

Original Research Article

Association of diet and physical activity with BMI among dental students in Puducherry

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ABSTRACT

Background: Adolescence is the age where the influence of marketing world is high and choice of right food and exercise becomes hurdled. The World Health Organization alarm on increasing NCDs among adolescents ratifies the need for appropriate intervention at this age group. The objective of the study was to find out the association between diet and physical activity with body mass index (BMI) among dental students in Puducherry.

Methods: A cross-sectional study was conducted in October 2016 among 85 dental students of Sri Venkateshwaraa Dental College, Puducherry. A self administered semi structured questionnaire was used to collect information about diet and physical activity. Height and weight were measured for all participants to compute BMI.

Results: The mean age of the study participants was 19.32 ± 0.6 yrs. Majority of them were females (76.5%). About 33% of students had normal BMI. Junk food consumption was 91.8% and 65% had habit of skipping meals. Only 38% of the students were doing regular physical activity. A significant association between calorie and protein intake with BMI categories viz: underweight, normal, overweight and obesity was observed ($p < 0.001$). There was a significant association ($OR = 18.4$, 95%CI-6.1, 54.6) between excess calorie intake and BMI but not between physical activity and BMI ($OR = 1.2$, 95% CI-0.5, 3).

Conclusions: Improper dietary habits including high calorie/protein intake was associated with increased BMI among the dental students. The role of regular physical activity alone as a single factor influencing variations in BMI among the students could not be established in the study.

Keywords: Body mass index, Diet, Physical activity, Dental students

INTRODUCTION

Epidemiological transition in relocating the etiological fields of morbidity and mortality from infections to Non-communicable diseases took an alarming deviation when World Health Organization (WHO) declared obesity as a global epidemic with major implications on human health in 1997.¹ Nutritional transition has also occurred over the last four decades with the food consumed by humans having an average 7% decrease in Carbohydrate-derived energy and 6% increase in energy derived from fats.² There has been a decline in consumption of traditional

diets which contain grains, vegetables and fruits and increase in unhealthy modern diets rich in fat, sugar and salt. Urbanization and Globalization have influenced the cultural values of people in selecting fancy and high calorie fast foods, popularly known as 'Junk foods' over their healthy counterparts.³ Physical inactivity has partnered unhealthy diet as the socio-economic transition made decline in traditional agricultural hard work to intermittently active computerized occupational activity which renders only 14% of the population in India involved in regular non-occupational physical activity.⁴ Adolescence is the age where the influence of marketing

world is high and choice of right food and exercise becomes hurdled. The WHO alarm on increasing NCDs among adolescents ratifies the need for appropriate intervention at this age group.⁵ Hence this study was undertaken to establish the association between diet, physical activity and Body Mass Index (BMI) among the dental students of a tertiary care hospital in Puducherry.

METHODS

A cross-sectional observational study was conducted among Dental college students of Sri Venkateshwarra Dental College, Puducherry for a period of two months between October and November 2016. The study was approved by the institutional ethical committee and the informed consent was obtained from all the students who had participated in the study. All the second year undergraduate students in the Dental College who had consented to participate in the study were included. A total of 85 students participated in the study. A self administered, semi-structured questionnaire was used to collect data regarding the socio-demographic variables, food and exercise frequency, reasons for improper diet and physical activity. Measurements such as weight and height were made for all the students and the BMI was calculated. Adequate physical activity was operationally defined as 30 minutes of exertion per day for atleast 5 days a week. Recommended calorie consumption was calculated based on standard reference human consumption co-efficient for moderate worker.

Data were entered and analyzed using SPSS version 21. Mean and SD were calculated for all parametric variables and percentage for all non-parametric variables. Odds ratio with 95% confidence intervals was used to determine the strength of association of diet and physical activity with BMI. A $p < 0.05$ was considered as statistically significant.

RESULTS

The study included 85 Dental undergraduate students among which majority were females ($n=65$, 76.5%) and few were males ($n=20$, 23.5%). All the study participants belonged to the adolescent age group with a mean age ($\pm$ SD) of 19.32 (± 0.6) years. Majority of them were day day-scholars ($n=61$, 71.8%) than hostellers ($n=24$, 28.2%). The BMI of the study participants along with their mean Calorie intake and protein intake is pictured in Table 1.

There is no significant difference ($p=0.24$) in the distribution of participants in various BMI categories. There is a significant increase in Mean Calorie and protein intake as the BMI increases showing significant differences ($p < 0.001$) among the four BMI Categories.

Among the students ($n=85$), 33% ($n=28$) had normal BMI, 91.8% ($n=78$) had history of junk food consumption and 65% had the habit of skipping meals. Lack of time (30.59%, $n=26$), aversion towards food (29.4%, $n=25$) and dieting (7.1%, $n=6$) were considered as major reasons for skipping the meals.

Table 1: Body mass index associated with calorie and protein intake.

BMI	Frequency (%)	Mean Calorie intake (K cal) $\pm$ SD	Mean protein Intake (grams) $\pm$ SD
Under weight (<18.5)	18 (21.2)	1666.50 $\pm$ 114.88	45.06 $\pm$ 7.0
Normal (18.5-22.9)	28 (32.9)	1926.50 $\pm$ 251.73	53.61 $\pm$ 9.9
Over weight (23-24.9)	21 (24.7)	2163.19 $\pm$ 294.25	56.67 $\pm$ 6.4
Obese (>25)	18 (21.2)	2640.89 $\pm$ 475.63	66.72 $\pm$ 5.8
Total	85 (100)	2099.3 $\pm$ 284.12	55.52 $\pm$ 7.3
p-value	0.242*	<0.001**	<0.001**

*Chi-square test for trends; **ANOVA test

Table 2: Association between Diet, physical activity and BMI

	Underweight/ normal (BMI ≤ 22.9)	Overweight/ obese (BMI ≥ 23)	Odds ratio (95% CI)
Diet:			
Recommended or less	38(82.6)	8(17.4)	18.4 (6.1-54.6)
More than recommended	8(20.7)	31(79.3)	
Physical activity:			
Adequate	19(57.6)	14(42.4)	1.2 (0.5 – 3.0)
Inadequate	27(51.9)	25(48.1)	

Figure in () indicates row percentage.

Only 38.8% ($n=33$) of the participants were involved in adequate regular physical activity (Table 2). Lack of time

(23.5%, $n=20$), lack of company (20%, $n=17$) and lack of motivation (14.1%, $n=12$) were major reasons for

skipping exercises. There was a significant association (OR=18.4, 95% CI-6.1, 54.6) between excess calorie intake and BMI but not between physical activity and BMI (OR=1.2, 95% CI-0.5, 3) (Table 2).

DISCUSSION

Food industry has been maximum influenced by globalization resulting in acculturation of modern, ready to consume, attractive, pseudo-tasty, maximally advertised and minimally nutritive (empty calorie foods) food called 'Junk foods' with the traditional nutritive Indian diet, gradually, replacing the healthy eating habit to unhealthy food consumption. In the present study 91.8% (n=78) had habit of junk food consumption. Shukla et al in their study among adolescent girls aged 14-19 years documented that 40.7% of students habitually consumed some type of junk food daily.⁶ This was less compared to our study and may be attributed to the higher availability of shops, lesser sample size and higher age group (mean age= 19.32±0.6) years) in our study compared to the former. Habitual junk food consumption changes the entire pattern and frequency of food consumption. The three time meals and two times snacks in between cycle of diet pattern gets broken due to the convenience in consumption of junk food anywhere and anytime. We found that 65% of students in our study skipped meals due to various reasons as mentioned earlier. This leads to erratic timing, quantity and quality (high calorie, low nutritive) of food intake which triggers major enzymatic/hormonal changes in the body splinting-up many non-communicable diseases including obesity. In the study by Kumar et al, 56% of study subjects skipped meals, which was similar to the findings of our study.⁷ Among the students (n=85), the proportion of underweight, normal BMI, overweight and Obesity were 21.2%, 32.9%, 24.7% and 21.2% respectively and were symmetrically distributed among the various BMI categories (p=0.24). In the study done by Geethamani in 2014, the proportion of overweight 24% was similar to our study but obesity 9.3% was comparatively low.⁸ This clearly shows that the incidence of obesity has increased among the dental students over years and it is an alarming trend. This increase in overweight and obesity was attributed to the physical inactivity in a study done by Saranya et al but a significant association of overweight, obesity and physical inactivity could not be established in our study.⁹

CONCLUSION

The study clearly showed that improper dietary habits including high calorie/protein intake was associated with increased BMI among the dental students. The role of regular physical activity alone as a single factor influencing variations in BMI among the students could not be established in the study. Hence proper diet

modifications including avoiding junk foods and including timed healthy food along with physical activity can help in preventing overweight and obesity.

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