

## Association between maternal oral health literacy and their preschoolers' oral health outcomes in Muradnagar -A cross-sectional study

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### Abstract

**Aim:** To assess the association between maternal oral health literacy and their preschoolers' oral health outcomes in Muradnagar.

**Materials and Method:** Among the preschool children of Muradnagar, a cross-sectional study was conducted to assess the association between maternal oral health literacy and their preschoolers' oral health outcomes. The examiner for interviewing mothers and for the clinical examination of children was single trained calibrated. Rapid Estimate of Adult Literacy in Dentistry (REALD-30) was used to measure maternal oral health literacy. Mother's socio-demographic variables, oral health related knowledge and behavior was recorded using a structured questionnaire. Clinical examination of the children was done by using Visible biofilm index, Modified gingival index and WHO dentition status 2013. SPSS software version 18 was used for statistical analysis.

**Results:** 48% of the children were males, among the 197 Mother/Child Pairs examined. REALD-30 scores and clinical oral health status of the child ( $p < 0.05$ ) showed a significant relationship.

**Conclusion:** Maternal oral health literacy significantly modifies oral health status of their preschoolers.

**Keywords:** Maternal Literacy, Oral health literacy, REALD-30

### Introduction

Dental caries is the most common chronic disease of children. The General Accounting Office has reported that poor children have five times more untreated caries than children from higher income families.<sup>(1)</sup> Dental caries may cause many problems in children like chewing, smiling, speaking etc if left untreated.<sup>(2)</sup> The significant impact of oral disease among young children and their families is well established.<sup>(3)</sup> Parents may play a vital role in the health of their children especially mothers. Caregiver literacy is related to other health outcomes among young children<sup>(2)</sup> and may be proved as an important factor for treating dental health problems in children. We hypothesized that maternal oral health literacy may be a crucial variable in oral health behavior and the development of dental caries among children.

An important determinant of oral health is Oral health literacy (OHL). OHL has been defined by the National Institutes of Dental and Craniofacial Research (NIDCR) as "the degree to which individuals have the capacity to obtain, process, and understand basic oral health information and services needed to make appropriate health decisions".<sup>(1)</sup> Individuals with low literacy skills often have poorer health knowledge and health status, unhealthy behaviors, less utilization of preventive services, higher rates of hospitalizations, higher rates of chronic diseases, increased health care costs, and ultimately poorer health outcomes than those with higher literacy levels. Individuals with low literacy skills often have poorer health knowledge and health status.<sup>(2)</sup>

This study was done to assess the association between maternal oral health literacy with their oral

health knowledge, oral health behaviors and the clinical oral health status of their child.

### Materials and Method

A cross sectional survey was conducted on preschool children of Muradnagar to assess the relationship between maternal oral health literacy and their preschoolers' oral health outcomes. Preschools of Muradnagar was the study area. Before starting the study ethical clearance was obtained from the ethical committee of I.T.S-CDSR Muradnagar, Written consent from preschool authorities and parents of children were taken before their participation and clinical examination of the children in the study. Mothers and school authorities were informed in advance before conducting the survey and collection of the data was carried out during the month of September- October 2015.

A pilot study was carried out on 20 (10%) subjects in the month of August 2015 to check feasibility of proforma and validity of questionnaire, their after necessary modifications were made. Calibration of the principal investigator was done in the Department of Public Health Dentistry I.T.S- CDSR Muradnagar, Ghaziabad to limit the examiner variability. The subjects were randomly called on different days and examiner repeated the examinations on them in order to reduce the intra examiner variability. The mean Kappa co-efficient values for intra-examiner reliability was 0.88.

The sample size was determined based on the results of the pilot study using the formula –

$$Z^2 P (1-P) / d^2$$

Where, P = Prevalence rate which was estimated to be 15% after the pilot study.

Z = Z statistic for a level of confidence (For the level of confidence of 95%, which is conventional, Z value is 1.96).

d = Precision (Least permissible error which was taken at 5.0%).

Using the above formula, the estimated sample size was 197.

**Inclusion criteria:**

1. Parents who gave their consent for participating in the study.
2. 3 to 5 years old children present on the day of examination

**Exclusion criteria:**

1. Children who were mentally or physically handicapped
2. Children who had medical problems and were undergoing any medication/Treatment.

**Data Collection:** Rapid Estimate of Adult Literacy in Dentistry (REALD-30)<sup>(4)</sup> was used to measure the maternal oral health literacy. REALD-30 was a previously validated word recognition test instrument and it contained 30 different words of dentistry arranged in the increasing order of difficulty level. In this the mothers were asked to pronounce the words aloud in front of the interviewer if they knew the word and asked to skip if they did not know about that particular word. The scoring was done by giving one point for correct pronunciation and then the total was summed up to get the net REALD-30 score of the individual. The lowest score could be zero indicative of lowest maternal literacy and highest could be 30 indicative of highest maternal literacy. A pretested, structured questionnaire in English was filled by single calibrated interviewer to examine socio-demographic status, the maternal oral health knowledge and the child's oral health behavior.<sup>(5)</sup> Clinical examination of the children was done by the examiner by using Visible Biofilm index,<sup>(6)</sup> Modified gingival index<sup>(7)</sup> and WHO dentition status 2013. The forms were arranged in serial number and stacked together. The bundles were labelled with ID numbers and date of recording so as to make them ready for data entry. The data entry was made on the same day so that if any discrepancy was seen it could be rectified easily.

**Inspection, Scrutiny and clarifications:**

The survey forms were rechecked to assess any missing information.

**Statistical analysis:**

It was carried out in 2 steps.

1. Data compilation and presentation
2. Analysis of data statistically

SPSS 18.0 was used for the analysis of the data. Systematic compilation of data was done. Master table was prepared in computer after transformation of data from a pre-coded proforma to the computer. Meaningful distribution and presentation of data was done.

Inferential and Descriptive statistical analysis of data was carried out in the present study. Results on continuous measurements were presented on Mean ±SD (Min-Max) and results on categorical measurements were presented in Numbers (%). P value was taken as not significant (p value: p > 0.05), significant (p value: 0.01 < P < 0.05) or, highly significant (p value: p < 0.01).

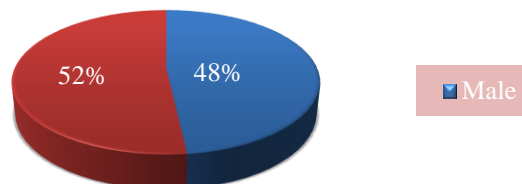
**Results**

52% children were females and 48% were males among the 197 mother/child pairs participated in the study (Fig. 1). The percentage of children in each age range (Fig. 2) was as follows: 11% were of 2 to 3 years, 43% were of 3 to 4 years, 46% were of 4 to 5 years old.

Socioeconomic status of the family showed significant relation with mother's oral health knowledge. Oral health literacy was high in mothers of high socioeconomic status (Graph 1).

Mother's knowledge and practice showed direct relation with REALD-30 score. Mothers with high total knowledge score and practice score were having high REALD-30 value and vice-versa (Graph 2).

Clinical findings of children were inversely proportional to REALD-30 score. Inverse proportional relation was also seen among the presence of dental caries to REALD-30 score. Visible biofilm index score and Modified gingival score was high in case of low REALD-30 score (Graph 3).



**Fig. 1: Distribution of study population on the basis of sex**

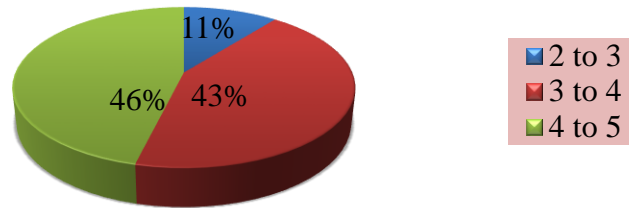
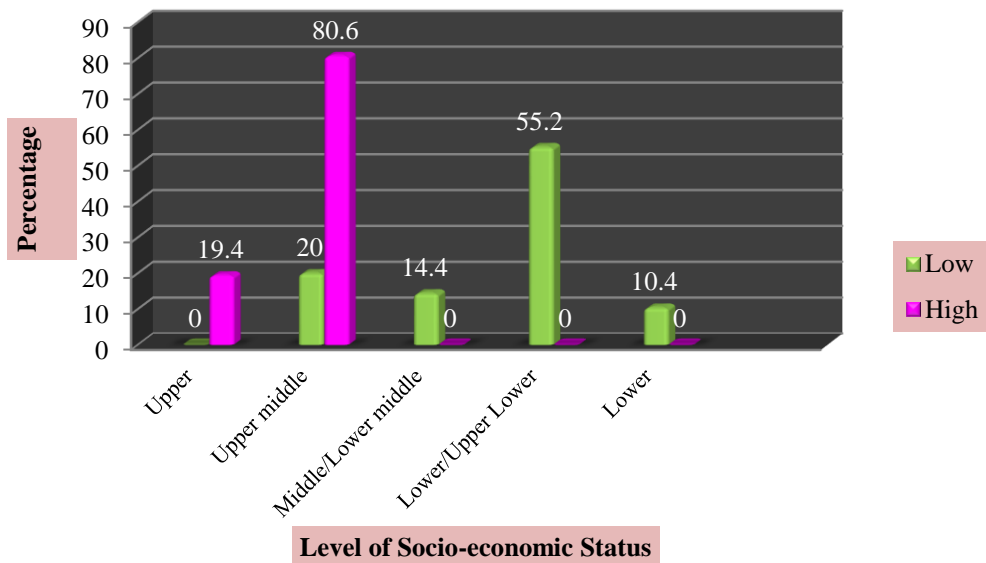
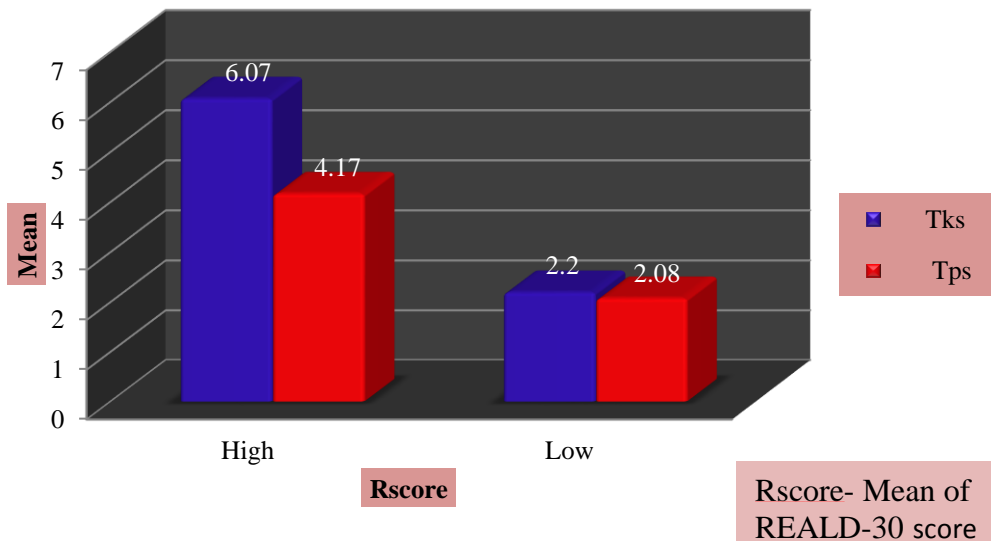


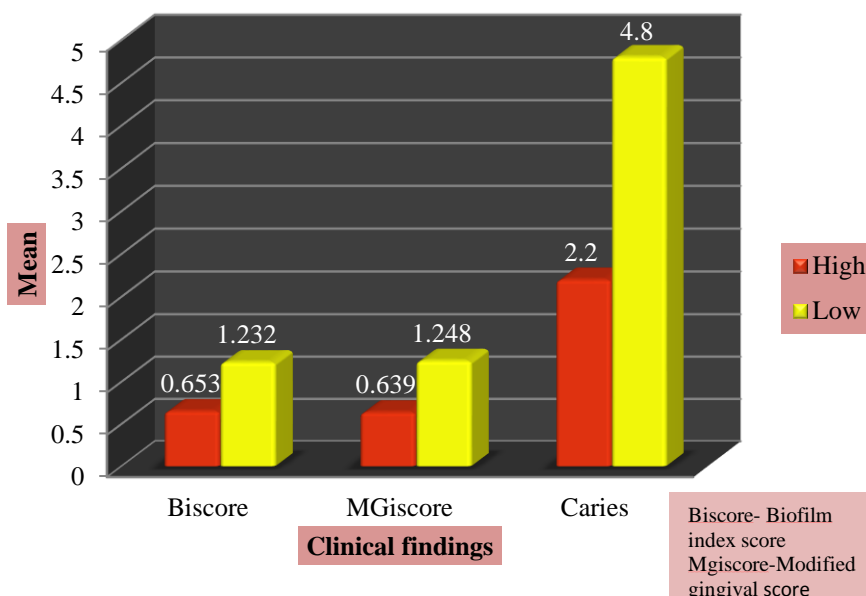
Fig. 2: Distribution of study population on the basis of age

Graph 1: Comparison of oral health literacy with socio-economic status



Graph 2: Comparison of REALD-30 with Total Knowledge Score (Tks) and Total Practice Score (Tps)



**Graph 3: Comparison of REALD-30 with clinical findings**

## Discussion

According to our knowledge, it is one of the pioneer study to assess the role of maternal literacy on oral health outcomes in Muradnagar.

The clinical literature supports the finding of our study. In our results maternal literacy was directly proportional to child dental health status and these results are same in spite of income as confounding variable. We found that the health outcome of the child was affected by maternal literacy and these findings are similar to studies done by Ross LA et al<sup>(8)</sup> and De Walt DA et al.<sup>(9)</sup> A study by Moon RY<sup>(10)</sup> on literacy and health knowledge also demonstrated similar results. Dental caries showed strong relationship with parental factor and is similar to findings of study done by Menon I et al.<sup>(11)</sup>

Some limitations are also present in the study. The study design is cross-sectional and while changing the study design, results may get varied. The used instrument REALD-30 is for English-speaking persons only.

Our study has several strengths as well. Clinical examination and mother's interview was done by a calibrated and trained examiner. Dental literacy was measured by a validated instrument. To assess the outcome a proper clinical examination was done.

Our study has a public health implication as well. It provides a baseline for designing interventions of improving knowledge, behaviours and literacy regarding oral health. It also gives opportunities to improve communication between mother and healthcare provider which ultimately improves child's oral health.

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