

A cross-sectional study on relationship between oral hygiene and socioeconomic status among 15 year old school children.

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Abstract

Background: Oral health is a part of general health and hence, has a direct bearing on the total well-being of individuals. Knowledge of oral health status and treatment needs of populations with different characteristics is important for developing appropriate preventive approaches.

Aim: The aim of the study is to determine the relationship between oral hygiene with socioeconomic status among 15 years old school going children of Lucknow city.

Materials & Methods: A descriptive cross-sectional study was conducted. The schools were selected by simple random sampling method following the lottery method of selection. Simplified Oral Hygiene Index with Kuppuswamy's socioeconomic status scale has been used.

Results: 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.⁽¹⁾ 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. . There are oral pathologic conditions in which a good oral hygiene is required for healing and regeneration of the oral tissues.⁽²⁾

Health is multifactorial, influenced by factors like genetics, lifestyle, environment, socioeconomic status and many others.⁽³⁾

Inequalities in socioeconomic status underlie many health disparities in the world, including oral health. Occupational status, income and education are intrinsically related and often serve as measure for each-other. In general, the population groups that suffer the worst oral health status are also those that have the highest poverty rates and the lowest education.⁽⁴⁾

Oral health is always an inseparable part of general health and several studies in the past have revealed an association between socioeconomic factors and oral health.⁽⁵⁾

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.

Materials & Methods

A Descriptive cross sectional study was conducted to determine the relationship between oral hygiene and socio-economic status among 15 years old school going children of Lucknow city. For the study purpose, list of schools located within the Lucknow municipality was obtained from District School Officer (DSO), Chowk, Lucknow. The various categories of schools were government, aided and unaided private schools, thereby giving a chance to incorporate students from different socio-economic background.

The city of Lucknow was divided in to 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. The ratio was maintained while selecting the samples from different areas. In every school, the classes of 8th and 9th standard were chosen. These standards have children of 15 years of age. Each class has three to four sections, and these sections were chosen for the purpose of data collection.

Before the commencement of the study, the investigator was standardized and calibrated in the department of Public Health Dentistry by faculty members to ensure uniform interpretations and understandings. A pilot study was conducted on 50 subjects to assess the validity and feasibility of the study. Internal consistency of the questionnaire was found to be good (0.87). Sample size was estimated as $(n) = 1 + 2C (SD/d)^2$

$$= 1 + 2 * 10.51 * (1.50/1.15)^2 \text{ (for } \alpha=0.05 \text{ and } 1-\beta=0.80 \text{ then constant)}$$

C=10.51)

= 36.76 = 37

i.e., 37 subjects in one socio-economic status class or total 185 subjects for five socio-economic status classes. On the basis of results obtained, sample size was fixed at 1000. A total number of 250 children were examined from each zone. 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.

In the development of this instrument, special consideration was given to developing a questionnaire, which was completed independently, without assistance. It was, therefore, important that the readability level of the questionnaire was pitched appropriately. Care was taken to avoid long sentences, complex terminology, acronyms or abbreviations, double-barrelled and leading questions.

Ethical clearance (CPGIDSH/EC/016-018 Dated: 3 February 2018) was obtained from the ethical clearance committee of the University. 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 study was carried out from the months of January 2018 to April, 2018. The study was conducted within the working hours of schools, as per the time allotted by principals of respective school. Written consent was taken from the principal of each schools and all children were informed about the study purpose and method.

The examination was done by the investigator who was assisted by an alert and co-operative recording clerk. The respective class teachers were used as co-ordinators in the survey. The Simplified Oral Hygiene Index (OHI-S) by Greene & Vermillion, 1964⁽⁶⁾ was recorded. Examination was done using mouth mirror and periodontal probe under adequate illumination.

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).

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.

Result

The present study determines the 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 ± 0.17 vs. 1.49 ± 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, χ^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

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.⁽⁷⁾

Inequalities in socioeconomic status underlie many health disparities in the world, including oral health. In general, the population groups that suffer the worst oral health status are also those that have the highest poverty rates and the lowest education. Higher income enable people to afford better housing and permit increased access to medical care. In the same time, high levels of education increase the opportunity to engage in oral health-promoting behaviors.⁽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⁾ Socio-economic disadvantage in childhood is associated with low educational attainment, risk of unemployment, job insecurity and low adult earnings for both men and women.⁽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.

Recommendations

The awareness regarding oral health is minimal among study participants. It may be due to ignorance, lack of knowledge, or lack of motivation. Professional treatment being quite expensive; the ideal and affordable strategy is to tackle the problem at the primary level itself.

1. Regular oral health screening programmes should be organized in schools.
2. Dental health professionals should involve school teachers so that it will be of immense help to them for early detection and proper referral for common oral conditions.
3. For the benefit of a community, dental health programmes have to be conducted repeatedly in order to reach the goals of World Health Organization.

Conflict of Interest: Nil

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Socio-economic status	Number of children examined	Percentage (%)
Upper	138	13.3
Upper middle	281	27.1
Lower middle	335	32.3
Upper lower	173	16.7
Lower	111	10.7

Table 1: Distribution of children according to socioeconomic status

SES	N	Mean	SD	F (DF=4,1033)	p Value
Upper	138	0.56	0.19	2701.00	p<0.001
Upper middle	281	1.30	0.21		
Lower middle	335	1.75	0.16		
Upper lower	173	2.13	0.23		
Lower	111	2.84	0.17		

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

Comparisons	Mean Difference	q	p value
Once vs. Twice	0.18	18.12	p<0.001

Once vs. More than twice	0.49	25.98	p<0.001
Twice vs. More than twice	0.31	15.25	p<0.001

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

Comparisons	Mean Difference	q	p value
Toothpaste vs. Toothpowder	0.44	41.97	p<0.001
Toothpaste vs. Others	1.32	61.58	p<0.001
Toothpowder vs. Others	0.88	39.74	p<0.001

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