

The Association between Dental Insurance Coverage, Socio-Economic Status and Use of Dental Care in Adolescents

Ali Golkari¹, PhD; Mehrdad Vossoughi¹, PhD; Mahsa Mohammadi², DDS; Arghavan Behbahanirad³, PhD; Maryam Bakhtiar³, PhD

¹Oral and Dental Disease Research Center, Department of Dental Public Health, School of Dentistry, Shiraz University of Medical Sciences, Shiraz, Iran

²Dentist, Shiraz, Iran

³Department of Dental Public Health, School of Dentistry, Shiraz University of Medical Sciences, Shiraz, Iran

Correspondence:

Maryam Bakhtiar, PhD;
Department of Dental Public Health,
School of Dentistry, Shiraz University
of Medical Sciences, Shiraz, Iran

Tel: +98 917 7365789

Email: bakhtiar@sums.ac.ir

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Abstract

Background: Several items affect the use of dental services. The objective of this study was to assess the association between socio-economic status (SES) and dental insurance coverage with the use of dental services amongst Iranian adolescents aged 13-15 years old.

Methods: In this cross sectional study, we used a researcher-made questionnaire to assess the association between socio-economic status (SES) and dental insurance coverage with the use of dental services in 423 Iranian adolescents aged 13-15 years old. Statistical Package for Social Sciences (SPSS) was used to analyze the data, generate descriptive statistics, and perform multiple logistic regressions.

Results: Use of dental services was statistically significant amongst the students with dental insurance and parents with higher income ($P < 0.001$), which was independent of the other socio-economic factors (parent's age, education and marital status).

Conclusion: The results showed that one of the important policies to reduce inequality in dental care is to improve dental insurance coverage.

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Introduction

The goal of any healthcare system is to preserve, restore and promote public health. This goal is attainable when the priority is access to health services.¹ In this context, access means the removal of social, systemic, economic, cultural, and behavioral barriers in using healthcare services.² In other words, access is defined as the use of health services.³ In dentistry, access to care is more vital, as its effectiveness is to immediately relieve pain and restore function when dealing with common oral health diseases, such as toothache.⁴

Oral health problems affect different aspects of people's lives including their activity, quality of life, employment status, and mental health. Oral health is an essential aspect of general health; hence, insurance equity in oral healthcare is as important as insurance equity in other forms.⁵ Oral diseases are increasingly

prevalent, and despite requiring treatment, only less than 50% of patients go to the dentists. Clearly, barriers of access to dental care prevents people from referring to dentists.⁶

There are various limitations such as financial burden as the most common one.⁷ Income-related inequity in oral health is confirmed globally.⁸ As expected, people with low income and those without dental insurance coverage were the most likely to report financial barriers.⁴

In a study in Jordan, "Treatment not necessary" and "cost" were found to be the most common barriers to regular dental attendance.⁹ Baldani et al. assessed the role of determinant factors on dental care utilization and found that 31% of children did not have dental visits at all.¹⁰ In another study by Santa Maria et al. Brazil, which assessed 12 year old school children's dental health and its utilization, found that children

with lower socio-economic statuses used the services less frequently.¹¹ In Medicare insurance plan, there is a significant relationship between the levels of payment to the dentists and the number of dental visits.¹² In South Australian adults aged 20–24 years, utilization of dental care was found to be associated with gender and cost, as well as having private health insurance.¹³ In American adolescents, lack of annual dental visits was found to be associated with gender, ethnicity, age, perception of health insurance, family income, and parent education.¹⁴ This study also reported a greater number of decayed teeth and extractions among individuals who were 18 years old or younger with low family income and education level, and whose mothers had low education level.¹⁵

In Iran's healthcare system, the principal insurance companies do not completely cover dental services; hence, patients must make substantial payment from their own pockets. Some complementary health insurances have dental services, but this type of insurance is only available to certain group of population.¹⁶

Therefore, the aim of this study was to analyze the association between socio-economic statuses of adolescent's parents, their dental insurance and dental care use in Iran. This information is essential to establish a baseline data that might be helpful in planning educational, promotional, and preventive programs.

Materials and Methods

Study Design and Sample

This is a cross-sectional study which was conducted in Shiraz. The study protocol was approved by local Ethics Committee of Shiraz University of Medical Sciences. A multistage random sampling strategy was used to select the participants. Shiraz was divided into four educational districts. The exceptional secondary schools were eliminated. Girls and boys' schools were categorized into each region separately; then, a code allocated to each secondary school. In each district, four schools (totally 16 schools), consisting of 2 girls' and 2 boys' schools, were selected randomly. In each school, 27 students were randomly selected from a list of eligible ones (adolescents aged 13-15). The method of coding and random selecting was used to select the schools and participants.

After explaining the study objectives, the participants and their parents signed a written informed consent. The students who did not agree to participate or changed their school were excluded from the study.

The sample size was calculated to be 423 based on unknown percentage of subject who had used

the dental services ($P=50\%$), a maximum error of 5%, significance level of 95%, and 10% possible no response rate.

The researcher-made questionnaire included questions on the socio-economic factors of parents. In addition, self-perceived barriers to oral health care was assessed by asking the participants to report from a list of 5 commonly described categories: cost, fear of dental procedure, lack of enough time, no feeling of the need and physical distance to dental care centers. Dental insurance as a supplement to support dental care was classified.

In order to collect DMFT index data, the examiner recorded the number of missing, decayed, and filled tooth by a WHO probe and a mirror. The first part of the questionnaire included questions on age, number of family members, educational level, and job status of each parent. The parents' occupation is categorized into two groups: employees and unemployed. The second part of the questionnaire was about economic statuses. Also, the third part included some questions to determine the affairs of the children's insurance coverage (private, public)

Statistical Analysis

Data were presented using frequency (%), mean and standard deviation (SD). Chi-square and student T-tests were used to assess the relationship between socio-economic characteristics and dental services utilization. A multiple logistic regression model was performed using dental services utilization as the dependent variable and corresponding odds ratio (OR) indices were reported. For this purpose, all variables that possessed a $P<0.05$ in univariate analysis were entered into the model. SPSS software for Windows version 18.0 (SPSS Inc., Chicago, IL, USA) was employed for statistical analysis. P values less than 0.05 were considered to be statistically significant.

Results

In total, 385 participants (177 males and 208 females) aged 13-15 years old were recruited. The mean age of the participants was 14.34 ± 0.31 years. Of them, 164 (42.6%) individuals mentioned that they had used dental services at least once within the past year. Table 1 shows descriptive statistics for demographic variables of the participants.

Table 2 shows their parents' reasons for not using dental services on regular bases or when it was necessary. Cost (58.7%) was the most prevalent barrier.

Table 3 shows the univariate association between the use of dental services within the past 12 months with socioeconomic and demographic status. Higher

Table 1: Description of demographic variables of the participants

Variable		Descriptive index*
Age	-	14.03±0.71
Gender	Male	177 (46%)
	Female	208 (54%)
Parent age	Father	45.8±5.5
	mother	40.1±5.04
Parent marital status	Married	358 (%92.99)
	Single	27 (%7.01)
Father job	Unemployed	43 (%11.2)
	Self-employed	159 (%41.3)
	Governmental	183 (%47.5)
Mother job	Unemployed	290 (%75.3)
	Self-employed	30 (%7.8)
	Governmental	64 (%16.6)
Father education	Under diploma	130 (%32.8)
	Diploma	87 (%22.6)
	University	168 (%43.6)
Mother education	Under diploma	169 (%42.9)
	Diploma	109 (%28.3)
	University	107 (%27.8)
Income (million toman)	<1	156 (%40.5)
	1-2	113 (%29.3)
	2-4	96 (%25)
	>4	20 (%5.2)
Complementary insurance	Yes	78 (%20.3)
	No	307 (%79.7)
Use of dental services	Yes	166 (%43.1)
	No	219 (%56.9)
DMFT	-	2.49±2.11

*Quantitative variables were described using mean±SD and qualitative variables were described using frequency (%)

Table 2: The reasons for not using dental services

Reason	Frequency (%)
No need	120 (31.17%)
No time	26 (6.75%)
Fear of treatment	62 (16.1%)
Cost	226 (58.7%)
Distance from the dental center	3 (0.77%)
No insurance	64 (16.62%)

family income was associated with higher use of dental services. Similar result was obtained for the parents' education level: the higher the level of education, the more the use of dental service for children. Parent's job was also another factor, associated with dental services utilization. The children of employed mothers in governmental organizations and employed fathers were more likely to use dental services.

The results of a logistic regression model to evaluate the association between using dental services and complementary insurance with the components of DMFT index are presented in Table 4.

The results of logistic regression model in Table 5 show that only income and complementary insurance that cover dental services had a significant impact on dental service utilization. Children who had a complementary insurance were 6.19 times more

likely to use dental care services (OR=6.19, p=0.020). The children of families with the income level of 1-2 million tomans and 2-4 million tomans monthly income had significantly higher chances of dental service utilization, compared to those with less than 1 million toman monthly income (OR₁=3.14, OR₂=2.90, respectively).

The mean number of decay and filling teeth were greater for children who had already used dental services (P₁=0.001 and P₂<0.001, respectively) (Table 5). Children who had a complementary insurance had greater mean number of decay and filling teeth than those who had no complementary insurance (P₁=0.013 and P₂<0.001, respectively).

Discussion

The results of the present study showed that there was

Table 3: The association between the use of dental services during the past 12 months with socioeconomic and demographic status

Variable		Use of dental services		P value	OR (%95 C.I)
		No	Yes		
Father job	Unemployed	23 (%76.7)	10 (%23.3)	-	1
	Self-employed	104 (%66.2)	53 (%33.8)	0.189	1.68 (0.77,3.68)
	Governmental	82 (%44.8)	101 (%55.2)	<0.001	4.06 (1.8,8.7)
Mother job	Unemployed	168 (%56.3)	120 (%41.7)	-	1
	Self-employed	22 (%72.3)	8 (%26.7)	0.112	0.5 (0.21,1.18)
	Governmental	28 (%43.9)	36 (%56.1)	0.034	1.8 (1.04,3.1)
Father education	Under diploma	96 (%75)	33 (%25)	-	1
	Diploma	46 (%53)	41 (%47)	0.001	2.67 (1.5,4.77)
	University	77 (%45.8)	91 (%54.2)	<0.001	3.54 (2.14,5.85)
Mother education	Under diploma	116 (%63.6)	52 (%36.4)	-	1
	Diploma	52 (%37.7)	57 (%52.3)	<0.001	2.4 (1.46,3.94)
	University	51 (%48.6)	54 (%51.4)	0.001	2.32 (1.42,3.82)
Income (million toman)	<1	115 (%74.7)	39 (%25.3)	-	1
	1-2	58 (%51.3)	55 (%48.7)	<0.001	2.8 (1.66,4.69)
	2-4	40 (%41.7)	56 (%58.3)	<0.001	4.1 (2.39,7.11)
	>4	6 (%30)	14 (%70)	<0.001	6.88 (2.47,19.1)
Parent age	Father	45.9±6.05	45.6±4.71	0.651	-
	mother	39.9±4.93	40.33±5.19	0.50	-
Parent marital status	Single	17 (%63)	10 (%37)	-	1
	Married	202 (%56.7)	154 (%43.3)	0.522	1.29 (0.57,2.9)
Complementary insurance	No	116 (%38)	189 (%62)	-	1
	Yes	48 (%61.5)	30 (%38.5)	<0.001	2.6 (1.56,4.34)

Table 4: The association between using dental services and complementary insurance with the components of DMFT index

Variable		D	M	F
Using dental services	No	1.85±1.63	0.06±0.28	0.32±1.13
	Yes	1.29±1.47	0.05±0.25	1.48±2.23
	P value	0.001	0.632	<0.001
Complementary insurance	No	1.75±1.65	0.07±0.29	0.5±1.16
	Yes	1.3±1.36	0.04±0.2	1.53±2.56
	P value	0.013	0.255	<0.001

Table 5: The results of logistic regression model

Variable		β	S.E	OR (%95 C.I)	P value
Father job	Unemployed	-	-	1	0.261
	Self-employed	0.79	0.48	2.20 (0.84,5.73)	0.107
	Governmental	0.71	0.65	2.03 (0.56,7.33)	0.272
Mother job	Unemployed	-	-	1	0.185
	Self-employed	-0.4	0.51	0.66 (0.24,1.83)	0.430
	Governmental	-2.18	1.27	0.11 (0.00,1.36)	0.080
Father education	Under diploma	-	-	1	0.262
	Diploma	0.38	0.38	1.46 (0.68,3.13)	0.324
	University	-0.27	0.53	0.76 (0.26,2.17)	0.607
Mother education	Under diploma	-	-	1	0.331
	Diploma	0.47	0.34	1.60 (0.82,3.11)	0.160
	University	0.69	0.69	1.90 (0.51,7.79)	0.311
Income (million toman)	<1	-	-	1	0.026
	1-2	1.14	0.40	3.14 (1.42,6.92)	0.004
	2-4	1.05	0.67	2.90 (1.02,10.90)	0.048
	>4	-0.59	1.39	0.55 (0.03,8.40)	0.660
Complementary insurance	-	1.82	0.78	6.19 (1.33,28.69)	0.020

a significant socio-economic inequality in oral health services utilization. Children who had parents with higher socio-economic status used the dental services more often. In addition, the findings showed an association between the levels of parent's education and utilization of dental care services. Another factor that improved using

dental services was having complementary insurance that covered dental services.

Somkotra et al. in a study on distribution of utilization showed that children in higher-socio-economic status families were more likely to use these services than their lower socio-economic

status counterparts.¹⁷ Millar and Locker reported that insurance and income are important determinants in a person's decision to visit a dentist. Canadians that had the highest-income level were about 3 times as likely to visit a dentist in comparison with the lowest income Canadians.¹⁸ Another study described a trend in socioeconomic disparities in the utilization of dental care in Brazil and Sweden, and found that people with higher socioeconomic status utilized dental services more.¹⁹ A cross-sectional survey in Uganda showed that students with highly educated parents had lower dental problems.²⁰ Pizarro et al. in Spain surveyed the effects of insurance coverage on dental care utilization and found that by increase in insurance coverage, utilization might increase.²¹ A study in Turkey showed that those who had higher education used more dental services as compared to those with low education.²² Probably, these results could be due to socio-economic status, which is linked to the quality of insurance of individuals, meaning that the higher the income level, the greater the opportunity to benefit from insurance with dental care coverage. Data on health utilization survey from a previous study in Shiraz showed that people with higher income who had insurance could increase the probability of dental care utilizations.¹⁶ The 2001 California Health Interview Survey showed that children with a past-year dental visit were likely to be insured and with high-income households.²³

Another finding in this study revealed that children whose parents had governmental jobs use dental services more than those whose parents were self-employed. It seems that some governmental organizations provide their staff with a budget to use health services.

The final finding was that almost half of the participants responded positively to financial barriers as the main reason for not visiting a dentist. Bahadori et al. assessed this determinant as a barrier to dental services usage. The determinants of cost, inconvenience, fear, organization, and patient-dentist relationship were identified, and the cost was the most important one.²⁴

One of the limitations of this research is the lack of evaluation of the effect of knowledge and attitude of individuals on the use of dental services, which is recommended to be done in another study with educational intervention.

Conclusion

Having dental care coverage insurance increases the use of dental services. By finding a real solution to deal with this barrier, dental health can be improved amongst different socio-economic levels.

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