Clustering of Dental Caries and Risk of Obesity with Television Viewing among Bangalore North Adolescents

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ABSTRACT

Introduction: The time spent on television viewing has been implicated as a possible risk factor for developing dental caries, particularly to those related to sedentary life style. Study aimed to examine the potential association between excessive TV viewing and dental caries, and its risk of obesity among adolescents in Bangalore north.

Material and methods: A study sample of 250 students between 12-16 years of age were randomly chosen from a school situated in Bangalore north. A self-reported questionnaire was used to collect data on sociodemographic,and television viewing duration. Also a height and weight of the individual were measured along with the clinical dental examination and dental caries was diagnosed by WHO criteria. Comparative evaluation was done to examine the association between time spent viewing television and DMFT and untreated caries among 12-16 years-old adolescents.

Results: Higher caries prevalence was found among children who watched television excessively and asked for more food in-turn resulted in obesity.

Conclusion: Longer extent of television viewing was significantly and reliably associated with higher DMFT and higher risk of obesity among Bangalore north adolescents.

Keywords: Television viewing, Obesity, Dental caries, Adolescents

INTRODUCTION

Dental caries affecting mankind still persisted as one of the most widespread, multifactorial diseases.[1] Its not only widespread among adults but also children, from 60% to 90% of them. In other words, six to nine children in every ten are affected by tooth decay.[2] Modern concept of dental caries includes social and behavioural factors regarding a particular individual.[3]

Childhood obesity has reached epidemic proportions.[4] Obesity is responsible for multiple complications and it is characterized by the energy and metabolism imbalance[5,6] In turn, obesity has been associated with diet, genetic, behavioural and psychological factors.[4] There is a strong dose-response relationship between the occurrence of overweight and hours of television viewed[7]

In current trend, television has become a major part of children's lives and watching TV is the dominant recreational pastime at all ages, especially for children and adolescents. Presently most of the children have a regular access to TV along with portable handheld devices (computer, smartphone, laptop, tablet, i Pad) and they also routinely engage in two or more forms of screen viewing at the same time. As there is no studies done among Bangalore population. The aim of this present study was to examine the potential association between TV viewing and dental caries experience and also its risk of obesity, among adolescents from Bangalore north. This article throws a knowledge about the link between television viewing and dental caries and obesity.

MATERIAL AND METHODS

Ethical committee clearance was taken from Institutional Ethics Committee, Krishnadevaraya college of dental science, Bangalore, Karnataka, India. Approval from the school authorities and informed consent from the parents were obtained. Children belonging to similar socioeconomic backgrounds and having television at home were included in the study. A cross sectional study was planned in which eight questionnaires were prepared and distributed among students of standard 7, 8, and 9 in their respective schools, followed by oral examinations. All examinations were carried out using mouth mirrors and standard explorers, by single examiner to avoid interexaminer variations. Dental caries of all the participating students were recorded using DMFT/dmft index. A total of 250 students aged 12-16 years in the schools of Bangalore north participated in the study. A questionnaire was administered to collect data on sociodemographic and television viewing duration. Also a height and weight of the individual were measured with digital scales (weight to the nearest 0.1 kg) and a portable stadiometer (height to the nearest 0.1 cm) while children were not wearing shoes. The body mass index (BMI) of each child was calculated along with the clinical dental examination and dental caries was diagnosed by WHO criteria.

STATISTICAL ANALYSIS

Descriptive and analytical statistics were done. The *Chi-square test* was done to check differences in proportions between groups. SPSS (Statistical Package for Social Sciences) Version 20.1 (Chicago, USA Inc.) was used for analysis. DMFT scores were considered from the median values i.e 2 and 3. Interactions between dental caries, risk of obesity with television viewing were analysed.

RESULTS

There were 250 adolescents aged 12-16 years out of which boys and girls ratio is 1:1.27.

Table-1A summarises the variables such as age, sex, BMI, ethnicity, area of residence, and source of entertainment where significant difference of dental caries experience was found between males and females at $p < 0.05$ and also age and BMI

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shows statistical significant results at $p < 0.01$.

Table-1B exhibits duration of screen viewing and kind and duration of food consumption while viewing, significant results of increased DMFT were seen among those who watched TV for longer duration, at $p < 0.05$, and also increased DMFT were noted in students who preferred snacks while viewing TV (95.9%) at $p < 0.01$.

Table-2 shows the correlation between TV viewing, BMI and DMFT experience, where the statistical significant result was found as the increase in time spent on TV viewing leads to increased BMI (overweight) and thereby increased caries experience.

Table-3 reveals odds ratios of high caries experience (DMFT ≥3) for 12-16 year olds and T.V. viewing, by age, sex, and BMI where females are commonly affected with the odds ratio of 1.911 significant at $p < 0.05$

Figure-1 gives a perfect description of Caries experience (Low: DMFT ≤2; High: DMFT ≥3) and its relation with T.V. viewing and BMI for 12-16 year olds, in which the results shows that TV viewing of more than 2hrs/day causes increased caries

Variables		Total N (%)	DMFT ≤2 N (%)	DMFT ≥3 N (%)	P-Value
Sex	Males	110 (44.0)	28 (35.0)	82 (48.2)	0.033*
	Females	140 (56.0)	52 (65.0)	88 (51.8)	
Age	12-13 years	077 (30.8)	23 (28.7)	54 (31.8)	0.001†
	14 years	117 (46.8)	28 (35.0)	89 (52.4)	
	15-16 years	056 (22.4)	29 (36.2)	27 (15.9)	
BMI	Underweight	025 (10.0)	20 (25.0)	05 (02.9)	0.001†
	Normal Weight	065 (26.0)	16 (20.0)	49 (28.8)	
	Overweight	115 (46.0)	35 (43.8)	80 (47.1)	
	Obese	45 (18.0)	09 (11.2)	36 (21.2)	
Ethnicity	Originally from Bengaluru	238 (95.2)	73 (91.2)	165 (97.1)	0.133
	Native of Bengaluru	007 (2.8)	04 (5.0)	03 (01.8)	
	Migrated to Bengaluru	005 (2.0)	03 (3.8)	02 (01.2)	
Area of Residence	Urban	014 (5.6)	06 (7.5)	08 (04.7)	0.076
	Semi Urban	207 (82.8)	60 (75.0)	147 (86.5)	
	Rural	29 (11.6)	14 (17.5)	15 (08.8)	
Main Source of Entertainment	Television	134 (53.6)	44 (55.0)	90 (52.9)	0.114
	Computer	080 (32.0)	20 (25.0)	60 (35.3)	
	i-Pad	026 (10.4)	10 (12.5)	16 (09.4)	
	Any Other	010 (4.0)	06 (7.5)	04 (02.4)	

* significant at $p < 0.05$; † significant at $p < 0.01$

Table-1A: Distribution of explanatory variables within groups by caries experience

Variables		Total N (%)	DMFT≤2 N (%)	DMFT ≥3 N (%)	P-Value
Duration of watching T.V./ Computer/ i-Pad	< 30 Mins/day	054 (21.6)	23 (28.7)	31 (18.2)	0.046*
	30 Mins–1 hr/day	086 (34.4)	29 (36.2)	57 (33.5)	
	2 hr/day	071 (28.4)	23 (28.7)	48 (28.2)	
	2-3 hr/day	028 (11.2)	03 (03.8)	25 (14.7)	
	> 3 hr/day	011 (04.4)	02 (02.5)	09 (05.3)	
Preferred channels to watch	Sports	094 (37.6)	26 (32.5)	68 (40.0)	0.175
	News	006 (02.4)	04 (05.0)	02 (01.2)	
	Nat. Geographic / Discovery	012 (04.8)	06 (07.5)	06 (03.5)	
	Cartoon Channels	062 (24.8)	18 (22.5)	44 (25.9)	
	Movie / Songs	076 (30.4)	26 (32.5)	50 (29.4)	
Consume snacks while watching T.V./ Computer/ i-Pad	Yes	217 (87.5)	54 (69.2)	163 (95.9)	0.001†
	No	031 (12.5)	24 (30.8)	07 (04.1)	
Kind of snacks while watching T.V./ Computer/ i-Pad	Food	015 (6.8)	06 (10.7)	09 (05.4)	0.012†
	Snacks	148 (66.7)	28 (50.0)	120 (72.3)	
	Ice-cream	002 (0.9)	00 (00.0)	02 (01.2)	
	Drinks	57 (25.7)	22 (39.3)	35 (21.1)	
Duration of snacking while watching T.V./ Computer/ i-Pad	30 Mins–1 hr/day	142 (64.0)	36 (64.3)	106 (63.9)	0.080
	2 hr/day	056 (25.2)	18 (32.1)	38 (22.9)	
	2-3 hr/day	024 (10.8)	02 (3.6)	22 (13.3)	
Habit of eating snacks at night-time	Yes	112 (46.7)	13 (18.3)	99 (58.6)	0.001†
	No	128 (53.3)	58 (81.7)	70 (41.4)	

* significant at $p < 0.05$; † significant at $p < 0.01$

Table-1B: Distribution of explanatory variables within groups by caries experience (cont.)

Hours of watching T.V.	BMI	Total N (%)	DMFT ≤2 N (%)	DMFT ≥3 N (%)	P-Value
< 30 Mins/day	Underweight	10 (18.5)	09 (39.1)	01 (3.2)	0.001†
	Normal Weight	12 (8.7)	02 (32.3)	10 (22.2)	
	Overweight	21 (38.9)	11 (47.8)	10 (32.3)	
	Obese	11 (20.4)	01 (4.3)	10 (32.3)	
30 Mins–1 hr/day	Underweight	08 (9.3)	06 (20.7)	02 (3.5)	0.006†
	Normal Weight	26 (30.2)	12 (41.4)	14 (24.6)	
	Overweight	39 (45.3)	07 (24.1)	32 (56.1)	
	Obese	13 (15.1)	04 (13.8)	09 (15.8)	
2 hr/day	Underweight	07 (9.9)	05 (21.7)	02 (4.2)	0.030*
	Normal Weight	17 (23.9)	02 (8.7)	15 (31.2)	
	Overweight	38 (53.5)	14 (60.9)	24 (50.0)	
	Obese	09 (12.7)	02 (8.7)	07 (14.6)	
2-3 hr/day	Normal Weight	06 (21.4)	00 (0.0)	06 (24.0)	0.186
	Overweight	14 (50.0)	03 (100.0)	11 (44.0)	
	Obese	08 (28.6)	00 (0.0)	08 (32.0)	
> 3 hr/day	Normal Weight	04 (36.4)	00 (0.0)	04 (44.4)	0.118
	Overweight	03 (27.3)	00 (0.0)	03 (33.3)	
	Obese	04 (36.4)	02 (100.0)	02 (22.2)	

*Significant at $p < 0.05$; † significant at $p < 0.01$

Table-2: Distribution of explanatory variables – hours of watching T.V. and BMI within groups by caries experience

Variables		Odds Ratio	95 % C.I.	P-value
Age (reference: 12-13 yrs)	14 years	3.71	1.58-8.67	0.002†
	15-16 years	5.06	2.28-11.20	0.010†
Sex (Male)	Female	1.911	1.00-3.62	0.047*
Watching T.V. (reference: < 30 mins)	30 Mins–1 hr/day	0.579	0.10-3.114	0.525
	2 hr/day	0.673	0.12-3.50	0.638
	2-3 hr/day	0.909	0.17-4.86	0.912
	> 3 hr/day	2.535	0.33-19.01	0.366
BMI (reference: Underweight)	Normal Weight	0.086	0.02-0.30	0.001†
	Overweight	1.420	0.50-3.98	0.505
	Obese	0.620	0.25-1.51	0.294

*Significant at $p < 0.05$; † significant at $p < 0.01$: model adjusted for age, sex, and BMI; log likelihood chi-square: 257.89, Prob > chi-square:<0.001, Pseudo R-square: 0.279

Table-3: Odds ratios of high caries experience (DMFT ≥3) for 12-16 year olds and T.V. viewing, by age, sex, and BMI

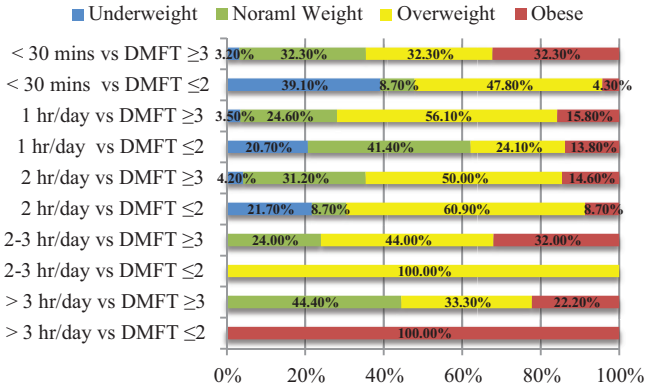

Figure-1: Caries experience (Low: DMFT ≤2; High: DMFT ≥3) and its relation with T.V. viewing and BMI for 12-16 year olds

experience with the higher risk of obesity.

DISCUSSION

In India, Children between the ages of 6-17 viewing television more than 35 hours a week which could severely generate higher prevalence of dental caries and a greater risk of obesity amongst them. The following statistics are dreadful that so many children today sit glued in front of the TV, being brainwashed by all sorts of demonic influences. According to the associated chamber of commerce and industry of India (ASSOCHAM), the average children watches more than 5 hours of TV each day (or 35 hours/week).[8]

The time spent on television viewing has been implicated as a possible risk factor for developing dental caries as they are more likely to consume more sweetened beverages and snacks while viewing TV.[9-11] Our findings are generally consistent with previous studies which have shown amplified viewing time to be linked with increased soft-drink consumption.[3] Thus in our findings higher caries prevalence was found among children who viewed television and asked additionally for more food and soft drinks. The other causative factor is type of channels viewed as it also has influence in dental caries and obesity.[12] About 50% of Cariogenic food advertisements were popular on children's favorite channels.[13] Fruit, vegetables, protein-rich foods products were rarely advertised, whereas foods frequently advertised are rich in fats and sweets, with candy being the most commonly advertised food.[13,14] The advertisement of high sugar products was 38.4% and low sugar products equated for only 17.0%. whereas the promotion of healthy living and oral hygiene

products accounted for only 1.8% and 0.3% respectively.[15] The current analysis also suggest the similar findings.

Incidence of dental caries and obesity is directly proportional to viewing television[6] and we also found an inverse relationship between television viewing and rate of planned physical activity. Because those who watch television for extended periods are likely to be less active than those who watch less television.[4] In our findings Children viewing television more than 2hrs had low physical activity and are also linked to increased consumption of obesogenic foods which may be a indicator for risk of obesity. One of the study done by Ramesh K,2010 reveals that increase in weight was observed in 19.6% children signifying that the television viewing may prompt to childhood obesity. In 30.4% cases decrease in physical activity was found.[16] Thus there is a strong relationship between the hours of television viewed and prevalence of overweight, and decrease in viewing time could help prevent common chronic health condition.[17] Also another stronger marker of increased risk of being overweight is TV in the child's bedroom which is an added effect.[18]

CONCLUSION

This study demonstrated that there is an strong link between Dental caries, obesity and TV viewing among adolescents in Bangalore north as there was a greater likelihood of having increased decayed teeth, risk of obesity with increasing time spent in viewing television.

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