies were run for all variables, followed by a Chi-square test of association. Chi-squared tests were conducted to determine if there is a significant association between marital status and whether an individual had a dental visit in the past 12 months, taking into consideration other socio-demographics. Then a nested logistic regression was conducted to determine which of the predictors effected having a dental visit in the past 12 months the most.

3. Results

Table 1 shows bivariate relationships between the utilization of dental services and the predictor variables. The relationship between *marital status* and *dental visits in the past 12 months* was statistically significant *(*χ^2 (1, N=4808)=62.470, p<.001). We see that about 60% of those who visited the dentist were married, roughly a ten percentage-point difference from those who did not visit the dentist and were married. In terms of *dental health status*, we see about two-thirds of those who went to the dentist reported excellent/very good dental health (χ^2 (1, N=4808)=345.893, p<.001). Furthermore, when *health Insurance type* was assessed we notice that roughly 90% of those who visited the dentist had private insurance but roughly 60% of those who did not have dental insurance also had private health insurance (χ^2 (1, N=4808)=631.51, p<.001). Approximately three-quarters of those who visited

the dentist had *dental coverage* while roughly 40% of those who didn't visit the dentist had dental coverage as well (χ^2 (1, N=4808)=476.819, p<.001).

Table 1: 2009 New Jersey Family Health Survey, Dental Health Utilization of Services, N= 4,808

	Had Dental Visit in past year?	
	Yes (N=3163)	No (N=1645)
	%	**%**
*Marital Status**		
Married (or living with partner)	59.7	47.7
Unmarried	40.3	52.3
Socio-Demographics Factors		
*Dental Health Status**		
Excellent/ Very Good	66.8	41.2
Good	23.6	33
Fair/ Poor	9.6	25.8
*Race/Ethnicity**		
Non-Hispanic White	77.6	55.6
Non-Hispanic Black	8.5	16.3
Hispanic	8.9	20.8
Other	5.1	7.4
*Sex**		
Male	44.5	52.4
Female	55.5	47.6
*Age (years)**		
19-40	41.1	53.4
41-64	58.9	46.6
*Education**		
Less than High School	2.3	10.2
High School or Equivalent	23	37.6
More than High School	74.6	52.3
*FPL %[1]**		
0-200%	10.2	31.3
201-350%	15.2	22.6
>350%	74.6	46.1
*Employment[2]**		
Working	73.8	65.5
Not Working	6.9	12.1
Not in Labor Force	19.3	22.4
*Citizenship Status**		
Born in U.S.	88.7	79
Naturalized citizen	8.3	10.7
Not U.S. citizen	3	10.3
*Had Dental Coverage**		
Yes	72	39.6
No	28	60.4
*Health Insurance Type**		
Private (Employer based/ Other private)	89.1	57.8
Public (Medicaid/ VA/ CHIP/ other public)	3.5	11.1
Uninsured	7.4	31.2

*Significant at p<.001
[1]Federal Poverty Level: 0-100% of the federal poverty level, 101-200% of the federal poverty level, 201-350% of the federal poverty level, >350% of the federal poverty level.
[2]Employment: *Working* describes individuals employed fulltime or part time, *Unemployed* describes individuals not employed, but actively seeking employment, *Not in Labor Force* describes those unemployed and not seeking employment (retired, homemakers etc.

R*ace/ethnicity, sex, age, income, education, employment and citizenship* were all significantly associated with visiting the dentist in the past 12 months. Among those who visited the dentist, the majority were Non-Hispanic whites (77.6%) (χ^2 (1, N=4808)=262.433, p<.001). We see that among those that visited the dentist, approximately 55% were females, a ten percentage-point difference compared to males (χ^2 (1, N=4808)=27.266, p<.001). Those between the ages of 41-64 (58.9%) had higher rates of visiting the dentist than those aged 19-40 (41.1%) (χ^2 (1, N=4808)=66.261, p<.001). Approximately 75% of those who visited the dentist had an annual income of 350% or greater than the FPL, which is approximately 8 times the amount of those between 0-200% of the poverty level (χ^2 (1, N=4808)=447.85, p<.001). Seventy five percent of those who visited the dentist had more than a high school education. Additionally, among those who didn't visit the dentist, the majority had over a high school education (52.3%) (χ^2 (1, N=4808)=294.431, p<.001).

Table 2 represents the series of nested multivariate linear regression models that were conducted to examine the relationship between marital status and dental health service utilization. Model 1 consisted of *marital status* (married individuals relative to unmarried individuals), and Model 2 adds *age* (19-40, relative to 41-64), *race/ethnicity* (Non-Hispanic Blacks, Hispanics and Others relative to non-Hispanic Whites) and *sex* (females relative to males). Model 3 incorporated *income* (0-200% of FPL and 201-350% of FPL, relative to greater then 350% of FPL), and *educational attainment* (less than high school and high school or equivalent, relative to more than high school). Model 4 then introduces *immigration status* (naturalized citizen and not United States citizen, relative to those born in United States) and *dental health status* (Good and Fair/ poor, relative to excellent/ very good). Lastly, model 5 integrates *dental coverage* (no, relative to the 'yes' group) and *health insurance type* (public and uninsured, relative to privately insured).

In the unadjusted model (1), married individuals had a 62% greater odds of visiting the dentist than non married individuals (OR=1.62, 95% CI: 1.437, 1.827; p< .001). This model accounted for 1.8% of the variability in dental visits in the past year. These relationships were attenuated somewhat after accounting for *age, race/ ethnicity* and *sex* in Model 2, but the effect of being married remained significant. Married individuals still have 35% greater odds of visiting the dentist than unmarried individuals (OR= 1.355, 95% CI: 1.173, 1.564; p< .001). In model 3, with the addition of *income* and *education*, we still see significance between *marital status* and *dental visits* (OR= 1.192, 95% CI: 1.026, 1.384; p= .022). With the addition of *Immigration status* and *dental health status* in model 4, *marital status* continues to remain significant (OR= 1.189, 95% CI: 1.019, 1.386; p= .027). However, in model 5 we see the significance of *marital status* is completely lost when *health insurance type* and *dental coverage* are added to the regression (OR= 1.004, 95% CI: .855, 1.179; p= .962). This model accounts for 27.4% of the variation in how many respondents visited the dentist in the past year.

These findings suggest that *health insurance* and *dental insurance coverage* are the leading factors for dental health service utilization and are confounders in the study by outweighing the effect of marital status. A chi-squared test was conducted to determine the relationship between marital status and insurance type. We find that 86.1% of married individuals have private insurance, (χ^2 (1, N=4808)=215.586, p<.001). This suggests co-variation between these two variables and explains why marital status is insignificant with the inclusion of insurance type and dental coverage.

Although marital status is not a significant predictor of dental health utilization in model 5, there are vulnerable populations within the socio-demographics that are worth noting. Younger individuals have a lower odds of visiting the dentist than those between 41 and 64 even with insurance status as a control (OR= .720, 95% CI: .613, .846; p< .001). Minorities (non-Hispanic black, Hispanic, Others) have lower odds than non-Hispanic whites of visiting the dentist. Specifically, Hispanics had the lowest odds of visiting the dentist in comparison to non-Hispanic whites in model 2 (OR= .320, 95% CI: .267, .382; p< .001); however, in model 5, after controlling for other demographics such as income and educational attainment, Hispanics have the 2nd greatest odds of visiting the dentist in reference to non-Hispanic whites, and non- Hispanic blacks have the worst odds (OR= .736, 95% CI: .589, .920; p= .007). In terms of income, in model 5 those who are in the 0-200% FPL bracket (OR= .654, 95% CI: .528, .810; p< .001) have relatively the same odds of visiting the dentist as those who are in the 201-350% FPL bracket when insurance and other demographics are controlled for (OR= .688, 95% CI: .575, .823; p< .001). Overall we see that young black males with lower income and poor oral health have the worst odds of visiting the dentist.

Table 2: Odds of having a dental visit in the past year

	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	P-Value	OR	P-Value	OR	P-Value	OR	P-Value	OR	P-Value
Marital Status [ref. group *'Unmarried'*]										
Married individuals	**1.62**	**<.001**	**1.355**	**<.001**	**1.192**	**0.022**	**1.189**	**0.027**	1.004	0.962
Age [ref. group '*41-64*']										
19-40			**0.803**	**0.003**	**0.767**	**<.001**	**0.651**	**<.001**	**0.72**	**<.001**
Race/ Ethnicity [ref. group '*Non-Hispanic White']*										
Non-Hispanic Black			**0.389**	**<.001**	**0.534**	**<.001**	**0.569**	**<.001**	**0.546**	**<.001**
Hispanic			**0.32**	**<.001**	**0.547**	**<.001**	**0.665**	**<.001**	**0.736**	**0.007**
Non-Hispanic Other			**0.485**	**<.001**	**0.486**	**<.001**	**0.604**	**0.001**	**0.571**	**<.001**
Sex [ref. group 'M*ale*']										
Female			**1.451**	**<.001**	**1.507**	**<.001**	**1.478**	**<.001**	**1.449**	**<.001**
Income [ref. group '*>350%*']										
0-200% FPL					**0.33**	**<.001**	**0.41**	**<.001**	**0.654**	**<.001**
201-350% FPL					**0.536**	**<.001**	**0.586**	**<.001**	**0.688**	**<.001**
Education [ref. group 'M*ore than High School'*]										
Less than High School					**0.421**	**<.001**	**0.609**	**0.003**	0.72	0.061
High School or equivalent					**0.524**	**<.001**	**0.596**	**<.001**	**0.653**	**<.001**
Immigration Status [ref group '*Born in the U.S.'*]										
Naturalized Citizen							0.851	0.192	0.939	0.622
Not U.S. Citizen							**0.632**	**0.004**	0.752	0.088
Self-Rated Dental Health Status [ref. group '*Excellent/ very good'*]										
Good							**0.555**	**<.001**	**0.583**	**<.001**
Fair/ Poor							**0.36**	**<.001**	**0.418**	**<.001**
Dental Coverage [ref. group 'Y*es*']										
No									**0.469**	**<.001**
Health Insurance Type [ref. group '*Private'*]										
Public									**0.516**	**<.001**
Uninsured									**0.476**	**<.001**
Nagelkerke R^2	1.8%		9.5%		18.5%		21.8%		27.4%	

4. Conclusion

4.1 Demographics

One of the main objectives of this study was to evaluate the relationship between demographics and utilization of dental services. This analysis found that age, race-ethnicity, sex, income, self-reported dental health, health insurance coverage, and dental coverage were significantly associated with dental visits in the past year. Results from the bivariate analysis reveal that age, education, and income are all positively associated with dental visits. Additionally, the percentage of women who have seen a dentist in the past 12-months is higher than for men. Furthermore, married U.S. citizens, with health insurance and good oral health history have higher percentages of dental visits during the past 12-month periods than do single, non-native-born individuals without health insurance who are in poor health. After initial bivariate tests were conducted, only age, race, sex, insurance coverage, education, health status and income remained significant predictors of having a dental visit in the multivariate analysis. The results indicated that education is positively associated with annual dental visits, such that those with

more than a high school education were significantly more likely to visit the dentist than those with less than a high school degree. However, this effect was partially mitigated once insurance status and other demographic controls were incorporated into the analysis, and those respondents who had less than a high school diploma were no longer significantly less likely to see a dentist over the past twelve months. In our sample, health insurance status is a more powerful predictor of a past dental visit than educational attainment. One could speculate that those with less than a high school education are less likely to have health insurance (data from our sample not shown).

4.2 Gender

In contrast to the previous literature, this study shows that females have greater odds of visiting the dentist than males. According to the literature women would be less likely to receive dental services in comparison to men[7]. Within a marriage, women have also been seen to have lower rates of health[6]. Contrary findings may be due to a few factors, one may be there is a gender difference in insurance coverage and income, education and other factors that are positively associated with dental service utilization.

4.3 Race/Ethnicity

This analysis provided significant evidence for racial disparities in dental service utilization. After controlling for various socio-demographics (income, education, insurance status etc.) minority populations still had lower odds of having a dental visit in the past year than their white counterparts. This is similar to previous finding on the utilization of dental services for minorities. African Americans have been seen to have poorer oral health and a higher rate of tooth loss in comparison to whites[5]. This may be due to African Americans utilizing dental services at a lower rate than whites. The importance of outreach, educational and health promotion programs is key to improving the rates of dental service utilization among minority populations.

4.4 Marital Status

Our second objective in this study was to investigate the effect of marital status on dental service utilization. We expected that married individuals would utilize dental services at a higher rate than unmarried individuals. We found that the effect of marital status is explained through insurance coverage. Insurance can be seen as a mechanism by which married individuals attend the dentist. Therefore, marital status is not a significant predictor of having a dental visit. This finding is interesting because in previous literature, we see that marriage produces greater odds of oral health care services[2]. Upon further analysis we discovered that our findings were due to the characteristics of the individuals who are married. Majority of those in the sample that were married had private health insurance and dental coverage, suggesting that marital status co-varies with insurance and dental coverage. Furthermore, there may be other socio-demographic differences between married and unmarried individuals, such as income and age, which alleviates a barrier for married individuals to visit the dentist.

4.5 Insurance Coverage

As indicated previously, after controlling for several demographics one of the major findings of this study is that health insurance and dental coverage are the main predictors of dental service utilization. This suggests that health insurance and dental coverage are the mechanism by which married individuals had a dental visit in the past year. Individuals with health insurance are more likely to have seen the dentist during the past year. This finding has policy implications and supports the notion that enhancing health insurance, specifically dental coverage, would increase dental visits, especially for vulnerable individuals such as low-income and minority populations. This seems to follow current beliefs that health insurance is one of the most substantial barriers in access to care[4]. If policies were instituted to improve the benefits provided by dental insurance to those who aren't covered or insured, access to those communities may be achieved and dental health would be improved. The impact of dental insurance can be examined from the observation that the majority of those who visited the dentist had health insurance and dental coverage. The Affordable Care Act (2012) may develop packages that benefit children; however, dental coverage for adults do not seem to be included in the plans that the Act covers. There is no basic dental benefit provided for adults, so the American adults in underserved, low-income areas will still have difficulty accessing dental care[4].

4.6 Strengths And Limitations

This analysis has a number of limitations. The NJFHS contacts one individual in the household that is most knowledgeable about the family's health needs. There may be pertinent information that the 'most knowledgeable individual' forgets, which can create flaws in the data. Furthermore, the data in our analysis did not specify if insurance coverage of married individuals came from their spouses. Those who are married may have the option of utilizing their own policy or their spouses, thus removing one barrier of access to dental care and this could impact our findings. Additionally, the data was unable to provide attitudes toward dentistry. The preconceived feelings toward the dentist or an unfortunate past event can weigh heavily on the respondent's willingness to visit the dentist.

The primary strength from this study is that the data were obtained through the New Jersey Family Health Survey, a large representative state survey. This allowed for many demographic groups to be represented in adequate numbers for this analysis. Furthermore, New Jersey is diverse and has a higher proportion of minority populations than many other states.

Future examinations on dental service use should include data sets, which oversample for minority and low-income individuals, to better illustrate the correlates of dental care in underrepresented communities. It may be of interest to look at married individuals within a low-income community to capture the impact marriage has on dental health service utilization since the majority of married individuals in the study were of a high income bracket, with private health insurance. Another option is studying gender differences within dental service utilization among those who are married and not married since women were more likely to visit the dentist than men. Furthermore, we can study any differences in dental service utilization from the two years that the survey was conducted (2001 and 2009), therefore understanding what policies may need to be enhanced to provide those with lower-income or no dental insurance access to care. In conclusion, health insurance has a greater impact on dental service utilization than marital status; the incorporation of policies that assist low-income individuals will help raise awareness to dental services and the necessity of oral exams.

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6. Bibliography

1. D. Albert, D. Sadowsky, P. Papapanou, M. Conicella, A. Ward, "An Examination of Periodontal Treatment and per Member per Month (PMPM) Medical Costs in an Insured Population," BMC Health Services Research 6 (August 16, 2006): 103
2. Chattopadhyay, A., Kumar, J. V., & Green, E. L. (2003). The new york state minority health survey: Determinants of oral health care utilization. *Journal of Public Health Dentistry, 63*(3), 158-165. doi:10.1111/j.1752-7325.2003.tb03494.x
3. Centers for Disease Control and Prevention. (2006). Oral Health. Retrieved http://www.cdc.gov/OralHealth
4. Discepolo, K, Kaplan, A. (2011). "The Patient Protection and Affordable Care Act Effects on Dental Care" *New York State Dental Journal, 77(5),* 34-38
5. G. Gilbert, R. Shewchuk, M. Litaker (2006). Effect of Dental Practice Characteristics on Racial Disparities in Patient-Specific Tooth Loss. *Medical Care, 4 (5),* 415-420.
6. Kiecolt-Glaser JK, Newton T. 2001. Marriage and health: his and hers. Psychol. Bull. In press
7. Lindström, M. (2009). Marital status, social capital, material conditions and self-rated health: A population-based study. *Health Policy, 93*(2–3), 172-179. doi:10.1016/j.healthpol.2009.05.010
8. Okunseri, C., Bajorunaite, R., Mehta, J., Hodgson, B., & Iacopino, A. M. (2009).

Factors associated with receipt of preventive dental treatment procedures among adult patients at a dental training school in wisconsin, 2001–2002. *Gender Medicine, 6*(1), 272-276. doi:10.1016/j.genm.2009.04.003

9. Seirawan, H. (2008). Parsimonious prediction model for the prevalence of dental visits. *Community Dentistry and Oral Epidemiology*, *36*(5), 401-408. doi:10.1111/j.1600-0528.2007.00420.x
10. US Department of Health and Human Services. *Oral Health in America: A Report of the Surgeon General*. Rockville, MD: US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.