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Review Article

The Differences in Oral Health-Related Quality of Life among Socioeconomic Groups in California, USA

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Abstract

The stated goal of this research is to gain a better understanding of the social disparities that arise due to oral health-related issues on quality of life among adults and elderly individuals. In a cross-sectional analysis, I obtained the most current data from the California Oral Health Survey. For this survey, there were details on 788 people, with 399 of them in the 35-45 year-old age group and 389 of them in the 65-75 year-old age group. The slope index of inequality (SII) and the relative index of inequality is used to quantify socioeconomic differences in Oral Impacts on Daily Performance scores (RII). The prevalence of negative impact of oral health on quality of life was 40.4% for the total sample, 39.3% among adults and 38.05% among elderly individuals. Because of the large actual and proportional wealth inequality measurements, the income class with the greatest prevalence of harmful impacts was observed with the entire sample (SII -26.7; RII 0.47) and all age classes. When it comes to education, there were no gaps found between the aged. Finally, socioeconomic disparities correlated with oral health-related quality of life impacts across all age ranges were evident in California, USA.

Keywords: oral health; quality of life; inequalities; demographic status

Introduction

While significant changes have been achieved in most countries in regards to the overall oral health status, it is important to recognize that individuals in society also face the burdens of oral health diseases. The poorer and less advantaged people were particularly impacted by oral health problems. Tooth decay and dental caries will also be avoided. Owing to pain, irritation, and reduced oral functioning, individuals with bad oral health have poorer quality of life. Social gradients in oral health are a longstanding problem. Higher socioeconomic status is associated with a higher prevalence of tooth decay, dental caries, and edentulous, worldwide. Health differences based on socioeconomic class were seen in research on the subjectivity of oral health, with some in the lower socioeconomic brackets showing more significant declines in quality of life [1-5].

The effect of oral health on the quality of life is greater in adults than in the elderly. About that, the results show a wide disparity in findings across different socioeconomic strata. Also, in the California Oral Health Survey, an earlier study discovered that oral health impacted adults' quality of life more for those with low levels of education than those with higher levels of education, but there was no link between oral health and elderly people. One investigation discovered that social disparities in the effect of oral health on quality of life did not exist among elderly residents in California. However, a new analysis showed that old, low-income Californians have a significantly higher effect on their quality of life due to their oral health.

It is important for health-policy implementation and enhancement to assess social gaps in oral health-related quality of life. Socioeconomic influences have only been studied by people from developing countries, and these findings show that oral health and quality of life are closely associated. The majorities of studies that have so far explored the connection between socioeconomic status and oral health have focused on whether socioeconomic factors correlate with a person's general well-being, but have not assessed the scale of socioeconomic disparities in oral health-related quality of life. In California, it seems that social status played a major role in determining the effect of oral health on quality of life for adults and older adults.

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To assess the extent of social differences in the harmful effect of oral health on quality of life in California, I carried out a cross-sectional analysis among adults and elderly individuals [6-10].

Materials and Methods

This survey took place in 2021 using Survey Monkey and healthcare workers at Cupertino Healthcare and Wellness Center, Cupertino, California. The survey reflected the population of the state and additional information about sample collection has been previously recorded elsewhere.

Oral surgeons qualified to gather data were at the residence to do so. Participants addressed questions relating to mental and socioeconomic problems when they were wearing earphones that recorded their answers. Following a systematic methodology set out by the World Health Organization, participants were given a clinical oral health test to follow. The present study included data on 788 individuals who had complete information—399 individuals in the 35–45 age group and 389 in the 65–75 age group. Age classes are chosen according to WHO guidelines to evaluate adults' oral health (WHO, 1997).

Outcome Measure

To test the effect of oral health on the standard of daily life, an Oral Effects on Daily Performance (OIDP) questionnaire was used. An instrument for measuring oral health's effects on multiple aspects of daily life was created. This measurement has been integrated into the Oral Health Surveys conducted by the National Institute of Dental and Craniofacial Research (NIDCR). This survey sought to discover what problems participants had in the last six months when doing tasks such as feeding, communicating plainly, brushing teeth, participating in outdoor activities, heading out, learning, or working, while avoiding getting irritated or distraught. To qualify as a participant who could have reduced quality of life due to oral health issues, respondents had to response "yes" to one or more of these queries.

Socioeconomic Position Indicator (SPI) and other variables

It was schooling and family incomes which were used as Socio Economic Status (SES) markers. Schooling was focused on years of formal schooling and was divided into four groups: 0–3, 4–7 years (incomplete primary education), 8–11 years (complete primary to complete high school), and 12+ years (complete high school with additional schooling) (higher education). Using monthly income brackets, I calculated monthly family income for the month: $0 to $500, $501 to $1,500, $1,501 to $2,500, $2,501 to $4,500, $4,501 or more. Other variables incorporated into the study were: demographic influences (age and sex) and professional oral health interventions (edentulous, functional dentition [presence of 20 or more teeth] (WHO, 2013), need for dental prostheses, use of dental prostheses and need for dental treatment) [16-26].

Comprehensive Data Analysis

For the initial data study, a summary of the sample and a bivariate analysis between the dependent variable, socioeconomic status predictor, and the rest of the covariates were completed. The data was analyzed using the Rao-Scott chi-square test for complex samples, and this confirmed that the relationship between the dependent variable and the covariates was statistically significant. In regards to the oral health effect on quality of life, the above partnership was recorded using the equip lot using STATA. In this diagram, each horizontal line represents the incidence of the result as a function of the levels of the various socioeconomic measurements. If we may visually compare the prevalence of impact in each category, and the distance between these classes reflects total disparity, so it is possible to envision the prevalence of impact in each group.

Using two different indexes of socioeconomic disparity, such as the Slope Index of Inequality (SII) and the relative index of inequality, socioeconomic disparities in OIDP were calculated (RII). Regression-based indexes use the whole social distribution to adjust for factors like income, race, education, and age. SII shows the total contrast of the incidence of the result between participants with the lowest education levels and those with the highest education levels, while the RII presents the relative difference between both classes. Where individuals are rated from 0 to 1 according to their degree of education (income), individuals with the least amount of education (income) are placed at "0" and those with the most amount of education (income) are placed at "1". (Income level). To make it equal, each education group was assigned a ridit-score that reflects the midpoint of the spectrum in the average distribution of the population of participants in that category. When the values of SII are lower than 0 and RII values are lower than 1, it indicates that those with lower educational attainment (income) have greater exposure to potential harm than those with higher educational attainment (income) [11-15].

The RII and SII were found by first using a regression to predict education's weighted score and then extrapolating the resultant equation. Using a Poisson regression model, Poisson and Exponential regression were applied to calculate SII and RII, respectively, for each age group. Both templates were tailored for age, sex, whether or not you have any dental prostheses, the amount of dental care you would need, and how many teeth you have. It was previously shown that these factors are closely related to the effect of oral health on overall quality of life in California. When performing analyses, the significance level is always set at 5% and a 95% confidence interval is always provided. The following tests were conducted using the statistical software program STATA version 13.0 (StataCorp LP, College Station, TX, USA) with the "svy" order to take into account the dynamic survey architecture.

Results

For the entire population, the prevalence of unfavorable effects of oral health on quality of life was 40.4 percent (95% CI 31.9-48.8). For the younger population, the prevalence was 39.3 percent (95% CI 33.5-45.1). And for the older community, the

prevalence was 38.05 percent (95% CI 29.7–46.4). (Table1). When looking at the sample as a whole, approximately one fifth (17.4%) had 0–3 years of schooling. This demographic had a higher proportion of older adults who recorded getting eight or more years of schooling, but the percentage of younger adults who indicated this academic standard was somewhat smaller (33.7 percent).

Table1: Demographic characteristics of the individuals (%).

Variables	Categories	Total (n = 788)	Age Groups	
			35-45 years (n = 399)	65-75 years (n = 389)
Sex	Male	40.3	38.4	42.6
	Female	59.7	61.6	57.4
Level of education	0-3	17.4	8.6	38.8
	4-7	29.4	29.3	27.5
	8-11	28.7	31.5	17.3
	>11	24.5	30.6	16.4
Family income	0-$500	6.9	7.2	5.5
	$501-$1500	51.4	42.3	55.3
	$1501-$2500	25.6	30.5	23.2
	$2501-$4500	10.5	14.6	11.3
	>4500	5.6	5.4	4.7

Table 2 shows the negative impact of oral health on quality of life according to socioeconomic and demographic variables.

Table2: Negative impact of oral health on quality of life according to socioeconomic and demographic variables.

Variables	Categories	Total	Age Groups	
			34-44 years	65-74 years
Sex	Male	41.2 (35.7, 44.5)	43.5 (50.0, 37.3)	35.8 (43.2, 29.3)
	Female	44.7 (40.0, 49.7)	44.6 (51.4, 42.8)	39.4 (33.5, 41.4)
Level of education	0-3	48.5 (31.4, 65.9) *	61.9 (55.0, 73.7) *	38.5 (58.3, 80.3)
	4-7	53.1 (30.6, 46.2)	53.8 (47.2, 60.4)	32.2 (36.5, 48.2)
	8-11	37.0 (30.5, 44.0)	39.7 (34.2, 45.5)	33.1 (30.6, 46.2)
	>11	33.9 (25.3, 43.6)	35.0 (23.8, 48.2)	29.4 (16.9, 31.5)
Family income	0-$500	59.9 (50.5, 66.8) *	68.9 (50.5, 66.8) *	41.8 (34.7, 49.3)
	$501-$1500	43.6 (37.6, 49.8)	51.4 (45.0, 57.8)	40.1 (34.6, 45.9)
	$1501-$2500	36.5 (30.0, 43.4)	34.1 (21.3, 49.8)	36.5 (40.8, 52.4)
	$2501-$4500	23.7 (10.3, 45.8)	22.2 (36.5, 48.2)	32.7 (31.5, 44.4)
	>4500	20.3 (24.5, 36.8)	25.6 (23.4, 36.7)	23.7 (10.3, 45.8)

*p < 0.05

Figure2. Prevalence of the negative impact of oral health on quality of life across family income for the total population and among age-groups (equiplot), Family income groups (in reais) = 1st = ≤500; 2nd = 501–1500; 3rd = 1501–2500; 4th = 2501–4500; 5th = 4501+.

Results presented in Table 3 indicate absolute and relative inequalities related to family income on the impact of oral health on the quality of life for both age groups. Individuals in the higher income group had 27.8 percent-points lower prevalence than individuals in the lowest income rank. However, absolute inequalities were lower for elderly individuals [SII -13.9 (95% CI -28.6; 0.7)] than for the younger group [SII −32.4 (95% CI −47.4; −17.4)] (Table 3). Similar results were found for relative inequalities with the two groups, with lower socioeconomic position having more negative impact than higher socioeconomic position. No differences were found in relation to schooling. The prevalence of negative impact of oral health on quality of life was 52% lower among individuals in the highest income rank for the total OIDP in the total sample. Relative differences were smaller for elderly individuals [RII 0.53 (95% CI 0.45; 0.89)], than for adults [RII 0.44 (95% CI 0.32; 0.64)].

Table3: Absolute and relative inequalities related to the negative impact of oral health on quality of life according to the socioeconomic position measures.

		SII (95% CI)	RII (95% CI)
Level of education	Total	-6.5 (-21.5; 4.5)	0.75 (0.54; 0.86)
	35-44 years	-12.8 (-26.9; 1.2)	0.63 (0.47; 0.87)
	65-74 years	3.5 (-15.9; 17.3)	1.04 (0.69; 1.12)
Family income	Total	-23.4 (-23.7; -0.136) **	0.42 (0.29; 0.59) **

	35-44 years	-25.8 (-37.6; -0.157) **	0.35 (0.36; 0.56) **
	65-74 years	-16.7 (-28.5; -0.012) *	0.57 (0.38; 1.01) *

*p < 0.05; ** p < 0.001

Discussion

The present study evaluated socioeconomic inequalities related to the impact of oral health on quality of life using a multidimensional instrument. To our knowledge, this was the first study to evaluate the magnitude of socioeconomic inequalities related to the oral health impact on quality of life in Brazil. The prevalence of negative impact was high, with 40.4% of younger adults and 38.05% of older ones reporting that their oral health had a negative impact in their daily activities in the 6 months prior to the survey. Significant absolute and relative income inequalities were found, with individuals in the lowest income group having the highest prevalence of negative impacts.

Our findings confirm previous studies that have identified higher prevalence of negative impact of oral health on quality of life among younger adults than among older adults in Brazil and in other countries. These differences across age groups may be associated with changes in expectations over the life course. It is possible that elderly individuals self-report better quality of life despite facing some difficulties in their daily activities. In fact, Brazilian elderly individuals have a high prevalence of severe tooth loss and edentulism, which may have been acquired at younger ages. However, it is possible that they learn to adapt to these poor oral health conditions and adjust their perceptions and expectations related to their quality of life.

Regarding the magnitude of inequalities, the scope for comparison with other studies is limited, as only one study based on a sample from the United States and England evaluated the magnitude of inequality related to the impact of oral health on quality of life using SII and RII. However, they used a different instrument to measure oral health-related quality of life—the Oral Health Impact Profile-14. In addition, that studies focused on adults 25 years and older without differentiation as to age. Based on the entire sample, the absolute income inequalities found in the present study was higher than the ones observed in the United States and England. However, relative inequalities in the present study were smaller.

Our findings confirmed previous studies conducted in Brazil that found no statistical association with education once results were adjusted for income. This lack of association with education has been previously reported in different countries, including Brazil. Among the reasons identified for the lack of association for education after adjusting for income may be the fact that income is more directly related to the ability to access and pay for dental treatment and rehabilitation services that can improve individuals' quality of life. Education, which is generally completed in early adulthood, influences other socioeconomic conditions later in life, including income. At older ages, educational level shows a weaker association with health than other material indicators, such as income.

Differences in the magnitude of socioeconomic factors are also related to cultural and behavioral experiences over the life course, which may explain the lower magnitude of inequalities among the elderly group. Thus, it has been suggested that age and cohort need to be observed while interpreting the relationship between oral health and socioeconomic factors. New cohorts of elderly individuals have more teeth and have higher expectations in relation to their oral health. As a result, inequalities may become wide in future cohorts of older adults as most of the tooth loss is likely to occur among those least privileged.

This study is based on a large representative sample of adults from the second most populous state in Brazil. Data used in the study came from an oral health survey, which made it possible to control for clinical variables that were previously reported to be important explaining oral health-related quality of life. The limitation of the present study is related to its cross-sectional design; therefore, we are unable to assess how education influences the impact of oral health over the life course and we cannot explore time-trends. Moreover, the study only used two measures of socioeconomic position and important variables such as access to health insurance were not collected in the study [27-32].

This study provides important evidence of the existence of inequalities in the impact of oral health on the quality of life among Brazilians adults and elderly individuals living in Minas Gerais, Brazil. The findings highlight the need to improve oral health throughout life and the need to reduce inequalities across socioeconomic groups.

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