Impact of Oral Health Literacy on Periodontal Health among Low-income-group Workers of Dental Institutes in Patna, Bihar, India

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ABSTRACT

Aim: To evaluate the impact of oral health literacy (OHL) on the periodontal health among low-income-group workers of dental institutes.

Materials and methods: A cross-sectional study was conducted on 137 class III and IV workers of dental college. Data collection was done by using a customized pro forma including demographics, REALD-30 for calculating OHL, and items on oral hygiene habits like toothpaste use, brushing frequency, and any other oral hygiene aid. Following which periodontal health status was determined, which was categorized into severe, moderate, and mild periodontitis (health). The analysis was done using the SPSS 11.5. Periodontal health status was associated with OHL scores, oral hygiene habits, and demographics using the chi-square test. The statistical significance level was set at 5% level.

Results: Among the 137 subjects, 25 participants reported health/mild periodontitis, 53 had moderate periodontitis, and 59 had severe periodontitis. Low OHL was observed in 52.5% and only 13.8% had high OHL. The participants who had low OHL, 56.94% ($n = 41$), were having severe disease, while the subjects who had better OHL, only 21.05% ($n = 4$) were found to have severe disease.

Conclusion: The people with low socioeconomic classes can be reached effectively if the community involvement concept is used through the workers of dental institutions. But first efforts should be made to improve the OHL of these workers.

Clinical significance: Improving OHL can be of great help to the clinicians and the community health workers because it helps them to make patient adherent to the treatment and the medications prescribed to them. Periodontitis affects people with low socioeconomic status and in the present study it was class III and IV workers. Improving OHL of this population will decrease the oral disease burden of India.

Keywords: Dental workers, Oral health literacy, Periodontitis.

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INTRODUCTION

Health literacy can be understood as the capability to engage with health information and services in a meaningful way.[1] The notion of health literacy is much bigger than capability to read pamphlets and look for health services. Health literacy is critical to empowerment as it includes the skillfulness of enhancing one's competence to use health information effectively.[2]

Oral health literacy (OHL) was largely neglected until recently, although of late it has become a significant concept.[3,4] The level to which individuals have the ability to acquire, practice, and grasp the fundamental oral health knowledge and the services required to make correct decisions related to health is OHL.[4] It is the inadequate OHL skills that are hypothesized as a major contributor to bring upon the oral health disparities, and negatively affecting better oral health outcomes.[4,5] Evidence from numerous studies have shown that grave oral health outcomes have been associated with low OHL, which ultimately leads to lower use of oral health services and most importantly more chances to miss the dental appointments, which eventually leads to complex forms of oral diseases and more cost and expenditure toward dental treatments to the population.[6–8]

Earlier studies on health literacy assessments focused entirely on reading competence and the link between reading skills of adults and health outcomes.[3] Whereas it has been found that health literacy is actually a collective function of social and certain individual factors like culture, customs, education, finances, and different aspects of health systems.[9] The circumstances in India are different from the other countries as here only reading capacity

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(word recognition) cannot envisage individual's health literacy. This may be because that almost all health-related materials in India including prescription pads, medicines, etc., are labeled in English.[10] It is just not the reading ability to read the healthcare information; it is also necessary to understand it and apply it on everyday basis for better utilization of healthcare amenities.

English-reading skills to a certain extent are acceptable in class I and II workers and to some point in class III working categories than

class IV workers in India. Education definitively would be considered as one of the important factors, but along with this the surrounding environment of an individual can be additive to the ignorant behavior toward health and especially oral health. The primary reason attributed to this ignorant behavior in these workers is that the people of this group generally do not come up for regular oral health check-up and they visit the doctor only when the condition has worsened.[11] This ignorant behavior of these workers makes them uninformed about various oral diseases, their preventive prospects, and various schemes provided by Government of India and many private healthcare organizations.[12] The prevalence of periodontitis is 89.6 and 79.9% in the age groups 35–44 and 65–74 years, respectively, in India.[13] For the successful management of periodontitis, it necessitates explicit understanding of intricate self-care regimens and exact adherence to recall interims; this can be related to OHL to a certain extent. Many Studies in the past have documented the fact that those periodontal diseases can viably be treated and settled over the time with persistent patient compliance.[14] If the class III and IV workers working in dental institute environment are involved, then they can be a better source to influence other such workers. So if the potential of these workers are tapped to increase the patient compliance of low-socioeconomic-status (SES) people, the disease burden can be reduced, as SES has been considered one of the major influential predictors ending in poor oral health.[15] Therefore, it is important to first assess the level of OHL and the periodontal health status of these workers. Thus, the present study was aimed to evaluate impact of OHL on the periodontal health among low-income-group class III and IV workers of dental institutes.

MATERIALS AND METHODS

Study Design

This cross-sectional study was conducted on 137 class III and IV workers, working in a dental college. A total of two dental colleges exist in Patna. The workers of both the institute were approached. Around 150 such workers were working in these institutions. Those who were present on the day of study and provided a written consent were included in the study. Ethical clearance was obtained from the institutional ethical committee. Prior to commencing of the study, the process and purpose were elaborated to each subject. The present study was carried out during September to December 2019. The data collection was done by using a customized pro forma divided in three parts as follows: part 1—Recording the sociodemographic profiles of the participants, which included gender, education, age, and annual family income. part 2–OHL was calculated using the REALD-30,[16] which comprises of 30 words related to dental/oral health arranged in escalating difficulty order. Subjects were asked to read out loud words in front of the single investigator. Subjects were instructed to pass over the word if they are not acquainted with it rather than trying to assume the word phonetically, as REALD-30 is a word recognition test. Each word accurately pronounced gets one point. The overall score ranges from 0 (least possible literacy) to 30 (maximum literacy). The REALD-30 score was regarded in three categories defined as high (≥26), moderate (22–25), or low (≤21). The oral health habits (Behavior) section consisted questions related to oral hygiene habits like brushing frequency, toothpaste use, and any other oral hygiene aid. Training and calibration of two interviewers was done to take interview and survey. After the interview, the periodontal

assessment was finished by a single calibrated and trained examiner and recorder (Kappa scores were >0.90). The outcome of OHL evaluation was not disclosed to them. The parameters of periodontal health was clinically measured by using the manual UNC-15 periodontal probe (Hu-Friedy Manufacturing, Chicago, IL, USA) at six different sites on the tooth comprised of probing depth (PD) and clinical attachment loss (CAL).

By means of the CDC case definition of periodontal disease,[16] which was based on amount and severity of the periodontal disease, the periodontal health status was determined, which was as follows: severe periodontitis: with ≥2 interproximal sites with clinical attachment loss ≥6 mm (>1 tooth) and ≥1 interproximal site with PD ≥5 mm; moderate periodontitis: with ≥2 interproximal sites with clinical attachment loss ≥4 mm (>1 tooth) or ≥2 interproximal sites with PD ≥5 mm (>1 tooth); mild periodontitis or health: neither "moderate" nor "severe" periodontitis.[17]

Data Analysis

The data collected were entered in Microsoft Excel 2010 and analyzed by using SPSS 11.5. The periodontal health status was associated with OHL scores, oral hygiene habits, and demographics using the Chi-square test. The statistical significance level was set at 5% level.

RESULTS

Among all the class III and IV workers included in the study, 137 agreed to willing participate. Most of the participant did not fill the details to which class worker they belong and thus we were unable to perform the results separately for each class and overall results were presented. Among the 137 subjects recruited for the study, majority were males (64.23%). Most of the participants belonged to the age group of 41–50 years and income of 5,000–10,000/month. There were total 25 (18.25%) participants with health/mild periodontitis, 53 (38.69%) had moderate periodontitis, and 59 (43.07%) had severe periodontitis. The distribution of patients was found statistically significant for gender and income ($p < 0.05$) (Table 1).

Table 2 shows that out of 137 participants maximum patients ($n = 69$) were in the category of last dental check-up in past 1–2 years. Similarly, most of them ($n = 83$) used toothbrush with toothpaste and frequency of oral hygiene once a day was most reported ($n = 101$). A total of 18 people with severe periodontitis had habit of performing oral hygiene other than toothbrush like twig or charcoal, etc. Family history of periodontitis was present in 37 participants with moderate periodontitis and 41 with severe periodontitis.

REALD-30 results showed that maximum participants (52.5%) were having low OHL scoring 21 or less and only 13.8% had high OHL scoring 26 or more. Among participants who had low OHL, 56.94% ($n = 41$) were having severe disease, while among subjects who had better OHL, only 21.05% ($n = 4$) were found to have severe disease. Similarly, among subjects having low oral health literacy, only 12.5% ($n = 9$) presented health/mild disease, while among subjects with high oral health literacy, 42.1% ($n = 8$) demonstrated health/mild disease (Table 3).

Table 4 shows that odds ratio (OR) was 1.23 for REALD-30 score, meaning if the scores of health literacy decrease by one unit then the probability of having worse form of periodontal disease was 1.23 times ($p = 0.001$).

Table 1: Distribution of periodontal status and demographics of study participants

Variable		Total (n = 137)	Percent	Mild (n = 25)	Moderate (n = 53)	Severe (n = 59)	p value
Gender	Male	88	64.23	16	34	38	0.04*
	Female	49	35.77	9	19	21	
Age group (in years)	<20	2	1.46	2	0	0	0.637
	21–30	23	16.79	7	12	4	
	31–40	39	28.47	8	14	17	
	41–50	47	34.31	5	17	25	
	>50	26	18.98	3	10	13	
Income/month	5,000–10,000	66	48.18	12	27	27	0.032*
	10,001–15,000	42	30.66	8	12	22	
	15,000–20,000	21	15.33	3	11	7	
	>20,000	8	5.84	2	3	3	
Total		137	100	18.25%	38.69%	43.07%	

*p value ≤ 0.05

Table 2: Distribution of oral health behavior and periodontal status of study participants

Variable		Frequency	Mild	Moderate	Severe	p value
Time since last dental check-up/cleaning	>2 years	22	03	08	11	0.036*
	1–2 years	69	14	34	21	
	<1 year	46	8	11	27	
Use of oral hygiene aid	Toothbrush with toothpaste	83	23	36	24	0.027*
	Toothbrush with toothpowder	35	2	16	17	
	Other	19	0	1	18	
Frequency of oral hygiene	Once/twice a week	3	0	0	3	0.004**
	Once a day	101	2	43	56	
	Twice a day	33	23	10	0	
Any other oral hygiene	Yes	22	18	4	0	0.012*
	No	115	7	49	59	
Family history of periodontal disease	Yes	94	16	37	41	0.024*
	No	43	9	16	18	

*p value ≤ 0.05

Table 3: Distribution of oral health literacy and periodontal status of study participants

	Total (n = 137) (100%)	Health or mild periodontitis	Moderate periodontitis	Severe periodontitis	p value
Low OHL	72 (52.55%)	9 (12.50%)	22 (30.56%)	41 (56.94%)	0.001*
Moderate OHL	46 (33.58%)	8 (17.39%)	24 (52.17%)	14 (30.43%)	
High OHL	19 (13.87%)	8 (42.11%)	7 (36.84%)	4 (21.05%)	

*p value ≤ 0.05

DISCUSSION

Most of the recent investigations have featured the significance of OHL because it identifies the oral health of the patient; but they did not concentrate explicitly on the periodontal health status particularly in laborers of dental set-up. In majority, the individuals belonging to class III and IV group show an inability to gain the information in health literacy due to lack of education, poor financial status, or negligence toward the oral health, causing minimum visits to dental health professionals unless the condition worsens so far that it becomes unavoidable. Whereas it is believed that the ambience in dental institutes builds up a healthy approach of an individual to health, thereby increasing the OHL of an individual even without having any inspiration or curiosity to aid any health-related knowledge in them.[18]

Table 4: Proportional odds model for oral health literacy and periodontal disease status*

	OR* 95% CI	p value
REALD-30 score (0–30)	1.23 (1.08, 1.37)	0.001*

*Odds of worse periodontal disease status

From results of the present study, it was observed that OHL was associated significantly with the periodontal health status ($p < 0.05$). Severe disease was observed in 56.94% subjects with low OHL and in 21.05% subjects with high OHL. Similar findings were seen in the study conducted by Wehmeyer et al.[19] (75% with low OHL and 39% with high OHL) and Baskaradoss[20] (33% participants with low OHL and 15% with high OHL).

In our study population, almost equal participants were found in moderate (38.69%) and severe (43.07%) periodontitis category. Divergent findings were reported by Wehmeyer et al.[19] where more than half of the subjects were having severe periodontal disease (53%) and 29% had moderate periodontitis. These differences in the range of amount of periodontitis could be due to the fact that our population being from dental set-up had daily accessibility to the dental services and thus there were fewer subjects whose conditions progressed to severe periodontitis.

Even though age was not associated with the periodontal status, nonetheless it has been considered as a predictor.[21] Our findings show that oral hygiene habits and family history are statistically significantly associated with the periodontal health status, which was also seen in other populations.[22–24]

Results from the REALD-30 showed that OHL scores were found low in our population (52% in low OHL category), which was again similar to other studies.[20,25] This was in contrast to results of Wehmeyer et al.[19] where participants were comparatively uniformly disseminated in three categories.[19] People with low OHL had more dental problems (severe periodontitis). These findings were in accordance with studies conducted by Jones et al.[5] and Lee et al.[26] However, it must be taken into consideration that all the other studies were conducted on patients attending dental settings for treatment, whereas the present study was conducted on workers of dental institutions. Our study population despite being working in dental institutions had such low levels of OHL.

LIMITATIONS

The results of the present study should be viewed in the light of limitations. The design of the present study is cross-sectional and hence casual inferences cannot be drawn. As only two dental colleges were taken in the study, the findings cannot be generalized. It is also imperative to comprehend the shortcomings of the REALD-30. It does not have the specificity to assess the subjects' knowledge levels pertaining to periodontal health[20] and is not all-inclusive dental health literacy instrument.[16]

CONCLUSION

The conclusions from the present investigation strengthen the requirement for effectual communication among the dental healthcare service providers and laymen with respect to their periodontal disease condition. Because of the chronic nature of periodontal diseases, it is the basic requirement that the patient should have comprehension of risk factors and the etiological components identified with periodontal diseases. The people with low socioeconomic classes can be reached effectively if community involvement concept is used through the workers of dental institutions. Further studies are expected to evaluate viable strategies to advance the dental healthcare provider's communication and the patient comprehension in oral health-care setting. Dental providers ought to recognize patients who are experiencing issues utilizing information on periodontal health and help them in a better way to follow this information by utilizing successful patient communication methods and strengthening good oral health practices.

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