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Factors Associated with Dental Service Use of Older Korean Americans

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Abstract

Objectives: Based on Andersen's health care utilization model, the present study examined factors associated with dental service use in older Korean Americans. Focus was on predisposing characteristics (age, gender, marital status, education, and region), oral health needs (problems with teeth or gums and self-rated oral health), and enabling factors (dental health insurance, length of stay in the U.S., acculturation, and family network).

Methods: Using data from surveys with Korean Americans aged 60 or older ($N = 2,128$), a Poisson regression model examined predictors of dental visit in the past 12 months.

Findings: More than 21% of the sample reported having a problem with teeth or gums, and over half rated their oral health as either fair or poor. Approximately 71% lacked dental health insurance. The number of dental visits in the past 12 months averaged 1.40 ($SD = 1.74$), with about 38% having no dental visits at all. Multivariate analyses showed that higher levels of education, the presence of a problem with teeth or gums, dental health insurance coverage, longer length of stay in the U.S., and larger family networks were associated with 1.01 to 1.35 times higher number of dental visits.

Conclusion: The findings not only confirmed the critical role of dental health insurance as a service enabler but also highlighted the importance of considering older ethnic immigrants' oral health and dental care from the perspectives of culture and family.

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Author Contribution

Y. Jang contributed to conceptualization, design, data analysis, and manuscript preparation. H. Yoon, M. K. Rhee, N. S. Park, D. A. Chiriboga, and M. T. Kim contributed to data interpretation and manuscript preparation. The manuscript has been read and approved by all authors.

Keywords

oral health; dental care; immigration; acculturation; older Korean Americans

Introduction

Despite national efforts to close the health gap in the U.S. over the past few decades, oral health and dental care continue to demonstrate disparities.¹⁻³ Referred to as a window to overall health, oral health directly or indirectly affects many aspects of an individual's life, including food intake, disease susceptibility, social interaction, self-esteem, quality of life, and even mortality.^{1, 3-5} Since the Surgeon General's landmark report in 2000 emphasized its importance for all Americans,² oral health has become a national priority.^{1, 3, 4, 6}

However, many segments of the U.S. population experience disproportionate oral health problems and inequities in dental care,¹⁻³ with older immigrants being at particular risk.^{7, 8} Their limited access to dental care is a public health concern not only because they are one of the fastest growing groups of the U.S. population^{9, 10} but also because they face unique challenges associated with language and culture.^{7, 8, 12}

Research on the oral health and dental care of Asian Americans has been limited.^{11, 14} Even more concerning is the fact that current knowledge is misleading. Studies of large population-based samples,^{14, 15} for example, often portray Asian Americans favorably in terms of their oral health and dental care status. The 2007 Medical Expenditure Panel Survey (MEPS) found that across all racial/ethnic groups Asian Americans had the lowest rate of unmet dental care needs (inability or delay in obtaining needed dental care).¹⁵ Yet such findings should be interpreted cautiously. In the case of the MEPS, the survey targeted only English-speaking Americans and thus excluded the substantial proportion of Asian Americans who face language barriers.^{16, 17} In support of this upward bias in English-only survey data, many community-based studies of Asian Americans that have included those with language barriers have in fact demonstrated vulnerabilities in oral health and dental care.^{7, 8, 12} Culturally and linguistically sensitive research approaches may therefore be especially important when recruiting older members of Asian American communities, the majority of whom are foreign-born and limited in English proficiency.¹⁷

Targeting older Korean Americans, the present study employed culturally and linguistically sensitive methods for participant recruitment. The approaches included providing the native language version of a survey questionnaire, using bilingual and bicultural recruiters and survey assistants, and establishing community partnerships. Older Korean Americans are an appropriate group to target for several reasons: (1) they are one of the rapidly expanding immigrant groups (i.e., Korean is the 5th largest Asian American subgroup), (2) they are limited in English proficiency (i.e., More than 80% of the Korean Americans speak a language other than English at home), (3) they manifest marked disparities in healthcare with a high rate of the uninsured and low rate of health service use, and (4) information on their oral health and dental care is limited.^{12, 16, 18}

Our research was guided by Andersen's health care utilization model,¹⁹⁻²¹ which has been widely used in health services research with diverse populations. Demographic and

background characteristics (e.g., age, gender, marital status, education, and region) served as predisposing variables that underlie the propensity to the use of dental care services. For oral health needs, reports of the presence of a problem with teeth or gums and the subjective rating of oral health were used. Previous studies demonstrate a high correlation between self-rated oral health and clinical measures of oral examination.^{22, 23}

Of particular interest in the present study was identifying enabling variables for dental service utilization. Selection of the variables was based on literature on health service utilization in general and ethnic minority populations.^{11, 24, 25} Dental health insurance is widely-known to facilitate proper and timely use of dental care services.^{6, 15} The loss of employment-based dental insurance and lack of dental coverage in social insurance programs pose challenges to the older population across all racial/ethnic groups.²⁶ For older immigrants, dental service use should be considered in the context of culture and family. Acculturation refers to the process of cultural adaptation that takes place when an individual had a prolonged exposure to a new culture.^{11, 25} Studies demonstrate the important role of acculturation as a determinant of health and well-being and an enabler of health service use.^{11–13} Family network is also known to promote service use in older immigrants.^{7, 12, 13} We anticipated that individuals in an early stage of immigration and cultural adaptation and/or with a weak family tie would be likely to be challenged with the use of dental services. Our conceptualization of culture- and family-related factors as enabling variables is based on their role as personal resources and potential utility as intervention targets.^{7, 11–13}

In summary, the aim of the present investigation was to examine how dental service use of older Korean Americans was associated with predisposing characteristics, oral health needs, and enabling factors. Based on the literature on immigrant populations and health service use,^{6–8, 11, 13} we hypothesized that dental service use would be associated with dental insurance coverage, longer length of stay in the U.S., higher levels of acculturation, and stronger family ties after controlling for predisposing and need factors.

Methods

Participants

Data were drawn from surveys of Korean immigrants aged 60 and older conducted in five states. The selected states were California, New York, Texas, Hawaii, and Florida, which respectively include 29.3%, 8.0%, 5.2%, 2.7%, and 2.2% of the total Korean population resident in the U.S.¹⁰ In each state, a primary metropolitan statistical area with a representative proportion of Korean Americans was selected: Los Angeles, New York City, Austin, Honolulu, and Tampa. Combined, these sites present a continuum of Korean population densities. The use of a multi-site was intended to allow analysis of geographic variations. The age of 60 was the low end of age eligibility because 60 is regarded as a start of a new cycle of life in Asian cultures.^{27, 28} The community-based samples were recruited by a team of investigators who shared the language and culture of the target population. At each site, research began by compiling a database listing Korean-oriented resources, services, and amenities; this database not only facilitated the research team's efforts for community engagement but also guided the selection of potential survey locations. In the development and use of these ethnic resource databases, community advisors' input was

actively solicited. The surveys took place at multiple locations and events (e.g., churches, temples, grocery stores, small group meetings, and cultural events). At each survey session, our bilingual and bicultural research team set a booth where participants could stop by and complete their questionnaires. Data collection continued until the targeted sample size at each site was met. Sample size targets were based on the Korean population density at each site (ranging from 300 to 600). Due to the necessity of moving the data collection team from site to site, data collection took place about 10 months, from April 2017 to February 2018. The survey instrument consisted of a standardized questionnaire in Korean. Developed through a back-translation and reconciliation method, the survey was designed to be self-administered, but trained interviewers were available for anyone who needed assistance. It took respondents about 40 minutes to complete the 12-page questionnaire, and they were each paid US \$20 for participation. The project was approved by a university Institutional Review Board (FWA#00002030). All participants were informed of the study goals and signed an informed consent form. A total of 2,176 individuals participated in the survey. After removal of those who had more than 10% of data missing ($n = 26$) and no response in the question on dental visit ($n = 22$), the final sample consisted of 2,128 participants.

Measures

Dental service use.—Participants were asked how many times they had visited a dentist in the past 12 months. The total count was used for the analysis.

Predisposing characteristics.—Demographic information included age (in years), gender (0 = *male*, 1 = *female*), marital status (0 = *not married*, 1 = *married*), education (0 = *high school graduation*, 1 = *>high school graduation*), and region coded by low to high Korean densities in the area (0 = *Florida*, 1 = *Hawaii*, 2 = *Texas*, 3 = *New York*, 4 = *California*).

Oral health needs.—Participants were asked if they had any problems with teeth or gums (0 = *no*, 1 = *yes*). Self-rated oral health was assessed by asking participants how they would rate their overall oral health status on a 5-point scale; their responses were dichotomized into *excellent/very good/good* (0) and *fair/poor* (1).

Enabling factors.—Dental health insurance coverage was coded as a binary variable (0 = *no*, 1 = *yes*). The length of stay in the U.S. was coded in years, and the level of acculturation was assessed with a 12-item acculturation inventory²⁹ that included questions on language use, media consumption, food consumption, social relations, sense of belonging, and familiarity with the host culture. The total score could range from 0 (*the lowest level of acculturation*) to 36 (*the highest level of acculturation*). Validation of the instrument has been conducted in previous studies with older Korean Americans.²⁹ Internal consistency of the scale in the present sample was high ($\alpha = 0.91$).

Family network was measured with a subset of the Lubben's Social Network Scale.^{30,31} The three items consisted of the number of family/relatives seen or heard from at least once a month, felt at ease to talk about private matters, and felt close to. Each item had six response categories, ranging from 0 (*none*) to 5 (*nine or more*). The total scores could range from 0 to

15, with higher scores indicating a stronger family network. The scale has been translated into Korean and validated for psychometric properties.³² Cronbach's alpha for the present sample was 0.85.

Analytic Strategy

Poisson regression analysis assessed factors contributing to the use of dental services. Poisson analysis was selected because of non-normal data distribution of the outcome variable: it is a generalized linear model known to be an optimal method for estimating count data with a high level of skewness.³³ Following the conceptualization based on Andersen's health care utilization model,¹⁹⁻²¹ the predictive variables included (1) predisposing characteristics (age, gender, marital status, education, and region), (2) oral health needs (problems with teeth or gums and self-rated oral health), and (3) enabling factors (dental health insurance, length of stay in the U.S., acculturation, and family network). The formula for calculating power, $50 + 8m$, was used, where m is the number of predictor variables to be entered in a regression model.³⁴ Results indicated that 138 participants were a minimum sample size when the regression included eleven predictors. The size of the present sample ($n = 2,128$) is sufficient to test the proposed hypotheses. All analyses were conducted using SPSS 25 (IBM Corp., Armonk, NY).

Findings

Descriptive Characteristics of the Sample

Sample characteristics are summarized in Table 1. Respondents' mean age was 73.4 years ($SD = 7.97$; range = 60 to 100). About 67% were female, 39% were not married, and 60% had a high school education or below. Distribution of the sample in the region by ethnic density was Florida (14.4%), Hawaii (15%), Texas (15.1%), New York (25.3%), and California (30.2%). Over 21% reported a problem with teeth or gums, and over 52% rated their oral health as either fair or poor. Nearly three quarters lacked dental health insurance. The length of stay in the U.S. averaged 31.5 years ($SD = 12.1$; range = 0.17 to 80). The mean score of acculturation and family network was 12.2 ($SD = 7.07$; range = 0 to 35) and 8.13 ($SD = 3.25$; range = 0 to 15), respectively. The number of dental visits in the past 12 months averaged 1.40 ($SD = 1.74$; range = 0 to 12); the distribution was non-normal (skewness = 2.53, kurtosis = 10.1), with approximately 38% of the sample reporting no use at all.

Poisson Regression Model of Dental Service Use

Table 2 summarizes the findings of the Poisson regression model of the count of dental service use. Among predisposing and needs variables, education and problems with teeth or gums were found to be significant. Education beyond high school graduation and the presence of teeth or gum problem were associated with 1.11 (95% confidence interval [CI] = 1.02, 1.22, $p < 0.05$) times and 1.13 (95% CI = 1.02, 1.24, $p < 0.05$) times more number of dental visits, respectively. Among enabling variables, all variables except for acculturation reached significance. The number of dental visits was increased by dental health insurance coverage (odds ratio [OR] = 1.35, 95% CI = 1.24, 1.45, $p < 0.001$), longer stay in the U.S.

(OR = 1.01, 95% CI = 1.01, 1.02, $p < 0.05$), and stronger family networks (OR = 1.03, 95% CI = 1.01, 1.04, $p < 0.001$).

Discussion

Guided by Andersen's health care utilization model,^{19–21} the present study explored factors associated with dental service use in older Korean Americans. Particular attention was paid to the role of enabling variables after controlling for predisposing and needs variables. Supporting the proposed hypotheses, our analyses showed significant contributions of dental insurance coverage, length of stay in the U.S., and family network in predicting dental service use.

Descriptive analyses revealed high levels of oral health needs in the sample. More than one in five participants reported a problem with teeth or gums. Over half of the sample (52%) rated their oral health condition as either poor or fair; the corresponding figure in the U.S. adult population is substantially lower at 30%.³⁵ The average number of dental visits in the past 12 months was 1.40 ($SD = 1.74$). Approximately 38% of the sample had no dental visits, and this figure is higher than the 31% in the adult sample of the U.S. non-Hispanic Whites.¹³ At about 29%, the rate of dental insurance coverage of the present sample was substantially lower than the rates reported in a national sample of several Asian American subgroups (44.6–60.2%).¹³ Our use of culturally and linguistically sensitive approaches (e.g., use of the native language version of the survey, recruitment and survey assistance by bilingual and bicultural individuals, and partnerships with community leaders) enabled us to recruit many older Korean Americans with cultural and linguistic barriers. As a consequence, the present sample demonstrated a high level of oral health needs and a low rate of dental health insurance coverage, contrary to previous findings from population-based studies of Asian Americans.^{14, 15} However, the overall status of oral health and dental care in the present sample was comparable to those in community-based samples of older Asian Americans that included participants with language barriers.^{7, 8, 12}

In the multivariate analyses, education emerged as a significant predisposing variable of dental service use. As a proxy of socioeconomic status, education may not only influence one's ability to access to dental care services but may also shape oral health-related knowledge and behaviors.¹³ The presence of a problem with teeth or gums was significantly associated with the use of dental services, but no association was found for the more general self-ratings of oral health. These finding suggests the importance of identifying specific oral health problem as opposed to the subjective perceptions of an overall oral health.

As an endeavor to explore the critical enablers of dental service use, an array of variables was included in this study. Consistent with previous studies,^{6, 15} dental health insurance was a powerful driver for the use of dental services. The number of dental visits increased 1.35 times (95% CI = 1.24, 1.45, $p < 0.001$) with dental insurance coverage. As variables specific to the experiences of immigrants, both the length of stay in the U.S. and acculturation were considered, but only length of stay was related to dental visits. A similar finding that years of residence in the U.S. are more prominent predictor of service use than the acquisition status of language and culture has been obtained in other studies of immigrants.¹³

Regardless of the level of acculturation, the time spent in the U.S. seems to enable individuals to overcome barriers and establish their own ways of dealing with healthcare needs (e.g., identifying a clinic to go to and seeking assistance for interpretation and transportation). The enabling role of family network was also found, and this finding is in line with literature showing the importance of family support and network in older ethnic minorities' healthcare utilization and decision making.¹²

Some limitations to the present study should be noted. Although the study was unique in that we recruited many individuals who were culturally and linguistically isolated by sampling across multiple locations, the sample was nonrandom and the resulting sample did not represent the entire population of older Korean Americans. Also, the cross-sectional design limited our ability to infer causal directionalities. For example, self-rated oral health served as one of the predictors of the use of dental services, but an inverse relationship might also be feasible. The absence of objective measures of clinical oral examinations also adds to the limitations. The single-item self-reported oral health measure might not be a sufficient indicator, and oral health needs should be quantified by clinical measures, such as the number of decayed, missing, and filled teeth, mouth dryness, and gum condition. Future studies also need to incorporate detailed information on dental service use, such as the nature of visits (e.g., preventive care, acute care, and limited prosthesis repairs), ethnic and linguistic concordance with care providers, and satisfaction with care received. Future studies should consider other enabling factors that might influence the pathways of evaluating oral health needs and utilizing dental services. Examples may include oral health literacy, cultural values and beliefs about oral health care, personal health choices, psychosocial characteristics, and community/environmental characteristics.

Despite these limitations, the present study documents overall issues in the oral health and dental care use among older Korean Americans and has identified factors associated with their use of dental services. The findings not only confirmed the frequently reported role of dental health insurance as a service enabler^{6, 15, 26} but also highlighted the importance of considering oral health and dental care from the perspectives of culture and family. Interventions to promote older ethnic immigrants' dental service use should target those who are in an early stage of immigration and who lack dental health insurance, and should incorporate family components.

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Table 1

Descriptive Characteristics of the Sample (N=2,128)

	%	M±SD (range)
Predisposing characteristics		
Age (in years)		73.4±7.97 (60—100)
Gender		
Male	33.2	
Female	66.8	
Marital status		
Not married	39.3	
Married	60.7	
Education		
High school graduation	59.8	
>High school graduation	40.2	
Region by ethnic density		
Florida	14.4	
Hawaii	15.0	
Texas	15.1	
New York	25.3	
California	30.2	
Oral health needs		
Problem with teeth or gums		
No	78.6	
Yes	21.4	
Self-rated oral health		
Excellent/very good/good	47.5	
Fair/poor	52.5	
Enabling factors		
Dental health insurance		
No	70.7	
Yes	29.3	
Length of stay in the U.S. (in years)		31.5±12.1 (0.17—80)
Acculturation		12.2±7.07 (0—35)
Family network		8.13±3.25 (0—15)
Outcome		
Dental service use in the past 12 months		1.40±1.74 (0—12)

Table 2

Poisson Regression Model of Dental Service Use

	Odds Ratio (95% Confidence Interval)
Predisposing characteristics	
Age	0.99 (0.99, 1.01)
Female	1.09 (0.99, 1.19)
Married	1.06 (0.97, 1.15)
>High school graduation	1.11 [*] (1.02, 1.22)
Region	0.98 (0.96, 1.01)
Oral health needs	
Problem with teeth or gums	1.13 [*] (1.02, 1.24)
Fair/poor rating of oral health	1.06 (0.97, 1.16)
Enabling factors	
Dental insurance coverage	1.35 ^{***} (1.24, 1.45)
Length of stay in the U.S.	1.01 [*] (1.01, 1.02)
Acculturation	0.99 (0.98, 1.00)
Family network	1.03 ^{***} (1.01, 1.04)

^{*}
 $p < 0.05$.

^{**}
 $p < 0.01$.

^{***}
 $p < 0.001$.