

## **Problematic Eating Behaviour and its Impact on Early Childhood Caries in South Indian Population - A Case Control Study**

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### **ABSTRACT**

**INTRODUCTION:** With increase in the reports of problematic eating behaviour in children, its association with the incidence of Early Childhood Caries is still unexplored. Hence, the aim of the present study was to explore the impact of problematic eating behaviour in children on the development of Early Childhood Caries.

**METHODOLOGY:** A case-control analysis was performed on 50 children who were assigned to one of two groups: Group A, who had ECC, and Group B, who did not have ECC. The dmft index was used to monitor dental caries. CEBQ was distributed to the parents of children in both classes. The obtained data was tabulated and subjected to Statistical analysis.

**RESULTS:** A highly statistically significant difference ( $P=0.000$ ) was noted between the ECC and Non- ECC group with respect to problematic eating behaviour. Food Responsiveness (FR), Satiety Responsiveness (SR), Emotional Under-

eating (EUE), Food Fussiness (FF), Emotional Overeating (EOE), Enjoyment of food (EF), Desire to Drink (DD), Slowness in Eating (SE) is found to have association with ECC. (P= 0.000)

CONCLUSION: Problematic eating habits in children has an influence on the development of ECC.

**Key words:** Child eating Behaviour, Problematic eating, Emotional eating, CBEQ and Early Childhood Caries

## INTRODUCTION

Early childhood caries is the most prevalent chronic conditions among children in the South Indian population. ECC has a multifactorial aetiology, with the key cause being the association of microorganisms and sugars in a specific time on a tooth surface. Dietary and feeding habits, excessive sugar consumption, a lack of oral hygiene, unawareness on fluoride exposure and enamel defects are major contributors to the progress of ECC.<sup>1</sup> The prevalence rate of ECC was reported 49.6% in India.

ECC begins as a white-spot lesion, on further development can cause complete destruction of the tooth structure.<sup>2</sup> Children with dental caries have a greater probability of caries in permanent dentition.<sup>3,4</sup> ECC can have influence in the general health issues such as slower growth pace, underweight and iron deficiency.<sup>5,6,7,8</sup>

Anorexia, selective eating, fussy eating, and neophobia are all examples of problematic eating habits in adolescents.<sup>9,10</sup> Pouching food and feeding slowly are examples of eating behavioural issues that could be important to paediatric dentists in terms of early childhood caries (ECC).<sup>11</sup> Eating behaviour in childhood may differ on a spectrum ranging from picky eating, erratic eating, overeating, food refusal, negative behaviour or showing tantrums during eating and slow eating.<sup>12</sup> It must be considered that the consequences of problematic eating habits, such as eating slowly, pouching food for a long time, and selective eating, have been largely unexplored in the causation of ECC.<sup>13</sup>

Eating behaviour in children is assessed by various psychometric instruments, of which the CEBQ is the most comprehensive instruments used for assessment of the children's behaviour.<sup>11,14</sup> There are no studies published till now for assessing the impact of problematic eating in Early Childhood Caries in the South Indian population. Hence, the present study aimed at assessing the association between children's eating behaviour and ECC in the South Indian population.

## MATERIALS AND METHODOLOGY

### DESIGN OF THE STUDY

A case-control study was designed to assess the impact of problematic eating behaviour on ECC in preschool children between 3 and 6 years in the South Indian population. Ethical approval was obtained from the institutional review board of SIMATS. The Child Eating Behaviour Questionnaire (CBEQ) and def index were used to measure the impact of problematic eating behaviour on ECC.

### INCLUSION AND EXCLUSION CRITERIA

Children between 3 and 6 years old who did not have any known medical history were selected for participation in the study. Exclusion criteria includes children with a history of food allergy, children who are on long-term drugs, children who were uncooperative during dental examinations, and parents who were unable to participate in the study.

### CALCULATION OF THE SAMPLE SIZE

With power at 95%, the sample of the study was calculated using G power software and arrived at a total sample size of 50, 25 per group.<sup>15</sup>

### STUDY SETTING

A total of 125 children between 3 and 6 years who visited the Department of Pediatric Dentistry either for dental treatment or as an accompanying person were examined. The dental examination was carried out by a single paediatric dentist. A

total of 50 children, who were eligible for the study based on the set selection criteria were invited for participation and were allowed to 2 groups: Group A- Children with ECC and Group B-Children without ECC. The Children's Eating Behaviour Questionnaire was provided to the parents of the children participating in the study and was filled under the supervision of the principal investigator. Parents were asked to answer the questions, and children's DMFT/def levels were recorded by a single dentist for all the participants. Informed consent was obtained from the parents of the children participating in the study.

#### STATISTICAL TEST

t test and Mann-Whitney test with statistical significance set at  $P < 0.05$  was used to analyse the collected data in SPSS software.

#### RESULTS

50 Children with mean ages of 3 and 6 years were included in the study. The demographic details of the participants are tabulated in Table 1 and Table 2. The statistical analysis shows that there was an equal distribution of the participants in both the groups based upon their age and sex.

A highly statistically significant difference ( $P = 0.000$ ) was noted between the ECC and Non- ECC group with respect to problematic behaviour Table 3. Individual factor analysis was done to find out the more specific eating habit associated with ECC. And the statistical analysis showed a highly significant difference with respect to Food Responsiveness (FR), Satiety Responsiveness (SR), Emotional Undereating (EUE), Food Fussiness (FF), Emotional Overeating (EOE), Enjoyment of food (EF), Desire to Drink (DD), Slowness in Eating (SE) in Table 4. Pearson Correlation test was done to compare the mean and standard deviation of CBEQ questionnaire and deft index, P value found to be not significant ( $P = .864$ ) in Table 5.

#### DISCUSSION

Problematic eating behaviour in children is increasing in recent years and becomes a concern for the paediatric dentist as it may be related with development of Early childhood caries(ECC). All possible risk factors associated with ECC should be addressed as it is the most common disease of childhood. One such spurned factor is the eating behaviour in children which includes picky eating, over eating, food refusal, slow eating, food pouching, fussy eating.<sup>16</sup> A very few studies have been conducted assessing the problematic eating behaviour in causation of ECC and the results are uncertain.<sup>11,15</sup> Hence, the present study aimed to evaluate the impact of problematic eating behaviour on early childhood caries.

Though there are a lot of questionnaires available to assess the eating behaviour in children, CEBQ was preferred in the present study as it was validated in children between 3 to 6 years of age and also recorded a wide range of eating patterns.<sup>17,18,19</sup> In the present study, the statistics show that all the factors except Satiety responsiveness(SR) and emotional undereating(EUE) have an impact on ECC.

Food Responsiveness (FR) is a child always wanting to eat and always having food in his/her mouth. Children with such habits are found to have more caries in the present study. The results of the present study were similar to the results by Anandakrishna et al, however contradicting to that given by Nembhwani et al.<sup>11,16</sup> On assessing Emotional Over Eating (EOE) habits in children, a significant association was found with ECC. Children with increased EOE habit showed increased incidence of ECC which is in accordance with the previously conducted studies.<sup>19,20</sup>

Enjoyment of food (EF) is the third factor in the present study that is associated with increased ECC, which is similar to the results of Nembhwani et al. but is contradictory to the results published by Anandakrishna et al, who stated that ECC was more in children who did not enjoy food.<sup>11</sup> However the results of the study by Anandakrishna et al were not statistically significant.<sup>13,16</sup> But still children who do not enjoy the food tend to pouch the food in the mouth for a longer time and tend to eat more slowly which are potential risk factors for development of ECC and hence should not be neglected. Slow Eating (SE) among children is the major concern reported by the parents and is found to have a statistically significant impact on ECC in the present study, which is contradictory to the results published in earlier studies.<sup>13,17</sup>

The statistics of the present study shows that increase Desire to Drink (DD) is also associated with increase in ECC, which is in accordance to the study published by Nembhwani et al. but it is again contradictory to that of Anandakrishna et al, who stated that DD factor was not significantly associated with ECC.<sup>11,16</sup> Desire to Drink what plays a major role as association between development of ECC and sweetened juices, carbonated drinks is already well established. In the present study Food Fussiness (FF) is another factor that is found to be associated with ECC. Nembhwani et, also reported an increase in ECC with increased fussiness of the child towards food. In the study conducted by Anandakrishna et al, Highest ECC was noted in children showing fussiness towards food intake however it was not statistically.<sup>11,16</sup>

In the present study, it was noted that with increase in SR and EUE habit, there was a decrease in ECC, which is conflicting the results of the earlier studies.<sup>21,22</sup> Comparing the results of the present study and previous studies, it can be concluded that Emotional Over Eating and Food Fussiness are the two definite factors associated with ECC. Food responsiveness, Enjoyment of food and Desire to drink are the other relative risk factors associated with ECC

## CONCLUSION

Problematic eating habits has an influence on development of ECC. Appraisal of the eating behaviour of the child should be incorporated in the routine dental examination for the dentists to provide holistic treatment to the children so as to prevent any new lesions in the future.

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**Table: 1 Age wise Distribution of Study participants with and without ECC**

	Age (ECC)	Age (Non-ECC)	P Value
Mean	4.32	4.20	0.082
Std. Deviation	.900	1.155	

**Table: 2 Distribution of study participants with and without ECC based on their sex**

	Children with ECC	Children without ECC	Total	P value
Male	56% (n=14)	32% (n=8)	44% (n=22)	0.077
Female	44% (n=11)	68% (n=17)	56% (n=28)	
Total	100% (n=25)	100% (n=25)	100% (n=50)	

**TABLE: 3** Comparison of the CEBQ factor values between the ECC and Non - ECC group

	GROUP	N	MEAN	Std. Deviation	P value
CEBQ	Children with ECC	25	114.04	8.379	0.000
	Children without ECC	25	83.88	8.838	

**TABLE: 4** Comparison of CEBQ factor values in terms of Mean and Standard deviation among both the groups using unpaired t test.

GROUP		N	MEAN	Std. Deviation	P Value
FR	Children with ECC	25	17.60	1.607	<b>0.000</b>
	Children without ECC	25	7.20	2.723	
EOE	Children with ECC	25	9.48	3.928	
	Children without ECC	25	4.80	.957	
EF	Children with ECC	25	18.44	2.293	
	Children without ECC	25	8.80	2.887	
DD	Children with ECC	25	14.08	1.801	
	Children without ECC	25	4.08	1.441	
SR	Children with ECC	25	11.16	2.035	
	Children without ECC	25	19.56	1.981	
SE	Children with ECC	25	16.32	.690	
	Children without ECC	25	10.64	2.215	
EVE	Children with ECC	25	7.56	3.110	
	Children without ECC	25	13.56	4.154	
FF	Children with ECC	25	19.40	1.958	
	Children without EC	25	15.24	1.640	

**TABLE 5:** Comparison of Mean and Standard deviation of CEBQ and Deft index.

	Mean	Std.Deviation	P value
CEBQ	114.04	8.379	<b>.864</b>
DMFT/deft	7.28	3.911	