

# Effect of parent's dental anxiety and oral health literacy on children's oral health

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## ABSTRACT

**Background:** Dental fear and anxiety have been shown to be a major factor contributing to avoidance of dental checkup routines resulting in poorer oral health. Low health literacy is one among many reasons why preventable diseases remain so common and why people often do not adopt healthy practices. It is important to detect patients with inadequate oral health literacy (OHL) and to improve the level of communication between the provider and the patient. The aim of this study was to evaluate the effect of parental dental anxiety and OHL on children's oral health, with selected sociodemographic variables among patients in Chennai, Tamil Nadu, India. **Materials and Methods:** A sample of 187 subjects from the Outpatient Department of Saveetha Dental College and Hospitals was administered the rapid estimate of adult literacy in dentistry (REALD)-30 and the Dental Anxiety Scale-Revised (DAS-R). The data collection of the children's oral health was from the patient records. Data were analyzed using *t*-tests, analysis of variance, and correlations. **Results:** The distribution of DAS-R scores and OHL values shows that children of parents having less anxiety have good oral health, only eight participants having fair oral health and only few parents having high anxiety and severe anxiety. The Pearson product-moment correlation shows negative correlation between DAS-R and REALD-30 scores, which was statistically significant. There is a statistical significance different between the education level of parents and REALD-30 scores as well as DAS-R and OHL level. **Conclusion:** It can be concluded that factors affecting poor children's oral health are interrelated and include parents' lower OHL skills and higher dental anxiety scores. It is understood that better communication between parents of pediatric patients and dental care providers is important to reduce oral health disparities.

**KEY WORDS:** Dental anxiety, Pediatric oral health, Patient-provider communication, Rapid estimate of adult literacy in dentistry

## INTRODUCTION

Research in several countries has shown that dental anxiety in adults is widespread<sup>[1,2]</sup> and is the most common reason for avoiding dental visits.<sup>[3,4]</sup> Avoiding routine dental care results in the likelihood of poorer oral health.<sup>[5,6]</sup> In addition, parents with higher dental anxiety scores are less likely to take their child to the dentist than parents with lower dental anxiety scores.<sup>[7]</sup> The fact that parents from lower socioeconomic backgrounds and with lower levels of education are more likely to have dental anxiety than their more affluent and better-educated counterpart<sup>[1,2,8,9]</sup> deserves attention, because it might affect the way they access dental care services for

their children, who are more likely to have oral health problems than children from middle and upper class socioeconomic backgrounds.<sup>[10,11]</sup>

Early childhood oral health behaviors, such as nighttime bottle feeding, snacking, and juice consumption, have been linked to parental level of education, and at the same time, oral hygiene, decisions about utilization of dental services, and dental care are the exclusive domain of the caregiver.<sup>[12-14]</sup> Caregiver's perceptions of their young children's oral health status are valuable when considering childhood oral health because vulnerability to early childhood caries has been linked to family- and parent-level factors.<sup>[12-17]</sup> Consequently, determinants of dental care-seeking behaviors are likely to include family-level characteristics such as awareness and recognition of oral conditions or symptoms, as well as the extent to which parent's value oral health.<sup>[18-22]</sup> There are several factors that cause common oral diseases.<sup>[23]</sup>

### Access this article online

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ISSN: 0975-7619

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Received on: 05-11-2018; Revised on: 07-12-2018; Accepted on: 10-01-2019

Despite considerable efforts to promote oral health, the gap between oral health knowledge and practices remains.<sup>[24]</sup>

Health literacy is defined as the degree to which patients are able to obtain and understand basic health information and services needed to make appropriate health decisions.<sup>[25]</sup> Adults with lower health literacy were 1.5–3 times more likely to encounter poorer health and to underutilize health resources.<sup>[26,27]</sup> Adults with lower oral health literacy (OHL) were also less likely to seek dental care for their children.<sup>[28]</sup>

OHL is a general term that encompasses reading, writing, numeracy, speaking, listening, and proper decision-making skills. The critical role of OHL lies in decreasing oral health disparities,<sup>[29,30]</sup> specifically among those with limited literacy who are unlikely to participate in preventive and screening programs, suggesting that more attention should be given to the topic. The association between health literacy and health outcomes is well documented, but evidence for the impact of limited literacy skills on oral health is scarce.<sup>[1,29,31]</sup> Existing OHL instruments are limited in their objectives, and they measure either the ability of a person to read specific dental health vocabularies or the ability of a person to read and comprehend written oral health information and to calculate the numbers. Examples of the former instruments are the rapid estimate of adult literacy in dentistry (REALD)-30 items, the REALD-99 items, the rapid estimate of adult literacy in medicine and dentistry, and the Hong Kong REALD.<sup>[32]</sup>

OHL can be assessed in a reliable fashion with the REALD-30 instrument. Research has shown that REALD-30 scores are correlated with the respondents' educational background; their oral health-related knowledge, oral health behavior, and perceived oral health status; the interval between dental visits; and behavior with regard to seeking dental care for their children. Not many researches so far have explored the relationship between dental anxiety and OHL, despite the fact that both of these factors are related to adults' oral health and oral health-care utilization as well as to parents' behavior with regard to accessing oral health-care services for their children. The aim of this study was to evaluate the effect of parental dental anxiety and OHL on children's oral health.

## MATERIALS AND METHODS

This study was approved by the Scientific Review Board for Public Health Dentistry at Saveetha Dental College and Hospitals, Chennai, Tamil Nadu, India.

### Respondents

The inclusion criteria were that the respondents (a) were accompanying children 11 years of age or

younger to a regularly scheduled dental appointment and (b) gave written consent that they allowed the researchers to collect information about the child's prior dental treatment from the child's clinical chart. A convenience sampling was done, wherein the study subjects were recruited from the parents/guardians who brought their child for a regularly scheduled dental appointment at the Pedodontics Department at Saveetha Dental College and Hospital. The data were collected over a 2 weeks period. A sample of 187 subjects from the Outpatient Department of Saveetha Dental College and Hospitals was administered the REALD-30 and the Dental Anxiety Scale-Revised (DAS-R).

### Procedure

When the parents/guardians arrived with their child for a regularly scheduled appointment at the pediatric dental clinic, they were asked by a research staff person if they were English speakers. No assent was sought from the pediatric patients who were <12 years old, and no data were collected from them in person. Once the respondents had signed the forms, the parents/guardians received the survey. After they completed the survey, the interviewer administered the REALD-30 test to assess the respondents' level of OHL. The pediatric patient records were reviewed at a later date.

### Materials

The survey asked about the respondents' background characteristics, information about the respondents' oral health characteristics, such as their self-reported oral health, their last dental visit, and their dental anxiety. Dental anxiety was determined with the DAS-R. This scale consists of 4 items that ask respondents to indicate their level of dental anxiety concerning four dental visit-related situations on a 5-point scale. An answer of "1" indicates that the parents are relaxed, and an answer of "5" expresses the highest level of dental anxiety. The answers to the 4 items were summed to create a total DAS-R score. The DAS-R is a reliable instrument that can be used to get an assessment of dental anxiety.<sup>[26]</sup> This survey also consisted of the REALD-30 instrument.<sup>[26]</sup> This test was administered by the interviewer.

### Statistical Analysis

The data were analyzed with the SPSS (Version 18). Descriptive statistics such as frequency distributions, means, and standard deviations were computed to describe the respondents' background characteristics. Data were analyzed using *t*-tests, analysis of variance, and correlations.

## RESULTS

The frequency of the patients' sociodemographic characteristics, DAS-R, REALD-30, and OHL is given

in Table 1. The age range was 24–50. Mean (standard deviation [SD]) age of participants is 35.64 (3.679) years. Among them, female was 56% and males were 44%. Educational level was widespread with 0.5% have no formal education, 34% went to higher secondary, 35.5% had undergraduate, and 30% had postgraduate. Mean (SD) DSA scores of participants are 9.35 (3.253) and mean (SD) REALD-30 scores are 9.38 (4.212).

The mean value of restoration, extraction, and pulp treatment of the sample was  $0.40 \pm 1.604$ ,  $0.40 \pm 0.731$ , and  $0.70 \pm 0.952$ . OHL of the respondents' children was such that 14.5% had fair oral health, >53% had good oral health, and only 32.5% were poor oral health.

A Pearson product-moment correlation was run to determine the relationship between DAS-R and REALD-30 scores. There was negatively correlation between DAS-R and REALD-30 scores, which was statistically significant ( $r = -0.388$ ,  $n = 200$ ,  $P = 0.000$ ). Respondents with lower OHL score had more dental anxiety and the participants with higher OHL score had lesser dental anxiety [Table 2].

There is a statistically significant difference between education level of parents and DAS-R scores ( $F = 18.271$ ,  $P = 0.000$ ), there is a statistically significant difference between education and REALD-30 ( $F = 146.40$ ,  $P = 0.000$ ), and there is a

**Table 1: Overview of the respondents' background and oral health characteristics**

Characteristics	n=200 (%)
Age	
Mean±SD	35.64±3.679
Median	36.00
Gender	
Female	112 (56.0)
Male	88 (44.0)
Education	
Secondary	1 (0.5)
Higher secondary	68 (34.0)
Undergraduate	71 (35.5)
Postgraduate	60 (30.0)
DAS score	
Mean±SD	9.35±3.253
Median	9.00
REALD-30	
Mean±SD	9.38±4.212
Median	9.00

DAS: Dental anxiety scale, REALD: Rapid estimate of adult literacy in dentistry, SD: Standard deviation

statistically significant difference between REALD-30 and OHL level ( $F = 4.362$ ,  $P = 0.014$ ). Respondents with higher education had higher literacy score and anxiety [Table 3].

## DISCUSSION

The previous research on low OHL has shown its effects on parents' knowledge about oral health issues,<sup>[33-37]</sup> and especially their own utilization of oral health care services<sup>[38]</sup> and their children's likelihood of receiving dental care.<sup>[39]</sup> Children under the age of 5 years are usually known to spend most of their time with parents and guardians, especially mothers, even when they attend preschools or nurseries. These early years involve "primary socialization" during which the earliest childhood routines and habits are acquired.<sup>[40]</sup> This study also takes into account the additional factor that might be related to OHL which is dental anxiety. The rationale of the study was to explore whether there was a negative relationship between DAS-R and REALD-30 scores. While research in the medical field has clearly demonstrated that health literacy is correlated with systemic health,<sup>[28,29]</sup> the relationship between OHL and adults' oral health has not received much investigation. It can be inferred that if parents do not understand their child's diagnosis and treatment plan provided during a dental visit, they might experience a raised level of uncertainty, which, in turn, might result in dental anxiety. Future research should focus on exploring these relationships. However, informing dentists about these findings could reinforce the fact that it is important to communicate effectively with patients with lower OHL and also to respond to their treatment needs in a way that reduces their level of dental anxiety. In addition to considering the implications of these findings for dental providers' interactions with their patients, it also seems worthwhile to consider how public health dentistry could develop interventions to counteract the negative consequences of poor OHL and dental anxiety.

The higher the respondents' dental anxiety, the poorer their children's self-reported oral health. This finding replicated findings from the previous studies.<sup>[3-6,10]</sup> A Pearson product-moment correlation was run to determine the relationship between age, DAS-R, and REALD-30 scores. There was negatively correlation between DAS-R and REALD-30 scores, which was

**Table 2: Pearson correlation coefficients were computed to determine the relationships between the DAS-R and REALD-30 scores**

Scores	DAS-R		REALD-30	
	Pearson correlation coefficient (r)	P-value	Pearson correlation coefficient (r)	P-value
DAS-R	1	0	-0.388	0.000
REALD-30	-0.388	0.000	1	0

DAS-R: Dental anxiety scale-revised, REALD: Rapid estimate of adult literacy in dentistry

**Table 3: Association between education, oral health, DAS-R, and REALD-30 scores**

Outcome variables	n(%)	DAS-R			REALD-30		
		Mean±SD	F-value	P value	Mean±SD	F-value	P value
Education							
Secondary	1	5.00	18.271	0.000	5.00	146.40	0.000
Higher secondary	68	11.21±3.321			5.37±0.945		
Undergraduate	71	9.20±2.906			9.31±2.358		
Postgraduate	60	7.50±2.311			14.08±3.295		
Oral health							
Poor	29	9.83±3.285	0.645	0.526	7.48±3.135	4.362	0.014
Fair	106	9.42±3.126			9.39±4.077		
Good	65	9.03±3.455			10.22±4.611		

DAS-R: Dental anxiety scale-revised, REALD: Rapid estimate of adult literacy in dentistry, SD: Standard deviation

statistically significant and there is no significant correlation between age and DAS-R and age and REALD-30 scores. On the basis of above result, there is a statistically significant difference between education level of parents and REALD-30 scores as well as DAS-R and OHL level. The results related to the respondents' REALD-30 scores are consistent with several previously found relationships by Shin *et al.* between OHL and parents' background characteristics such as their years of education. This study had several limitations. First, the pediatric patients' oral health-related characteristics were not assessed in actual screening examinations. Instead, a chart review was conducted to collect information about the children's oral health. An actual oral health assessment would have provided further insights into the relationships among dental anxiety, OHL, and oral health outcomes among these respondents. Since research on the relationship between adults' OHL and oral health is scarce, having objective oral health data would have allowed a more comprehensive understanding of these issues. Second, the study could only be conducted among respondents capable of reading and writing English as a DAS-R scale and REALD-30 assessment in Tamil, the language native to the Chennai population is not yet defined. Not having data from onsite oral examinations of the children did not allow a more in-depth analysis of the relationship among the respondents' dental anxiety, their OHL, and their own and their children's oral health status. A third limitation was the size of the study population, which was limited as only respondents fluent in English could participate in the study.

## CONCLUSION

It can be concluded that factors affecting poor children's oral health are interrelated and include parents' lower OHL skills and higher dental anxiety scores. The parent's support and involvement in child's oral health are important in influencing the dental health of the child. It is understood that better communication between parents of pediatric patients and dental care providers is important to reduce oral health disparities. The present study also emphasizes

the need to initiate more dental awareness programs for parents and their children at the primary school level to assess as well as to spread the oral health awareness in the Indian society.

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Source of support: Nil; Conflict of interest: None Declared