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## **ORAL HEALTH LITERACY OF PATIENTS ATTENDING COMMUNITY DENTAL OUTREACH PROGRAM: A CROSS-SECTIONAL STUDY**

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## ABSTRACT

**INTRODUCTION.** Limited health literacy among adults contributes to poor health outcomes. Low health and oral health literacy (OHL) are particularly more visible among rural population of developing countries.

**PURPOSE.** The present study was done to assess OHL among patients attending community dental outreach program in Punjab, India.

**MATERIALS AND METHODS.** A cross-sectional study was conducted on 652 patients who attended community dental out-reach programs organized by the institute on regular basis. A self-constructed questionnaire (divided into Section A and Section B) written in English and Punjabi language was given to each subject. OHL was graded on a 15-point Likert scale and was assessed as low, medium and high on the basis of sum of total responses. Statistical analysis was done using SPSS-21 statistical package. ANOVA and Student t-test were used to do comparisons between different groups.

**RESULTS.** 52.4% of the study subjects were having low OHL scores and only 19.3% of subjects had high scores. Dental terms like ‘mouth-guard,’ ‘abrasion’ and ‘abscess’ were known to only 20.4%, 37.4% and 32.5% of the subjects respectively. Mean OHL score revealed a significant association with occupation ( $p=0.035$ ) of study subjects. Only 45.2% of study subjects were ‘interested in seeking more information on oral health’ and it was significantly associated with educational qualification of study subjects.

**CONCLUSION.** More than half of the subjects were having low OHL scores. There is an urgent need to address this problem especially among rural population by taking appropriate measures by the government so that their health literacy level can be raised.

**Keywords:** *oral health, knowledge, literacy, education, India*

## INTRODUCTION

Oral health is considered as an integral part of a person's overall health and well-being. Poor oral health due to some oral disease can result in toothache, fair/poor self-rated oral health, discomfort with appearance and food avoidance which can also have a significant impact on general health (1). Oral Health Literacy (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 any appropriate health decisions" (2). Knowledge of oral health is considered to be a prerequisite for any health related behaviour. Increasing OHL of public can play a major role in reducing two of the most prevalent dental diseases – dental caries and periodontal disease (3). OHL has gained prominence in the dental literature and dental curriculum in the past few years. Individuals having limited OHL are at a higher risk for oral diseases and the problems related to those diseases (4). People who possess adequate literacy skills may also sometimes find it difficult to comprehend oral health information. Lower literacy has been related to problems with the use of preventive dental services, delayed diagnoses of dental or medical conditions, poor self-management skills, increased mortality risks, poor dental health outcomes, and higher cost of dental treatment (5). Missed dental appointments are more commonly noticed in people having poor oral health literacy (6).

More than 70% of Indian population resides in rural areas. Due to unequal distribution of dental health professionals in urban and rural areas in India, numerous challenges are encountered while delivering oral health services to the needy (rural) population (7). Therefore, majority of people residing in rural parts of India have low level of oral health awareness and practice as compared to urban populace (8). Due to this, impending dental problems multiply later on and affect the overall health. Carefully executed community dental outreach programs involving oral health education can positively change this vulnerable population's oral health behavior (9). Dental professionals (public health dentists) can be of great help to individuals with low oral or general health literacy, thus empowering them to achieve optimum oral health care. Community outreach programs play a vital role in bridging the gap between oral health and other health issues and provide us a clear picture of oral health needs of people residing in rural areas. Although, few studies (10,11) have been conducted to assess OHL of patients in the recent past but studies assessing OHL of rural population especially through community outreach programs are still lacking. Therefore, the aim of this particular study was to assess oral health literacy of patients

attending community dental outreach programs organized by the institute especially in rural areas of Punjab, India.

## MATERIALS AND METHOD

**Ethical clearance.** Ethical clearance to conduct the present study was obtained from the Institutional Ethics Committee before starting the study. Participation in the study was voluntary and subjects were fully informed about the purpose of the study. Subjects were also assured of data confidentiality and it will only be used for research purposes. Informed consent was obtained from those study subjects who were willing to participate.

**Study population and study sample.** A descriptive cross-sectional study was conducted among patients who attended community dental outreach programs (dental camps) organized on weekly basis (two per week) by the institution. Outreach programs are conducted in villages situated within a distance of 15-20 kms from the institution. Free dental check-up and basic dental treatment (restorations, scaling, simple extractions) are provided to the patients inside the mobile dental van. The following formula was used to calculate the required sample size:

$$n = \frac{Z^2_{1-\alpha/2} \times s^2}{d^2}$$

where, Z is the standard normal score with 95% confidence interval (CI) ( $\alpha=0.05$ ), s is the standard deviation of the variable, and d is maximum acceptable error. After applying the formula, 652 subjects constituted the final sample size. A total of eight outreach programs were conducted over a period of two months in four villages till the required sample size was reached. Non-responders were excluded from the study.

**Questionnaire/Research Instrument.** A self-designed close-ended questionnaire written in English and Punjabi (local or native language) was constructed specifically for the study. The content of the questionnaire was verified by oral health specialists and experts in oral hygiene (Periodontists and Public Health Dentists) and it was pre-tested for validity and reliability. The reliability of the questionnaire was good (Cronbach's coefficient 0.84). The subjects who gave consent were made fill the questionnaire while they were undergoing dental check-up. During this time, one of the investigators made sure that concerned subjects fully understood the questions.

The questionnaire was split into two sections: Section A – which collected socio-demographic details of the subjects (age, gender, occupation, education etc.), and section B which

comprised of 15 questions assessing oral health literacy. The oral health literacy questions assessed the degree of subjects' oro-dental knowledge. The terms or sentences for measuring oral health literacy were collected from a sample of oral health educational brochures or pamphlets and written materials provided to dental patients and from a list of terms commonly encountered in dental settings (12). These involved a wide range of dental topics like preventive dental procedures, dental hygiene, knowledge regarding primary and permanent teeth, harmful effects of smoking and chewing tobacco, etc. Two sentences (statements) were also added separately in the questionnaire (yes or no) regarding subjects' view on oral health.

**Measurement of OHL.** Total OHL score was calculated on the basis of each subject's response. Each positive response was awarded a score of '1' and score of '0' was awarded to each negative response. The total score was calculated by adding the sum of all responses (from 1 to 15), on a Likert Scale. Categorization of final OHL score was done at three levels: low (0-5), medium (6-10) and high (11-15).

**Statistical Analysis.** All the data were entered into Microsoft excel spreadsheet. Categorical measurements were done using number and percentages. Results were statistically analyzed using SPSS package version 21.0 (SPSS, Chicago, IL, USA). Analysis of Variance test (ANOVA) was and Student's t-test were used to find significance between different groups (two or more than two groups). The significance level was set at <0.05.

## RESULTS

**Demographic profile of subjects.** A total of 652 adult patients were included in the present study. Socio-demographic profile of the subjects is mentioned in Table 1. Majority of the subjects were in the age-group of 41-50 years (42.6%) and a vast majority of subjects were males (58.5%). Educational qualification distribution showed that 292 (44.7%) subjects had completed high school education. Occupational profile of subjects showed that 43.8% were self-employed and 15.6% were doing government jobs (Table 1).

**Response to OHL questionnaire.** Subjects' response towards OHL questionnaire (terms) is depicted in Figure 1. More than seventy percent of subjects were knowledgeable about terms such as 'dental caries' (70.2%) and 'complete denture' (75.2%). A vast majority of subjects (88.2%) were aware of the term 'primary and permanent teeth'. Almost half of the subjects (50.4%) knew the term 'dental plaque'. On the contrary, very few subjects were familiar with the terms like

‘mouth-guard’ (20.4%), ‘abrasion’ (37.4%) and ‘abscess’ (32.5%). Only 20.2% of the subjects knew about ‘dental specialist’. Regarding the statement: ‘oral health is as important as systemic health’, 58.7% of the subjects gave an affirmative response (yes). However, less than half of the subjects (45.2%) were ‘interested in seeking more information on oral health’ (Figure 2). Influence of subjects’ education on responses regarding above two statements on oral health was also done. Subjects who were more educated showed more ‘interest in seeking additional information on oral health’ as compared to less educated ones ( $p=0.035$ ).

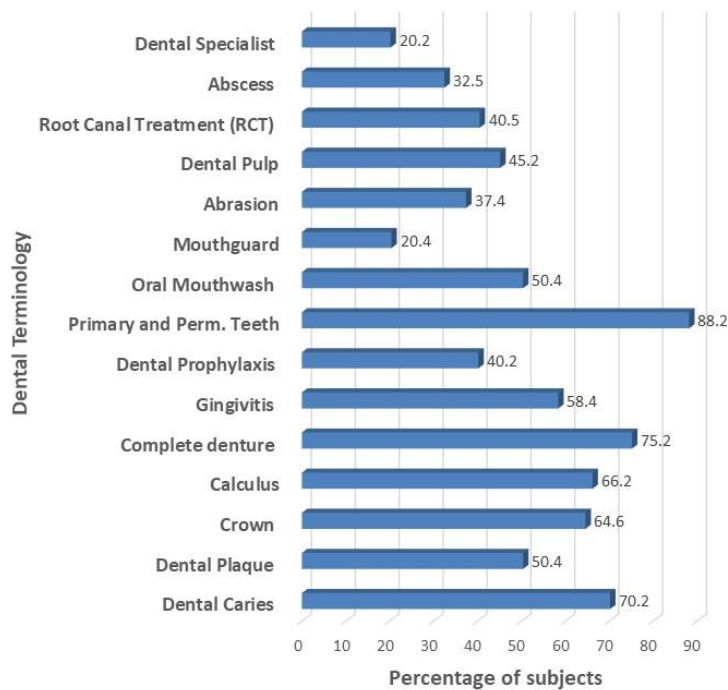


Figure 1. Response of the subjects towards the OHL questionnaire. Percentages of participants who knew the individual terms.

**Oral health literacy level.** Among the study subjects, 52.4% showed low literacy scores, 28.3% had a medium score and 19.3% exhibited high literacy score (Table 2). Mean oral health literacy scores according to different socio-demographic profiles are summarized in Table 3. Mean oral health literacy scores revealed a significant association with occupation ( $p=0.035$ ) of study subjects whereas there was no significant difference in case of age, gender and educational qualification ( $p>0.05$ ).

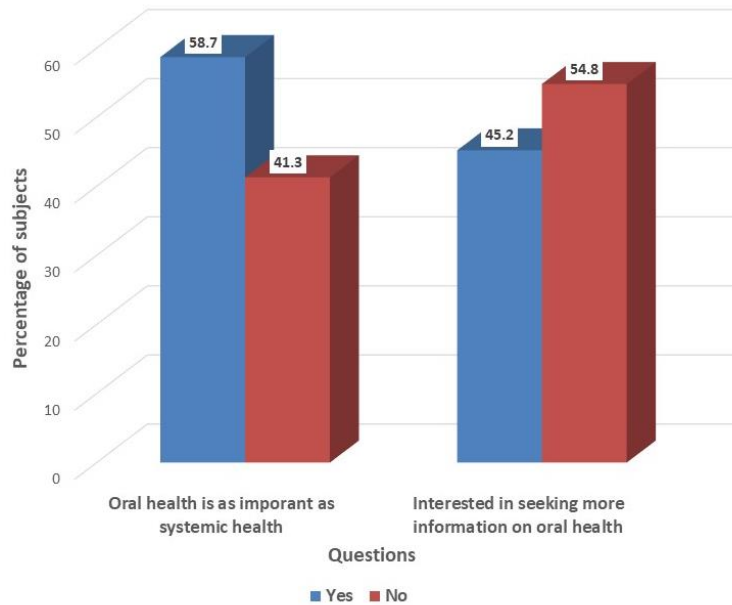


Figure 2. Subjects' response regarding two statements on oral health

## DISCUSSION

Scientific research in the medical field has emphasized this constantly: health starts from the mouth. Oral health is considered as an integral part of general health and plays a vital role in the diagnosis and treatment of many systemic diseases and it is not limited to maintaining tooth health (13). OHL is a key factor for addressing inequalities in oral health and promoting better health outcomes, including those related to periodontal health and dental caries (14). Moreover, literacy level also has a considerable influence on regularity on the part of patients seeking dental treatment.

Oral diseases in India, a developing country with a population of more than one billion, pose a considerable public health burden. Health literacy emerges one of the major key issues among other factors (cultural, financial etc.) for extensive spread of preventable oral disease in the country. According to the official government reports and recent census, India's literacy rate stands at 74.04% with some states like Kerala and Mizoram having rates significantly higher than the national average (15). However, when it comes to health literacy, nine out of ten individuals lack health literacy which directly impacts OHL (16).

The present study was conducted on a rural based population through community outreach programs. Neglect of oral health is noticed among such population groups as they do not prefer regular visits to a dentist and focus mainly on pain relief and emergency dental treatment (17). This is evident as more than half of the study subjects reported with low OHL scores. This could undermine their perspective towards oral health care and consequently lead to poor utilization of dental services.

Results of the present study report that very few subjects knew about common dental terminology like ‘mouth-guard’, ‘abrasion’, ‘abscess’, ‘dental prophylaxis’ etc. This finding indicates that people residing in rural areas are not literate enough to fully understand written oral health information (brochures, pamphlets) and this can act as barrier in identification of their oral health needs. However, contrary findings were observed in some other study conducted elsewhere among rural adults (18).

OHL level was significantly related to occupational profile of study subjects in the present study with subjects engaged in government jobs revealing higher mean OHL scores. This could be due to the reason that many government jobs require a minimum high school diploma or graduation as a basic qualification, consequently more knowledge and awareness regarding health issues. Contradictory findings were reported by a study conducted among rural adults in some other part of India (19). Mean OHL scores of male subjects was slightly higher as compared to female subjects but there was no such significant difference between the two groups ( $p=0.075$ ) which is in congruence with some other studies conducted in India and Pakistan (20, 21). This shows that male subjects gave more preference to oral health and hygiene as compared to female subjects.

A noteworthy finding in our study was the need for seeking more information on oral health which was indicated by less than half of the study subjects, even though only 19.2% of the subjects had high OHL scores. This emphasizes the need for targeted oral health education programs among these populations to improve oral health outcomes (22). Also, dental professionals need to understand the beliefs, values, cultural mores and traditions of these people so that effective communication can take place.

Several tools are mentioned in the literature that are widely used to measure oral health literacy (23). These may not be directly applicable to Punjabi speaking subjects as they are prepared for subjects who are literate in English. Moreover, some of these tools have been widely criticised for providing only an approximate measure of OHL based mainly on word recognition. For this



reason, the present study designed a questionnaire (glossary of terms verified by experts) both in English and Punjabi language so that subjects can easily understand it. The subjects were asked if they knew the ‘dental terminology’ and also the meaning of it. The instrument used in the study provides estimates of OHL, however it does not measure all domains of health literacy. Even though, the reliability of the questionnaire (made in local or vernacular language) was good, the self-reported nature may contribute some bias. Nevertheless, this study provides an insight into the OHL levels among this Indian rural populace.

### CONCLUSION AND RECOMMENDATIONS

It can be concluded from the study that OHL of more than half of the study subjects was low. Very few subjects knew about commonly used dental terminology. Occupation of the study subjects had an important bearing on the OHL scores. There is an urgent need for comprehensive dental awareness and education programs especially among the rural masses. Low OHL can be improved with the use of *plain language* which is a key part of clear communication (24). Using plain language facilitates accessible health communication to become the norm, rather than the exception, in the field of medicine and dentistry. Health professionals need to identify those individuals who have difficulty understanding and assessing oral health information and should take appropriate measures to address their oral health needs. Moreover, as there is scarcity of dental health professionals in rural parts of India, regular community outreach programs are vital for improving OHL of these people.

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Table1. Distribution of study subjects according to socio-demographic characteristics

| <b>Socio-demographic characteristic</b> |                                       | <b>Number</b> | <b>Percentage (%)</b> |
|---|---------------------------------------|---------------|-----------------------|
| Age (in years)                          | 31-40                                 | 122           | 18.7                  |
|   | 41-50                                 | 278           | 42.6                  |
|   | 51-60 and above                       | 252           | 38.6                  |
| Gender                                  | Male                                  | 382           | 58.5                  |
|   | Female                                | 270           | 61.5                  |
| Education                               | Primary School                        | 164           | 25.1                  |
|   | High School (Class 12 <sup>th</sup> ) | 292           | 44.7                  |
|   | Graduate & above                      | 196           | 30.2                  |
| Occupation                              | Unemployed                            | 92            | 14.1                  |
|   | Self-employed                         | 286           | 43.8                  |
|   | Private job                           | 172           | 26.3                  |
|   | Government job                        | 102           | 15.6                  |

**Table 2:** OHL score of study subjects on the basis of Likert scale

| <b>OHL Score</b> | <b>Number of subjects</b> | <b>Percentage of subjects</b> | <b>95% CI</b> |
|------------------|---------------------------|-------------------------------|---------------|
| Low              | 342                       | 52.4                          | 42.26-52.64   |
| Medium           | 184                       | 28.3                          | 31.43-44.14   |
| High             | 126                       | 19.3                          | 24.23-30.14   |
| Total            | 652                       | 100                           |               |

Table 3. Mean OHL scores of subjects according to different socio-demographic variables

| Socio-demographic profile                     | OHL score |                    | P-value              |
|---|-----------|--------------------|----------------------|
|   | Mean      | Standard Deviation |                      |
| <b>Age (in years)</b>                         |           |                    |                      |
| 31-40   | 8.23      | 3.45               | F= 2.245<br>P=0.062  |
| 41-50   | 7.14      | 2.16               |                      |
| 51-60 and above                               | 7.23      | 2.46               |                      |
| Total   | 7.53      | 3.14               |                      |
| <b>Gender</b>                                 |           |                    |                      |
| Male  | 8.56      | 2.34               | F=2.443<br>P= 0.075  |
| Female  | 7.87      | 4.23               |                      |
| Total   | 8.21      | 2.12               |                      |
| <b>Education level</b>                        |           |                    |                      |
| Till class 10 <sup>th</sup>                   | 6.88      | 1.46               | F= 1.546<br>P=0.074  |
| From class 10 <sup>th</sup> -12 <sup>th</sup> | 7.34      | 2.14               |                      |
| Graduate & above                              | 9.56      | 2.45               |                      |
| Total   | 7.92      | 3.56               |                      |
| <b>Occupation</b>                             |           |                    |                      |
| Unemployed                                    | 6.78      | 3.28               | F=2.168<br>P= 0.035* |
| Self-employed                                 | 8.55      | 2.13               |                      |
| Private job                                   | 8.56      | 2.67               |                      |
| Government Job                                | 9.23      | 4.65               |                      |
| Total   | 8.28      | 3.54               |                      |

P<0.05 (statistically significant), Tests used: Student-t test, ANOVA