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Original Research

Evaluation of correlation between healthy eating index, body mass index and early childhood caries in school children

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ABSTRACT:

Background: In many areas, early childhood caries (ECC), which arises from a persistent imbalance between several risk factors and protective variables, continues to be a public health concern. The present study was conducted to assess association between healthy eating index, body mass index and early childhood caries in school children. **Materials & Methods:**250 school children of 5-7 years were selected.The WHO standards (1997) were used to record caries; caries experience was determined using decayed, missing, and filled teeth (dmft) scores. The Healthy Eating Index (HEI) was noted. **Results:** 5 years had 85 children, 6 years had 100 and 7 years had 65 children. The difference was significant (P< 0.05). The mean dmft score of obese was 10.2, overweight was 10.6, normal had 7.4 and underweight had 4.7. The difference was significant (P< 0.05). The mean HEI of severe ECC children was 48.8 and in simple ECC was 53.0.The difference was significant (P< 0.05). **Conclusion:** Authors found positive correlation between BMI scores and ECC. There was higher rate of dental caries in overweight children. Diet was considered risk factor for dental caries and obesity.

Keywords: Diet, obesity, overweight

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INTRODUCTION

In many areas, early childhood caries (ECC), which arises from a persistent imbalance between several risk factors and protective variables, continues to be a public health concern.[1] Consequences of ECC include the formation of new carious lesions in both primary and permanent dentitions, higher treatment expenditures, delayed physical growth and development, missed school days, more days with limited activity, and a reduced capacity to learn. Severe forms of ECC can necessitate dental rehabilitation under general anesthesia and have been shown to have a detrimental effect on young children's quality of life and that of their families.[2]

Dental caries affects almost all age groups, but thepresence of caries in young children is an important concernthan that of elderly people.[3] Early childhood caries can rapidlydestroy the primary dentition of toddlers and small childrenaffecting their general health, growth patterns, and quality oflife, and if left untreated can lead to pain, acute infection, andpremature loss of deciduous teeth, malocclusion, nutritionalinsufficiencies, and speech problems.[4]

Caries is largely caused by diet. One measure of total diet quality is the Healthy Eating Index (HEI), which is based on the food pyramid and uses a 24-hour dietary recall. It consists of ten component scores, each of which ranges from 0 (poor) to 10 (good). One of the fundamental needs for any living thing to develop and maintain life is nutrition.[5] The present study was conducted to assess association between healthy eating index, body mass index and early childhood caries in school children.

MATERIALS & METHODS

The present study was carried out on250 school children of 5-7 years of both genders. Parents were informed regarding the study and written consent was obtained.

General data such as name, age, gender etc. was recorded. A thorough oral examination was done in all children.The WHO standards (1997) were used to record caries; caries experience was determined using

decayed, missing, and filled teeth (dmft) scores. The Healthy Eating Index (HEI) was noted. Ten components make up the HEI, each of which represents a distinct facet of a balanced diet. The components add up to the HEI, which can have a score between 0 and 100. A score between 0 and 10 is assigned to each of the ten dietary components. A diet is considered "good" if it is over 80, "needs improvement" if it is between 51 and 80, and "poor" if it is less than 51.Body mass index was assessed as BMI =Weight in kg/ Height in $m.^2$Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant (P< 0.05).

RESULTS

Table I Distribution of patients

Age group (Years)	Number	P value
5	85	0.05
6	100	
7	65	

Table I shows that 5 years had 85 children, 6 years had 100 and 7 years had 65 children. The difference was significant (P< 0.05).

Table II Distribution of children based on BMI and dmft index

	Obese (35)	Overweight (85)	Normal (90)	Underweight(40)	P value
Decayed	10.2	9.4	7.3	4.1	0.18
Missing	0.0	0.8	0.3	0.0	0.64
Filled	0.152	0.13	0.17	0.0	0.12
dmft	10.2	10.6	7.4	4.7	0.01

Table II, graph I shows that mean dmft score of obese was 10.2, overweight was 10.6, normal had 7.4 and underweight had 4.7. The difference was significant (P< 0.05).

Graph IDistribution of children based on BMI and dmft index

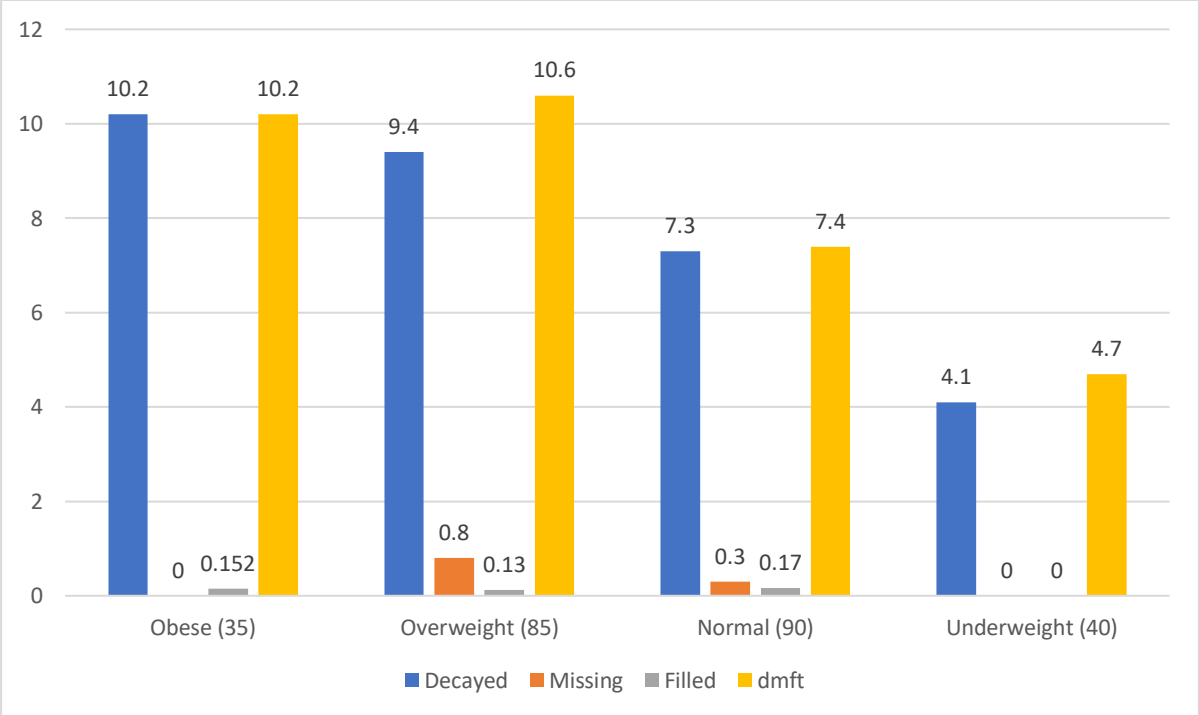

Table III Distribution of children based on HEIand early childhood caries

	Severe ECC	Simple ECC	P value
Milk	1.63	1.7	0.01
Meat/Dal	4.7	3.2	0.91
Total Fat	8.7	9.7	0.05
Saturated Fat	9.10	9.6	0.01
Cholesterol	10.5	9.1	0.91
Grain	1.4	7.2	0.93

Vegetables	0.5	0.6	0.08
Fruit	1.21	0.4	0.12
Sodium	10.3	10.5	0.92
Sugar	0.8	0.0	0.05
HEI score	48.6	52.0	0.04

Table III shows that mean HEI of severe ECC children was 48.8 and in simple ECC was 53.0.The difference was significant (P< 0.05).

DISCUSSION

Oral hygiene, meal composition and frequency, socioeconomic level, salivary immunoglobulin, bacterial load, and fluoride intake are factors that influence the development of carious lesions.[6] ECC can be a particularly virulent type of caries that starts shortly after tooth eruption, develops quickly on smooth surfaces, and has a long-lasting negative effect on the dentition. It can be harmful to general health, but it also has a significant impact on children's quality of life and food intake, particularly when it is accompanied by pain and discomfort.[7]The present study was conducted to assess association between healthy eating index, body mass index and early childhood caries in school children.

We found that 5 years had 85 children, 6 years had 100 and 7 years had 65 children. The mean dmft score of obese was 10.2, overweight was 10.6, normal had 7.4 and underweight had 4.7. 350 children of both sexes participated in a study by Alghamdi et al.[8] The majority of participants (69%) had normal BMIs for their age, with underweight, overweight, and obese groups following. For underweight, normal, overweight, and obese children, the mean dmft values were 4.9 ± 4.0, 4.6 ± 3.3, 2.7 ± 1.9, and 4.4 ± 3.0, respectively. These results were not statistically significant.

We found that mean HEI of severe ECC children was 48.8 and in simple ECC was 53.0.**T**he 269 caregiver-child pairs in Ashour et al.'s[9] study, 88.5% were part of the Family Health Program. Mothers made up the majority of caregivers (67.7%), with an average age of 35.3 ± 10.0 years and 9.8 ± 3.1 years of formal education. The average family income exceeded the minimum wage in Brazil by 2.3 ± 1.5 times. The children in this study were 68.7 ± 3.8 months old on average. Of these, 45.0% had active ECC, 17.1% had severe ECC, 51.7% were boys, and 23.4% were overweight or obese. The children's dmft index was 2.5 ± 3.2 and their average body mass index (BMI) was 15.9 ± 2.2. None of the three types of dental caries were correlated with BMI (p > 0.05).In contrast, higher family incomes were significantly associated with the lack of caries experience in children, but the mother's level of education was not significantly associated with ECC.

A research by Vundavalli et al[10] involved 350 students. The decayed, missing, and filled teeth (dmft) index (WHO standards 1997) was used to record caries experience; anthropometric measurements, including height, weight, and BMI, were recorded in accordance with normal protocols. The study involved 350 male volunteers, ages ranging from 5 to 6, with a mean age of 5.4 ± 0.7. Eighty-seven percent of the study participants had ECC. Children who were underweight, normal, overweight, and obese had mean dmft values of 4.73, 7.8, 9.4, and 10.8, respectively, for each BMI category.The mean intake of grains was 1.9, vegetables 0.61, fruits 1.31; milk 1.78, meat/dal 4.8, total fat 9.9, saturated fat 9.9, cholesterol 10 refined carbohydrates 10, and variety 0.17 in children with severe ECC (S-ECC). Overall mean HEI score was significantly higher in children with S-ECC compared to simple ECC low (43.25 ± 3.44 vs. 57.46 ± 4.12), and HEI and dmft values were negatively correlated.

The shortcoming of the study was small sample size.

CONCLUSION

The authors discovered a favorable relationship between ECC and BMI. Children who were overweight had a higher incidence of dental caries. Diet was thought to be a risk factor for obesity and dental caries.

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