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ORIGINAL ARTICLE

Effect of Parental Socioeconomic Indicators on Oral Health Related Quality of Life of their Children in Riyadh, Saudi Arabia

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ABSTRACT

Aim: There is scientific evidence that there is correlation between socioeconomic status and oral health integrity, more specifically children affected by dental caries have a reduced quality of life This research will thus shed light on the factors proving this correlation between the oral health related quality of life (OHRQoL) of their young children and parental socioeconomic status that is backed up by their occupation, income, and educational level.

Materials and Methods: This is a descriptive cross-sectional study that collected the oral health information for children from their parents in different areas of Riyadh City. The study comprised parents from different areas in Riyadh City who were enrolled through simple random sampling technique**.** Sample Size of 350 was estimated using online Raosoft® sample size calculator based on acceptable margin error of 5%, confidence level of 95%.

Results: overall ECOHIS score showed significant differences across the educational levels of mother (F=4.668, P = 0.003) and father (F=2.821, P = 0.039). However, child impact score (F=0.717, P = 0.581), family impact score (F=0.930, P = 0.447) and overall ECOHIS scores (F=0.900, P = 0.465) did not differ significantly across the various employment categories of mothers

Conclusion: Parental socioeconomic conditions have a direct influence on OHRQoL of their children measured on ECOHIS. These factors should be attentively addressed when planning oral health promotion interventions for the Saudi Arabian population. Based on our study, these strategies should take into account socially and financially disadvantaged groups along with oral health behaviors and clinical variables.

Keywords: oral health, socioeconomic status, caries

INTRODUCTION

The world health organization (WHO) have reported that oral health is important to general health and good quality of life (1). Oral health is multifaceted and involves the capacity to talk, smile, smell, taste, touch, chew, swallow, and transmit a variety of feelings through confident and pain-free facial expressions of the craniofacial complex. Oral health plays a significant role in a child's general health and well-being, especially in early childhood, as oral health is connected to comprehensive health; that is, it is a component of it.

A healthy and pain-free mouth supports good nutrition and the ability to sleep and focus at school or work. In contrast, poor oral health can lead to pain and discomfort, difficulty sleeping, poor self-esteem, social isolation, as well as other problems (2). Oral diseases are of high prevalence in children worldwide despite the improvements in oral health indices initiated in the last decades (3-5). It is evident that their consequences on children are serious and can affect their quality of life (6-10). Therefore, the preservation of healthy primary teeth is such an important health issue among children (11).

One of the main oral diseases in childhood is dental caries (11). It is well known that dental caries cause complications that consume time and cost due to treatment (12). Early childhood caries is a serious public health concern especially for socially unprivileged groups in both developed and developing worlds. Nonetheless, it remains relatively unexplored and poorly defined in many developing countries.

In 2007, Early Childhood Oral Health Impact Scale (ECOHIS) was developed to measure the impact of dental diseases on Oral Health-Related Quality of Life both in children and their families specifically targeting preschool children (10)(15). It is important because oral health conditions have an indirect impact on parents and family members given the lost workdays or the time and money spent on dental care, that is modulated by the parent's socioeconomic status. ECOHIS provides high reliability, good validity, and responsiveness (16-19), and it has been adapted into about ten different languages and countries. Quality of life for the average person is continuously disrupted by health-related problems, more instinctively by oral health-related issues (e.g., tooth decay, malocclusion, and chronic oral diseases). Children with improper dietary and feeding habits are mostly affected by oral health problems especially early childhood caries that is a form of tooth decay (20)(21).

There is a correlation between socioeconomic status and oral health integrity, more specifically children affected by dental caries have a reduced quality of life according to a study conducted by Chaffee et al. (13). Children from lower-income families in the United States who have been enrolled in the latter study and whose ages ranged between 3-5 years had a lower oral health literacy which has ultimately led to an under-reporting of symptoms by their caregivers. Another recent meta-analysis study showed an inverse association between dental caries and socioeconomic status among children and adults (14).

This research will thus shed light on the factors proving this correlation between the oral health related

quality of life (OHRQoL) of their young children and parental socioeconomic status that is backed up by their occupation, income, and educational level. The work will be conducted by investigating the impact of parental level of education, household income, and occupation alongside their socioeconomic condition on oral health-related quality of life of their children using ECOHIS.

MATERIALS AND METHODS

Design and settings: This is a descriptive cross-sectional study that collected the oral health information for children from their parents in different areas of Riyadh City. Approval for the study was first obtained from the research center of Riyadh Elm University (RC/IRB/2019/147). A written informed consent was also obtained from all study participants.

Study Population: The study comprised parents from different areas in Riyadh City who were enrolled through simple random sampling technique**.**

Study Sample: Sample Size of 350 was estimated using online Raosoft® sample size calculator based on acceptable margin error of 5%, confidence level of 95%.

Study Instruments: The study's questionnaire was prepared in English which included questions on the demographic characteristics of the parents (i.e., educational status, employment status, type of housing, tenure housing, car ownership, material ownership, total family income) in addition to children-related information. Questions from the Arabic version of ECOHIS questionnaire (22) were also added. The total score for ECOHIS was calculated by summing up the response codes of the all 13 items. 'Don't know' responses were recorded as missing. The overall score, thus, ranged between 0 and 52;0–36 for the Child Impact Score (CIS) and 0–16 for the family impact score (FIS). Higher scores signified incraesed oral health concerns and poorer OHRQoL.

Data collection: The final questionnaire was then circulated online. Asked questions covered the following subdomains of children's oral health: oral symptoms, functional wellbeing, emotional well-being, school, and peer interaction.

Statistical analysis: Descriptive statistics of frequency distribution and percentages were calculated for the socioeconomic and other child related variables. While mean and standard deviation values were calculated for the continuous variables. ANOVA test was applied to compare child impact, family impact and overall ECOHIS scores across education, employment and family income of the parents. All data were processed using the SPSS version 21 (IBM, Armonk, NY, USA) data processing software. Significance was set at 0.05.

RESULTS

This study included 256 families where the parents' sociodemographic characteristics are presented in Table 1.

The majority of the mothers, 158 (61.7%), and fathers, 140 (54.7%), have reached a university level of education. Nearly half of the mothers, 124 (48.4%), were homemakers while the other half, 148 (57.8%), were in the labor office and working under government services. Villa was the most common type of housing as reported by 116 (45.3%) mothers and 117 (45.7%) fathers. More than half of the parents held ownership of their housing. More than half of the mothers, 131 (51.2%), had no car while 131 (98.8%) fathers had one care. The family income was found to be above 15000 SAR for around half of the parents, 119 (46.5%) (Figure 1).

Table 1: Characteristics of the study participants (Parents)

Variables		Mother		Father	
		n	%	n	%
Education	Illiterate read and write	8	3.1%	4	1.6%
	school degree	48	18.8%	50	19.5%
	Diploma and university	158	61.7%	140	54.7%
	Higher education	42	16.4%	62	24.2%
Employment	In the labor office	92	35.9%	148	57.8%
	Housewife	124	48.4%	2	0.8%
	Retired	6	2.3%	17	6.6%
	other employment	34	13.3%	89	34.8%
Type of housing	Traditional house	32	12.5%	32	12.5%
	Villa	116	45.3%	117	45.7%
	A floor in traditional house	40	15.6%	40	15.6%
	Apartment	67	26.6%	66	262%
Tenure of housing	Owned	143	55.9%	141	55.3%
	Rented	85	33.2%	86	33.7%
	Provided	21	8.2%	21	8.2%
	Others	7	2.7%	7	2.7%
Car ownership	No car	131	51.2%	3	1.2%
	one car	125	48.8%	253	98.8%

Children-related information is shown in **Table 2**.

Table 2: Child related information

Child information		n	%
Gender	Male	128	50.0%
	Female	128	50.0%
	Total	256	100.0%
Birth order of the child	1.00	97	37.9%
	2.00	41	16.0%
	3.00	32	12.5%
	4.00	38	14.8%
	5.00	17	6.6%
	6.00	14	5.5%
	7.00	17	6.6%
	Total	256	100.0%
Last visit to dentist	0-6 Months	194	75.8%
	More than 6 months	62	24.2%
	Total	256	100.0%
Treatment received during last visit	Checkup	150	58.4%
	Treatment	106	41.6%
	Total	256	100.0%

An equal number of males and females was enrolled in the study. The majority of them, 97 (37.9%), were the eldest in the family. Around three quarters of the children, 194 (75.8%), had their last visit to a dental clinic within the last six months in which more than half of them, 150 (58.4%), have not received therapy.

Table 3 presents the parents' responses to ECOHIS survey questions which demonstrates the impact of oral and jaw problems amongst children on the parents and the children themselves. Most of the parents answered by never/hardly ever on all ECOHIS questions implying an unaffected parents and children quality of life (i.e., difficulty sleeping, eating, drinking, talking, or smiling).

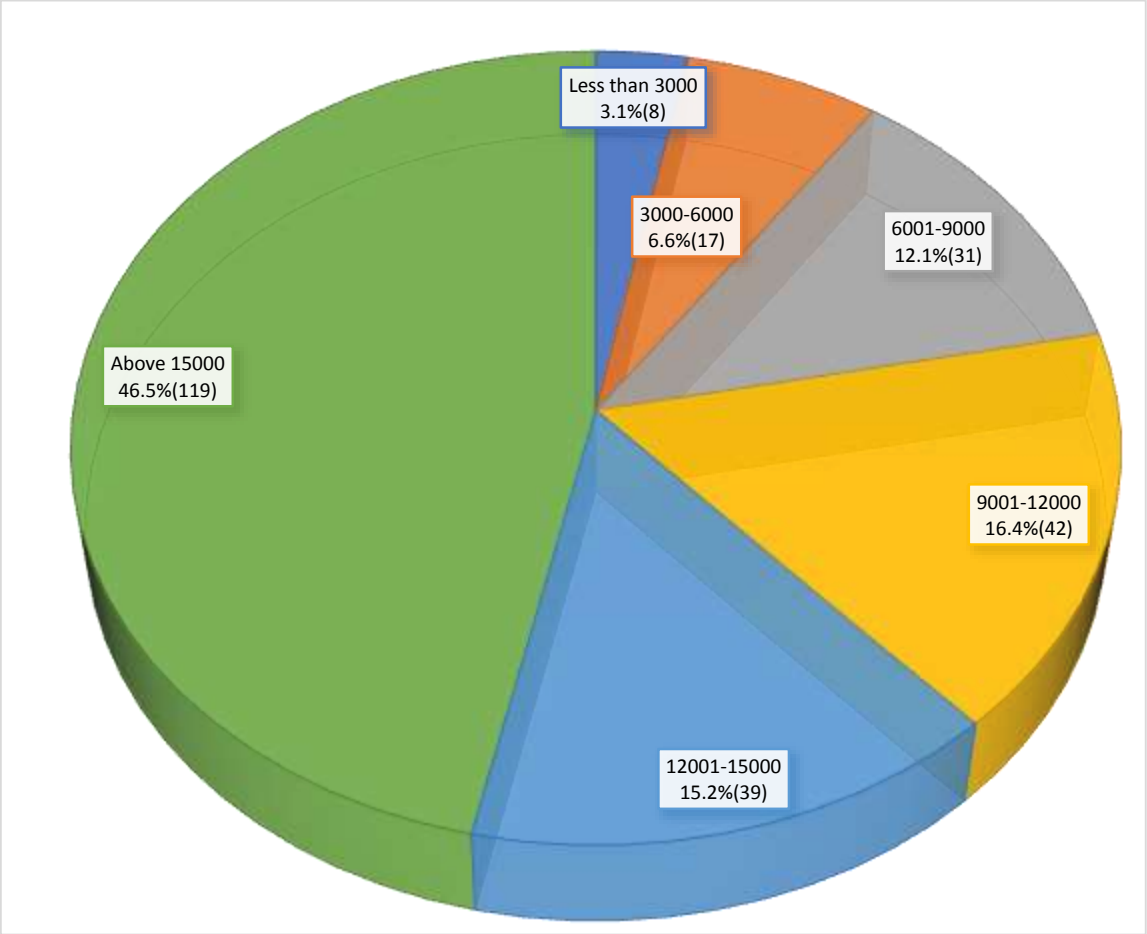

Figure 1: Distribution of the total family income of the parents

Table 3: ECOHIS responses in the survey of parents of 5-year-olds (N = 256)				
Impacts		Never/Hardly ever	Occasionally, often, or very often	Don't know
How often has your child had pain in the teeth, mouth or jaws	n	152	96	8
	%	59.4%	37.5%	3.1%
How often has your child .... because of dental problems or dental treatments?				
Had difficulty drinking hot or cold beverages	n	195	51	10
	%	76.2%	19.9%	3.9%
Had difficulty eating some foods	n	185	66	5
	%	72.3%	25.8%	2.0%
Had difficulty pronouncing any words	n	197	54	5
	%	77.0%	21.1%	2.0%
Missed preschool, daycare or school	n	228	22	6
	%	89.1%	8.6%	2.3%
Had trouble sleeping	n	210	41	5
	%	82.0%	16.0%	2.0%
Been irritable or frustrated	n	218	34	4
	%	85.2%	13.3%	1.6%
Avoided smiling or laughing	n	228	26	2
	%	89.1%	10.2%	0.8%
Avoided talking	n	223	31	2
	%	87.1%	12.1%	0.8%
How often have you or another family member.....because of your child's dental problems or treatments? been upset	n	157	95	4
	%	61.3%	37.1%	1.6%
Felt Guilty	n	162	90	4
	%	63.3%	35.2%	1.6%
Taken Time Off from Work	n	200	52	4
	%	78.1%	20.3%	1.6%
How often has your child had dental problems or dental treatments that had a financial impact on your family?	n	197	56	3
	%	77.0%	21.9%	1.2%

Figure 2 displays the mean, standard deviation, and maximum scores for child impact (4.92±5.26, 34), family impact (3.22±3.27, 13) and overall ECOHIS scores (8.14±7.71, 47). Child impact scale ranged from (0-36) while family impact scale ranged from (0-16).

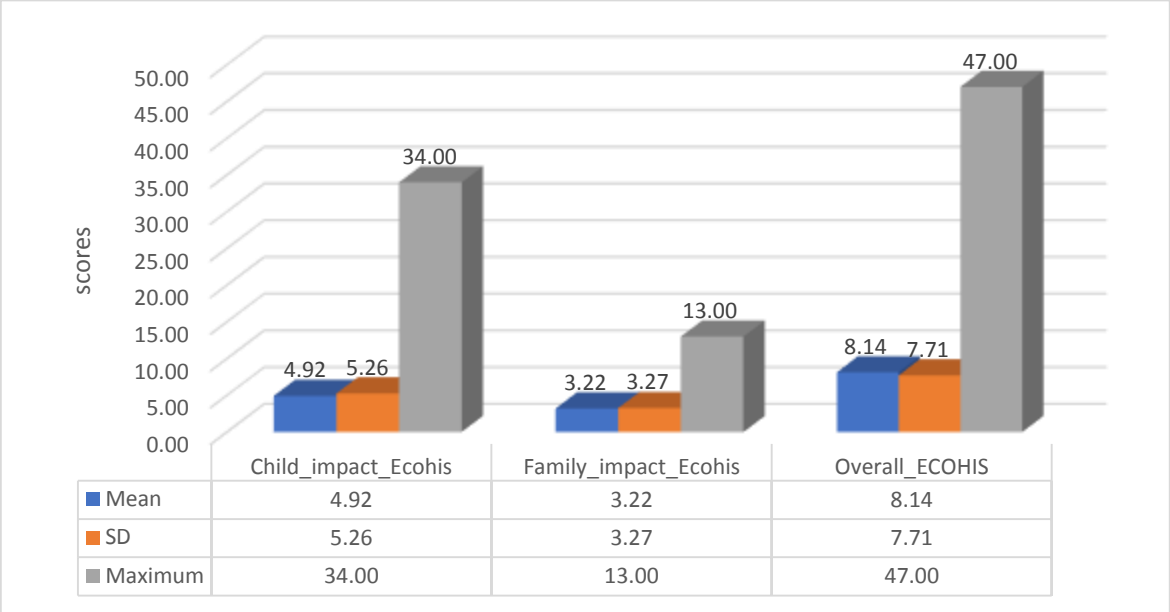

Figure 2: Child impact, Family impact and overall ECOHIS scores

Correlations between the parents' educational level and ECOHIS scores are shown in Table 4.

Table 4: Educational level of parents and ECOHIS scores

Impact	Education	Mother				Father			
		Mean	SD	F	p	Mean	SD	F	p
Child impact	Illiterate read and write	8.88	11.17	4.723	0.003	7.00	2.94	2.97	0.032
	school degree	6.79	6.41			5.92	7.09		
	Diploma and university	4.41	4.47			5.21	5.07		
	Higher education	3.93	4.25			3.31	3.51		
	Total	4.92	5.26			4.92	5.26		
Family impact	Illiterate read and write	3.50	4.72	3.12	0.027	1.25	1.50	2.155	0.094
	school degree	4.42	3.36			3.80	3.66		
	Diploma and university	3.04	3.02			3.39	3.24		
	Higher education	2.48	3.55			2.50	2.97		
	Total	3.22	3.27			3.22	3.27		
Overall ECOHIS	Illiterate read and write	12.38	15.39	4.668	0.003	8.25	2.63	2.821	0.039
	school degree	11.21	9.00			9.72	10.11		
	Diploma and university	7.45	6.59			8.60	7.43		
	Higher education	6.41	7.09			5.81	5.65		
	Total	8.14	7.71			8.14	7.71		

Child impact scores differed significantly across the educational categories of the mother (F=4.723, P = 0.003) and fathers (F=2.97, P = 0.032). Family impact scores were significantly varied between mothers with different educational categories (F=3.12, P = 0.027), while fathers' educational categories did not show any significant differences in family impact score (F=2.155, P = 0.094). However, overall ECOHIS score showed significant differences across the educational levels of mother (F=4.668, P = 0.003) and father (F=2.821, P = 0.039).

However, child impact score (F=0.717, P = 0.581), family impact score (F=0.930, P = 0.447) and overall ECOHIS scores (F=0.900, P = 0.465) did not differ significantly across the various employment categories of mothers (Table 5).

Table 5: Mothers employment status and ECOHIS

Impact	Employment	Mean	SD	F	P
Child impact	In the labor office	4.59	4.30	0.717	0.581
	student	2.50	2.07		
	Housewife	5.35	5.79		
	Retired	5.83	6.24		
	other employment	4.44	5.66		
	Total	4.92	5.26		
Family impact	In the labor office	2.76	2.97	0.930	0.447
	student	2.33	2.58		
	Housewife	3.58	3.37		
	Retired	3.50	3.78		
	other employment	3.18	3.66		
	Total	3.22	3.27		
Overall ECOHIS	In the labor office	7.35	6.28	0.900	0.465
	student	4.83	2.86		
	Housewife	8.93	8.35		
	Retired	9.33	9.91		
	other employment	7.62	8.65		
	Total	8.14	7.71		

Fathers' employment categories showed significant differences in mean family impact scores (F=2.930, p=0.034). However, child impact scores (F=1.046, P = 0.373) and overall ECOHIS scores (F=2.008, P = 0.113), as shown in (Table 6).

Table 6: Fathers employment status and ECOHIS

Impact	Employment	Mean	SD	F	p
Child impact	In the labor office	5.30	5.43	1.046	0.373
	Housewife	8.50	4.95		
	Retired	4.29	3.93		
	other employment	4.31	5.18		
	Total	4.92	5.26		
Family impact	In the labor office	3.54	3.24	2.930	0.034
	Housewife	8.00	4.24		
	Retired	2.59	3.02		
	other employment	2.70	3.25		
	Total	3.22	3.27		
Overall ECOHIS	In the labor office	8.84	7.77	2.008	0.113
	Housewife	16.50	0.71		
	Retired	6.88	5.35		
	other employment	7.01	7.88		
	Total	8.14	7.71		

Child impact score (F=4.210, P = 0.001), family impact score (F=3.144, P = 0.009) and overall ECOHIS scores (F=4.615, P = 0.000) differed significantly across various family income categories as shown in (Table 7).

Table 7: Family income and ECOHIS score

Impact	Income	Mean	Sd	F	P
Child impact	Less than 3000	9.38	8.99	4.210	0.001
	3000-6000	5.94	5.73		
	6001-9000	7.32	7.47		
	9001-12000	4.79	4.70		
	12001-15000	5.51	4.94		
	Above 15000	3.70	4.02		
	Total	4.92	5.26		
Family impact	Less than 3000	5.50	4.72	3.144	0.009
	3000-6000	4.53	3.64		
	6001-9000	4.19	3.74		
	9001-12000	3.17	3.28		
	12001-15000	3.56	3.45		
	Above 15000	2.53	2.75		
	Total	3.22	3.27		
Overall ECOHIS	Less than 3000	14.88	12.80	4.615	0.000
	3000-6000	10.47	8.02		
	6001-9000	11.52	10.42		
	9001-12000	7.95	6.77		
	12001-15000	9.08	7.62		
	Above 15000	6.23	6.07		
	Total	8.14	7.71		

DISCUSSION

Based on data from Elamin et al.'s systematic review, dental caries was found to be highly prevalent among Middle eastern children. Such oral diseases were also found to be potentially correlated with the children's characteristics and family background. This highlights a pressing need for approaching those modifiable socioeconomic determinants (23). In the aforementioned review, low maternal education, low overall socioeconomic status, among other factors were among the most common determinants for worsened oral health status (23). In addition to oral diseases, several factors have been thought to affect the OHRQOL including the socioeconomic status of the household (24,25) which could ultimately affect the children's oral health status or the parents' subjective perception of oral health (26). Despite the possible correlation between socioeconomic status and family environment and OHRQoL, the literature still lacks robust evidence that supports this relationship in schoolchildren.

Several questionnaires have been developed to evaluate the OHRQOL including the Child-OIDP, Parental-Caregivers Perceptions Questionnaire (P-CPQ), and Family Impact Scale (FIS) components of COHQoL, Oral Health Impact Profile (OHIP); however, ECOHIS was the preferred instrument in preschool children while the Child Perceptions Questionnaire (CPQ11-14) was the most widely used for children and adolescents. In the study, ECOHIS was used to determine the effect of parents' sociodemographic status on the children's OHRQOL and the risk factors for poor OHRQoL.

Although the majority of participants had an impacted OHRQoL to some degree where the ECOHIS score was different from zero, data shows that minimal child and family impacts are present. One possible explanation to this finding is the cultural differences in oral health perception or the enrollment of asymptomatic populations rather than dental patients. The present study findings also suggest that not only clinical variables (e.g., caries) affect OHRQoL, but also support data from the literature, where OHRQoL was found to be dependent on socio-economic status. ECOHIS scores describing the impact of oral diseases on the QOL of the family were significantly affected by the parents' educational level, father's employment status, and family income but not by the mother's employment; however, the child impact was only affected by the parents' educational status and family income.

Similarly, in Kragt et al.'s study, children's OHRQoL was minimally affected by maternal education and employment status (27). One reason for this might be related to the Arab culture where the father is deemed the principal earner in the family. Contrarily, maternal employment status was considered to be a potential socioeconomic indicator for OHRQoL in Generation R Cohort. In Ballo et al.'s study, children from higher income families had low OHRQoL impacts compared to their peers from lower socio-economic status (28). This is best explained by the effect of material deprivation on lifestyle and diet among poorer families. Contrarily, children living in higher income households had better OHRQoL in Canada (24) and Brazil (29), while children living in a low income household or with a single parent had a negative impact on their OHRQoL as reported by Locker et al (24). This is in part due to better oral hygiene behaviors and the easier access to preventive interventions among higher income families..

Other determining factors that were suggested to have a negative impact on OHRQoL in Paula et al.'s study are the number of siblings, mother's education, and household overcrowding (30). Likewise, findings of Bilal et al. 's study indicates that the number of siblings is independently associated with HRQoL (31). Similarly in Kragt et al. 's study, paternal employment and income level

were the most significantly associated variables with OHRQoL (27).

Strengths and limitations: Our study enrolled participants through a simple random sampling technique which increases the odds of generalizability of the study and representativeness of the sample . Additionally, we manipulated a readily-available, reliable, validated, and cross-cultural questionnaire (A-ECOHIS) which had been validated in Arabic culture to assess OHRQoL. However, several limitations are evident in this study. First, this is a cross-sectional study which limits the ability to conclude causal relationships due to residual confounding factors. Second, response/ information bias is also possible due to the questionnaire's self administration by parents or hawthorn's effect precipitated by the parents' desire to modulate their behaviour out of embarrassment. Third, recall bias is also possible. Lastly, some socio demographic indicators continuously change over time, thus their status at the time of the study may be different from before.

CONCLUSION

Parental socioeconomic conditions have a direct influence on OHRQoL of their children measured on ECOHIS. These factors should be attentively addressed when planning oral health promotion interventions for the Saudi Arabian population. Based on our study, these strategies should take into account socially and financially disadvantaged groups along with oral health behaviors and clinical variables.

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