

Impact of Oral Health Literacy on Oral Health Related Quality of Life Among Adult Patients Seeking Dental Care in a Dental College, Bangalore, India

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ABSTRACT

Aims and Objectives: To investigate the impact of OHL on Oral health-related quality of life (OHRQoL) among adult patients seeking dental care in The Oxford Dental College, Bangalore.

Materials and Methods: A total of 400 patients seeking dental care were given a questionnaire that included demographic variables, Oral Health Literacy (OHL), oral health knowledge (OHK) and short version of Oral Health Impact Profile (OHIP - 14).

Results: The study group consists of 218 (54%) females. The sample majority was graduated (71%) and a mean age of 30 years. 226 (57%) of patients had socio – economic status of upper middle class. The proportion of patients with inadequate OHL and inadequate OHK was 26% and 71%, respectively. The OHIP – 14 mean severity and extent scores for males were 0.80 and 0.87 respectively and for females were 12.93 and 10.78 respectively. A significant association ($p < 0.001$) with all the three OHRQoL measures, OHL and OHK was seen.

Conclusion: This study documents that OHL and OHK has a significant impact on OHRQoL.

Keywords: Oral health literacy, oral health knowledge, adult patients, OHRQoL.

INTRODUCTION

According to the most recent National Assessment of Adult Literacy Survey, nearly half (43%) of adults in the United States (U.S.) are at risk for low literacy. Because written health information is frequently provided at above the 10th grade level, approximately 90 million adult Americans with low health literacy skills struggle to understand fundamental health information including consent forms, verbal instructions, and drug labels.¹

Individuals with low health literacy skills often have poorer health knowledge and health status, unhealthy behaviors, less utilization of preventive services, higher rate of hospitalizations, increased health care costs, and ultimately poorer health outcomes than those with higher literacy levels.² People are often embarrassed or ashamed to admit they have trouble understanding health information and instruction, and they often develop well-practiced coping mechanisms that effectively mask their problem. Limited health literacy is estimated

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to cost the U.S. between \$100 and \$200 billion each year.³

Health literacy, including health literacy in dentistry, is multi-dimensional and context specific and is usually influenced by individual literacy skills (i.e., ability to perform basic reading and numerical tasks), psychosocial dynamics, and various health contexts (i.e., anxiety experienced during a dental or medical encounter, complexity of information being described and/or ability of a provider to effectively communicate).⁴

In an effort to focus on the assessment of health and quality of life issues, the term "health-related quality of life" is now widely been used. Theoretical models have provided the framework that links clinical conditions with patient perceptions and impacts on their oral health-related quality of life (OHRQoL).⁵ OHRQoL has wide-reaching applications in survey and clinical research. It is an integral part of general health and well-being. In fact, it is recognized by the World Health Organization (WHO) as an important segment of the Global Oral Health Program (2003).⁶

Very few studies have been there relating to impact of OHI on OHRQoL. An accumulating body of evidence links low OHL with worse oral health outcomes such as oral health status, dental neglect as well as sporadic dental attendance.⁵ Few studies state OHL was not associated with self reported oral hygiene status but it was associated with increase prevalence of OHIP – 14 impacts.

As there is lacunae in literature regarding the association of OHL and OHQoL which go hand in hand this study was taken up with the aim to investigate the impact of OHL and OHRQoL among adult patients seeking dental care in the Oxford Dental College, Bangalore.

MATERIALS AND METHODS

The study population comprised of adult patients seeking dental care in The Oxford Dental College, Bangalore. Sample size was determined by using sampling formula. Sample = z^2pq/Δ^2 , where $z = 1.96$ (standard normal distribution), p (prevalance) = 0.5, $q = 1 - p$ and $\Delta = 0.05$ (margin of error = 5%, 95 % confidence interval). The sample of 384 was derived which was rounded off to 400.

Therefore, a total of 400 patients were recruited for the present study. Patients who studied English as a language till 12th standard, who are at least 18 years of age but younger than 80 years and who gave the consent were included. Patients with cognitive impairment, vision or hearing problems and with obvious sign of drug or alcohol intoxication were excluded.

Preparation of special questionnaire

A self administered questionnaire was given to the patients' who participated in the study. The information collected by the questionnaire included:

- 1) Demographic details like age, gender, educational level, occupation, income and last dental visit.
- 2) Oral health literacy and oral health knowledge instrument using Oral Health Literacy Instrument (OHLI).

Oral Health Literacy Instrument (OHLI) consists of two sections: reading comprehension and numeracy. The reading comprehension section is a 38-item test with words omitted from two passages, one on dental caries and the other on periodontal disease. The dental caries passage contains 13 sentences with 264 words, while the periodontal disease passage consists of 14 sentences with 228 words. Four possible choices are offered, one of which is correct; the remaining choices are either similar sounding words or grammatically or contextually incorrect terms.

The numeracy section consists of 19 items to test comprehension of directions for taking common prescriptions associated with dental treatment, postextraction instructions and clinical appointments. The oral health knowledge test consists of seven pictures depicting 17 labelled items such as perioral an intra-oral structures, oral diseases and conditions, dental fillings, a dental prosthesis, and different oral hygiene aids. To the left of each picture is a list of numbered words. Participants were asked to match the picture with the numbered item.

- 3) Oral health related quality of life (OHRQoL) by using short version of Oral Health Impact Profile (OHIP - 14).

Table 1: Distribution of the study population based on demographic variables.

Gender	n	%
Male	182	45.5%
Female	218	54.5%
Education		
12th Std	76	19%
Graduate	284	71%
Post Graduate	40	10%
Occupation		
Professional	204	51%
Semi Professional	56	14%
Shop Owner	23	5.75%
Student	73	18.25%
Housewife	44	11%
Socio - Economic Status		
Upper Class	112	28%
Upper Middle Class	226	56.5%
Lower Middle Class	62	15.5%

Table 2: Distribution of the study population according to Oral Health Knowledge and Oral Health Literacy.

Oral Health Knowledge	n	%
Inadequate	283	70.75%
Marginal	75	18.75%
Adequate	42	10.5%
Oral Health Literacy		
Inadequate	102	25.5%
Marginal	155	38.75%
Adequate	143	35.75%

Table 3: Distribution of oral health – related quality of life (OHRQoL) measures [OHIP – 14 estimates and corresponding 95% confidence limits (CL)] by demographic characteristics among study population.

Parameter	n	%	Prevalance (95% CL)	Severity (95% CL)	Extent (95% CL)
Gender					
Male	182	45%	22 (17- 29)	12.93 (11.70-14.15)	0.80 (0.49-1.11)
Female	218	55%	51 (45-58)	10.78 (10.09-11.46)	0.87 (0.70-1.03)
Education					
12th Std	76	19%	70 (59-79)	12.50 (11.38-13.62)	1.37 (1.01-1.73)
Graduate	284	71%	35 (30-41)	11.18 (10.30-12.06)	0.81 (0.61-1.02)
Post Graduate	40	10%	---	14.40 (13.19-15.61)	---
Occupation					
Profession	204	51%	32 (26-39)	9.35 (8.65-10.02)	0.45 (0.34-0.56)
Semi Profession	56	14%	25 (16-38)	18.61 (15.97-21.24)	1.75 (0.84-2.66)
Shop Owner	23	6%	---	10.09 (7.38-12.79)	---
Student	73	18%	88 (78-93)	13.81 (12.74-14.88)	1.42 (1.23-1.62)

Others	44	11%	23 (13-37)	11.73 (9.69-13.77)	0.95 (0.32-1.59)
SE Status					
Upper Class	112	28%	47 (38-57)	8.32(7.52-9.13)	0.53 (0.41-0.64)
Upper Middle Class	226	57%	38 (32-45)	12.86 (11.85-13.88)	1.11 (0.84-1.39)
Lower Middle Class	62	16%	23 (14 -36)	13.41 (12.72-14.70)	0.45 (0.20-0.69)
Patient Type					
New	248	62%	47 (41-53)	11.24 (10.38-12.09)	0.92 (0.69-1.14)
Established	152	38%	24 (18-31)	12.60 (11.50-13.70)	0.71 (0.47-0.95)

Table 4: Oral health – related quality of life (OHRQoL) measures [OHIP – 14 estimates and corresponding 95% confidence limits (CL)] according to Oral Health Literacy among study population.

OHRQoL (OHIP – 14 estimates)	Oral Health Literacy			
	Inadequate	Marginal	Adequate	P-Value
Prevalance (Mean)	36.6 (29.4-44.5)	36.0 (28.8-43.8)	27.5 (21.0-35.0)	<0.001*
Severity (Mean)	17.20 (15.40-18.99)	10.07 (9.35-10.79)	9.70 (8.91-10.49)	<0.001*
Extent (Mean)	2.00 (1.45-2.55)	0.57 (0.44-0.71)	0.29 (0.22-0.37)	<0.001*

*denotes significant difference

Table 5: Oral health – related quality of life (OHRQoL) measures [OHIP – 14 estimates and corresponding 95% confidence limits (CL)] according to Oral Health Knowledge among study population.

OHRQoL (OHIP – 14 estimates)	Oral Health Knowledge			
	Inadequate	Marginal	Adequate	P-Value
Prevalance (Mean)	76.5 (69.2-82.5)	17.0 (11.9-23.7)	6.5 (3.6-11.6)	<0.001*
Severity (Mean)	12.89 (12.05-13.73)	6.73 (6.00-7.46)	13.07 (11.41-14.73)	<0.001*
Extent (Mean)	1.00 (0.78-1.22)	0.56 (0.37-0.75)	0.24 (0.10-0.37)	<0.001*

*denotes significant difference

For this analysis, ordinal values were coded for each question ranging from zero for a response of 'never' through to four for a response of 'very often'. Three summary variables were then computed:

- Prevalence: is the percentage of people reporting one or more items 'fairly often' or 'very often'.
- Extent: is the number of items reported 'fairly often' or 'very often'.
- Severity is the sum of ordinal responses: hence, it additionally takes into account impacts experienced occasionally or hardly ever, and could range from 0 to 56.

The threshold for defining prevalence, extent and severity is consistent with previously established summary statistics for the OHIP-14 questionnaire.⁷The investigator introduced himself to all the patients in the OPD and appraised them about the study. The respondents were informed

about the aim of the study as well as the fact that participation in the study was totally voluntary and anonymous.

STATISTICAL ANALYSIS

Statistical analysis was done using computer with the aid of Statistical Package for Social Science (SPSS), version 16, USA. In the present study, descriptive statistics was used to summarize the variables. Percentage was to describe the discontinuous variables. ANOVA test was done to determine the relationship between the groups.

RESULTS

In the study population out of total 400 patients, 218 (54.5%) patients were females and 182 (45.5%) patients were males (Table I). With respect to oral health knowledge, 283 (70.75%)

patients had inadequate oral health knowledge and 102 (25.5%) patients had inadequate oral health literacy (Table II).

The OHIP – 14 prevalence percentages according to socioeconomic status for the upper class, upper middle class, lower middle class were 47%, 38% and 23%, respectively. Mean severity score for the upper class, upper middle class, lower middle class were 8.32, 12.86 and 13.41, respectively (Table III). A significant association ($p < 0.001$) with all the three OHRQoL measures, oral health literacy (Table IV) and oral health knowledge was seen (Table V).

DISCUSSION

In context on Oral health literacy, an accumulating body of evidence links low OHL with worse oral health outcomes such as oral health status, dental neglect as well as sporadic dental attendance. In an investigation among a group of Indigenous Australians, Parker and Jamieson found that although low OHL was not associated with self reported oral health status, it was associated with increased prevalence of OHIP-14 impacts (proportion of items reported fairly/very often). Noteworthy, in a recent study among child-caregiver dyads in the US, caregivers' OHL modified the association between children's oral health status and child OHRQoL impacts, with low-literacy caregivers reporting less impacts.⁵

In the present study, 102 (25.5%) patients had inadequate oral health literacy, 155(38.75%) had marginal and 42(35.75%) had adequate oral health literacy whereas, in a study done by Sabbahi et al.(8) 3% had inadequate oral health knowledge, 8% had marginal and 89 % had adequate oral health literacy. This difference may be possible as English is the second language in India. Among the study population, the prevalence of oral health impacts 73% was higher compared to nationally representative samples from other studies including the Australia (dentate subjects-18.2%), United Kingdom (dentate subjects-15.9%)⁷. One possible interpretation of this finding is that our study group was of patients seeking dental care. Lawrence et al.(6) demonstrated that OHIP- 14 scores show good correlation with clinical oral health status, independent of gender and socioeconomic inequalities in oral health.

In the present study, a significant association ($p < 0.001$) was seen with all the three OHRQoL measures, prevalence%, mean severity and mean extent and Oral Health Literacy outcomes which are inadequate, marginal and adequate. Also, a significant association ($p < 0.001$) was seen with all the three OHRQoL measures, prevalence%, mean severity and mean extent and Oral Health knowledge outcomes which are inadequate, marginal and adequate. Previous pilot studies have explored the patterns of association between OHL and measures of OHRQoL using the Test of Functional Health Literacy in Dentistry (TOFHLiD) and the Rapid Estimate of Adult Literacy in Dentistry (REALD-99). Interestingly, as in the Parker and Jamieson study ((10) reported that OHL was significantly associated with dental health status, higher OHL scores were significantly associated with less perceived OHIP-14 impacts, indicating better OHRQoL. Lee et al.(9) reported a significant association of REALD-30 with OHIP-14 scores; however, the authors noted that because the data were collected on a convenience sample of health care-seeking subjects.

The present study suggests an association of OHRQoL, OHL and OHK. However, future studies in this field of research can consider longitudinal studies and can also take up probability sampling technique. The findings provide a foundation to enhance OHL, or rather improve the readability of written materials and accessibility to dental services to appropriate literacy level. It remains uncertain whether improvement in OHL is feasible and if so, whether this would lead to better oral health status and subjective oral health. Although education and income arguably remain the strongest correlates of oral health and disease, and literacy is one of numerous other distal determinants, OHL may be part of causal mechanisms that lead to worse oral health.

Future research should be conducted on a probability sample that represents a larger and diverse population, preferably not regular users of the dental care system. Further studies should include oral health outcomes, for example, oral health status using clinical indices.

CONCLUSION

This study investigates the impact of OHL and OHRQoL among adult patients seeking dental care in the dental college with significant association ($p < 0.001$) with all the three OHRQoL measures, OHL and oral health knowledge.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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