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RESEARCH ARTICLE

CORRELATION OF EARLY CHILDHOOD CARIES WITH THE PARENTAL EDUCATION, OCCUPATION, FAMILY INCOME AND THE SOCIO-ECONOMIC CLASS

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ABSTRACT

Acute Early childhood caries is a public health problem which has biological, social, and behavioural determinants. **Aim of This study:** The aim of this research is to evaluate the different socio-economical determinants of early childhood caries in north Kolkata. **Materials and Methods:** The questionnaire-based study was conducted on a sample of 902 children between 2 to 5 years age and their respective parents (either mother or father or both), in north Kolkata in a span of 1 and half years. Either of the parent with higher income was considered as the head of the family. The decayed-missing-filled teeth (dmft) indices (dmft, Greubbell,1994) was recorded for each child in the study population and socio-economical status of the children was determined by their parental education, occupation, monthly family income according to modified Kuppuswamy scale (2017). **Statistical Analysis:** All the data collected were subjected to statistical analysis using ANOVA test, Tukey post hoc analysis and unpaired t test. **Result:** Caries status or prevalence was inversely proportional with parental education, occupation, monthly family income, socio-economic classes. **Conclusion:** Oral health assessment and dental health education of children at an early stage helps in improving dental behaviour and attitudes, which is beneficial for life time. This can be achieved by educating the parents and mainly reaching out to that class of society who is deprived of education thereby with lower occupational levels and lower socioeconomic status and educating them about oral health through different oral health education programmes.

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INTRODUCTION

Oral health is a part of general health and is an important factor in the normal development of a child. Oral health problems can influence the overall development of a child and his general health and can adversely affect the quality of life (Poulsen, 1996). Childhood caries is a public health problem that affects infants and preschoolers throughout the world, the sequelae of which can be pain, chewing difficulties, speech problems, general health disorders, psychological problems and lower quality-of-life (Agarwal, 2011). Decay of primary teeth can also affect children's growth which can lead to malocclusion as the correct guidance to the permanent dentition may be affected. Like any other types of dental caries, early childhood caries is also multi-factorial.

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The centers for disease control and prevention reported that caries is perhaps the most prevalent of infectious diseases among children which affects the general population but is more likely to occur in children who are of low socio-economic status (SES), with low education level of the parents (American Academy of Pediatric Dentistry,. 2009). In 1994 the scientific community of the Center for Disease Control and Prevention first published the term early childhood caries "in order to better the multi-factorial pathogenesis of the disease (Kaste, 1995)" . According to AAPD In 2011 Early childhood caries (ECC) is the presence of 1 or more decayed (no-ncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child of 71 months of age or younger. In children younger than 3 years of age, any sign of smooth-surface caries is indicative of severe early childhood caries (S-ECC). From ages 3 through 5, 1 or more cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth or a decayed,

missing, or filled score of ≥4 (age 3), ≥5 (age 4), or ≥6 (age 5) surfaces constitutes S-ECC (Drury, 1999).

Causes and Determinants of Early Childhood Caries

According to the guideline of European Academy of Paediatric Dentistry (EAPD), Early childhood caries is a public health problem which has biological, social, and behavioural determinants (European Academy of Paediatric Dentistry, 2008). Many social and behavioural determinants are considered to be risk factors for early childhood caries. Low socio-economic status, immigrant families, inadequate health literacy and low educational attainment in parents are all risk factors for early childhood caries (Fédération Dentaire Internationale, 1988; Seow, 1998).

Aim of this study: The aim of this research is to evaluate the different socio-economical determinants of early childhood caries in north Kolkata amongst children between 2-5 years of age.

MATERIALS AND METHODS

The questionnaire-based study was conducted on a sample of 902 children between 2 to 5 years age and their respective parents(either mother or father or both), in 9 different pre-schools in north Kolkata. The duration of the study was 1 and half years. The aims and procedure of the study was explained to the parents and the informed consent was obtained from them prior to the study. Either of the parent with higher income was considered as the head of the family.

Inclusion criteria:

- 2-5 years old children
- parents who gave informed consent.

Exclusion criteria

- Children with developmental enamel defects.
- Children with systemic disease

Study design and methodology: The study was conducted in 9 pre- schools of north Kolkata.

Method of data collection

Before starting the study, an ethical clearance was obtained from the institutional ethical committee of Gurunanak Institute of Dental sciences and Research, Kolkata, panihati. An approval from the concerned school authorities was taken by explaining the entire study procedure to the school authorities prior to the study. Parents were also asked to be present on the day of the examination.

Purpose, study procedure, examination procedure was explained to the parents and informed consent was taken from the parents. Before going to the clinical examination all the general information like parental level of education, occupation, socio-economic status, was taken from the parents. All the study subjects were examined by a single examiner (researcher himself) to avoid intra examiner biasness.The examiner performed all intraoral clinical examinations by direct visual inspection and by using a mouth mirror and explorer under good natural light source with the child sitting on a chair in front of the examiner. Disposable gloves ,mouth mirrors and explorer were used. The necessary instruments were disinfected by boiling water. Treatment cards were issued for those children who required treatments.

Measurements of Parameters

ECC (early childhood caries)

The decayed-missing-filled teeth (dmft) indices (dmft, Greubbell, 1994) was recorded from each child in the study population.

Socio-economic status

Socio-economical status of the children was determined by their parental education, occupation, monthly family income according to *modified Kuppuswamy scale (2017)*

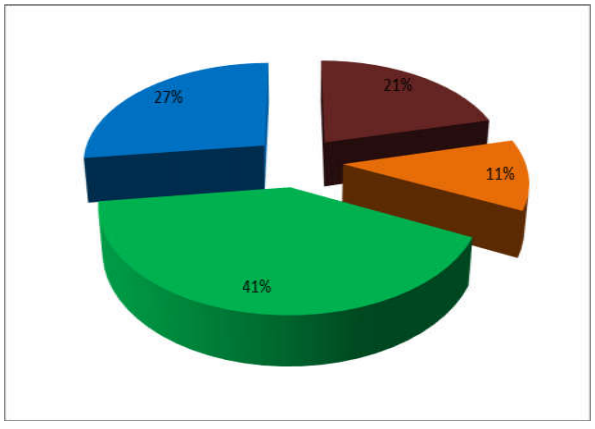
Statistical analysis

All the data collected were subjected to statistical analysis using ANOVA test, Tukey post hoc analysis and unpaired t test. The measures of central tendency (mean) and standard deviation were calculated for variables. The dmft index of the children with their socio-economic class was compared. A difference was considered to be the statistical significant if the p value was <0.05.

RESULTS AND ANALYSIS

Table 1. Distribution of Age of the children

Age	Frequency	Percent
2 years	190	21.1%
3 years	100	11.1%
4 years	368	40.8%
5 years	244	27.1%
Total	902	100.0%



Graph-1. Distribution of study population according to age

DISCUSSION

The oral health of pre-schoolers is an overlooked aspect of childhood health and well-being, especially in cases of ECC. These children constitute a population vulnerable to caries because of their dependence and inability to communicate with their parents. School going children of the concerned region have always been considered a good sample source as schools

Table 2. Distribution of mean dental caries (dmft) score of children with Education of head of family

	Education of head of family	Number	Mean	SD	Minimum	Maximum	Median	p-value
Dmft	Profession or honors	97	.0000	.0000	0.0000	0.0000	0.0000	<0.0001
	Graduate or postgraduate	281	38.0000	.6991	0.0000	5.0000	0.0000	
	Intermediate or post high school diploma	151	41.0000	.9656	0.0000	5.0000	0.0000	
	High school certificate	60	73.0000	1.7764	0.0000	5.0000	0.0000	
	Middle school certificate	51	162.0000	1.4381	0.0000	5.0000	3.0000	
	Primary school certificate	135	417.0000	1.1360	0.0000	5.0000	3.0000	
	Literate	127	418.0000	1.1347	0.0000	5.0000	3.0000	

With increasing education level of the head of the family the mean caries (dmft) score decreased and it was statistically significant (p<0.0001), F statistic: 301.1346.

Table 3. Distribution of mean dental caries (dmft) with Occupation of head of family

		Number	Mean	SD	Minimum	Maximum	Median	p-value
dmft	Profession	81	.0000	.0000	0.0000	0.0000	0.0000	<0.0001
	Semi-profession	277	.1697	.7543	0.0000	5.0000	0.0000	
	Clerical, Shop-owner	155	.2452	.8554	0.0000	5.0000	0.0000	
	Skilled worker	61	1.2623	1.7311	0.0000	5.0000	0.0000	
	Semi-skilled worker	49	2.4898	1.5695	0.0000	5.0000	3.0000	
	Unskilled worker	160	3.0125	1.4450	0.0000	5.0000	3.0000	
	Unemployed	119	3.2185	1.2430	0.0000	5.0000	3.0000	

With increasing occupation level of the head of the family the mean caries(dmft) score decreased and it was statistically significant (p<0.0001), F statistic: 225.9879.

Table 4. Distribution of mean carries (dmft) with Monthly income of family of the children

	Income	Number	Mean	SD	Minimum	Maximum	Median	p-value
dmft	>41430	113	.0000	.0000	0.0000	0.0000	0.0000	<0.0001
	20715-41429	146	.1306	.6821	0.0000	5.0000	0.0000	
	15536-20714	54	.3448	1.1016	0.0000	5.0000	0.0000	
	10357-15535	62	1.0645	1.5668	0.0000	5.0000	0.0000	
	6214-10356	145	3.3519	1.3758	0.0000	5.0000	3.0000	
	2092-6213	314	3.0616	1.2161	0.0000	5.0000	3.0000	
	<2091	68	3.2212	1.1932	0.0000	5.0000	3.0000	

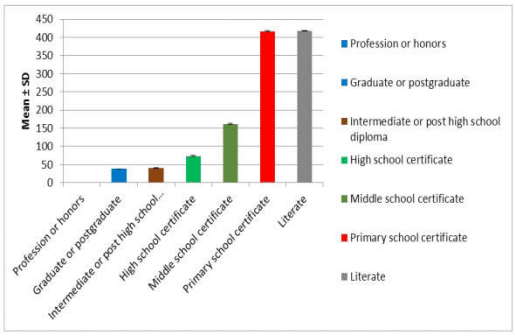
With decreasing monthly income of family the mean caries (dmft) score of the child increased and it was statistically significant (p<0.0001), F statistic: 280.6796.

Table 5. Distribution of mean dental caries (dmft) score of the children with Socio economic class of the children

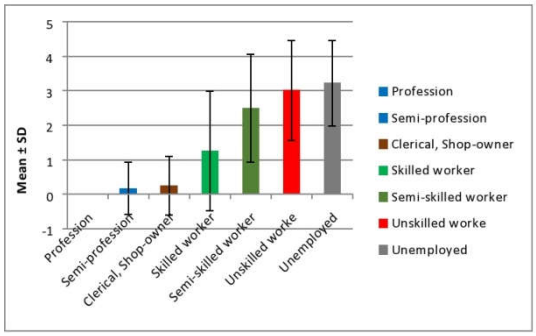
	Socioeconomic class	Number	Mean	SD	Minimum	Maximum	Median	p-value
Dmft	Upper class	44	.0000	.0000	0.0000	0.0000	0.0000	<0.0001
	Upper middle class	274	.1934	.8137	0.0000	5.0000	0.0000	
	Lower middle class	221	.3846	1.1645	0.0000	5.0000	0.0000	
	Upper lower class	194	2.9175	1.4516	0.0000	5.0000	3.0000	
	Lower class	169	2.6331	1.6059	0.0000	5.0000	3.0000	

With increasing socio economic class the mean caries(dmft) score of the child decreased, and it was statistically significant (p<0.0001), F statistic: 238.4261.

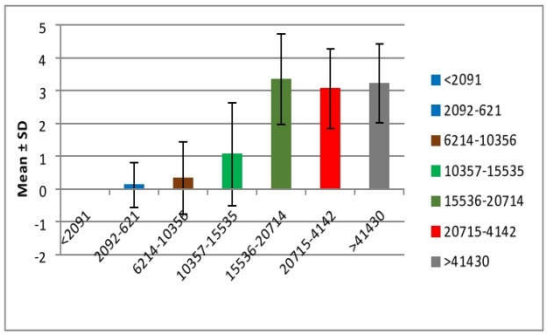
provide a platform for the promotion of health and oral health not only for students but also for staff, families and members of the community as a whole. In the present, study 902 children were examined. Among them 190(21.1%) children were 2 years of age, 100(11.1%) children were 3 years of age, 368(40.8%) children were 4 years of age and 244(27.1%) children were 5 years of age (Table-1).A Norwegian study by Koposova et al. (2010) reported that low parental education is considered as one of the predisposing factor leading to poor child health, including oral health. Moreover parental education level have been reported to be directly associated with family socio-economic status by pizzo et al (2010). Parental attitude towards oral health depends on their education. According to this study In graduate or postgraduate the mean caries (dmft) of their children was (mean± s.d.) 38.0000 ± 6991,in intermediate or post high school diploma the mean caries (dmft) of their children was (mean± s.d.) 41.0000 ± .9656, in high school certificate the mean caries (dmft) of their children was (mean± s.d.) 73.0000 ± 1.7764, in middle school certificate the mean caries (dmft) of their children was (mean± s.d.) 162.0000 ± 1.4381, in primary school certificate the mean caries (dmft) of their children was (mean± s.d.) 417.0000 ± 1.1360 and in literate the mean caries (dmft) of their children was (mean± s.d.) 418.0000 ± 1.1347. With increasing education level the mean caries (dmft) score or prevalence of ECC among children was decreased (Table-2). The study carried out by Rajab et al. (2002) also reported that better educated parents take more care for their children oral health so that their child gets less affected from dental caries. Children's oral health strongly depends on their parental occupation and family income. According to result of this study, with increasing occupation level the mean caries(dmft) score or caries prevalence decreased (Table- 3) and with decreasing monthly income of family the mean caries (dmft) score or caries prevalence increased(Table- 4). Other studies by sogi GM et al (2002), Patricia Correa-Faria et al (2010) showed that dental caries prevalence is significantly higher in lower income group as compared to higher income group because usually people belonging to lower income group are devoid of hygienic practice and they live in unhygienic environment. Our study showed that with increasing socio economic class the mean caries (dmft) score decreased (Table - 5). Jibieke Wulaerhan et al. (2014) also found that caries



Graph 2. Correlation of mean dmft score of the child with the education of the head of the family of the study population



Graph 3. Correlation of mean dmft score of the child with the occupation of the head of the family of the study population



Graph 4. Correlation between mean dmft score with the monthly income of the family

prevalence is more among them who belong to low socio-economic background.

Conclusion

The present study is an epidemiological survey to evaluate the different socio-economical determinants of ECC(early childhood caries), in the pre-schools of north Kolkata. Caries status or prevalence was inversely proportional with parental education, occupation, monthly family income, socio-economic classes. The school population today is the adult of tomorrow so educating them about oral health would develop a sense of responsibility about the same. Oral health assessment and dental health education of children at an early stage helps in improving preventive dental behaviour and attitudes, which is beneficial for life time. This can be achieved by educating the parents and mainly reaching out to that class of society who is deprived of education thereby with lower occupational levels and lower socioeconomic status; and educating them about oral health through different oral health education programmes. If the child does not maintain adequate health, the benefits of education on the whole will be lost because of absenteeism or lack of attention due to ill health. It can be stated that oral health status of higher economic status is better than middle and low economic status but a study with bigger population should be carried out to confirm findings of this study.

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