

# The Oral Hygiene Habits and General Oral Awareness in Public Schools in Mumbai

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## ABSTRACT

This paper is based on previous research carried out on the topic of oral hygiene. In this literature review, various studies have been considered, some from outside of India as well as some from within India, which is the origin of our research. This was done to obtain a global view of the topic and also to be able to compare how Indian oral hygiene and awareness compares with the same for the rest of the world.

In a study conducted in 2011 that pertained to the oral health practices was conducted in the rural areas of the Kanchipuram District in Tamil Nadu, India. The participants were children between the ages of 5 and 10. The mean age of the children was 8.5 years and there were a total of 81 participants. The aim of this survey was 'to evaluate the awareness and knowledge among the rural children on the dental health problems, their oral hygiene practices and the pattern of practices of dental treatment.' A number of results pertained to the oral health practices of the participants. A number of results pertained to the oral health practices of the participants were found in the study by authors VC Punita, P Sivaprakasam, in the rural children of Kanchipuram in the year 2011.<sup>14</sup>

Out of the 81 children participating, only 51 children used toothbrushes while the rest used their fingers as a tool to clean their teeth. That accounts to only 62.96% brushing their teeth with brushes. This is attributed to the children coming from a 'very low socioeconomic background'. It was reported that 92.59% of the participants brushed their teeth once a day and 7.40% brushed twice a day. Moreover, only 45 out of the 81 children used toothpaste (55.55%) while the rest used twigs of the *Azadirachta indica* plant, traditionally known as datum, in combination with chalk powder, charcoal or sand. From the children who used brushes, 50.98% of them changed their brush when it got worn out, 27.44% of the participants changed their brush every 3 to 6 months. While the rest did not know how often they changed their brush.

The author concludes that 'by giving adequate information, motivation and practice of the measure to the subject' this situation can be improved.

In recent study done in 2012 authors Mehta A and Kaur G, it was found that 71.4% of the participants used a toothbrush with toothpaste, which is significantly higher than the 62.69% used by participants in the previously described study.<sup>18</sup> Moreover, in this study, only 1.4% of participants used the *Azadirachta indica* twigs to clean their teeth, which is a significantly better result than the previous study. In this study, 25% of participants brushed their teeth more than once a day, which is a major improvement over the 7.40%, reported in the previous experiment.

In a study conducted by Amin and Al-Asad on the 'Oral hygiene practices, dental knowledge, dietary habits and their relation to caries among male primary school children in

Al-Hassa, Saudi Arabia' (2008). This study showed similar results in Saudi Arabia to those in the first study discussed. A total of 24.5% of the students brushed their teeth more than twice a day. However, 44.6% of the students used Malwak which is similar to the *Azadirachta indica* used in the first and second studies.

Another important segment of our study is tobacco use. Tobacco is classified in two forms, one which is smoked and the other which is used in forms other than being smoked. Smoked tobacco includes cigars, cigarettes, pipes, hookahs, bidis and kreteks. Smokeless forms of tobacco include betel nut, pan, pan masala and snus.

Another important study was conducted in Bangalore, which focused on various oral practices and oral health in missionary schools in Bangalore. They studied the oral health of school children of the age 11- to 12-year-old.<sup>19</sup> From all the participants studied, 5.4% of them smoked cigarettes at least once a week while 3.9% of the chewed tobacco at least once a week. These results are eye opening as the children who took part in the experiment were 11 to 12 years old and tobacco use at such a young age is extremely harmful.

The other articles lacked knowledge about tobacco use in the participants.

Another aspect of our study is the diet of our participants. A study was conducted to compare oral habits and oral health knowledge in American school students living in Amritsar and Indian school children living in the same city.<sup>20</sup>

It was concluded that the diets of the school students compared was found to be 'comparable.' (Grewal and Kaur (2007). This was attributed to the urbanization of cities in India. However, the hygiene practices in the group of Indian participants was different from that of the American participants. The author suggests the hygiene practices in the group of Indian participants have not changed over time.

The last aspect of our study is oral health knowledge. In the study conducted in the Panchkula district, it was found that 83.2% of participants knew the importance of brushing regularly.<sup>18</sup> Moreover, 69.5% of participants stated that the importance of visiting a dentist regularly, which is to maintain healthy teeth. Around 17.6% of the participants knew the benefit of using toothpaste which contained fluoride. Lastly, 41.8% of the participants knew that the consumption of sugary foods can result in dental caries.

**Keywords:** Survey, Tobacco, Dental health, Oral health status, Caries, Diet.

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## INTRODUCTION

Oral health is an integral part of the general health and well-being of an individual. Tooth decay and gum disease are among the most widespread conditions in human population, affecting over 80% of school children in some countries.<sup>1-3</sup>

Early childhood caries is a disease characterized by severe decay in the teeth of infants or young children. Early childhood caries (ECC) is a very common bacterial infection affecting 70% children worldwide. While education should be promoted, especially in high-risk communities and population groups (low-income families and native population), it should not be the only preventive strategy of ECC. Early screening for signs of caries development, starting from the first year of life, could identify infants and toddlers who are at risk of developing ECC and assist in providing information to parents about how to promote oral health and prevent the development of tooth decay.<sup>4</sup>

The majority of children in India from the low socio-economic strata of society have never visited a dentist or been for a dental check-up. This is primarily because of economic constraints, insufficient awareness and low parental literacy rates. Primary preventive dental treatment, which is a fundamental step to maintain optimal oral health, is inaccessible to this group of people.

Primary prevention can be defined as 'action taken prior to onset of disease which removes the possibility that a disease will occur' (Soben Peter). Modes of intervention in primary prevention are as follows:

1. Health promotion through health education, environmental modification, nutritional interventions and lifestyle changes.
2. Specific prevention, e.g. fluorides and pit and fissure for caries prevention.

Also primary preventive treatment helps to prevent medical indigence. Medical indigence constitutes an inability to pay large bills for medical care which the lower socioeconomic strata of society can ill afford.

The American Academy of Pediatric Dentistry's recommendation is 'first visit by first birthday' and then at intervals recommended by their dentist.<sup>5</sup>

A study in the Journal Pediatrics showed that children who have their first dental visit before age one have 40% lower dental costs in their 5 five years than children who do not, due to the cost of dental and medical procedures that may be necessary as a result of poor oral health.<sup>5</sup>

## AIMS OF THE SURVEY

The aim of our survey was to assess the:

1. Awareness of oral hygiene habits and methods of prevention

2. Dietary habits
3. Awareness of tobacco and its ill effects
4. Awareness of the role of the dentist frequency of dental visits.

## METHODOLOGY

Surveys were performed across three municipal (government aided) schools around the western suburbs of Mumbai, India. A total of 169 children between the age of 7 and 17 participated in the survey. The survey consisted of open-ended and close-ended questions. The study focused on oral hygiene habits, frequency of cleaning, cleaning aids used, tobacco use, knowledge of who a dentist is and the frequency of visits to a dentist and dietary habits. The assessment of a participant's oral health-related knowledge also included questions on the benefits of fluoride, the need for regular dental visits and the role of sugar in causing dental caries. The survey consisted of 25 questions and was divided into three sections namely personal information, dietary habits and oral hygiene. This particular research paper does not take into account the dietary habits section in detail. Another separate paper will focus on that aspect of the survey.

The team comprised of a periodontist, nonclinical personnel, a local social worker, a dental student and a high school student. The surveys were conducted personally. This was chosen as the data collection method since some of the questions were open ended and needed detailed explanation. All the subjects were interviewed in their respective school premises. The interviews were conducted in Hindi as it was the medium of instruction.

The independent variable controlled in this experiment was the socioeconomic strata of the children who took the survey. Children attending public schools in India hail from lowmiddle-income households. Moreover, India is considered as a lower-middle income economy and hence studying these middle-lower incomes is important as they make up the largest proportion of India's population.<sup>6</sup>

The sampling method employed in this survey is purposive sampling. The children picked from the schools were selected at random.

## LIMITATIONS AND ERRORS

A limitation of this survey is the interviewer bias that could have affected the interviewee's answers. Interviewer bias is defined as 'the influence of the interviewer on the interviewee'. This may result from several factors, including the physical and psychological characteristics of the interviewer, which may affect the interviewees and cause differential responses among them.<sup>7</sup>

Another error rises from inaccurate information given by the interviewee while taking the interview. These are qualitative errors and hence cannot be quantified; however, these errors should be kept in mind.

Moreover, this research paper is limited to only the school children in urban Mumbai; however children from rural have not been included, hence this is a limiting factor for this research paper.

Another error is the misinterpretation of answers given by the interviewee, this is a human error, however to minimize the risk of this error videos were taken of some of the interviews and were referred to later to check the validity of the answers that were taken down by the interviewers. This was done as a measure to minimize the risk of human error.

Our study also lacked a clinical examination of the participants. A clinical examination would have substantiated our survey.

One major limitation of this study is the use of open-ended questions. As a result of this, it was a challenge to effectively and concisely collate and represent the data because of the varied answers the surveyors received. The intent of the open-ended questions was to not lead them to an answer and hence give us an indication of the awareness levels.

## RESULTS

In the survey conducted, there were a total of 169 students across three schools. Out of this 169, 87 of the participants were males while the other 162 were females. The children were aged from 7 to 17 years of age. The results are depicted in the form of Tables and Graphs.

### ORAL HEALTH PRACTICES

The crux of the survey was to investigate the oral hygiene practices and awareness levels in the school children.

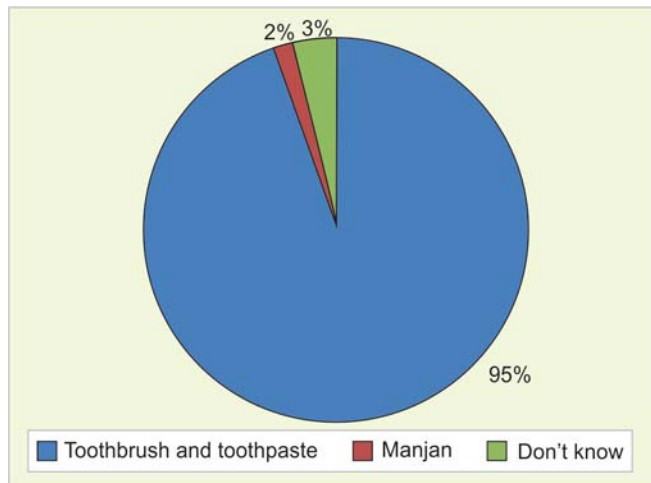
Out of the 169 participants asked about the method, they used to clean teeth, 160 of them used a toothbrush and toothpaste. Hence, 94.7% of the participants used this method. Three participants (1.8%) used Manjan (local concoctions) while six participants (3.5%) did not know which method they used. The results are published in Graph 1.

The results for the brushing technique used by the participants is given in Graph 2.

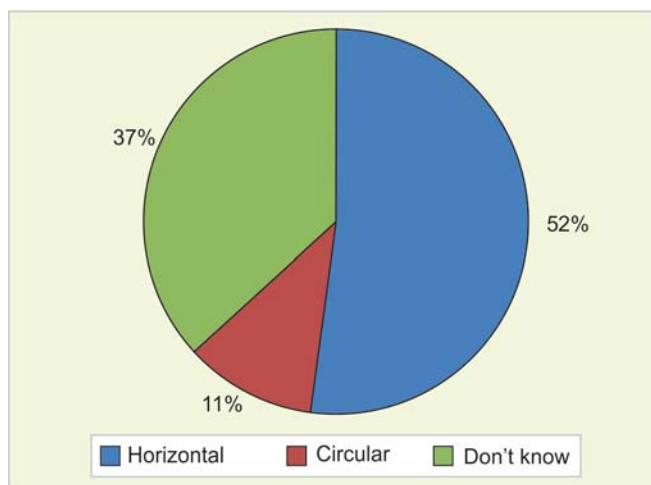
The results for the question ‘how often do you change your toothbrush?’ are given below in Table 1 and Graph 3.

The next question was ‘who taught you how to brush?’, the results are given in Table 2 and Graph 4.

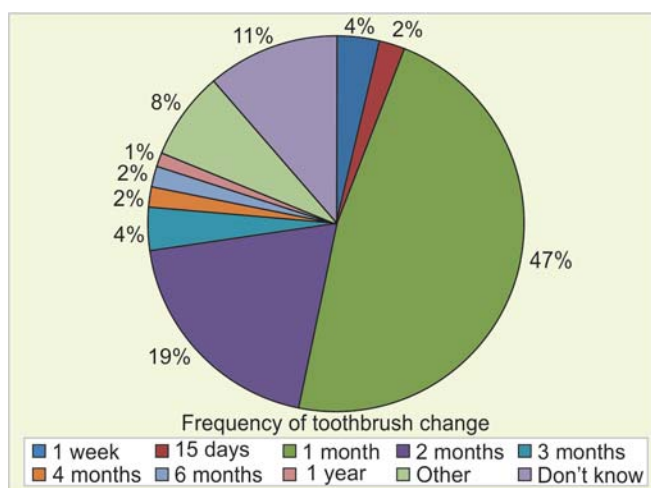
The following question was to evaluate how many of the participants cleaned their tongue (Graphs 5 and 6). We also assessed how they cleaned their tongue.



Graph 1: Method used to clean teeth



Graph 2: Brushing technique



Graph 3: How often do you change your toothbrush

### DENTAL PROBLEM

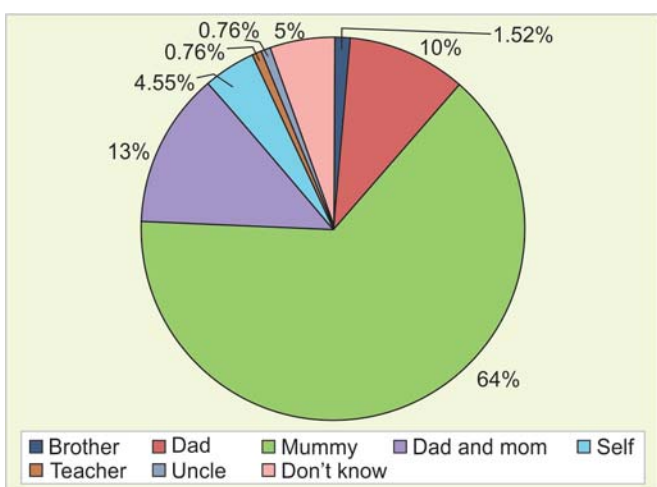
The next question was asked to assess the number of the participants who have experienced dental problems. Around 49% of the participants stated that they had experienced dental problems while 51% of participants said they had not experienced dental problems (Graph 7).

**Table 1:** Results of the question 'how often do you change your toothbrush?'

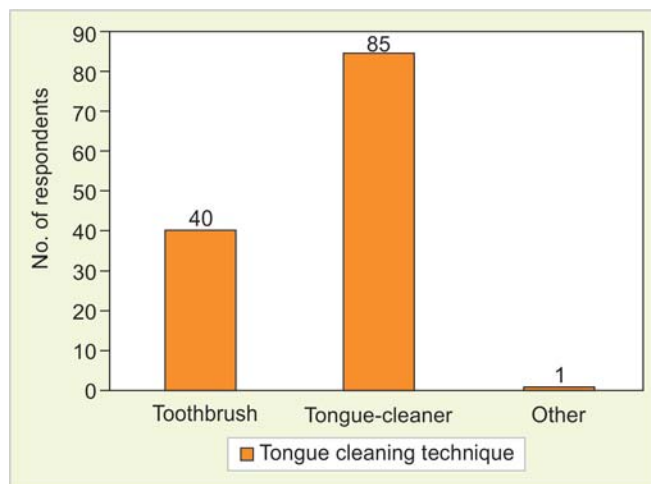
	Frequency	Percentage
1 week	6	4
15 days	4	2
1 month	80	47
2 months	33	19
3 months	6	4
4 months	3	2
6 months	3	2
1 year	2	1
Other	13	8
Don't know	19	11

**Table 2:** Results of the question 'who taught you how to brush?'

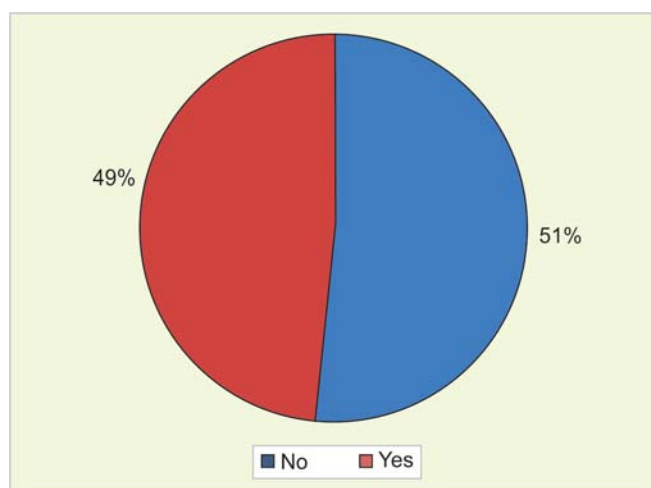
	Frequency	Percentage
Brother	2	1.52
Dad	13	9.85
Mummy	85	64
Dad and Mom	17	13
Self	6	4.55
Teacher	1	0.76
Uncle	1	0.76
Don't know	7	5
Total	132	100.0



**Graph 4:** Answers to question 'who taught you how to brush?'



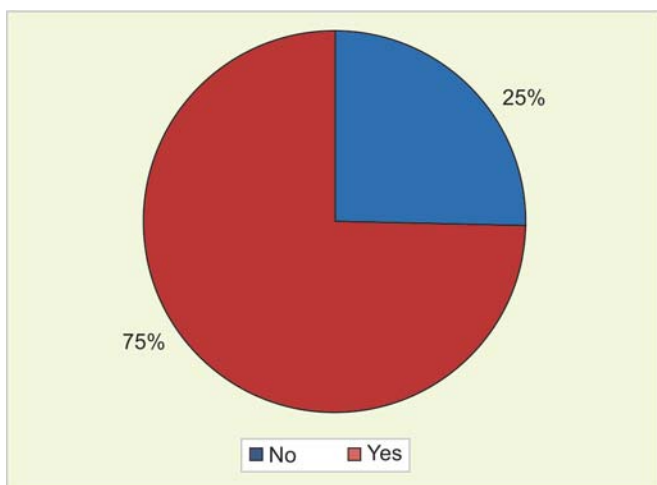
**Graph 6:** Tongue cleaning technique



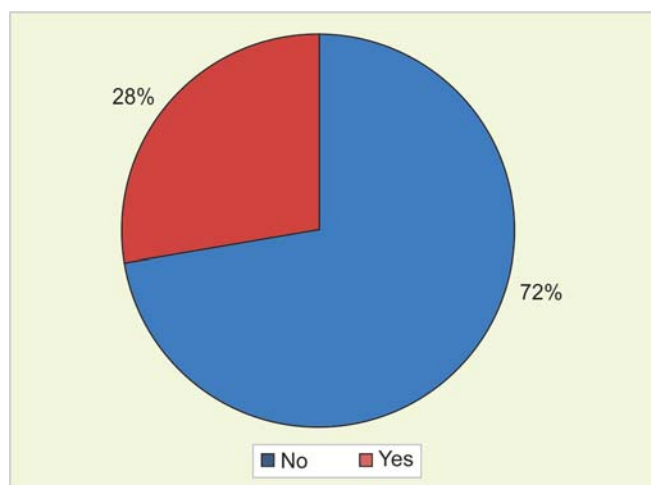
**Graph 7:** Dental problem

**AWARENESS OF DENTIST**

The next question which was a crucial one in our survey was how many knew who a dentist is. Majority of 72% were not aware who a dentist is and had never been to a dentist (Graph 8).



**Graph 5:** Tongue cleaning



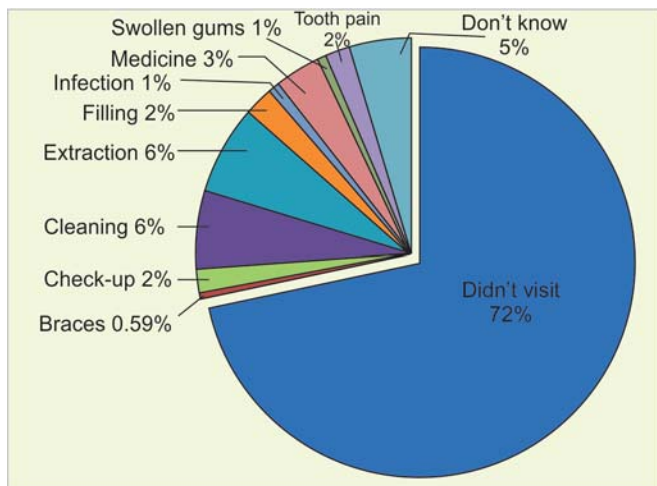
**Graph 8:** Awareness of dentist

### VISITS TO DENTIST AND TREATMENT TAKEN AT DENTIST

The next question dealt with how many had visited a dentist and what treatment they had taken. Out of 169 participants, 28% of the participants had visited dentist and 72% of the participants had not (Graph 9 and Table 3).

**Table 3: Treatments done at the dentist**

	Percentage
Swollen gums	1
Tooth pain	2
Medicine	3
Infection	1
Fillings	2
Extraction	6
Cleaning	6
Check-up	2
Braces	0.59
Don't know	5



**Graph 9:** Visits to dentist and treatment taken

### TOBACCO HABIT

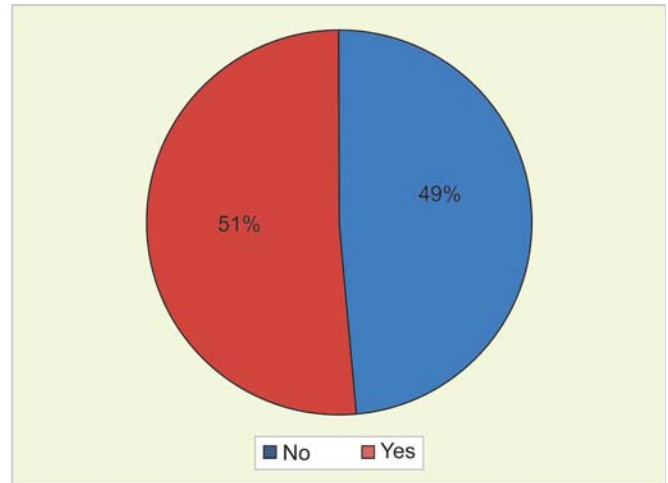
The next topic of the survey covered was the awareness of the ill effects of tobacco and the use of tobacco. The results have been illustrated in Graphs 10 and 11 and Tables 4 and 5 respectively.

### DIETARY HABITS

Out of the 169 students questioned, two of them ate only once a day which is 1.2% of the entire participant group. Around 50 out of the 169 students ate twice a day (29.6%), 114 of them ate thrice a day (67.4%) and three of the participants ate more than thrice a day (1.8%). These results have been showcased in Table 6 and Graph 12. The eating frequency includes only meals and not snacks in between meals.

### BEVERAGE CONSUMPTION

The survey found that a high proportion of the participants (145) which amounts to 85.8% consume fizzy drinks.



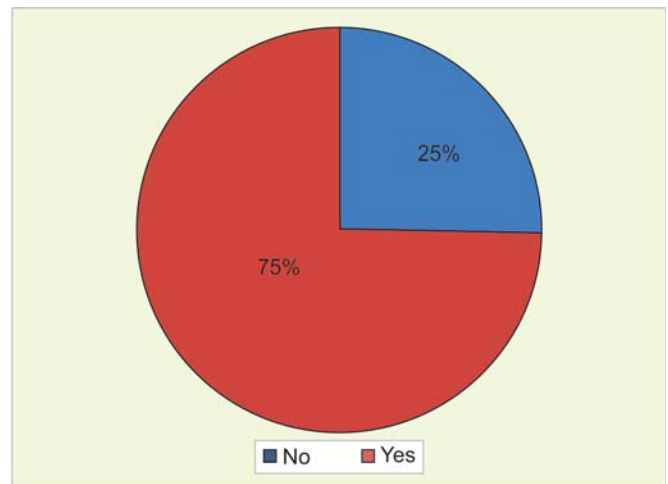
**Graph 10:** Tobacco habit

**Table 4: Gender and tobacco habit cross-tabulation**

	Tobacco habit		Total
	No	Yes	
Gender Female	34	48	82
Male	49	38	87
Total	83	86	169

**Table 5: Awareness of ill effects of tobacco**

	Percentage
Yes	75
No	25



**Graph 11:** Awareness of ill-effects of tobacco

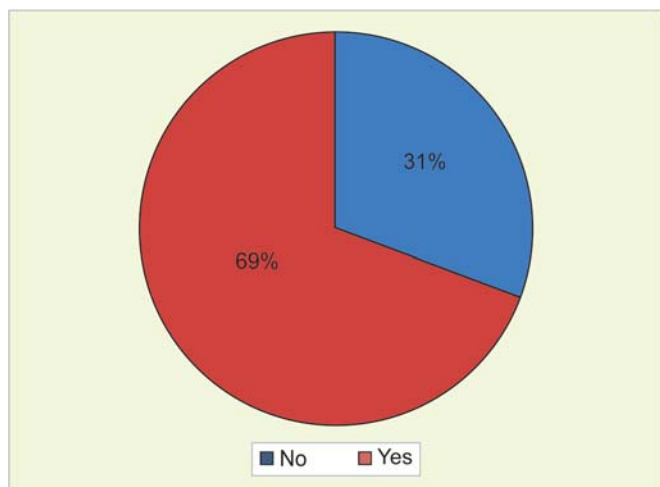
While 14.2% of the participants do not consume fizzy drinks (Table 7, Graphs 13 and 14).

Out of the 145 who consume fizzy drinks, 22 (15.2%) of them consume it every day, 66 (45.5%) of the participants consume fizzy drinks every week while the rest of the participants (39.3%) consume fizzy drinks once in a while.

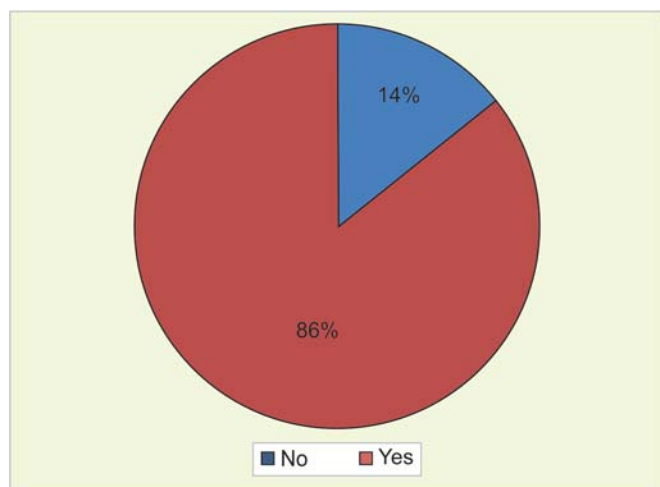
Also out of the 169 participants, none (0%) of them were aware of fluoride and floss.

**Table 6:** Snacking in-between meals

	Frequency	Percentage
No	52	30.8
Yes	117	69.2
Total	169	100.0



**Graph 12:** Snacking in-between meals



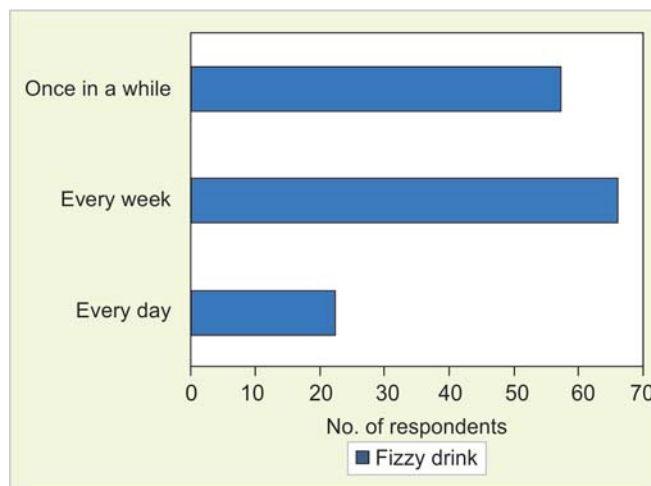
**Graph 13:** Consumption of fizzy drinks

**DISCUSSION**

Oral health is essential for one’s overall wellness and it is an integral part of one’s physical, social and mental well-being. Poor oral health can cause pain, diminish the quality of life and contribute to diabetes, cardiovascular and lung disease.<sup>8</sup>

**Table 7:** Consumption of fizzy drinks

Fizzy drink	Frequency	Percentage
No	24	14.2
Yes	145	85.8
Total	169	100.0



**Graph 14:** Fizzy drink consumption

It is very important to instill good oral health practices from a young age to ensure long-term dental health and hygiene.

‘Over the past two decades, a marked decline in dental caries experience of children has been observed in many industrialized countries.<sup>9,10</sup> Against this, increasing levels of dental caries have been found in some developing countries, especially for countries where preventive programs have not been established.’<sup>11-13</sup>

India is one such country wherein preventive programs have not been completely established and this reflected in the results, which have been discussed below. In the study conducted in the rural areas of Kanchipuram District, only 62.69% of the participants brushed while the rest used their fingers.<sup>14</sup> However, the results obtained from the study show that 94.7% of all the participants brushed their teeth. This is a large difference and it can be attributed to the urban setting of this study. The urban population is exposed to a large amount of advertising and awareness campaigns, which has led to the 94.7% of the participants using toothbrushes. Moreover, 75% of the participants used either a toothbrush or a tongue cleaner as a tool to clean their tongue. This can be attributed to tongue cleaning being a deeply rooted cultural practice in India. Interestingly, none of them were confident of the brushing technique. This could be because the brushing knowledge came from the mother, sibling or relative, most of which in this case were uneducated.

**However, 0% of the participants used floss to clean their teeth and also none of the participants knew the benefits of fluoride.**

Tobacco use was another topic, which produced startling results. Fifty-one percent of the students surveyed had a tobacco habit. In a nationwide study conducted in 2003, it was noticed that ‘16% of the study population (29.3% men and 2.3% women) smoked tobacco; 20% of the study population (28.1% men and 12.0% women) chewed

tobacco/pan masala; and 30% of the study population (46.5% men and 13.8% women) either smoked or chewed tobacco.<sup>15</sup>

Tobacco (smokeless) use in the students surveyed was much higher (51%) among school children than the general population (30%). This is surprising considering 75% of the students surveyed knew the ill effects of tobacco use. Perhaps, they were not aware that some of the products they consumed contained tobacco. Our investigators concluded that peer pressure to be a prime influencing factor as groups of friends were found to be consuming the same product.

Nutrition and diet impact on oral health in many ways. Diet is a major etiological factor for dental caries and enamel erosion, and nutritional status impacts on the development of the teeth and the host's resistance to many oral conditions, including periodontal diseases and oral cancer.<sup>16</sup>

The most significant result in the dietary habits section of the study was the results which pertained to beverage consumption. A staggering 85.8% (145) of the 169 participants consumed fizzy drinks. Out of the 145 students who consumed fizzy drinks, most of them consumed it every week (45.5%). Moreover, 56.8% of the participants that consumed warm beverages added 1 to 2 spoons of sugar to their beverages.

A dynamic relation exists between sugars and oral health. Diet affects the integrity of the teeth; quantity, pH, composition of the saliva and plaque pH. Sugars and other fermentable carbohydrates, after being hydrolyzed by salivary amylase, provide substrate for the actions of oral bacteria, which in turn lower plaque and salivary pH. The resultant action is the beginning of tooth decay.

The school population of today is the adult of tomorrow; they should be educated, so that a sense of responsibility develops in them about oral health. Studies on oral health assessment and dental health education of children at an early age helps in improving preventive dental behavior and attitudes, which is beneficial for a lifetime.<sup>17</sup>

To be successful in preventing dental disease, intervention must begin within the first year of life.

Most dental awareness is coming from companies. However, the information given is peppered with product promotion and as a result is sometimes unreliable. From the survey, we concluded that the oral hygiene maintenance Arsenal owned by the children is more or less complete. However, they lack in knowledge of technique and method. Hence, the unbiased knowledge should come from dental professionals.

It is essential for awareness and treatment to reach the Indian children while they are still in school to prevent future oral problems. This can be done most effectively by

combining government and multinational initiatives hence providing the following (listed) things to school children:

1. Optimal oral hygiene instructions and counseling
2. Dietary counseling
3. Preventive dental interventions (e.g. fluorides and pit and fissure sealants).

As a developing country, it is essential for health care and other vital services to not just reach the elite few of a nation but also the citizens that cannot afford costly treatment and the mentioned partnership will go a long way in realising this objective in the long term.

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