

BODY MASS INDEX AND DENTAL CARIES

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ABSTRACT

Objective: *The purpose of this study was to determine the relationship between age-specific body mass index (BMI-for-age) and dental caries among Pakistani adults*

Methods & Materials: *The design of our study was analytical cross-sectional. Sample size of our study was 406 which comprised of adult patients of both sexes. The patients were selected from the Department of Operative Dentistry, Khyber college of Dentistry, Peshawar. Body Mass Index (BMI) and Decayed Missing Filled teeth Index (DMFT) were the study variables. All the results were analyzed on SPSS version 16.*

Results: *Odds ratio and Pearson chi square test were tests of significance and both showed no association between BMI and Dental caries and thus the Null Hypothesis was accepted. Odds ratio was calculated as (0.65), which showed no association between BMI and Dental caries. Pearson chi square test showed values of (2.13) P(.144)*

Conclusion: *Our study did not find any association between BMI and dental caries*

Key words: *Dental caries, Obesity, Body Mass Index, DMFT*

INTRODUCTION

Dental caries has been found to be most chronic childhood disease in oral cavity. It is a multifactorial disease and several factors contribute towards it including oral hygiene maintenance, use of fluorides and amount of fermentable carbohydrates in food^{1,2}. Anthropometric measurements provide information on body growth and its composition. By acquiring such anthropometric measurements we obtain data about body growth and thus individuals can be classified as overweight, underweight, wasting or stunting and thus a relationship can be drawn between these measurements and adverse health outcomes³. At present, there is little information available regarding relationship between dental caries and underweight/ overweight categories⁴⁻⁸. positive association has been shown in a few cross-sectional studies between dental caries and obesity⁴⁻⁸. whereas other studies have reported weak or no association between body mass index and dental caries⁶.

The aim of this study was to evaluate the association between body mass index and dental caries in Peshawar, Khyber Pakhtunkhwa, Pakistan.

HYPOTHESIS (NULL)

There exists no association between BMI and dental caries

METHOD AND MATERIALS

This analytical cross sectional study was conducted in the Department of Operative Dentistry, Khyber College of Dentistry, Peshawar from May, 15th 2012 to September, 15th 2012, after the approval of the institutional ethical committee of Khyber College of Dentistry was obtained.

In each of the subjects, Body Mass Index was calculated.

PROCEDURE

Weight was assessed using a single calibrated scale. Height was measured using a stadiometer by having the subject standing straight without shoes. Body Mass Index (BMI) was calculated using the standard formula - Mass (lbs)/height(feet&inches)¹⁶. The following

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categories were observed

- Underweight = <18.5
- Normal weight = 18.5–24.9
- Overweight = 25–29.9
- Obesity = BMI of 30 or greater

Dental caries was diagnosed according to WHO criteria using DMFT index. All selected patients were clinically examined for dental caries. The examination was carried out using a dental explorer, a mouth mirror. Teeth were considered as decayed when in addition to showing clinical signs such as color change, wedging and catching by an explorer tip, during the examination of occlusal surface with some degree of resistance. Marthaler method was used for the proximal surfaces. According to this method, a surface is diagnosed as decayed if the explorer is retained.

Number of missing and filled teeth was also calculated for each patient and then a grand total was calculated by summing up with caries score.

RESULTS

In this study 406 consecutive adult patients who were willing to participate were recruited. The mean age of the subjects was 32.3 years. Of 406 patients 56.2 % were males and 43.8 % were females. Regarding geographical distinction 76.8 % subjects belonged to urban areas while rests were of rural origin. Mean DMFT was calculated as 4.77, 2.55.

Table 1 for body mass index

Valid	Frequency	%	Valid%	Cumulative%
Normal	197	48.5	48.5	48.5
over weight	81	20.0	20.0	68.5
under weight	128	31.5	31.5	100.0
Total	406	100.0	100.0	

Table 2 for Chi Square Test

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.130 ^a	1	.144		
Continuity Correction ^b	1.736	1	.188		
Likelihood Ratio	2.146	1	.143		
Fisher's Exact Test				.158	.094
Linear-by-Linear Association	2.125	1	.145		
N of Valid Cases ^b	406				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 28.14.

b. Computed only for a 2x2 table

According to BMI calculation 48.5% subjects were of normal weight, 31.5 % subjects were under weight and 20 % of the subjects belonged to over weight category(Table 1).

No significant change was observed in DMFT values of all 3 categories of BMI.

Test of significance was Pearson Chi Square test with a confidence level of 95 % (Table 2), thus accepting the Null Hypothesis.

Odds ratio was also found out which showed no association between BMI and dental caries (Table 3).

DISCUSSION

Dental caries is a multifactorial infectious disease⁹. Factors affecting the onset of carious lesions include oral hygiene, diet composition and frequency, socioeconomic status, salivary immunoglobulins, bacterial load and fluoride intake¹⁰

Deviation from normal weight results from an imbalance between caloric consumption and energy expenditure. Both under-weight/malnutrition and overweight/obesity have significant adverse implications for health¹¹.

It is thought that the increase in children's over-weight status has occurred because of an increase in caloric intake and also because of lack of physical

Table 3 for Odds Ratio

	95% Confidence Interval		
	Value	Lower	Upper
Odds Ratio for nBMI (0to 1/2 to3)	.657	.373	1.158
For cohort nDMFT = 1.00	.697	.428	1.137
For cohort nDMFT = 2.00	1.061	.980	1.148
N of Valid Cases	406		

activity among children and adolescents¹².

The amount of carbohydrates in children's diet has been increasing over the last 10 years as a consequence of recommendations to decrease dietary fat. Overweight in children has been associated with increased carbohydrate intake and may be related to prolonged exposure to carbohydrates^{13,14}. Given the causative relation between refined carbohydrates and dental caries, it is appropriate to hypothesize that overweight might also be a marker for dental caries in children and teenagers¹⁵. The methodologies varied for determination of caries and overweight. Body weight of a population can be viewed as a continuum from underweight to obesity.

Larsson et al found that caries-prone adolescents were more obese and had higher blood pressure than caries-free adolescents¹⁷. Another study from Willerschausen following 2071 primary school pupils, aged 6 to 10 years showed the significant correlation between BMI and caries frequency persisted even after adjustment to the children's age¹⁸. In a Swedish study, children with DMFT indices over 9 had significant higher BMI values than caries-free children¹⁹. Another Swedish study of 15-year-old children revealed a significant positive correlation between DMFS indices and relative BMIs in the obese group²⁰.

Several reports described an inverse relationship between dental caries and weight^{21,22}. Chen et al²³ also investigated BMI index and dft score in three-year-old children. They concluded that there were no significant differences in the dft score of carious children among different BMI groups and there is no relationship between carious deciduous teeth and weight status. Macek and Mitola²⁴ found that overweight children aged 6–7 years had a significantly lower dental caries severity than children of normal BMI-for-age. Pinto et al⁷ concluded that there is no statistically significant association between BMI-for-age and dental caries prevalence for children aged 6–11 years. Sheller et al²⁵ found that in severe early childhood caries, the BMI percentile was not correlated with dmft or the number of pulp-involved teeth.

Our study showed no association between BMI and dental caries. To the best of our knowledge it is the first such study conducted in Pakistan. Previous studies focused only on school going children which also showed no association between BMI and Dental caries.

Odds ratio of (0.657) and P value of (0.144) clearly support our findings.

External validity of our study can be questioned as it has been conducted in one city alone, nevertheless, it will prove to be a step forward in right direction which will work as a catalyst to encourage further studies in this regard.

CONCLUSION

Our study did not find any association between BMI and dental caries

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