Social predictors affecting oral health of school children in Lucknow city (Uttar Pradesh).

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Abstract

Background: Oral health is established as a fundamental component of general health. Physical and emotional health, cognitive development, as well as social functioning in children are strongly influenced by the social status and functioning of their family. Aim: The aim of the study is to correlate the relationship between oral hygiene with socioeconomic status and determine whether socio-economic status plays any role in the levels of oral hygiene among 15 years old school going children of Lucknow city. Materials & Methods: A descriptive cross-sectional survey was conducted. Simple random sampling method followed by the lottery method was carried out for the selection of schools. Simplified Oral Hygiene Index and Kuppuswamy’s socioeconomic status scale has been used. Socioeconomic and oral hygiene status was obtained by a pretested questionnaire following which these children were examined for calculus and deposits. Results: A significant correlation was observed between socio-economic status and oral hygiene of children. As socio-economic status decreases; mean OHI-S increases. Comparing the mean OHI-S between different SES groups, ANOVA revealed significantly different OHI-S among the groups (F=38.84, p<0.001). Conclusion: The mean
scores of OHI-S revealed a significant relation with socio-economic status. It was reported that as the socioeconomic status decreased, oral hygiene status of the children deteriorated.

**Keywords:** Socio-economic, Oral hygiene, Education, School, Children.

**Introduction**

Oral health is a part of general health and hence, has a direct bearing on the total well-being of individuals which is established as a fundamental component of general health. Knowledge of oral health status and treatment needs of populations with different characteristics is important for developing appropriate preventive approaches, anticipating utilization patterns, and planning effectively for organization and financing of dental resources.

Oral hygiene is the practice of keeping the mouth and teeth clean to prevent dental problems, especially the common dental caries and gingivitis, and bad breath.

The enjoyment of highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, economic and social condition.

Socioeconomic status has been defined as "a broad concept that refers to the placement of persons, families, households and census tracts or other aggregates with respect to the capacity to create or consume goods that are valued in our society." Inequalities in socioeconomic status underlie many health disparities in the world, including oral health.

Socio-economic factors have been identified as predisposing factors in the development of both dental caries and periodontal disease which depends on oral hygiene habits of the population.

The literature on the association between socioeconomic factors and prevalence of dental caries, periodontal diseases as well as oral premalignant and malignant lesions among adults in India is scanty. To cast light upon the ambiguous situation prevailing with regard to the oral hygiene status and practices in many parts of our country, a need was felt for this study, that would attempt to explain any role of socio-economic status as a pre-disposing factor in the development of oral diseases. This would in turn attempt to make up for the deficiency in
baseline data concerning the oral health of school going children in Lucknow city (Uttar Pradesh).

**Materials & Methods**

The present study was conducted among 15 years school children of both private and government schools thereby giving a chance to incorporate students from different socio-economic background of Lucknow city, Uttar Pradesh. This was a descriptive cross-sectional study done over a period of three months from August 2019 to November 2019.

The city of Lucknow was divided into four zones. From each zone, 5 schools were selected, i.e. a total of 20 schools. The schools were selected by simple random sampling method following the lottery method of selection. In every school, the classes of 8th and 9th standard were chosen. These standards have children of 15 years of age. A pilot study was conducted on 50 subjects and on the basis of results obtained, sample size was fixed at 1000. A total number of 250 children were examined from each zone. Children who had completed 15 years or running in 15th year of life on the date of the examination, who were willing to participate and who were present on the day of the study were included. Children who had and were undergoing orthodontic treatment were excluded from the study.

The self administered close-ended questionnaire was formulated in English version. The proforma consisted of two parts. First part consisted of recording general information including name, age, gender, parent’s education, parent’s occupation and income, family members, and oral hygiene practices. Second part consisted of Simplified Oral Hygiene Index. The Simplified Oral Hygiene Index (OHI-S) by Greene & Vermillion, 1964\(^{(6)}\) was recorded.

Ethical clearance was obtained from the institutional ethical committee. Written informed consent was taken from the principal of each school and all children were explained about the study purpose and methodology. Immediately after the survey, oral health education was given to the children regarding the method of tooth brushing and oral hygiene practices using posters and models. Survey findings were reported to the concerned school authorities.

Groups were also compared by one way analysis of variance (ANOVA) and the significance of mean difference between the groups was done by Tukey HSD (honestly
significance difference) post hoc test after ascertaining the normality by Shapiro-Wilk test and the homogeneity of variance by Levene’s test. A two-sided ($\alpha=2$) significance level $p<0.05$ was considered statistically significant. All analyses were performed on STATISTICA (window version 6.0).

**Results**

There is a strong relationship between oral hygiene with socio-economic status among the school going children of Lucknow city aged 15 years. A total of 1038 children were selected randomly from different schools of Lucknow city. There were 629 males (60.6%) and 409 females (39.4%). The %age of male children was higher than females.

The socio-economic status (SES) of studied children were evaluated according to Kuppuswamy’s socioeconomic scale (1976) updated by Dr. Neeta Kumar et al. in 2012, and summarized in Table 1. The studied children mostly belong to Upper middle and Lower middle class accounting 59.3% of total population. Comparing the mean OHI-S scores of two genders, t-test revealed significantly different and higher OHI-S of males as compared to females ($1.94 \pm 0.17$ vs. $1.49 \pm 0.20$, $t=38.84; p<0.001$).

The SES wise OHI-S of studied children are summarized in Table 2. It shows that as SES decreases; mean OHI-S increases. Comparing the mean OHI-S between different SES groups, ANOVA revealed significantly different OHI-S among the groups ($F=38.84$, $p<0.001$). Further, Tukey test also revealed significantly ($p<0.001$) higher mean OHI-S especially in Lower middle, Upper lower and Lower SES groups as compared to both Upper and Upper middle SES groups.

Among children, mostly had Good OHI-S (46.3%) followed by Fair (38.2%) and Poor the least (15.4%). Comparing the proportions of OHI-S severity among different SES groups, $\chi^2$ test revealed significant association between OHI-S severity and SES ($\chi^2=165.50$, $p<0.001$). In other words, Poor OHI-S severity significantly ($P<0.001$) associated especially with both Upper lower and Lower SES. Further, the Poor OHI-S severity was higher in males (19.7%) than females (8.8%).

The mean OHI-S scores lowered with increasing daily brushing frequency. Comparing the mean OHI-S between different daily brushing frequency groups, ANOVA revealed
significantly different OHI-S among the groups (F=227.70, p<0.001). Further, Tukey test Table 3 revealed that the mean OHI-S lowered significantly (p<0.001) in those who brush daily more than twice as compared to both those who brush daily Once and Twice. Further, the mean OHI-S also lowered significantly (p<0.001) in those who brush daily Twice as compared to those who brush daily Once.

Table 4 revealed that the mean OHI-S lowered significantly (p<0.001) in those who use Toothpaste as compared to both Toothpowder and Others. Further, the mean OHI-S also lowered significantly (p<0.001) in those who use Toothpowder as compared to those who use Others.

**Discussion**

Total well being of the society is determined by the healthy population inhibiting it. As oral health is an integral part of general health, it plays a key role in improving the general well being of an individual.\(^7\)

The terms socioeconomic status (SES), socioeconomic position and social class are widely used in health research. Assessment of SES is an important aspect in community-based health research as this is a major determinant of health and nutritional status as well as of mortality and morbidity. Inequalities in socioeconomic status underlie many health disparities in the world, including oral health.\(^8\)

Kuppuswamy scale is widely used to measure the socioeconomic status of an individual in urban community based on three variables namely education, occupation and income.\(^9\) There is a strong and consistent association between unfavorable socio-economic circumstances and oral health.\(^10\)

In case of children, oral health plays a vital role. Oral health renders profound influence on children’s growth and development, on their physical, mental and social aspects, their performance in school, and hence their success in their later life time. School provides a place where they are gathered in the largest possible numbers. These can be a perfect setting for programmes aiming to control the growing burden of oral diseases and to promote oral health.\(^11\)
Oral health is very much dependent on the oral hygiene maintenance, thus the present study was undertaken with the main aim to determine the relationship between oral hygiene with socioeconomic status.

In the present study, females had significantly good oral hygiene when compared to males. Mean OHI-S for males (1.94 ± 0.17) was more than for females (1.49 ± 0.20). This was statistically significant (p<0.001). Similarly, Mahesh Kumar P. et al (2005)(12), and Nanda Rajiv (1990)(13) reported that girls have significantly cleaner mouths than boys. A possible explanation for this may be the fact that girls mature earlier than boys and become more interested in their appearance and grooming habits.(14,15)

The present study reported that as the socioeconomic status decreased, mean OHI-S increased. In particular, children from upper socioeconomic status were found to have significantly better oral hygiene than those children from middle or lower socioeconomic status groups. Similar findings were also reported by Doddamani AS et al (2010)(1), Addy M et al (1990)(16), Qureish Taani Dafi S (1996)(17), Sogi G.M et al (2002)(8). This can be attributed due to the fact that oral health is a function of better oral hygiene among better educated, good income, more positive attitudes towards oral hygiene, and a greater frequency of dental visits.

In the present study while comparing the proportions of OHI-S severity among different socioeconomic groups, it was found that poor OHI-S was significantly associated especially with both Upper Lower and Lower socioeconomic status. When mean OHI-S scores within different socioeconomic status group were compared, the results showed were statistically highly significant (p<0.001).

In this study, as the frequency of tooth cleansing increased, the mean OHI-S scores decreased and these results were statistically significant (p<0.001). Similar findings were reported by Norton M.R.et al (1989)(14), Macgregor D. M., Balding J.W (1987).(18)

In the present study, the mean OHI-S score was lowest in children using toothpaste to clean their teeth (1.13±0.24), and highest in children using other materials (2.45±0.21). The mean values of OHI-S for children using different cleansing materials were statistically significant.
The mean OHI-S lowered significantly (p<0.001) in those who used tooth paste as compared to both toothpowder and other materials.

The variation in the oral hygiene practices between upper and lower socioeconomic groups may be attributed to lack of oral hygiene education in lower socioeconomic groups which is reflected in their oral hygiene maintenance. (19)

Conclusion

The mean scores of OHI-S especially in Lower middle, Upper lower, and Lower socioeconomic status groups were significantly higher when compared to both Upper, and Upper middle socioeconomic status groups. This can be attributed due to the fact that oral health is a function of better oral hygiene among better educated, good income, more positive attitudes towards oral hygiene, and a greater frequency of dental visits. Therefore, the results of the present study concluded that oral hygiene of the school children were significantly related to their socio-economic status.

Conflict of Interest: Nil

Financial Support: Nil

References


### Table 1: Distribution of children according to socioeconomic status

<table>
<thead>
<tr>
<th>Socio-economic status</th>
<th>Number of children examined</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>138</td>
<td>13.3</td>
</tr>
<tr>
<td>Upper middle</td>
<td>281</td>
<td>27.1</td>
</tr>
<tr>
<td>Lower middle</td>
<td>335</td>
<td>32.3</td>
</tr>
<tr>
<td>Upper lower</td>
<td>173</td>
<td>16.7</td>
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<tr>
<td>Lower</td>
<td>111</td>
<td>10.7</td>
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</table>

### Table 2: Mean values of OHI-S according to Socioeconomic status

<table>
<thead>
<tr>
<th>SES</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>F  (DF=4,1033)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>138</td>
<td>0.56</td>
<td>0.19</td>
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<tr>
<td>Upper middle</td>
<td>281</td>
<td>1.30</td>
<td>0.21</td>
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<tr>
<td>Lower middle</td>
<td>335</td>
<td>1.75</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper lower</td>
<td>173</td>
<td>2.13</td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>111</td>
<td>2.84</td>
<td>0.17</td>
<td></td>
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</tr>
<tr>
<td>Comparisons</td>
<td>Mean Difference</td>
<td>q</td>
<td>p value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-----------------</td>
<td>------</td>
<td>---------</td>
<td></td>
<td></td>
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<tr>
<td>Once vs. Twice</td>
<td>0.18</td>
<td>18.12</td>
<td>p&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once vs. More than twice</td>
<td>0.49</td>
<td>25.98</td>
<td>p&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twice vs. More than twice</td>
<td>0.31</td>
<td>15.25</td>
<td>p&lt;0.001</td>
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</tbody>
</table>

Table 3: Significance (p value) of mean difference of OHI-S between different daily brushing frequency groups by Tukey test

<table>
<thead>
<tr>
<th>Comparisons</th>
<th>Mean Difference</th>
<th>q</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toothpaste vs. Toothpowder</td>
<td>0.44</td>
<td>41.97</td>
<td>p&lt;0.001</td>
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<tr>
<td>Toothpaste vs. Others</td>
<td>1.32</td>
<td>61.58</td>
<td>p&lt;0.001</td>
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<tr>
<td>Toothpowder vs. Others</td>
<td>0.88</td>
<td>39.74</td>
<td>p&lt;0.001</td>
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</table>

Table 4: Significance (p value) of mean difference of OHI-S between different brushing materials by Tukey test