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students– A cross-sectional analytical survey

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ABSTRACT

Background: There have been several advances in the field of dentistry and yet oral

health remains a neglected sector among the upcoming generation. Oral Health Literacy

(OHL) is merely a tool to propagate the importance of maintaining oral health and thus

bridging the gap between healthcare providers and patients. The study aimed to assess the

association between oral health literacy and oral health status among management

students. *Materials and Methods:* A cross-sectional analytical survey of 150 students

presently studying at the Institute of Management was carried out. There were 55.34%

($n = 83$) males and 55.6% ($n = 67$) females. Oral Health Literacy was assessed by using

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the Rapid Estimate of Adult Literacy (REALD-30) followed by an examination of oral health status using the DMFT index. The association between comprehension (number of words taken without any pause) and the decayed teeth was assessed using the Spearman correlation coefficient. Student't' test was applied to assess the association between the time taken to the presence of caries among students. **Results:** The mean age of the study population was 20.68±1.87. The mean time taken was 45.12±12.85. The Oral Health Literacy was average with a REALD-30 score ranging from 2 to 25 with a mean score of 15.88±4.49 in males and 16.34±4.30 in females. There was a negative correlation between decayed teeth and OHL. **Conclusion:** It was concluded that low Oral Health Literacy was associated with a higher number of decayed teeth (calculated using the DMFT Index) among the management students involved in the present study.

Key words- Students ;Young adults; Oral health literacy; Decayed teeth

Introduction

"Health literacy represents the 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." The focus on Health Literacy approaches at a time when our country's demographic features are swiftly altering and the requirements of self-care and health services are constantly on a rise. [1]The World Health Organization (WHO) defines oral health as "a state of being free from chronic mouth and facial pain, oral & throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay & tooth loss, other diseases and disorders that affect the oral cavity". Individual oral hygiene determines the oral health status or the condition

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of the oral cavity in a particular individual. [2]An individual's oral health-seeking behavior is influenced by a number of factors, such as his/her perception of the signs and symptoms, the perceived value of good oral health, and the ability to understand the health care system. [3]

Oral health is a much-neglected healthcare sector in today's Indian society. The question lies as to why the management of oral issues is not considered to be of prime concern among individuals of Indian society. The answer to this question is the lack of awareness and to some extent negligence by individuals. Oral health literacy refers to the "degree to which individuals have the capacity to obtain, process and understand the basic oral health information and services necessary to make appropriate health decisions". [4]In the Oral health context, literacy can be considered as the skill imperative for people to understand the roots of poor oral health, in order to learn and adopt the foundational aspects of positive oral self-care behaviour. It helps individuals to reach out to oral healthcare providers, place their names on dental treatment waiting lists or organize appointments to find their way to the dental clinic. It aids to fill out necessary forms and comply with any necessary regimes including follow up appointments and abide by the prescribed medications. [5]It is an amalgamation of culture, lifestyle, education system, language and behaviour as a tool that is fundamental for the success of interaction between individuals and the health provider to achieve successful clinical outcomes. [6]

Studying the literacy level by relating the reading ability and health among individuals is evolving as an important benchmark in the treatment provided by the health givers today. A national survey of English literacy included the first-ever assessment of an adult's ability to perform literacy tasks by using written health-related information. This study is

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important because the skills necessary to perform a health literacy-related task are not the same as those required for general literacy tasks, although they are related. The study showed that 30 million adults have no more than the most basic of health literacy skills, and another 47 million can only perform simple everyday tasks. These findings mean that almost 80 million adults are unable, for example, to consult reference about vitamins required daily to remain healthy or interpret data on a blood pressure-related table. [7]

This highlights the fact that there is a significant link between health-related information perceived by an individual and his or her behavior towards it. There are two main strategies to evaluate oral health literacy: word recognition and reading comprehension. Word recognition instruments (REALD-30, REALD-99, REALM-D, TS-REALD, HKREALD-30) were created first and concentrated on a respondent's ability to correctly pronounce oral health-related vocabularies. [4,8]Reading comprehension tests, such as the TOFHLiD, OHLI, OHL-AQ, HKOHLAT-P were constructed to evaluate functional literacy, and, therefore, measured a person's ability to understand and apply written information, including numerical data and have been used in a number of research studies to assess the validity of literacy in relation dental status of individuals. [9-11]

This study is majorly focussed on analysing the literacy level of young university students as they are more probable to accept new norms, take interest in improvement of oral hygiene, and influence the future society. A study was conducted to assess the dental health status and oral health behaviour of university students in ASEAN countries in the year 2015. It was found that a considerable proportion of self-reported poor dental status and poor oral behaviour among university students in five ASEAN countries. [12]This draws attention to the fact that young individuals today are least aware of the importance

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of maintaining good oral hygiene. It has been seen in previous research studies that young individuals are the ones who generally miss appointments and come up with excuses for long working hours being the reason behind missed appointments. [3] With the recent advances in the field of dentistry, oral health literacy shall emerge as an important tool in educating the upcoming generation and thus bridging the gap between inadequate patient knowledge and the availability of abundant oral health care services. The main objective of this research work is to assess the association between oral health literacy and oral health status among management students. The subject population that was considered in this study are university students who are going to be major contributors to the majority of the educated patient influx in the near future. With no direct link to the field of medicine in any respect, this group of individuals suits the objective of the study quite well.[13]The statement of hypothesis stated that there was no association between oral health literacy and oral health status among management students.

Methodology

The target respondents for the study were students who are pursuing their post-graduation degree, Master in Business Administration. The design of the study was cross-sectional analytical type. The sample size was calculatedbased on the finite population of 350 students studying in four different colleges. The following formula was applied { $n = n_0 N / n_0 + (N-1)$ } to calculate the sample size.The final sample size for the study was 150 students. Lottery method was applied to select two colleges out of four. The sampling element consisted of 83 males and 67 female students.Permission to conduct the study was obtained from the Director of the Management Institute. Ethical clearance to conduct

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the study was obtained from the Institutional Ethics Committee.(Protocol Ref No: 18159). Written informed consent was obtained from all the subjects prior to administrating the questionnaire.

The Oral health Literacy was assessed by using the Rapid Estimate of Adult Literacy (REALD-30). It follows a disease-specific framework that includes etiology, anatomy, prevention, treatment, and treatment categories to guide in the selection of words. All the words are from The American Dental Association (Glossary of Common Dental Terminology). For the estimation of the REALD-30 score,the number of words taken without pause was given a score of 1 and the words taken with a pause or hesitation were scored as 0.We measured OHL with REALD-30, a validated word recognition literacy test,where 0=lowest literacy and 30=highest literacy. [4]Higher the score, the higher is the oral health literacy of an individual. This was followed by an examination of oral health status using the DMFT index. The association between comprehension (number of words taken without any pause) and the decayed teeth was assessed using the spearman correlation coefficient.Student't' test was applied to assess the association between the time taken to the presence of caries among students.

Data management and statistical analysis- The data was coded and analyzed by using the SPSS (Statistical Packages for Social Sciences) version 17.0 (SPSS Inc, Chicago IL). The student 't' test and correlation was applied. The level of statistical significance was kept at value $p < 0.05$.

Results:

The respondents were 150 management students with a finite population of 350. There were (55.34%, $\mathbf{n} = 83$) males and (55.6%,$\mathbf{n} = 67$) females. The mean age of the study

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population was 22.68±1.87. The gender-wise distribution of study participants was tabulated in Table 1.

Table 1: Descriptive statistics on gender distribution and mean age of the participants

Gender	Frequency	Mean±sd
Male	83(55.34%)	20.80±2.04
Female	67(44.66%)	20.54±1.63

The words taken with and without pause are tabulated in Table 2.

2: Frequency distribution of REALD -30 with and without pause among the participants

Sl. no	Words	Without pause (Male)	With pause (Male)	Without Pause (Female)	With pause (female)
1	Sugar	83(100%)	0	67(100%)	0
2	Smoking	83(100%)	0	67(100%)	0
3	Floss	83(100%)	0	67(100%)	0
4	Brush	81(97.6%)	2(2.4%)	67(100%)	0
5	Pulp	81(97.6%)	2(2.4%)	58(86.6%)	9(13.4%)
6	Braces	76(91.6)	7(8.4%)	58(86.6%)	9(13.4%)
7	Fluoride	68(81.9%)	15(18.1%)	53(79.1%)	14(20.9%)
8	Genetics	74(89.2%)	9(10.8%)	56(83.6%)	11(16.4%)
9	Restoration	47(56.6%)	36(43.4%)	32(47.8%)	35(52.2%)
10	Bruxism	19(22.9%)	64(77.1%)	8(11.9%)	59(88.1%)
11	Abscess	55(66.3%)	28(33.7%)	46(68.7%)	21(31.3%)
12	Extraction	74(89.2%)	9(10.8%)	57(85.1%)	10(14.9%)
13	Denture	53(63.9%)	30(36.1%)	41(61.2%)	26(38.8%)
14	Enamel	69(83.1%)	14(16.9%)	55(82.1%)	12(17.9%)
15	Dentition	39(47%)	44(53%)	35(52.2%)	32(47.8%)
16	Plaque	29(34.9%)	54(65.1%)	23(34.3%)	44(65.7%)
17	Gingiva	8(9.6%)	75(90.4%)	5(7.5%)	62(92.5%)
18	Malocclusion	9(10.8%)	74(89.2%)	3(4.5%)	64(95.5%)

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19	Incipient	20(24.1%)	63(75.9%)	16(23.9%)	51(76.1%)
20	Caries	33(39.8%)	50(60.2%)	26(38.8%)	41(61.2%)
21	Periodontal	15(18.1%)	68(81.9%)	15(22.4%)	52(77.6%)
22	Sealant	31(37.3%)	52(62.7%)	26(38.8%)	41(61.2%)
23	Hypoplasia	17(20.5%)	66(79.5%)	5(7.5%)	62(92.5%)
24	Halitosis	25(30.1%)	58(69.9%)	23(34.3%)	44(65.7%)
25	Analgesia	11(13.3%)	72(86.7%)	6(9%)	61(91%)
26	Cellulitis	6(7.2%)	77(92.8%)	7(10.4%)	60(89.6%)
27	Fistula	35(42.2%)	48(57.8%)	32(47.8%)	35(52.2%)
28	Temporomandibular	2(2.4%)	81(97.6%)	0	67(100%)
29	Hyperemia	6(7.2%)	77(92.8%)	7(10.4%)	60(89.6%)
30	Apicoectomy	1(1.2%)	82(98.8%)	0	67(100%)

The Oral Health Literacy was average with REALD-30 Score ranging from 2 to 25 with a mean score of 15.85±4.49 in males and 16.34±4.30 in females. The following are the words taken with a maximum pause:apicectomy, temporomandibular, hyperemia, cellulitis, malocclusion, and gingiva. If the candidate has a lower REALD30 score and more time is taken to finish the 30-word chart it is considered as low oral health literacy. The inferential statistics using student 't' test was applied to compare the oral health literacy with gender, time taken to complete the REALD-30 with the DMFT was showed in Table 3. There was no statistical significance between these parameters.

Table 3: Gender wise comparison to REALD -30, time taken to complete, and DMFT

Sl. No	Characteristics	GENDER	Mean	Std. Deviation	Std. Error Mean	Significance (p value)
1.	REALD-30	Male	15.85	4.49	0.49	0.50
		Female	16.34	4.30	0.52	0.50
2.	Time taken	Male	45.59	13.20	1.45	0.61
		Female	44.54	12.47	1.52	0.61
3.	DMFT	Male	2.80	2.05	0.22	0.80

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		Female	2.72	1.65	0.20	0.79
4.	Decayed teeth	Male	1.96	1.46	0.16	0.82
		Female	2.01	1.37	0.16	0.82
5.	Missing teeth	Male	0.01	0.11	0.01	0.21
		Female	0.04	0.20	0.02	0.24
6.	Filled teeth	Male	082	1.57	0.17	0.57
		Female	0.69	1.22	.014	0.56

A Correlation test was applied between the time taken to complete REALD-30 to total DMFT and the presence of decayed teeth. The REALD-30 score was negatively correlated to DMFT score and decayed teeth with statistical significance($r=0.227$, $p=0.005$). The complete description of correlation was depicted in Table 4.

Table 4: Correlation between REALD -30, time taken to complete, and DMFT

		REALD-30	Decayed	Missing	Filled	DMFT
Time taken	r	-0.64**	0.23	-0.10	-0.98**	0.14
	p value	0.00*	0.01*	0.21	0.23	0.08
DMFT	r	-0.12**	0.68	0.19	0.51	
	p value	0.142	0.00	0.02	0.00	
REALD-30	r		-0.23**	0.03	0.10	-0.12**
	p value		0.01*	0.68	0.22	0.14

*statistically significant** Negative correlation

Discussion:

The conducted study was an attempt to assess the influence of OHL on the Oral Health Status of management students using REALD-30. The participants were not recruited from a clinical environment so selection bias was avoided which is one unique asset of this study. This study is the first of its kind as it brings to light the awareness of maintaining good oral hygiene among young individuals who are not health care professionals. The shortcomings of REALD-30, particularly in that it measures word recognition only with no test of comprehension or function have been acknowledged.

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[4]Nevertheless, it has been demonstrated by previous studies that OHL estimates derived from word recognition tests such as REALD-30 correlate well with comprehension and functional health literacy. [5]

The mean REALD-30 score as recorded in this study was 15.85±4.49 in males and 16.34±4.30 in females. Comparable mean scores were obtained in previous studies on other populations that have used the same OHL instrument bya)Adults attending Dental College hospitals in India[14]b)on an indigenous Australian community[15]and c) on low-income WIC population in seven counties in North Carolina, USA. [5]

Our study showed that the OHL score was more in females in comparison to males. This finding was similar to that obtained in the study conducted on adolescents in Tamil Nadu. [16]

It was observed that higher REALD scores were associated with lower caries experience (DMFT score) similar to the study by Haridas et al. [15] In our study, the REALD 30 score was negatively correlated to the DMFT score with no statistical significance. When the individual components of DMFT were analyzed, it was found that REALD 30 was positively correlated both (FT score) and (MT score) with no statistical significance but positively correlated with the decayed (DT score) showing statistical significance.

Similar results have been noted in terms of the relation between low literacy and an increase in the number of decayed teeth in a study conducted to assess the relationship between oral health literacy and oral health behaviors and clinical status .[17]

On considering the time taken to complete the 30-word chart by each subject, it was found out that time taken was negatively correlated with the REALD 30 score showing statistical significance thus it was clearly spotted how OHL influences the oral hygiene

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level in young adults. It was perceived that an increase in oral health literacy increases the filled component in the DMFT index indicating an increase in the awareness to maintain good oral hygiene and seek oral health services provided.

Conclusion:

Itwas concluded that low Oral Health Literacy associated with higher the number of decayed teeth (calculated using DMFT Index) among the management students involved in the present study.

Data availability statement – The paper copy of the data is with Principal Investigator. If required, it can be mailed. The anonymized data is entered in an excel sheet and analyzed by using the SPSS (Statistical Packages for Social Sciences) version 17.0 (SPSS Inc, Chicago IL). The link can be shared if asked for further clarification

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Declaration of interest- Authors declare no conflicts of interest

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