

Dental Service Utilization among Urban and Rural Older Adults in China – A Brief Communication

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Abstract

Objectives: China's health care system is bifurcated in nature between rural and urban areas. In addition, there is a huge gap in socioeconomic status between rural and urban residents. The purpose of the study was to examine the factors related to dental visits among elders in rural and urban areas of Shanghai, China. **Methods:** Using a stratified random sampling method, a cross-sectional, face-to-face survey was conducted among elders aged 60 years and above in Shanghai during 2003-04. A total of 1,044 older respondents were included in the sample. **Results:** There was a significant urban and rural difference in dental visit rates over the 12-month period of the study. Results from the logistic regression analysis suggested that residing in urban areas was a significant positive factor related to dental visits. In addition, being younger, being able to pay out-of-pocket medical expenses, having had regular medical checkups, having a higher number of limitations because of chronic conditions, and being more concerned about eating a healthy diet were associated with increased odds of dental visits. **Conclusions:** Results suggest that urban-rural differences, as reflected in the socioeconomic status gap, disparity in medical insurance coverage, and access to dental care, have a significant impact on the use of dental services by Chinese elders. Individual sociodemographic characteristics, health status, and health attitude are important explanatory variables.

Key Words: dental care utilization, urban and rural, oral health, Chinese elders

Introduction

Oral diseases and conditions are very common in China, particularly among older adults. Data from the China Third Oral Epidemiological Survey show that 97.6 percent of the adult population had some oral disease (1). Some statistics suggest that 92.2 percent of elders had dental caries and 80 percent had periodontal disease. Dental care utilization is a major factor affecting oral health status (2). However, few studies published in either Chinese or English have reported specifically on dental care utilization in China, especially among older adults.

Because of variations in health care, pension policies, and state provisions, rural and urban differences are critical in understanding dental care utilization of older adults in

China (3). Urbanites have higher incomes, pension coverage, and social medical insurance covering most medical expenses (including some dental expenses). In addition, until recently, housing had been provided by the government or work units in urban areas. In contrast, rural elders do not have pension coverage, have much lower incomes, and only recently have begun to have collective medical insurance (which covers only limited medical expenses and no dental services). Overall, these differences have a significant impact on affordability, access, and the availability of dental care. Despite being few in number, studies on dental care utilization have indicated that rural elders had a much lower rate of dental visits than urban residents (4,5).

Increasing attention has been paid to the impact of lifestyle on oral health and dental care use (2,6-8). Given the high incidence of functional impairment among older adults, these factors would also inevitably have some impact on oral health and dental care utilization. Recent studies suggested that those with unhealthy lifestyles (unhealthy diet, smoking, and heavy drinking) and higher levels of functional impairment would be less likely to use dental services (2,6,7). Currently, no studies in China have considered these factors.

This study extended previous studies by analyzing the factors related to dental visits among elders in rural and urban areas of Shanghai, China. In particular, it examined whether location of residence is an independent factor affecting dental visits while controlling for individual sociodemographic characteristics, health status, and health behaviors. This study was also unique in its investigation of the impact of functional status and lifestyle factors on dental care utilization.

Methods

Sample and Data Collection.

Between 2003 and 2004, the author directed a study on health services utilization among Chinese elders in Shanghai, China. Three rural villages and six urban neighborhood communities were selected for data collection. Each community is overseen by an administrative committee that maintains a housing registry for each home. The housing registration is an official document containing basic

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demographic characteristics for each resident. With assistance from each committee, the author and her assistants randomly selected study subjects from the housing registration. The response rate was 89 percent, with the nonresponse rate largely resulting from unavailability. A total of 1,044 respondents aged 60 and older (420 urban and 624 rural) completed a household interview.

Measures.

Dependent variable. Respondents were asked about visits to a dentist, coded as 1 if respondents indicated having visited a dentist in the past 12 months.

Independent variables. A set of independent variables found in previous studies to be important predictors were selected: demographics, insurance coverage, physical health, health behaviors, and attitude.

Sociodemographic characteristics included age (measured in years), gender, living alone, education (middle school or above = 1), monthly income (below 1,000 RMB = 1), life satisfaction, place of residence (urban = 1), medical insurance coverage, and the ability to pay out-of-pocket medical expenses. The survey also measured life satisfaction by asking respondents to rate the following three statements: 1) my life should be better than it currently is; 2) these recent years have been the best years of my life; and 3) looking back on my life, I am quite satisfied. The answers were coded from strongly disagree = 1 to strongly agree = 5, except for item 1, which was coded in a reverse order. The Cronbach's alpha for these three items was 0.61. The summary variable life satisfaction is the sum of the scores for these three variables. A higher score represented a greater sense of life satisfaction. Two types of medical insurance (social insurance and collective medical insurance) were measured in the study. Yes was coded as 1 for these insurance measures, as was the ability to pay medical expenses.

Physical health measures included several variables: self-rated health, number of limitations result-

ing from chronic conditions, and functional limitations. Self-rated health was coded as fair or poor = 1, 0 otherwise. A scale was created for the number of limitations resulting from chronic conditions (from 0 to 12): arthritis, back/neck problems, eye/vision problems, hypertension, difficulties with walking, hearing loss, bone fractures, lung/breathing problems, heart disease, diabetes, stroke, and emotional problem. A summary scale was calculated by counting the number of limitations resulting from each of these chronic conditions.

Functional limitations were measured by asking whether they received any activity of daily living assistance: dressing, toileting, transferring, bathing, and eating; or any instrumental activity of daily living assistance: taking medicine, managing finances, shopping, doing household work, cooking, and transportation (4). A code of 1 was assigned to each activity if respondents answered "yes." The functional limitation score was calculated by combining the reported help they received. The score ranged from 0 to 11, where a high score represented higher functional impairment.

Health behaviors included regular physical exams (having exams in the past 12 months = 1), smoking (smoker = 1), drinking (having an alcoholic beverage at least two to three times per week = 1), and exercise (people who exercised on a regular basis, two to three times a week or more = 1). Health attitude was defined as concerned about eating a healthy diet. This measure ranged from not at all = 1 to moderately concerned = 2 to extremely concerned = 3.

Data Analysis. In addition to the use of descriptive and bivariate statistics, the use of dental services was examined by estimating a logistic regression. Pearson correlation analysis was performed before the models were finalized. In order to avoid the issue of multicollinearity, several variables were not included in the final multivariate models. For example, in this study, income dis-

tribution is drastically different between urban and rural elderly residents. Ninety-five percent of rural respondents had a monthly income below 1,000 RMB (equivalent of 120 USD in 2003), but only 22 percent of urban residents were in that income bracket. Income and type of insurance were highly correlated with place of residence and so were not included in the models. A hierarchical logistic regression analysis was conducted. The first step only included place of residence. The second step entered all significant correlates of dental visits as identified from a partial correlation analysis. The third step added all remaining variables identified in the conceptual model.

Results

Sample Characteristics.

Table 1 compares urban and rural differences in dental care utilization, sociodemographic characteristics, health status, and health behaviors and attitude among older adults. A significantly higher percentage of urban respondents had visited a dentist in the previous 12 months than their rural counterparts.

Logistic Regression Results.

Table 2 describes the results from the logistic regression models predicting dentist visits for Chinese elders. Odds ratios (OR) and 95 percent confidence intervals (CI) are presented in the table.

Place of residence had a significant association with dental visits for elders. In the fully specified model (model 3), the odds of seeing a dentist were 127 percent higher for urban residents than their rural counterparts (OR: 2.27, CI: 1.02 to 5.08). Additionally, younger individuals with a greater ability to pay out-of-pocket medical expenses were more likely to seek dental care. On the other hand, individuals with a higher sense of life satisfaction were less likely to see a dentist. Physical health was related to dental visits. A number of limitations resulting from chronic conditions had positive correlations with dental visits. Among the domains related to health behav-

Table 1
Descriptive Analysis of the Sample Characteristics

	Rural sample Mean (SD)/ Percentage Total (<i>n</i> = 624)	Urban sample Mean (SD)/ Percentage Total (<i>n</i> = 420)	<i>P</i>
Dental visits	3.4%	11.7%	<0.01
Sociodemographics			
Age (range: 60-103 years)	71.3 (7.3)	69.9 (6.6)	<0.05
Female	55.8%	58.8%	NS
Monthly income <1,000 RMB*	95%	22%	<0.01
Middle school or above	12.7%	64.5%	<0.01
Social medical insurance coverage	6.4%	86.4%	<0.01
Collective medical insurance coverage	75.3%	0.0%	<0.01
Ability to pay out-of-pocket expenses	52.4%	92.1%	<0.01
Overall life satisfaction (range: 3-15)	9.1 (2.3)	8.0 (2.1)	<0.01
Living alone	14.3%	9.1%	<0.05
Health status			
Health rated as fair or poor	66.2%	72.6%	<0.05
Number of limitations resulting from chronic conditions	3.6 (2.1)	3.2 (2.2)	<0.05
Number of ADL and IADL assistances received (range: 0-11)	1.2 (2.1)	1.5 (2.0)	<0.01
Health behaviors and attitude			
Regular physical exam	8.2%	35.2%	<0.01
How concerned about healthy food			<0.01
Not at all	32.1%	5.0%	
Moderately	48.6%	33.6%	
Extremely	19.4%	61.4%	
Smoker	21.0%	13.6%	<0.01
Drinker	16.4%	15.0%	NS
Exercise regularly	27.2%	73.6%	<0.01

P-values are generated by χ^2 tests for categorical variables and by *t*-test for continuous variables.

* 1,000 RMB was equivalent to 120 USD in 2003.

SD, standard deviation; NS, not significant; ADL, activity of daily living; IADL, instrumental activity of daily living.

iors, individuals who had regular physical examinations and who were more concerned about a healthy diet had higher odds of use of dental care.

Place of residence, the variable alone, explained 5 percent of variance in dental visits (model 1). While including all significant correlates of dental visits (as identified from a partial correlation analysis), the model explained 14 percent of its variance (model 2). The fully specified model explained 16 percent of its variance (model 3).

Discussion

This study has extended previous research by showing that place of residence has an independent effect

on dental service use while controlling for the individual's socioeconomic status, health status, health behaviors, and attitude. Individual sociodemographic characteristics, health status, and health attitude are important explanatory variables.

Urban-rural differences are reflected by socioeconomic status and disparities in insurance coverage; it may also serve as a proxy for access to care (e.g., availability of dentists), which is unmeasured in the study. While over 65 percent of the population is rural, an overwhelming majority of dental professionals are in the urban areas (9).

Affordability is another major reason for the underutilization of dental care, particularly among rural

elders. Currently, dental insurance is rare in China. Social medical insurance, which only covers urban employees, can partially or totally reimburse expenditures for basic dental health care. On the other hand, collective medical insurance covers only minimal medical expenses and no dental expenses. Therefore, because rural residents have to pay out of pocket for all dental care, that ability to pay has a direct impact on service utilization.

Within the health behaviors and attitude domain, eating healthy food was significantly related to dental care utilization. The Chinese have a long tradition of linking food to oral diseases. As findings from a previous study on older adults showed, three of the most frequently cited causes for dental caries and gum disease were sweet, deep-fried, and hot foods. Furthermore, consuming less sugar and avoiding spicy food were the two most frequently mentioned prevention measures (10). In addition, urban residents, in particular, are increasingly concerned about eating healthy food. It is likely that individuals who are more concerned about their diet would pay more attention to their oral health and seek dental care services more promptly. Similarly, having regular physical exams reflects health conscientiousness. Individuals who had regular physical exams would be more likely to seek dental care.

While studies in the United States found that functional limitations, smoking, and heavy drinking were negatively related to dental care utilization (2,7), this study did not find these associations. There are several possible reasons: a low proportion of individuals had dental visits or the data lacked sufficient specific measures on smoking and drinking. Another factor could be that Chinese and Americans may have different reasons for visiting the dentist, and their cultural attitudes toward drinking and smoking may also be different.

Several data limitations of this study need to be acknowledged. The survey did not contain information

Table 2
Logistic Regression Analysis for Dental Visit in the Previous 12 Months (*n* = 1,044)

Variable	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Sociodemographics			
Urban	3.79*** (2.24-6.43)	2.13* (1.07-4.23)	2.27* (1.02-5.08)
Age		0.94* (0.90-0.99)	0.95* (0.90-0.99)
Female ^(a)			0.68 (0.36-1.27)
Education ^(b)			0.72 (0.36-1.42)
Overall life satisfaction		0.87* (.077-0.99)	0.85* (0.75-0.97)
Out-of-pocket expense ^(c)		2.40* (1.03-5.61)	2.52* (1.05-6.02)
Living alone ^(d)			0.41 (0.12-1.39)
Health status			
Health rated as fair or poor ^(e)			0.82 (0.43-1.55)
Number of limitations resulting from chronic conditions		1.26*** (1.11-1.42)	1.27*** (1.12-1.45)
Number of ADL and IADL assistance received			0.92 (0.80-1.06)
Health behaviors and attitude			
Regular physical exam ^(f)		1.96* (1.10-3.49)	1.95* (1.06-3.59)
Concern about healthy food†		1.79* (1.10-2.91)	1.85* (1.13-3.04)
Smoker ^(g)			0.62 (0.25-1.53)
Drinker ^(h)			0.70 (0.30-1.65)
Exercise regularly ⁽ⁱ⁾			1.22 (0.64-2.33)
Pseudo <i>R</i> square	0.05	0.14	0.16

Reference categories: ^(a)male; ^(b)primary school or below, rural; ^(c)unable to pay out-of-pocket expenses; ^(d)living with others; ^(e)health rated as good, very good, or excellent; ^(f)no regular physical exam; ^(g)nonsmoker; ^(h)nondrinker; and ⁽ⁱ⁾not exercising regularly.

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; two-tailed test.

† Concern about healthy food is an ordinal variable (not at all = 1, moderately concerned = 2, extremely concerned = 3).

OR, odds ratio; CI, confidence interval; ADL, activity of daily living; IADL, instrumental activity of daily living.

on self-rated oral health, dental anxiety/fear, or the purpose of the visit (e.g., routine dental examination preventive services, restorative procedures). In addition, the data were collected in only one area in China; given the size and heterogeneity of the country, generalization of the findings should not be made. Moreover, because of the nature of the data, we were only able to investigate the factors associated with dental care utilization of elders. Longitudinal studies are needed to further analyze causal relationships between the independent variables and dental care utilization in general.

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¹ I did not include Chinese-language sources in the references, except for reference #1.