

# Parental Oral Health Literacy and Child Oral Health Impact Profile among 15-year-old Schoolchildren in Davangere City, Karnataka, India

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## ABSTRACT

**Introduction:** The public can encounter an overwhelming amount of complex health information in everyday life. The growth in information and the rapid advances in dental scientific knowledge require that the public should have an understanding of oral health to make good decisions about their own and their children's oral health. Studies have reported that parental education has a direct impact on oral health of children.

**Aim:** To determine parental oral health literacy (OHL) and children oral health impact profile among 15-year-old schoolchildren in Davangere city, Karnataka, India.

**Materials and methods:** A cross-sectional study was conducted using health literacy in dentistry (HeLD) dental scale to assess the OHL of parents, and their children's oral health-related quality-of-life (OHRQoL) was assessed using child oral health impact profile (COHIP) among 15-year-old schoolchildren. Questionnaire was distributed to the children and their parents for collecting the data. This was followed by a clinical oral examination of children to record the number of decayed, missing, and filled components of their permanent dentition. Chi-squared test and linear logistic regression were used to analyze the data using Statistical Package for the Social Sciences (SPSS) version 20.

**Results:** The present study showed that 57.5% of parents have educational qualification below intermediate level and 36% were not able to pay to consult a dentist. However, only 17.1% of students in the present study agreed that they had pain in their teeth and 73% of students expressed that they were confident of their teeth. The mean number of decayed, missing, or filled teeth (DMFT) of the students in the study was  $1.43 \pm 1.64$ .

**Conclusion:** The relation of parental OHL and child OHRQoL is not a direct cause-and-effect connection, but rather a more elusive relationship. These results suggest that education and counseling of parents with low OHL levels may be an important component for the oral care of their children.

**Keywords:** Child oral health impact profile, Health literacy in dentistry, Schoolchildren.

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## INTRODUCTION

The preservation of healthy teeth is one of the key health issues in childhood. Family creates an environment necessary for healthy lifestyle, increases self-confidence, and helps habit formation in children. Adoption of consistent behavioral habits in childhood takes place at home, with the parents being the primary model for behavior. Parental knowledge and attitudes toward the importance of oral hygiene play a major role. Low-education families do not pay enough attention to dental care measures.<sup>1,2</sup>

Poor general literacy and, in particular, poor health literacy skills are recognized as possible causes of health disparities. The multilevel consequences of low health literacy have been reviewed and these include negative health behaviors, reduced utilization of preventive health services, and poorer adherence to therapeutic protocols. Limited reading skills are usually associated with a limited understanding of the concepts of risk, chronicity, and their associated treatment protocols.<sup>3,4</sup>

In the recent scenario, many advanced indices are available to measure literacy as it relates to oral health. The HeLD developed recently takes a broad approach to measure an individual's ability to seek, understand, and utilize oral health information to make appropriate oral health-related decisions.<sup>5-7</sup>

It has been suggested that quality-of-life measures should include "positive" and "negative" items to encompass all aspects, which may impact upon well-being. Multiple measures of OHRQoL have been developed and standardized for use in adults. Efforts have been made to develop a measure of OHRQoL that would be appropriate for use with children. The COHIP measures oral health, functional well-being, social-emotional well-being, school environment, and self-image as well as the overall OHRQoL of the child. It was designed to be used

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with a broad age (8–15 years) across oral conditions and include positive (e.g., confidence, attractiveness) as well as negative aspects of OHRQoL.<sup>6,8</sup>

Both the above-mentioned scales are the latest in their domain and literature search showed hardly any studies designed to assess the child's self-reported OHRQoL using COHIP and their parent's OHL using HeLD. Hence, the aim of the present cross-sectional study was to assess parental OHL using HeLD and child's oral health impact profile using COHIP among 15-year-old schoolchildren in Davangere city, India.

## MATERIALS AND METHODS

A cross-sectional study was conducted among 15-year-old schoolchildren (both private and government) and their parents in Davangere city from July to September 2016. Ethical approval was obtained from the Institutional Ethical Board and informed consent was obtained from the parents and a verbal assent was obtained from the schoolchildren.

### Sample Size Estimation

A pilot study was conducted among 30 students and their parents attending the nearby school to assess the feasibility of the study and for sample size estimation.

Sample size was estimated by using the following formula

$$\text{Sample size} = n = \frac{z^2 \times p \times q}{d^2}$$

where

$d$  = allowable error = 15% of  $p$

$p$  = prevalence of dental caries = 30

$q$  =  $100 - p$  = 70

$z$  = 1.96

Substituting the values obtained from the pilot study in the following formula,

$$\text{Sample size} = \frac{(1.96)^2 \times 30 \times 70}{3^2}$$

Hence, the sample size was approximately 398. But, considering the dropouts and missing data, sample was rounded off to 414. Pilot study participants were not included in the main study.

The questionnaire used for parents to assess their OHL<sup>8,9</sup> and for children to assess their OHRQoL<sup>7</sup> was previously validated by piloting, and the appropriate changes have been made before it was finalized for the study. The list of schools obtained from the District Education Office showed that the city is divided into north and south zones. By using the lottery method, two schools

from the north and two schools from the south zone were randomly selected for the study. The 15-year-old schoolchildren present on the day of examination and those who gave informed consent were included in the study until the total sample size of 414 was achieved.

Children suffering from severe systemic diseases, not staying with their parents, undergoing orthodontic treatment, and who have undergone dental treatment in the past 3 months were not included in the study.

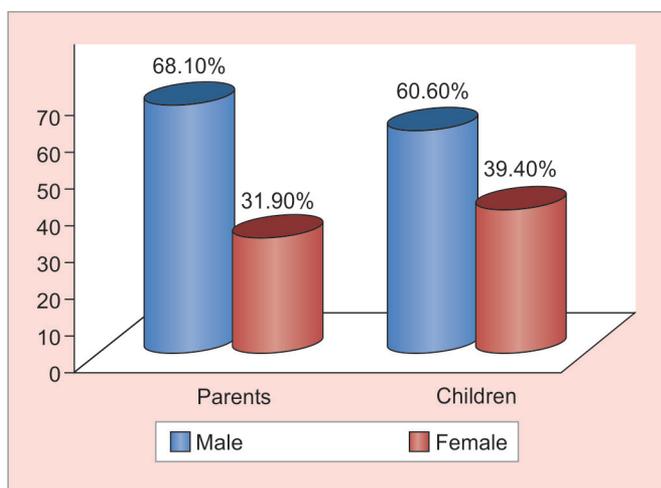
The study was conducted by a single trained examiner along with an assistant scribe. A structured pro forma was used. The data were collected in three parts. The first part consisted of sociodemographic details of the student and their parents. The second part consisted of COHIP-15 that was rated on a 3-point Likert scale followed by American Dental Association type III clinical oral examination of children within the school premises under strict aseptic precautions to record the number of decayed, missing, and filled components of their permanent dentition. Kappa value for intraexaminer reliability was 0.82. The third part consisted of HeLD-10 consisting of 10 questionnaires for their parents rated on a 3-point Likert scale. Participants were asked to fill the first and second parts of the pro forma in front of the examiner. Adequate time was provided and later the third part was distributed among the students to carry home and get it back filled by one of their parents with the higher educational qualification. A small incentive like oral hygiene kit was also offered to the students for this purpose.

The data so obtained were entered into the Excel sheet, and descriptive and inferential statistical analyses were made using SPSS version 20.0. The chi-squared test was used to test the association between the responses among the parent and children toward their respective questionnaire. Logistic regression was used to estimate the relationships among educational qualification of parents and their OHL, gender of children, and their OHRQoL. The difference in the means of DMFT was tested using unpaired t-test between male and female children. For all the tests, the level of significance was set up at  $p \leq 0.05$ .

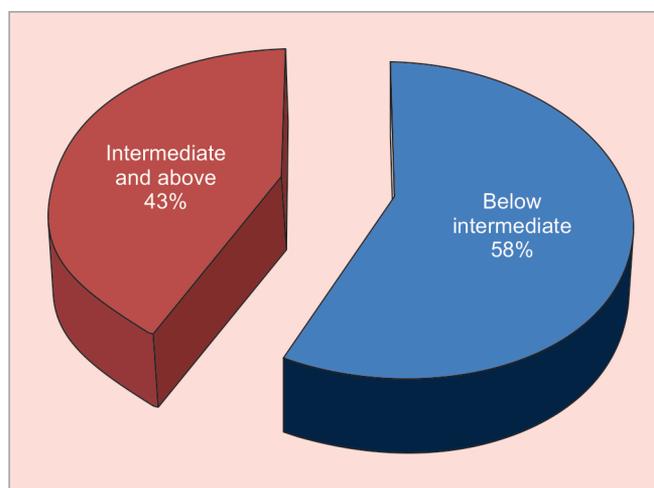
## RESULTS

Total sample size comprised 414 students and their parents, with a response rate of 100%. Most of the participating children and their parents were males (Graph 1) and more than half (57.5%) of the participating parents had attained education below intermediate level (Graph 2).

Table 1 describes the chi-squared results for the significant responses with respect to gender among 15-year-old schoolchildren about their OHRQoL using COHIP.



Graph 1: Genderwise distribution of parents and students



Graph 2: Percentage distribution of parents based on their education

Table 1: Response of 15-year-old schoolchildren about their OHRQoL using COHIP based on their gender

Questions	Options	Number	Percentage	p-value
Had pain in your teeth/toothache	1 = Disagree	290	70.1%	0.048*
	2 = Do not agree	53	12.8%	
	3 = Agree	71	17.1%	
Had discolored teeth or spots on your teeth	1 = Disagree	237	57.3%	0.043*
	2 = Do not agree	42	10.1%	
	3 = Agree	135	32.6%	
Had crooked teeth or spaces between your teeth	1 = Disagree	237	54.9%	0.016*
	2 = Do not agree	41	9.9%	
	3 = Agree	146	35.2%	
Had bad breath	1 = Disagree	329	79.5%	0.003**
	2 = Do not agree	37	8.9%	
	3 = Agree	48	11.6%	
Had difficulty eating foods you like the most because of your teeth/mouth or face	1 = Disagree	337	81.4%	0.031*
	2 = Do not agree	41	9.9%	
	3 = Agree	36	8.7%	
Been worried about what other people think about your teeth/mouth or face	1 = Disagree	309	74.6%	0.008**
	2 = Do not agree	36	8.7%	
	3 = Agree	69	16.7%	
Been teased, bullied, or called names by other children because of your teeth/mouth or face	1 = Disagree	350	84.5%	0.034*
	2 = Do not agree	31	7.5%	
	3 = Agree	33	8%	
Been confident because of your teeth/mouth or face	1 = Disagree	104	25.1%	0**
	2 = Do not agree	8	1.9%	
	3 = Agree	302	73%	
Felt that you were attractive (good looking) because of your teeth/mouth or face	1 = Disagree	127	30.7%	0**
	2 = Do not agree	18	4.3%	
	3 = Agree	169	64.9%	

$\chi^2$  = Chi-squared test; \*p $\leq$ 0.05 significant; \*\*p $\leq$ 0.01 highly significant

Only 17.1% of the participating schoolchildren agreed that they had pain in their teeth. About 32.6% children agreed that they have discolored teeth. Less than half (35.2%) of the participating schoolchildren agreed that they have spaces between their teeth and only 11.6% of children said that they have bad breath. Majority of schoolchildren (74.6%) disagreed that they are worried about what other people think about their teeth and 84.5%

of children disagreed that they are called or been teased or bullied by other children because of their teeth. About 73% of children in the study agreed that they are confident because of their teeth.

Table 2 describes the chi-squared results for the significant responses with respect to age, gender, and educational qualification of parents on OHL-based questions of HeLD.

**Table 2:** Response of parents on OHL questions of HeLD based on their age, gender, and educational qualification

Questions	Options	Number	Percentage	p-value
Are you able to pay attention to dental health needs?	1 = Never	251	60.6%	0**
	2 = Occasionally	34	8.2%	(age, gender, education)
	3 = Often	129	31.2%	
Are you able to make time for things good for dental health?	1 = Never	251	60.62%	0**
	2 = Occasionally	39	9.42%	(age)
	3 = Often	124	29.95%	0.001 (gender, education)
Are you able to fill in dental forms?	1 = Never	214	51.6%	0**
	2 = Occasionally	71	17.1%	(age, gender, education)
	3 = Often	129	31.1%	
Are you able to read dental information brochures?	1 = Never	233	56.28%	0**
	2 = Occasionally	26	6.28%	(age, education)
	3 = Often	155	37.43%	0.3 (gender)
Are you able to take support to a dental appointment?	1 = Never	215	51.9%	0**
	2 = Occasionally	78	18.8%	(age)
	3 = Often	121	29.3%	0.001** (gender, education)
Are you able to pay to see a dentist?	1 = Never	149	36%	0**
	2 = Occasionally	34	8.2%	(age, gender, education)
	3 = Often	231	55.8%	
Are you able to pay for dental medication?	1 = Never	152	35.7%	0**
	2 = Occasionally	39	9.4%	(age, gender, education)
	3 = Often	223	53.9%	
Do you know how to get dentist's appointment?	1 = Never	176	42.5%	0**
	2 = Occasionally	42	10.1%	(age)
	3 = Often	196	47.4%	0.006** (gender) 0.002** (education)
Are you able to look for a second opinion?	1 = Never	155	37.4%	0**
	2 = Occasionally	39	9.4%	(age, education)
	3 = Often	220	53.2%	0.001** (gender)
Are you able to carry out dental instructions?	1 = Never	231	55.8%	0**
	2 = Occasionally	19	4.6%	(age, gender, education)
	3 = Often	164	39.6%	

$\chi^2$  = Chi-squared test; \*p $\leq$ 0.05 significant; \*\*p $\leq$ 0.01 highly significant

Majority of parents (60.6%) said that they are not able to pay attention to dental health needs; approximately 60% of the participating parents said that they are not able to make time for things good for dental health and around half of the participating parents said that they are not able to fill in dental forms and not able to read dental information brochures, and not able to take support for making a dental appointment. More than half of parents were often able to pay for dental medication and are often able to look for a second opinion. About 55.8% of parents were not able to carry out dental instructions.

Table 3 depicts the regression values of responses among the parents with different education qualification.

Parents with educational qualification above intermediate level are 0.642 times more likely to pay attention to

dental health needs and 0.334 times more likely to make time for things good for dental health, and 0.152 times more likely to fill in dental forms. Parents with education above intermediate are 0.408 times more likely to carry out dental instructions compared with parents with education below intermediate level.

Table 4 depicts the regression values of responses among the schoolchildren toward their OHRQoL using COHIP.

Male children had 0.084 times more likely dental pain compared with female children, 0.096 times male children had spaces in between the teeth compared with female children.

Table 5 depicts the difference in the means of DMFT tested using unpaired t-test with respect to gender of

**Table 3:** Logistic regression analysis of responses among the parents with different education qualification using HeLD as OHL scale

Questions	Regression coefficient	p-value	Odds ratio	95% confidence interval	
				Lower	Upper
Are you able to pay attention to dental health needs?	0.161	0**	0.642	1.621	2.229
Are you able to make time for things good for dental health?	0.111	0**	0.334	0.691	1.211
Are you able to fill in dental forms?	0.023	0.002**	0.152	0.173	0.760
Are you able to take support to make a dental appointment?	0.084	0**	0.290	0.510	0.988
Are you able to pay to see a dentist?	0.061	0**	0.247	0.436	0.969
Are you able to pay for dental medication?	0.038	0**	0.195	0.281	0.816
Do you know how to get dentist's appointment?	0.003	0**	0.054	-0.491	0.138
Are you able to look for a second opinion?	0.004	0**	0.066	-0.492	0.093
Are you able to carry out dental instructions?	0.166	0**	0.408	0.903	1.403

\*p≤0.05 significant; \*\*p≤0.01 highly significant

**Table 4:** Logistic regression analysis of responses among schoolchildren toward their OHRQoL using COHIP

Questions	Regression coefficient	p-value	Odds ratio	95% confidence interval	
				Lower	Upper
Had pain in your teeth/toothache	0.007	0.004**	0.084	0.034	0.480
Had discolored teeth or spots on your teeth	0.004	0**	0.060	0.500	0.118
Had crooked teeth or spaces between your teeth	0.009	0**	0.096	0.596	0.001
Had bad breath	0.005	0**	0.069	0.387	0.063
Had difficulty eating foods you like the most because of your teeth/mouth or face	0	0.004**	0.012	0.189	0.245
Been worried about what other people think about your teeth/mouth or face	0.004	0.004**	0.064	0.088	0.424
Been teased, bullied, or called names by other children because of your teeth/mouth or face	0.004	0.07	0.062	0.071	0.329
Been confident because of your teeth/mouth or face	0.030	0**	0.172	0.256	0.893
Felt that you were attractive (good-looking) because of your teeth/mouth or face	0.059	0**	0.244	0.486	1.096

\*p≤0.05 significant; \*\*p≤0.01 highly significant

**Table 5:** Mean DMFT scores of children

Caries experience	Boys	Girls	t-value	p-value
Mean DMFT	1.44 ± 1.57	1.42 ± 1.74	0.114	0.201*

Unpaired t-test; \*p≤0.05, significant

children. The mean DMFT score between male and female schoolchildren did not differ significantly.

## DISCUSSION

The OHL is defined as the "degree to which individuals have the capacity to obtain, process and understand basic oral health information and services needed to make appropriate health decisions". Internationally, interest in OHL is driven by oral health disparities, particularly for disadvantaged groups, with conditions, such as dental caries contributing substantially to the global burden of disease. Oral diseases and disorders during childhood can have a negative impact on the life of children and their parents.<sup>10</sup> Perceptions of positive and negative impacts of oral health status on the quality-of-life must necessarily be reported by the people. The importance of oral health beyond dental care is reflected in the World Health

Organization (WHO) Global Oral Health Program. Priority action areas of the WHO are directed at improving OHL to drive increased knowledge and health-promoting behaviors.<sup>8,11,12</sup> The HeLD is an instrument that takes a broad approach to OHL. The development and evaluation of the HeLD-14 have been described previously.<sup>8,9</sup>

Efforts have been made to develop a measure of OHRQoL that would be appropriate for use with children. The COHIP is a measure of the impact of the oral health, functional well-being, social/emotional well-being, school environment, and self-image.<sup>7</sup> The present study was carried out to assess the association of parental OHL using HeLD with OHRQoL using COHIP-Short Form (SF) among 15-year-old school-going children in Davangere city.

The present study provides information that only 17.1% of participating students have pain in their teeth, which is in contrast with the study of El Osta et al<sup>13</sup> among 12-year-old children in New Caledonia, where 40% children suffered from pain due to dental problems in the last 3 months. El Osta et al<sup>13</sup> reported that 26% of the children claim to have difficulty in chewing food due to dental problems, which is higher when compared with

the present study where only around 9% students have difficulty in eating food because of their teeth. This difference might be attributed to sociodemographic behavior and cultural differences in the study population.

A study by Li et al<sup>14</sup> among 8- to 15-year-old school-children using the Korean version of COHIP concluded that 2.1% children felt that they are attractive because of their teeth whereas in the present study, the majority of students (61.9%) felt that they are attractive. Around 73% of students in the present study are confident because of their teeth, which is contradictory to the study by Li et al,<sup>14</sup> where negligible number of students (2.6%) felt that they are confident. These variations could be due to differences in the age group, oral hygiene practices, and sociocultural background.

In the present study, 31.2% parents agreed that they are often able to pay attention to dental health needs and 31.1% are able to fill in dental forms and more than half of the parents (51.6%) are able to pay for a dentist and around 29.6% are able to carry out instructions given by a dentist. All the above-mentioned results are statistically highly significant. This was the first of its kind using COHIP and HeLD-SF; hence, we could not compare our results with other studies.

### Strengths of the Study

- It can act as a stepping stone for further research to confirm the relationship between OHL of parents and OHRQoL of their children.
- Study participants were recruited from both private and government schools with a varied background. This represents the existing scenario of OHL among their parents.
- The tools used for this study (HeLD-14 and COHIP-SF) are validated tools that are often used in research across the world.

### LIMITATIONS

- As this study is cross-sectional, it measures cause and effect at the same point in time, introducing the problem of temporal ambiguity and inability in establishing a causal relationship.
- This study involved only 15-year-old students pursuing their education in various streams and their parents. Further studies are recommended in a cross-section of the population represented by all sections of society.
- In the present study, OHL of parents was not found to be associated with OHRQoL of their children. Further trials are suggested to understand the nature and extent of this association. This will aid in developing better oral health care programs for the population.

- Parents were not contacted directly; there is a barrier between trained examiner and parent communication. So, special efforts may be taken to eliminate this barrier.

### CONCLUSION

A number of studies have concluded that higher education levels coincide with positive dental health.<sup>15-17</sup> However, the present study concluded that the relation of parental literacy and child oral health behavior is not a straightforward cause and effect connection, but rather a more elusive relationship with various external (objective) and internal (subjective) factors playing a role in the process.

### RECOMMENDATIONS

The HeLD and COHIP are simple and may be used in dental practice on a routine basis, to determine their ability in classifying patients based on their OHL levels and designing appropriate parent-centered communication approaches to improve their children's oral health.

More studies are required using HeLD and COHIP in various settings to confirm their ability to detect various degrees of OHL existing in the population and OHRQoL of children. Hence, professional intervention is crucial for improving OHL of parents and OHRQoL of their children.

### REFERENCES

1. Saldunaite K, Bendoraitiene EA, Slabsinskiene E, Vasiliauskiene I, Andruskeviciene V, Zbiene J. The role of parental education and socioeconomic status in dental caries prevention among Lithuanian children. *Medicina (Kaunas)* 2014 Jul;50(3):156-161.
2. Oakada M, Kawamura M, Kaihara Y, Matsuzaki Y, Kuwahara S, Ishidori H, Miura K. Influence of parents' oral health behaviour on oral health status of their school children: an exploratory study employing a causal modelling technique. *Int J Paediatr Dent* 2002 Mar;12(2):101-108.
3. Rudd RE, Horowitz AM. Health and literacy: supporting the oral health research agenda. *J Public Health Dent* 2005 Sep;65(3):131-132.
4. Lee JY, Rozier RG, Lee SY, Bender D, Ruiz RE. Development of a word recognition instrument to test health literacy in dentistry: the REALD-30—a brief communication. *J Public Health Dent* 2007 Spring;67(2):94-98.
5. Do LG, Spencer A. Oral health-related quality of life of children by dental caries and fluorosis experience. *J Public Health Dent* 2007 Summer;67(3):132-139.
6. Jokovic A, Locker D, Tompson B, Guyatt G. Questionnaire for measuring oral health-related quality of life in eight- to ten-year-old children. *Pediatr Dent* 2004 Nov-Dec;26(6):512-518.
7. Broder HL, McGrath C, Cisneros GJ. Questionnaire development: face validity and item impact testing of the Child Oral Health Impact Profile. *Community Dent Oral Epidemiol* 2007 Aug;35(Suppl 1):8-19.

8. Jones K, Brennan D, Parker E, Jamieson L. Development of a short-form Health Literacy Dental Scale (HeLD-14). *Community Dent Oral Epidemiol* 2015 Apr;43(2):142-151.
9. Dickson-Swift V, Kenny A, Farmer J, Gussy M, Larkins S. Measuring oral health literacy: a scoping review of existing tools. *BMC Oral Health* 2014 Dec;14:148.
10. Kinnby CG, Palm L, Widenheim J. Evaluation of information on dental health care at child health centers: differences in educational level, attitudes, and knowledge among parents of preschool children with different caries experience. *Acta Odontol Scand* 2015;49(5):289-295.
11. Sarnat H, Kagan A, Raviv A. The relation between mother's attitude toward dentistry and the oral status of their children. *Pediatr Dent* 1984 Sep;6(3):128-131.
12. Williams NJ, Whittle JG, Gattrell AC. The relationship between socio-demographic characteristics and dental health knowledge and attitudes of parents with young children. *Br Dent J* 2002 Dec;193(11):651-654.
13. El Osta N, Pichot H, Soulier-Peigue D, Hennequin M, Tubert-Jeannin S. Validation of the child oral health impact profile (COHIP) French questionnaire among 12 years-old children in New Caledonia. *Health Qual Life Outcomes* 2015 Oct;13:176.
14. Li C, Xia B, Wang Y, Guan X, Yuan J, Ge L. Translation and psychometric properties of the Chinese (Mandarin) version of the Child Oral Health Impact Profile-Short Form 19 (COHIP-SF 19) for school-age children. *Health Qual Life Outcomes* 2014 Nov;169(12):1-8.
15. Jones M, Lee JY, Rozier RG. Oral health literacy among adult patients seeking dental care. *J Am Dent Assoc* 2007 Sep;138(9):1199-1208.
16. Miller E, Lee JY, DeWalt DA, Vann WF Jr. Impact of caregiver literacy on children's oral health outcomes. *Pediatrics* 2010 Jul;126(1):107-114.
17. Garrett GM, Citi AM, Gansky SA. Parental functional health literacy relates to skip pattern questionnaire error and to child oral health. *J Calif Dent Assoc* 2012 May;40(5):423-430.