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Association of Dental Caries and Obesity with Television Viewing Practices among School Children of Moradabad City

Ravishankar TL, Aastha Malik*, Amit Tirth and Vaibhav Tandon

Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh, India

***Corresponding author:** Aastha Malik, Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh, India, Tel: 969-071-1100; E-mail: aastha.malik.02@gmail.com

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Abstract

Background: Television viewing has been implicated as a possible risk factor for the increase in a number of chronic diseases, particularly those related to sedentary life style.

Objective: Study was aimed to examine the association of television viewing on oral health and BMI (body mass index) among school children of Moradabad city.

Materials and method: Convenient samples of 1100 children aged 7-12 yrs were recruited from schools of Moradabad. Sixteen-item, close-ended, validated questionnaire were distributed among study subjects and parents of 7 year old children, followed by clinical examination of the students; which includes oral examination and calculating BMI, by a single calibrated examiner in the classroom with adequate natural light.

Results: Of all children 52% watched television for more than 1 hr per day. 62.4% children who had their meals in front of television, 61.9% who demanded snacks after watching advertisements were having dental caries (Decayed Missing Filled Teeth ≥ 1) DMFT and many were found to be overweight who had similar habits. 56.5% of children who watch television for >1 hr were having a plaque score (>2).

Conclusion: The present study shows high prevalence of dental caries, poor oral hygiene and increased BMI was associated with television viewing habits of children.

Keywords: Dental caries; BMI; Television viewing

Introduction

The rapid economic changes over the past few decades have been accompanied by changes in behavioural patterns, lifestyle and cultural norms. As a result of those changes, there is more sedentary lifestyle and changes in dietary habits [1]. Television viewing is one of the notable changes in our social environment in the 21st century that has a particularly detrimental effect on children's wellbeing [2]. Television began in India on 15th September 1959 as an experiment. Very few homes had television sets some fifty years ago. Till 1990s Doordarshan was the only channel available to a vast majority of Indians. In 1990 advent of private channels in India began. The mind of child is like clay. It forms early impressions on what it sees, and these early impressions determine how he/she sees the world and affect his grown-up behaviour and television plays an important role in it. Television viewing is a dominant sedentary pastime at all ages [3]. It has a great impact on general health of children and adolescents. Many of whom are not yet mature enough to distinguish fantasy from reality, particularly when it is presented as "real life". Excess television exposure leads to subsequent aggressive behaviour, ideas, arousal, and anger [2]. Association between TV viewing and suicidal behaviour has also been reported in some studies [4]. Primack et al. [5] showed that excessive TV viewing is a risk factor for development of depression in young adulthood. Some authors found that the more time children spent watching TV, the less time they spent with their families [6]. Lack of sleep because of more TV viewing, results of which, children become less alert during the day, and this results in poor school performance. Television viewing also has certain effects on oral health of children. Now a days, children spend longer hours watching TV that leads to a reduction in physical activities and an increase in consumption of unhealthy snacks while watching TV, that results in obesity [7]. Several studies also reported that the frequency and the time of food advertisements on TV were directly linked to increased consumption of obesogenic foods [8]. Rodd and Patel [9] found that 34% of the advertisements were related to food and drink products on children's channels, 95% of these being deemed potentially cariogenic or erosive to teeth. The current periodontitis disease model emphasizes on the influence of behavioural factors which influence progression of disease [10]. Sedentary lifestyle and unhealthy eating habits could lead to poor oral hygiene statuses and increase the tendency to develop periodontitis and obesity at young ages [11]. So the current study was done to assess the relation between television viewing, BMI and oral health among school going children of Moradabad city.

Materials and Methods

A cross-sectional questionnaire based study was conducted among school going students aged 7-12 yrs of Moradabad city to assess the relation between Dental caries, BMI with television viewing practices/habits. Ethical clearance was obtained from institutional ethics and review board KDCRC, Moradabad. Approval from the school authorities and informed consent from the parents and children were

obtained. A convenient sample of 1100 school children aged 7-12 yrs were recruited from five private and four government schools of Moradabad city. Children with special health care needs and children/parents who were not willing to participate were excluded. Two sets of sixteen item, close ended, validated questionnaire were formulated with similar meaning, one for the students aged 8-9 yrs, 9-10 yrs, 11-12 yrs and other for parents of children aged 7 years. These pre-structured questionnaires elicited the information regarding children's hours of television viewing, frequency of television viewing, their preference of having meals while watching television etc. The pre structured questionnaires were distributed among students and parents of 5-6 yrs students in their respective schools followed by clinical examination of the students, which includes oral examination and calculating the Body Mass Index (BMI). Dental caries of all participants was recorded by using DMFT/DMFS indices and plaque status was recorded by using modified Silness & Loe Index. Only permanent teeth were used for accessing the plaque index by a single calibrated examiner in the classroom with adequate natural light. The duly filled questionnaires were collected from the participants on the same day. The comparative analysis of BMI, Dental caries with responses to the pre-structured questionnaire, was done using Pearson Chi-square test. Statistical significance was set at p-value ≤ 0.05.

Results

Out of 1100 children aged 7-12 yrs 53.5% were boys and 46.5% were girls. Of all the children 48% watched television for less than 1 hr per day, 52% watched television for more than 1 hour per day. 69.5% children preferred to watch television during weekdays and 30.5% watched television during weekends. Of all the children 61.1% took their meals in front of television and 38.9% on dining tables. 59.1% of the children demanded snacks after watching advertisements. 38.1% children of the study population avoided playing games just to watch television (Table 1).

Questions	Response A	Response B
Hours of watching television? (a) 0-30 min (b) 30 min-1 hr (c) 1-2 hr (d) >2 hr	528 (48%) (a+b)	572 (52%) (c+d)
When do you watch more television? (a) Weekdays (b) Weekends	764 (69.5%)	336 (30.5%)
Where do you take your meals? (a) In front of television (b) On dining table	672 (61.1%)	428 (38.9%)
Do you prefer watching television while eating? (a) Yes (b) No	684 (62.2%)	416 (37.8%)
Do you demand purchasing eatables after watching its advertisements? (a) Yes (b) No	650 (59.1%)	450 (40.9%)
Do you avoid playing games just to see television? (a) Yes (b) No	419 (38.1%)	681 (61.9%)
Frequency of eating while watching television? (a) Often (b) Always	678 (61.6%)	422 (38.4%)
Do you like going for outdoor games while your vacations and weekends? (a) Yes (b) No	646 (58.7%)	454 (41.3%)

Table 1: Responses of Study Population to the Questionnaire.

The association of DMFT in responses to the questionnaire is shown in Table 2: out of 1100 children 27.09% had a DMFT score (0), whereas almost 72.9% had a DMFT score (≥ 1). On evaluating 62.4% & 61.9% of children were having dental caries (DMFT score (≥ 1).) who had their meals in front of television and who demanded for snacks after watching advertisements and the results were found to be statistically significant (≤ 0.05).

Questions	Options	DMFT=0 n=298	DMFT ≥ 1 n= 802	p-value
Hours of watching television	a	78 (26%)	198 (25%)	0.543
	b	64 (22%)	188 (24%)	
	c	87 (30%)	256 (32%)	
	d	69 (24%)	160 (20%)	
Where do you take your meals?	a	171 (57.4%)	501 (62.4%)	0.024*

	b	127 (42.6%)	301 (37.5%)	
Do you prefer watching television while eating?	a	183 (61.4%)	501 (62.4%)	0.747
	b	115 (38.5%)	301 (37.5%)	
Do you demand purchasing eatables after watching its advertisements?	a	160 (53.6%)	490 (61.9%)	0.026*
	b	138 (46.3%)	312 (38.9%)	
Do you avoid playing games just to see television?	a	103 (34.5%)	316 (39.4%)	0.142
	b	195 (65.4%)	486 (60.5%)	

Table 2: Association of DMFT with Television Viewing Habit/ Practices [Statistically significant= (*)].

Among whole of the study population 12.9% children were under weight (≤ 18.5), 55.27% were normal (19-24.5) and 31.8% were overweight (≥ 25).On evaluation, 64.5% & 65.7% children of study population were found to be overweight ,who had their meals in front of television and who demanded purchasing snacks after watching advertisements and the results were found to be statistically significant (≤ 0.05), whereas 40.5% of children among the study population who avoided playing games just to see television were also found to be overweight and the results were found to be statistically significant (≤ 0.05) (Table 3).

Questions	**Option**	**BMI ≤ 18.5**	**BMI 18.5-24.9**	**BMI ≥ 25**	**p-value**
		n=142	**n=608**	**n=350**	
Hours of watching television	a	46 (32.3%)	144 (23.6%)	86 (24.5%)	0.55
	b	40 (28.1%)	130 (21.3%)	82 (23.4%)	
	c	38 (26.7%)	196 (32.2%)	109 (31.1%)	
	d	18 (12.6%)	138 (22.6%)	73 (20.8%)	
Where do you take your meals?	a	65 (45.7%)	382 (62.8%)	225 (64.2%)	<0.001*
	b	77 (54.2%)	226 (37.1%)	125 (35.7%)	
Do you prefer watching television while eating?	a	82 (57.7%)	376 (61.8%)	226 (64.5%)	0.356
	b	60 (42.2%)	232 (38.1%)	124 (35.4%)	
Do you demand purchasing eatables after watching its advertisements?	a	53 (37.3%)	367 (60.3%)	230 (65.7%)	0.55
	b	89 (62.6%)	241 (39.6%)	120 (34.2%)	
Do you avoid playing games just to see television?	a	33 (23.2%)	244 (40.1%)	142 (40.5%)	<0.001*
	b	109 (76.7%)	364 (59.8%)	208 (59.4%)	

Table 3: Association of BMI with Television Viewing Habit/ Practices [Statistically significant= (*)].

Table 4 shows of whole study population only 3.45% of the children were having good oral hygiene i.e. (Plaque Index score=0), whereas 56% children were having fair (score=1) oral hygiene and 40.5% were having (score=2+3) i.e. score=2 (poor) and score=3 (very poor) oral hygiene. On evaluation 56.5% (c+d) of children who watch television for >1 hr were having a plaque score (>2). Those who watch television for <1 hr were having score (<2) and the results were found to be statistically significant (≤ 0.05).

Questions	Option	Dental Cleanliness Score (0)	Dental Cleanliness Score (1)	Dental Cleanliness Score (2+3)	p-value
		n=38	n=616	n=446	
Hours Of Watching Television	a	15 (39.4%)	145 (23.5%)	11 (26%)	0.016*
	b	10 (26.3%)	164 (26.6%)	78 (17.4%)	

	c	8 (21.05%)	186 (30.1%)	149 (33.4%)	
	d	5 (13.1%)	121 (19.6%)	103 (23.1%)	
Where Do You Take Your Meals?	a	15 (39.4%)	377 (61.2%)	280 (62.7%)	0.004*
	b	23 (60.5%)	239 (38.7%)	166 (37.2%)	
Do you demand purchasing eatables after watching its advertisements?	a	11 (28.9%)	365 (59.2%)	273 (61.2%)	0.001*
	b	27 (71.05%)	251 (40.7%)	173 (38.7%)	
Do you avoid playing games just to see television?	a	6 (15.7%)	226 (36.6%)	187 (41.9%)	0.009*
	b	32 (84.2%)	390 (63.3%)	259 (58.1%)	
Do you brush your teeth before going to bed?	a	31 (81.5%)	296 (48.05%)	212 (47.5%)	<0.001*
	b	7 (18.42%)	320 (51.9%)	234 (52.4%)	

Table 4: Association of Dental Cleanliness with Television Viewing Habit/Practices [Statistically significant= (*)].

62.7% of the children among study population were having Plaque Index score (3) who had their meals in front of television, 61.2% children of the study population demanded purchasing snacks after watching advertisements.

Discussion

The commercialization of children's television programs is one of the several concerns raised by child health professionals, regarding the impact of television on children's wellbeing [12]. The current study was done to assess the influence of television viewing practice/habit on children and its impact on their oral health. 52% of the children watch television for more than one hour per day which is similar to the study done by Jorge Motal et al. [13]. Earlier there was no cable television. Recently, television service providers offer a set of programs that can be watched at any time, television set in the child's bedroom which lacks parental control over television viewing time is also one of the reasons for more television viewing. Children who are marginalized by their peers use TV to escape the stresses of their lives and meet their social needs [14]. Parents watch more television these days is also one of the reasons for watching more television. Hoyos et al. [15] stated that the parents who watch more television, their children are 5 times likely to do the same. Children spend more time watching TV, results in significantly shorter amount of time with their friends and family, causing poor peer relationships and thereby increase the risk for social isolation, anxiety disorder, agoraphobia, and antisocial behaviour, including aggression and gang involvement Bick ham et al. [16].

When analyzed 32% of the children in current study were found to be overweight, of which 64.2% children had their meals in front of television. That means more than half of the overweight children had their meal watching television. There is also a positive relationship between dental caries and having meals before television. 62.4% of the children with dental caries (DMFT>1) had their meals watching television. Dietz and Gortmaker [17] stated that each additional hour of TV viewing per week increased the risk of obesity by 2%. Chaput JP et al. [3] stated that watching television is a distracting activity that makes the eater ignore the sensations of satiety and fullness, which often leads to over consumption of food. TV watching is associated with more 'mindless' eating, and may thus increase the amount of foods and thus the amount of calories consumed Vik N Froydis et al. [18]. Children who spend more time in front of television, tends to eat more junk food Geeta and Sunita [19]. As snacks are consumed more frequently during television viewing than any of the meals, that contributes to increased energy intake and more amount of acid secretion as food is consumed for longer time duration and thereby is associated with increased dental caries and BMI.

59.1% of the children demanded eatables after watching its advertisements, of which 61.9% had dental caries (DMFT score ≥ 1) and majority of them were overweight (65.7%) which is similar to the study done by Ghimire Neeta and Rao Arathi in Mangalore city. This suggests that advertisements do have an influence on children's character, behaviour, and eating habits, thus resulting in higher caries prevalence [20]. Television is the most efficient and effective promotional tool, especially when the target group is children [21]. Majority of the children watch cartoon channels regularly. Majority of advertisements on these channels are of food/ drinks which are high in sugar content, therefore deemed to be potentially cariogenic Morgan Maria et al. [22]. Certain studies revealed that fruits, vegetables, protein-rich foods (i.e. meat, fish, poultry, beans, nuts, and eggs), and dairy products are rarely advertised, whereas foods rich in fats and sweets are advertised frequently, with candy being the most commonly advertised food Carol Byrd-Bredbenner [23]. Watching advertisements can also become conditioned cues for eating, such that a child who is not hungry and begins television watching may find that the advertisements related to food products cues eating [24]. In the present study 38.1 % children of the whole study population avoided playing just to see the television of which 39.1% had a dental caries (DMFT score ≥ 1) and around 41% of children were found to be overweight which was found to be statistically significant. This might be due to sedentary behaviour that generally involves sitting or lying down, and include television viewing, using a computer, reading and drawing etc.

Parents now days especially in cities avoid telling their children to go outside and play, keep themselves busy and not come inside until dark! Today's parents appear to be shifting their focus away from providing physically active free-play opportunities for their kids. As now a days majority of the families in cities are nuclear and parents being more protective in nature, they want their children always to be under supervision while playing, which is not possible every day, so they prefer opting for organized sports and recreation programs. This is one of the reasons that children watch more TV on weekdays than

on weekends as they are more indulged into recreation programs and organized sports. Our results also shows that 69.5% children of the whole study population watch more television on weekdays as a result of which, they are less likely to participate in vigorous activities and tend to have higher BMI Durant et al. [25].

The results of our study also show that 40.5% of study population had poor oral hygiene status when it is recorded with the help of Plaque Index (Silness & Loe). 56% children among study population had a plaque score (≥ 2) who watched television for (>1 hr). Whereas 62.7% and 61.2% children were also having a plaque score (≥ 2) who had their meals in front of television and those who demanded purchasing snacks after watching its advertisements. Nithya Anand et al. stated that children who spent more time watching television were having poor oral hygiene, as their consumption of soft drinks, sticky food and fast foods was more, and due to the consumption of food for longer duration of time while watching television. Sedentary lifestyle and unhealthy eating habits can lead to poor oral hygiene status and increase the tendency to develop periodontitis and obesity at young ages [11].

Conclusion

The present study shows high prevalence of dental caries, poor oral hygiene and increased BMI in children, as majority of the children spend more time watching television especially cartoon channels on which majority of advertisements are of food/ drinks which are high in sugar content and are potentially cariogenic. Parents can use specific parenting practices, such as rules on television viewing by reducing TV viewing time will be beneficial. Ideally, children need to spend several hours outdoors every day. This is not only a matter of improving a child's immediate health condition, but also ensuring excellent health in the long term, thereby reducing the future burden of subsequent adult chronic diseases. We need to find ways to optimize the role of TV in our society, taking advantage of their positive attributes and minimizing their negative ones.

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