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Association between oral health behavior and oral health literacy among college students

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Abstract

Background and Aim: Oral health literacy is a new imperative in dentistry and is considered as a new determinant of oral health and should be considered more intensively in oral health research. Knowledge of oral health is considered to be a prerequisite for health related behaviour. The present study was undertaken to evaluate the association of oral health literacy with oral health behaviours.

Materials and Methods: A cross sectional, analytical study was conducted among 402 subjects aged 18-25 years selected through simple random sampling. Data regarding tobacco use was collected using a questionnaire to collect information on demographics, oral health behaviours and oral health literacy.

Results: The response rate was 95.7% and the mean age of participants was 20.56 ± 2.63 years with male: female ratio of 1:1.29 respectively. 70.4% of study participants had high oral health literacy. A statistically significant association was found between OHL and oral health behaviours.

Conclusion: Our findings indicate that oral health literacy is associated with differences in oral health behaviours and clinical oral health status. An understanding of participants' oral health literacy levels is crucial for designing effective health educational materials and creating intervention programs to promote oral health.

Keywords: Health literacy, oral health literacy, oral health behaviours and HeLD-14

1. Introduction

Oral health is widely recognized as an essential and integral component of overall health in the present scenario. It is defined as a state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity. U.S. Surgeon General in his report stated that, no one can be truly healthy unless he or she is free from the burden of oral and craniofacial diseases and conditions. Oral diseases are not only a major cause of infection and tooth loss but they can cause debilitating pain and difficulty with eating and speaking, as well as limit social interactions thus exerting a significant impact on quality of life ^[1]. The understanding of the causes and treatment of diseases has grown exponentially in past decades. However, profound and consequential health disparities still persist globally ^[2]. Social, environmental, biological, behavioural, community, cultural, financial and political factors, lack of access to oral health care services, complicated oral health care systems, lack of oral health information material and low oral health literacy could be the possible reasons why these oral diseases are so common even now and people often do not adopt practices that have been scientifically shown to be effective in maintaining health ^[3]. Literacy being a new concept and plays an important role in communication, which is essential for the effective delivery of healthcare and perhaps one of the most powerful tools in a clinician's arsenal ^[4]. The term health literacy was first used to express the capacity to deal with health information and healthcare services ^[2]. Nowadays, health literacy is considered as the currency for improving the quality of health and a powerful predictor of health status, health-related behaviours and health related knowledge ^[5]. Health literacy is defined as cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use the information in ways which promote and maintain good health (WHO 1998) ^[6]. It is the process of acquiring oral health information, appraising its concepts and applying oral health prevention and treatment plans appropriately requires new skill development ^[7].

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Health behaviours are defined as the activities undertaken by people in order to protect, promote or maintain health and to prevent disease^[8]. Oral health behaviours such as daily tooth-brushing, rinsing, flossing and regular dental visits are necessary to prevent rapid accumulation of plaque that can lead to long-term health problems such as periodontitis, dental caries, or tooth loss, and may be a risk factor for various systemic conditions and diseases^[9]. An individual's health literacy is represented by a constellation of skills including word recognition, reading comprehension, communication proficiency, and conceptual knowledge^[10]. Poor health literacy can impede one's ability to seek the needed health information, to process, understand and use to make appropriate health care decisions and is regarded as "silent epidemic". A mismatch between the literacy skills of individuals and demands of oral health services may create an un-necessary barrier in preventive care and treatment^[11].

Although many oral health literacy measurement tools were developed like Reald, Realdm-20, OHLA-S, Tofhlid, Ohli, Cmohk and Hkohlat-P^[12]. But, focus was on word recognition, pronunciation to assess the reading ability of common dental words^[13]. And, none measured the individual's ability to seek, understand and utilize oral health information to make appropriate oral health-related decisions. Thus, Health literacy in dentistry (HeLD-14) scale comprising of 14 items based on seven oral health literacy domains: communication, understanding, receptivity, utilization, support, financial and access was developed Each item was ranked on a 5-point scale with scores ranging from 0 to 56 and higher scores indicating minimal difficulty in performing functions (high oral health literacy) and vice versa^[14].

A positive association might exist between limited health literacy and outcomes, such as poorer knowledge about health conditions, lower use of preventive services, higher hospitalization rates and poorer self-reported health. Hence, determining relative significant factors that influence health literacy is an important beginning step for assessing its influence on oral health. But scarcity of literature was found on the relationship of oral health literacy, oral health behaviours. Thus, our study is aimed at assessing oral health literacy using HeLD-14 scale and determining its relationship with oral health behaviours and oral health status among adults aged 18-25 years in Bengaluru city, Karnataka. Hence, the results and conclusions of this study can be used to substantiate the available literature on relationship of oral health literacy with oral health behaviours among adults.

2. Materials and Methods

A cross sectional descriptive study was carried out on 402 college students aged 18-25 years from 6 different colleges of Bangalore City, Karnataka State, India. Prior ethical approval was obtained from Institutional Review Board and permissions were sought from the respective head of institutions before study. A simple random sampling technique was used in the study. A specially designed proforma comprising of 3 sections was used to collect data on socio-demographics, oral health behaviours and oral health literacy. It tested for validity and reliability before the start of the survey. Test and retest method was used to check for reliability, and the kappa value was found to be 0.80 and back translation method was used to check content validity of the questionnaire. A prior written informed consent was obtained from the participants of the study.

2.1 Oral health literacy

Awareness regarding the oral health highly depends on one's literacy level. Oral health literacy was assessed using Health literacy in dentistry-14 scale (HELD-14) having 14 items and the responses were assessed on the basis of the level of difficulty experienced while performing these tasks or functions^[14].

2.2 Oral health behaviours

Oral health behaviours were assessed by asking certain close-ended questions about the frequency of tooth brushing, type of toothpaste used, frequency of self-checking oral health with a mirror, dental visiting pattern.

2.3 Statistical analysis

The data was analysed using Statistical Package for Social Sciences, IBM Corporation, SPSS Inc., Chicago, IL, USA version 21 software package (SPSS). Descriptive statistics with frequency mean and standard deviation was computed. Chi-square test was used to analyse gender and age differences. Mann Whitney U test was used for Gender-wise comparison of oral health literacy scores Association of oral health behaviour questionnaire items with oral health literacy scores was done using Chi-square test. Statistical significance was set at the 5% level.

3. Results

A cross sectional descriptive study was carried out on 402 college students aged 18-25 years from 6 different colleges of Bangalore City, Karnataka State, India. Out of the 402 participants, 175 (43.50%) were males and 227 (56.50%) were females (Table 1).

Among the different age groups studied, the maximum number of subjects (n=144, 35.8%) were found to be of 18 years of age, out of which 64 were males and 80 were females. Least number of the subjects (n=22, 5.5%) were found to be in 20 year age group (Figure 1). The mean age of participants was 20.56 ± 2.63 years.

Oral health literacy scores among study participants

Based on the interquartile range, all the patients were divided according to their oral health literacy into 3 categories (low, moderate and high). Regarding distribution oral health literacy scores it was found that 70.4% study participants presented with high oral health literacy whereas about only 6.2% were having low oral health literacy. (Figure 2)

However, oral health literacy scores when compared with gender using Chi-square test, it was found that 58.4% females and 41.6% males had high oral health literacy. However, these associations were not statistically significant ($p > 0.05$). Overall, the mean OHL scores were 47.16 ± 8.57 and with females having higher mean OHL scores i.e. 48.1 ± 7.7 as compared to males. These differences were found to be statistically significant ($p = 0.005$) (Figure 3).

Oral health behaviours among study participants

Regarding oral health behaviors, it was observed that the participants with high oral health literacy brushed their teeth more often, had the habit of changing toothbrush once in a month, cleaned their teeth using interdental aids. 44.8% of participants used herbal toothpaste to clean their teeth. Only 13.7% had visited dentist once in 6 months while a vast majority (73.9%) were visiting dentist whenever its required. 91.3% had the habit of self-checking their mouth in mirror daily. Self-reported oral health is commonly used as an

acceptable nonclinical alternative in epidemiological oral health survey. It was measured using a single global item wherein participants were asked to range their oral health from excellent to poor. A total of 59.2% rated their oral health as good and this was found to be statistically significant ($p=0.05$). (Table 2)

Table 1: Gender-wise distribution of study participants

Gender	No. of participants (n)	Percentage %
Males	175	43.50
Females	227	56.50
Total	402	100

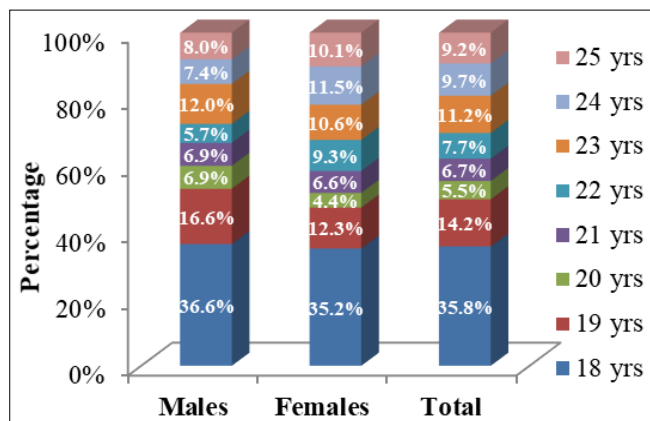


Fig 1: Age and Gender-wise frequency distribution of study participants

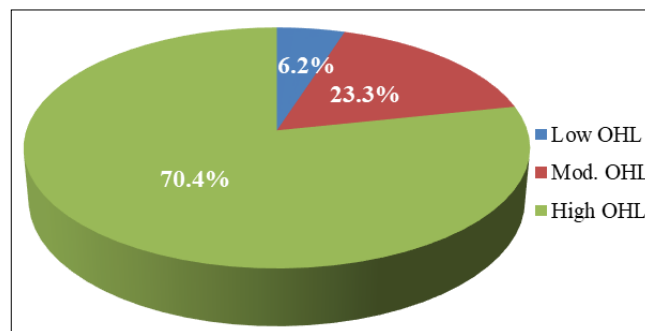


Fig 2: Percentage distribution of OHL scores among study participants

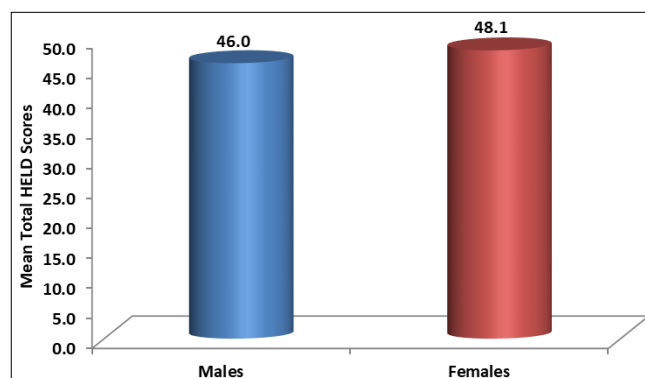


Fig 3: Gender-wise comparison of mean HeLD-14 scores among study participants

Table 2: Frequency distribution of responses to oral health behaviour questionnaire

Response	Low OHL	High OHL	Total	χ^2 value	p-value
	%	%	%		
Item 1- Tooth brushing frequency					
Once	56.0	41.9	43.5	2.663	0.05*
Twice	44.0	52.7	51.5		
Thrice	0.0	4.2	3.5		
> Thrice	0.0	1.6	1.5		
Item 2- Frequency of changing toothbrush habit among the study participants					
Once in a month	35.0	40.0	39.6	3.018	0.81
In 6 - 12 months	10.0	13.0	12.9		
In 3 - 6 months	45.0	38.1	37.6		
When bristles fray	10.0	8.9	10.0		
Item 3- type of toothpaste used for brushing teeth by study participants					
Fluoridated	10.0	19.0	19.7	4.845	0.56
Non-fluoridated	5.0	6.0	5.5		
Herbal	50	46.0	44.8		
Not Specific	35.0	28.9	30.1		
Item 4 -Responses regarding habit of self-check mouth in a mirror					
Yes	90.0	91.4	91.3	0.055	0.97
No	10.0	8.6	8.7		
Item 5 - Preferences for self- checking mouth in a mirror					
Painful tooth	15.0	30.2	30.1	10.670	0.10
Food Lodgement	40.0	25.7	24.9		
Mouth Sores	20.0	9.8	11.7		
Routinely	25.0	34.3	33.3		
Item 6 - Dental visiting pattern					
Once in 6 months	10.0	14.9	13.7	5.018	0.29
Once in 12 months	20.0	13.0	12.4		
When thr's dental problem	70.0	72.1	73.9		
Item 7- Self-rating oral health.					
Very good	16.0	15.9	16.4	15.924	0.01*
Good	36.0	61.1	59.2		
Fair	44.0	14.3	15.4		
Poor	4.0	8.6	9.0		

* - Statistically Significant

4. Discussion

Youth is a special period of human development, not just physically but also emotionally and cognitively and an increased awareness for beautiful and healthy appearance is commonly associated with this age. That could be reason for better attitude towards oral health amongst majority of subjects in present study.

In 2015, average literacy rate of India was reported to be 90%. Specifically for Bengaluru, it is 87.67% overall with 91.01% and 84.01% for males and females respectively with a literacy gap of 7.0. However, this is not reflected in the current study, where the females had higher oral health literacy scores which could be attributed to their understanding about what good oral health entails in it and a more positive dental health attitude. Consistent results were seen in Sistani *et al* [15] and Sabbahi *et al* [12] studies. However, lower prevalence was seen in Veerasamy *et al* [16] and Kanupuru *et al* [17] studies.

In our study, it was seen that, a majority of 151 (53.3%) subjects with high oral health literacy brushed their teeth at least twice daily suggesting that they were more concerned about oral health and take into consideration that maintenance of good oral hygiene, including healthy dentition and supporting structures, is an important part of general health. These results were in line with study conducted by Ying *et al* [18] and Wehmeyer *et al* [19].

Regarding frequency of changing toothbrush, it was found that 39.6% were changing their brush once in a month and 37.6% were changing their brush every 3-6 months. These results are in accordance with the results of study conducted on Health University students, Malaysia by Ying *et al* where it was noticed that 57.2% of students were changing toothbrush after every 3 months [18].

The type of toothpaste used for brushing teeth plays an important role in oral hygiene and use of fluoridated toothpaste is a practice preferred worldwide, due to its scientifically proven benefits. In this study, only 19.7% of subjects used fluoridated toothpaste, however 44.8% of subjects used herbal toothpaste. This could be attributed to cultural and religious beliefs of Indian population where natural products are given a priority. Also the preference for these had made a large number of brands, companies to manufacture such products on large scale and also availability is not an issue after the spectacular comeback of herbal products in Indian markets.

Lack of oral health knowledge and paying low attention to importance of oral health could relate to of dental visiting pattern. In our study, only 13.9% visited regularly in every 6 months while 73.9% visited whenever there is any dental problem. This reflects the vast difference in attitudes of students in India which could be attributed to ignoring the symptoms or trying self-medication or traditional cures first. The youth of the country should be more informed about the importance of regular dental check-up. Similar trend was seen in Indonesian study done by Ying *et al* where 19.1% pay regular dental visits every 6-12 months while 51.1% visited dentist only when they have dental pain [18]. Contrasting results were seen in a Canadian study adults where only 19% of subjects visited a dentist visited whenever there is any dental problem, while 40% visited literacy every 3-6 months [12].

As the younger adults at their age are very much aspiring about their dreams and try to socialize more at this age, so for them appearance and smile play a very important role in building their self-confidence. Study results revealed that a

preponderant component of study population (91.4%) with high OHL followed this practice on a routine basis (34.3%), while in a Japanese study only 18.4% with high OHL were also doing so [20].

Self-perceived oral health has a direct impact on individuals' well-being and quality of life. Because the perception of oral health influences care-seeking behaviour and reception of oral health-promotion activities, it affects actual oral health status. In our study, it was found that 61% subjects with high oral health literacy rated their oral health as good. Consistent results were seen Sistani *et al* study where 84.5% of study participants rated their oral health as good [15]. Contrasting results were observed in Jones *et al* where 69% with low OHL reported their oral health as poor [21]. A statistically significant difference was observed in the different categories of oral health literacy and self-reported oral health.

5. Conclusion

All the domains of health literacy in our study were positively correlated with each other which indicating that higher the oral health literacy of participants could be attributed to tooth brushing habit, regular dental check-ups, and their better oral hygiene status. Oral health literacy may be part of causal mechanisms that lead to worse oral health. Low oral health literacy levels directly affected the oral health status. Improving health literacy is a critical goal in improving health outcomes and requires intensive collaborative efforts among healthcare. An understanding of participants' oral health literacy levels is crucial in designing effective health educational materials, as well as designing intervention programs to successfully achieve oral health promotion at a community level.

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