


Association Between Health-Related Beliefs and Oral Health Behaviors Among Uninsured Primary Care Patients

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Abstract

Introduction: The collaborations between dental care providers and other health care providers are especially needed for underserved populations. There is a deficit of research focused on underserved populations who utilize a safety net facility such as a free clinic in the United States. The purpose of this study is to examine the association between health-related beliefs and oral health behaviors among uninsured adults utilizing a primary care free clinic providing oral health care. **Methods:** Uninsured primary care patients utilizing a free clinic (N = 585) participated in a self-administered paper survey in May and June, 2016. **Results:** More than 60% of free clinic patients reported a perceived need for dental treatment. Free clinic patients who brush their teeth more than once a day reported better perceived general health compared with those who do not brush their teeth more than once a day. Free clinic patients who had perceived a need for dental treatment reported worse perceived general health compared to those who did not report dental needs. **Conclusions:** The results of this study indicate a pressing need for the further development of dental care services at safety-net clinics. By including dental care in health promotion programs, it will have positive impacts not only on oral health but also on a healthy lifestyle and the general health of underserved populations utilizing a safety-net clinic. The implementation and evaluation of the integrated health programs, which include primary care and oral health care together, would be beneficial to reduce oral health disparities.

Keywords

perceived needs for dental treatment, oral health behaviors, self-reported general health, medically uninsured, safety-net

Introduction

Oral health is a significant public health issue in the United States that is often overlooked in the national discussion about expanding health insurance coverage to low-income, uninsured adults.^{1,2} Nearly one-third of adults aged 20 to 64 years have untreated tooth decay.³ The percentage of adults aged 40 to 64 years who retain a full set of permanent teeth in the United States is only 33.6%.³ Overall, oral health status has been improving since the 1960s.³ This may be due to the initiation of city and school water fluoridation programs that occurred during this time period or the increase of public health knowledge regarding the spread of bacteria.⁴ Despite the improvements, unmet needs for oral health care are extensive, especially among low-income individuals and families.⁵

Untreated oral health issues negatively affect not only oral health but also overall general health. In addition, general health problems can negatively affect oral health.⁴

Patients with chronic diseases such as rheumatoid arthritis, diabetes, or liver conditions have a critical need for dental treatment.⁶ The literature for the past 3 decades has discussed direct and indirect associations between periodontal disease and other systemic diseases including cardiovascular disease, pre-term labor and diabetes mellitus.⁷ Although interdisciplinary collaborations between dental care providers and other health care providers are essential to improve oral and physical health, dental care providers are often not considered a part of interdisciplinary health care teams.⁸

The collaborations between dental care providers and health care providers are especially needed for underserved

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populations. Poverty is one of the primary predictors of poor oral health.^{1,2,9,10} Individuals in poverty are less likely to see a dentist,^{11,12} less likely to have a preventive dental visit,¹³ and more likely to receive emergency oral treatment.¹⁴ Barriers to accessing oral health care among low-income populations include lack of dental insurance and the inability to pay for dental treatment.^{15,16}

Underserved populations tend to receive health care at a single safety-net facility.¹⁸ To increase access to oral health care for underserved populations, it is important to have dental care and primary care co-located in facilities such as free clinics which provide free or reduced-fee health care services to the underserved populations.¹⁷ At this time, only one-third of free clinics provide onsite dental services.¹⁹ Increasing the number of free clinics that provide both medical and dental care has the potential to improve the oral health of the patients served. Currently, there is a deficit of research on this correlation.

The purpose of this study was to examine the association between health-related beliefs and oral health behaviors among uninsured adults utilizing a primary care free clinic providing oral health care. This study contributes to increasing knowledge about health-related beliefs and oral health behaviors among underserved populations. The results of this study are expected to enhance the integration of oral health care and primary care into a safety-net health care setting. Results can also help provide further promotion of oral health needs at these clinics.

Methods

Setting

This community-based study was conducted at a free clinic in the intermountain west, and was a collaboration between a free safety-net clinic and an academic institution. The clinic provides free primary care services to uninsured individuals who are not eligible for public or private health insurance coverage and live below 150% of the federal poverty level. The majority of the clinic patients are aged between 19 and 64 years. Individuals in this age range are less likely to have access to governmental insurance such as the Children's Health Insurance or Medicare than those younger than 18 years or older than 65 years. Approximately half of the patients self-identify their ethnicity as Hispanic. The clinic opened in 2005, is not affiliated with any religious organizations, is funded privately, and does not receive any public funding. The financial resources of the clinic include donations and nongovernmental grants. Six paid staff and more than 300 volunteers keep the clinic open 5 days a week. The total number of patient visits was 15229 in 2014.

The clinic has provided only limited oral health care services such as adult tooth extractions. A qualitative study with the patients of the clinic in the summer of 2014

suggests strong needs for expanded oral health services.²⁰ In 2014, the university located in the same city accepted the inaugural class in its new school of dentistry. Since then, the clinic and the school of dentistry have worked together to initiate the provision of expanded oral health services at the clinic. At the time of this study, dental students provided services (preventive care and oral health maintenance instructions) at the clinic under the supervision of faculty for several hours intermittently during the academic year. The clinic currently has 2 dental operatories (dental work stations), and it is expected that when the clinic expands to 5 dental operatories in the future, dental students will provide comprehensive dental treatment.

Study population and data collection

This study was approved by the university's institutional review board. A self-administered paper survey was collected by study assistants from a convenience sample in the waiting room of the clinic in May and June 2016. Informed consent was obtained from each participant. Participants were patients of the clinic who were 18 years old or older and could read and speak in English or Spanish. All survey materials (a consent cover letter and a survey instrument) were available in English and Spanish. A bilingual translator translated English materials into Spanish. Another bilingual translator conducted back-translation. The third translator checked the accuracy of the translation. Participants of the survey received a sample dental care set (eg, tooth brush, dental floss—approximately US\$1 value) when they completed the survey.

Measures

Perceived General Health. Perceived general health was measured using the general health subscale of the 36-item Short Form Survey (SF-36).²¹ The SF-36 is a validated and reliable scale to measure self-reported health status. The general health subscale includes 5 items. One of the items asks "In general, would you say your health is . . ." (1 = Excellent, 2 = Very good, 3 = Good, 4 = Fair, 5 = Poor). Other 4 items that were asked (eg, "I seem to get sick a little easier than other people," "I am as healthy as anybody I know") are measured using a 5-point Likert-type scale (1 = Definitely true, 2 = Mostly true, 3 = Don't know, 4 = Mostly false, 5 = Definitely false). Based on the scoring instructions,²² the total scores of the perceived general health subscale ranges from 0 to 100. Higher scores indicate better perceived general health. The baseline mean score is 56.99 (SD = 21.11).²² The US general population norm for the general health subscale is 50.10.²³ Cronbach alpha of this study population was .704.

Oral Health Behaviors. The questions about oral health behaviors included (1) whether a participant has a

Table 1. Sociodemographic Characteristics of Participants and Descriptive Statistics.

	Total (N = 584)	Need for Dental Treatment (n = 379)	No Need for Dental Treatment (n = 205)	P ^a	F
Female, n (%)	393 (67.3)	255 (67.3)	138 (67.3)	NS	
Race/Ethnicity, n (%)					
White	115 (19.7)	72 (19.0)	43 (21.0)	NS	
Hispanic/Latino/Latina	359 (61.5)	241 (63.6)	118 (57.6)	NS	
Asian or Pacific Islander	65 (11.1)	39 (10.3)	26 (12.7)	NS	
US born, n (%)	129 (22.1)	78 (20.6)	51 (24.9)	NS	
Some college or higher, n (%)	248 (42.5)	168 (44.3)	80 (39.0)	NS	
Currently employed, n (%)	240 (41.1)	165 (43.5)	75 (36.6)	NS	
Currently married, n (%)	269 (46.1)	180 (47.5)	89 (43.4)	NS	
Patient of the clinic—2 years or longer, n (%)	263 (45.0)	169 (44.6)	94 (45.9)	NS	
Brush teeth more than once a day, n (%)	424 (72.6)	282 (74.4)	142 (69.3)	NS	
Floss teeth at least once a day, n (%)	265 (45.4)	164 (43.3)	101 (49.3)	NS	
Received dental care at the clinic, n (%)	58 (9.9)	37 (9.8)	21 (10.2)	NS	
Received preventive dental care in the past 6 months, n (%)	107 (18.3)	53 (14.0)	54 (26.3)	<.01	
Age, mean (SD)	45.77 (13.69)	45.80 (12.59)	45.73 (15.58)	NS	24.73
Overall general health, mean (SD)	52.47 (19.71)	51.08 (19.66)	55.19 (19.56)	<.05	0.47
Self-efficacy, mean (SD)	2.95 (0.76)	2.93 (0.76)	2.98 (0.76)	NS	0.05

Abbreviation: NS, not significant.

^aP value denotes significance from Pearson's chi-square tests between categorical variables (for cell size ≥ 5 only), and independent-samples *t* tests for continuous variables comparing participants who reported perceived need for dental treatment and those who did not.

perceived need for dental treatment, (2) frequency of brushing teeth, (3) frequency of flossing teeth, (4) whether a participant has received dental care at the clinic, and (5) whether a participant had received preventive dental care in the 6 six months.

Self-efficacy. Self-efficacy was included in the analysis because previous studies suggest a significant impact of self-efficacy on general health.²⁴⁻²⁶ Health-related self-efficacy was measured using 5 items, which ask participants to indicate their level of agreement on the following statements²⁷: (1) I am confident I can have a positive effect on my health, (2) I have set some definite goals to improve my health, (3) I have been able to meet the goals I set for myself to improve my health, (4) I am actively working to improve my health, and (5) I feel that I am in control of how and what I learn about my health. Scoring is based on a mean of the items using a 5-point Likert-type scale (0 = Disagree very much, 4 = Agree very much). Higher scores indicate higher levels of self-efficacy. Cronbach alpha of this scale was .857.

Sociodemographic Characteristics. The following sociodemographic information was collected from the participants of the survey: age, sex, race/ethnicity, country of origin, educational attainment, employment status, marital status, and whether a participant has been a patient of the clinic for 2 years or longer.

Data Analysis

Data were analyzed using SPSS (version 22). Descriptive statistics were used to describe the distribution of the outcome and independent variables. The 2 groups of participants—those who reported perceived needs for dental treatment and those who did not—were compared using Pearson's chi-square tests for categorical variables (if each cell had more than 5 respondents) and independent-samples *t* tests for continuous variables. Multivariate multiple regression analysis was conducted to test the association between perceived general health, and oral health behaviors, and individual factors. Based on a multicollinearity test, there was no significant multicollinearity among the variables. Regression coefficients (standard errors) were used to obtain a 95% confidence intervals (CIs).

Results

Table 1 summarizes the sociodemographic characteristics of participants (N = 584) and descriptive statistics. Sixty-five percent of the participants (n = 379) reported perceived needs for dental treatment. The average age of the participants was 45.77 years (SD = 13.69). Nearly 70% of the participants were female (n = 393, 67.3%). Approximately 60% of the participants self-identified their race/ethnicity as Hispanic (n = 359, 61.5%) followed by white (n = 115, 19.7%) and Asian/Pacific Islanders (n = 65, 11.1%). Less

Table 2. Predictors of General Health.^a

	General health β	<i>P</i>	95% CI Lower Bound	95% CI Upper Bound
Age	-0.17	<.01	-0.29	-0.04
US born	-1.56	NS	-6.01	2.89
Hispanic	-6.95	<.01	-10.66	-3.23
Married	4.58	<.01	1.13	8.04
Female	-4.39	<.05	-7.90	-0.88
Some college or higher	4.52	<.01	1.21	7.83
Employed	5.31	<.01	1.94	8.68
Clinic patient 2+ years	-0.36	NS	-3.75	3.02
Self-efficacy	5.37	<.01	3.15	7.58
Need for dental treatment	-4.67	<.01	-8.12	-1.22
Brush teeth more than once a day	4.34	<.05	0.39	8.28
Floss teeth every day	1.13	NS	-2.24	4.51
(Constant)	45.23	<.01	34.91	55.54
R^2	0.17			
<i>F</i>	8.13			
<i>P</i>	<0.01			

Abbreviation: NS, not significant.

^a*N* = 584. Multivariate multiple regression. *P* value denotes significance from multivariate regression analysis.

than one-fourth of the participants were born in the United States (*n* = 129, 22.1%). Non-USborn participants are from 39 countries. Slightly more than 40% of the participants had some college or higher educational level (*n* = 248, 42.5%). Likewise, slightly more than 40% of the participants were employed (*n* = 240, 41.1%). Less than half of the participants were married (*n* = 269, 46.1%). Forty-five percent of the participants (*n* = 263) had been patients of the clinic for 2 years or longer. There was no significant difference in sociodemographic characteristics between participants who had needs for dental treatment and those who did not.

Slightly more than 70% of the participants (*n* = 424, 72.6%) brushed their teeth more than once a day. Less than half of the participants (*n* = 265, 45.4%) flossed their teeth at least once a day. However, the percentages were much lower if the analysis was limited to USborn participants—55.5% brushing their teeth more than once a day and 33.6% flossing every day (not shown in the table). Approximately 10% of the participants (*n* = 58, 9.9%) had received dental care at the clinic. Less than 20% of the participants (*n* = 107, 18.3%) had received preventive dental care in the past 6 months.

Table 2 presents the predictors of perceived general health. The following factors were significantly associated with worse perceived general health: needs for dental treatment ($P < .01$), older age ($P < .01$), Hispanic ethnicity ($P < .01$), and women ($P < .05$). The following factors were related to better perceived general health: brushing teeth more than once a day ($P < .05$), married ($P < .01$), some college or higher educational attainment ($P < .01$), employed ($P < .01$), and higher levels of self-efficacy ($P < .01$).

Discussion

This study examined the association between health-related beliefs and oral health behaviors among uninsured free clinic patients, and has 3 findings. First, more than 60% of free clinic patients reported a perceived need for dental treatment while the percentage reporting regular oral health behaviors (brushing and flossing) is not low. Second, free clinic patients who brush their teeth more than once a day reported better perceived general health compared with those who do not brush their teeth more than once a day. Third, free clinic patients who had perceived needs for dental treatment reported worse perceived general health compared to those who did not report dental needs.

Although more than 60% of the participants reported perceived needs for dental treatment, their reported oral health habits (brushing and flossing) are somewhat above those reported by the US general population. The percentage of the participants who brush teeth more than once a day (73%) is slightly higher than that among the US general population (69%).²⁸ Likewise, the percentage of the participants who floss teeth at least once a day (45%) is actually slightly higher than that among the US general population (40%).²⁸ There is no further information to identify the reasons that participants reported regular oral hygiene practice. However, USborn participants reported lower percentages of tooth brushing and flossing than the US general population. Future research should address the gap in home dental care between US and foreign born safety-net patients. In any case, it is clear that less than half of the participants floss their teeth every day. Improving these oral health

behaviors among free clinic patients could have a positive impact in many areas of general health. Low-income adults tend to have limited knowledge about oral health.²⁹ Increasing knowledge about oral health is imperative to improve oral health behaviors among low-income adults.³⁰

Furthermore, safety-net clinic patients who indicated that they brush their teeth more than once per day reported better perceived general health than those who indicated that they brush their teeth less frequently than once per day. Since this study is cross-sectional, the causal relationship between tooth brushing and perceived general health is not determined. One possible explanation is that individuals who brush their teeth every day may be more health conscious and have a healthier lifestyle in general than those who do not. A study conducted in Japan suggests that people who have knowledge about healthy diets reported fewer dental health problems.³¹ Health promotion programs for underserved populations usually focus on chronic conditions or smoking cessation.³²⁻³⁴ This study indicates that the inclusion of oral health in health education programs may be beneficial not only for improving oral health but also for contributing to a healthy lifestyle and, as a result, better general physical health. Establishing effective plaque-removal habits, such as regular tooth brushing, may be an easy lifestyle change, and may increase health consciousness resulting in an improved lifestyle in the long term. Future research should examine how health education related to oral health care can have an impact on promoting a healthy lifestyle and improve overall physical health.

The results of this study also suggest that uninsured safety-net clinic patients who have perceived needs for dental treatment have worse self-reported perceived general health compared to those who do not report those needs. However, there is no difference in sociodemographic characteristics between participants with needs for dental treatment and those without such needs. This is an indicator that perceived needs for dental treatment alone can be strong predictors of perceived general health. Previous studies have demonstrated oral health and health of the rest of the body to be closely related to each other.⁴ Safety-net clinic patients who self-report needs for dental treatment may also manifest signs of physical health problems or vice versa. The results confirm that oral health is an essential part of general health,³⁵ even for perceived oral and general health. Safety-net clinic patients who express needs for dental treatment may require further attention when it comes to oral and general health.

While this study provides important information about relationships between health-related beliefs and oral health behaviors among safety-net clinic patients, there are limitations. This study is cross-sectional and is limited in determining causal directions among variables. The participants were recruited based on a convenience sample, and there is no information on how respondents and non-respondents

are different from each other in terms of health-related beliefs and oral health behaviors. Compared to the entire patient population of the clinic, women and those who self-identify as Hispanics were slightly over-sampled. The results of this study might be skewed by responses from female and Hispanic participants.

Finally, this study was conducted at one safety-net clinic, and the results may not be generalizable to other safety-net clinics that serve different underserved populations (eg, African Americans). All free clinics, however, do serve underserved populations. Thus, the clinic where this study was conducted shares some common features with other free clinics. Despite the limitations, this study has added important new knowledge about the relationship between health-related beliefs and oral health behaviors among underserved populations.

Conclusions

This study fills the gap in research on the relationship between health-related beliefs and oral health behaviors among underserved populations in a safety-net setting and indicates a pressing need for the further development of dental care services at safety-net clinics. Including dental care in health promotion programs will have positive impacts not only on oral health but also on a healthy lifestyle and perceived general health of underserved populations utilizing a safety-net clinic. Future research should further examine oral and general health among underserved populations who have significant disadvantages to ensure their health and well-being. The implementation and evaluation of the integrated health programs which include primary care and oral health care together would be beneficial to reduce oral health disparities.

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Declaration of Conflicting Interests

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