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**ORIGINAL RESEARCH**

# Impact of health education about oral health on knowledge, attitude and practice among high school students in Thiruvananthapuram

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## ABSTRACT

**Background** Dental health is related to the general health of the individual. Dental caries is a highly prevalant oral disease particularly among children. We took high school students as the focus of our survey, as an approach to improve knowledge, attitude and practices of dental hygiene. The objective was to assess the impact of health education about oral health on knowledge, attitude and practice among high school students. **Materials and methods** A health educational interventional study was done among high school students using a questionnaire and the study was repeated after 2 weeks following health education. **Result:** The mean knowledge score before intervention was 4.02 with standard deviation of 2.29 and it increased to 9.00 with standard deviation zero. The attitude score before intervention was 1.8 with a standard deviation of 0.94 and it increased to 3.00 with a standard deviation of zero. The practice score before intervention was 6.06 with standard deviation of 1.78 and it increased to 9.78 with a standard deviation of 1.45. **Conclusion** This study demonstrated that a school based, educational intervention can be effective in improving oral health among school children.

**Keywords:** Dental health, Knowledge, High school students



## INTRODUCTION

Oral disease have been a public health problem globally, with almost every individual experiencing poor oral health at least once in their life time [1]. Oral health affects the general health, well-being, education and development of children and their families and determines the quality of life [2]. Globally poor oral hygiene has been reported among children and adolescents [3]. Essential nutrients for the body is obtained by an individual by the ability to chew and swallow which is a critical function and provides the building blocks for general health [4] .World-wide, 60-90% of school children have dental cavities [5] .Decline in dental caries has been reported in certain developed nations, which is attributed to the use of fluorides in different forms [6]. According to WHO 2003 database, the mean DMFT index at 12 years old ranges between 0.5-3.94 for Indian school going children. A nationwide survey of oral health conducted in 2004 throughout India, has shown that the prevalence of dental caries is 51.9% among 5-year-old children, 53.8% among 12-year old children and 63.1% in 15-year-old children, highlighting that dental caries is a significant oral health diseases in their later years [7] Oral disease in children and adults is higher among poor and disadvantaged populations. Risk factors for oral disease include an unhealthy diet, tobacco use, harmful alcohol use, and poor oral hygiene. Treatment for oral health conditions is expensive and usually not part of Universal Health Coverage (UHC). Most low- and middle-income countries do not have sufficient services available to prevent and treat oral health conditions. Most oral health conditions are largely preventable and can be treated in their early stages. The WHO Global Oral Health Status Report (2022) estimated that oral diseases affect close to 3.5 billion people worldwide, with 3 out of 4 people affected living in middle-

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income countries [8]. Globally, an estimated 3 billion people suffer from caries of permanent teeth and 514 million children suffer from caries of primary teeth [9]. Marketing of food and beverages high in sugar, as well as tobacco and alcohol, have led to a growing consumption of products that contribute to oral health conditions and other NCDs. The burden of oral diseases and other noncommunicable diseases can be reduced through public health interventions by addressing common risk factors. These include promoting a well-balanced diet low in free sugars and high in fruit and vegetables, and favouring water as the main drink, stopping use of all forms of tobacco, including chewing of areca nuts, reducing alcohol consumption and encouraging use of protective equipment when doing sports and travelling on bicycles and motorcycles (to reduce the risk of facial injuries). Unequal distribution of oral health professionals and a lack of appropriate health facilities to meet population needs in most countries means that access to primary oral health services is often low. Paying for necessary oral health care is among the leading reasons for catastrophic health expenditures, resulting in an increased risk of impoverishment and economic hardship [10]. Hence we selected high school students as our study groups to assess their knowledge, attitude and practices**.**

## OBJECTIVE

To assess the effectiveness of oral health education on knowledge ,attitude and practices among high school students.

## REVIEW OF LITERATURE

The effectiveness of a school based dental health education program for adolescents conducted by Redmond C.A et al in United Kingdom among 2678 students in 2000, produced statistically significant improvement in knowledge about periodontal diseases and dental caries. The reported frequency of brushing did not change, but the group who had received 12 months of the intervention, was more likely to brush for over a minute. At 6 months, the early intervention group had a statistically significant 13% reduction in the mean proportion of the sites with plaque compared with the late intervention group. These improvements were accompanied by a significant improvement in oral hygiene and a reported reduction in gingival bleeding.

A cross-sectional Study was conducted by Abeer Al Subait et al on oral health knowledge, attitude and behaviour among 287 students of 10 to 18 years old attending Jenadriyah festival Riyadh in year 2013. In the study, around 67% students reported brushing teeth daily. There was a significant difference in brushing habits between genders with girls showing better dental practice, were aware of bleeding gums, oral health effects on general health and importance of dental checkup. [pIn Tamil Nadu, a study was conducted by Vishnu G Ashok on oral hygiene among school children in a rural school. Study comprised of 160 students, who were in the age group of 12 to 15 yrs. It was concluded that 53.1% students were brushing twice daily and remaining 46.9% brushed once daily. Majority of study subjects [92%] were using tooth paste for brushing.

A study was conducted by David J et al in Thiruvananthapuram, Kerala among 838 children in upper primary schools. Socio-demographic factors, oral health behaviours, attitudes and knowledge were assessed by a self-administered questionnaire. The prevalence of dental caries in the permanent dentition was 27%. The mean number of decayed, missing and filled teeth was 0.5. Multiple logistic-regression analysis showed that children had a higher risk of having dental caries if they lived in urban areas, did not use a tooth brush, consumed sweets or performed poorly in school. The prevalence of caries in this sample of 12 year old school children was low compared to that in the other developing countries.

A study was conducted by Muhammad Ahad, in government, aided and private schools of Chennai among 250 school children on awareness of proper tooth brushing techniques and related to the knowledge of oral health, concluded that the majority (53.2%) brush their teeth twice a day, while 46% brush once daily.

In a study on Oral health status of 5, 12, 15 year old school children in Thiruvalla, Kerala, India during the period of May 2013 to May 2014, among 5688 students revealed that 73.9 % of 12 year old students had healthy gingival. Among girls 21.8% had calculus and 2.5% had bleeding gums and among boys 24.3% had calculus, 3.1% had bleeding gums.

## MATERIAL AND METHODS

### Study design

Interventional study

### Study Setting

St. Aloysius Higher Secondary School, Alappuzha**,** Govt. Vocational Higher Secondary School, Nedumangad, MTS High School, Anaprampal**,** St. Thomas English Medium Higher Secondary School, Nerettupuram

### Study subjects

Students studying in $8^{th}$ , $9^{th}$ and $10^{th}$ standard of respective schools under study

### Study Period

Conducted during May 2022-October 2022

### Sample size

Sample size is calculated using the formula n= ( 〖2(Za+Zb)〗 ^2 p(1-p))/ 〖(p1-p2)〗 ^2 Minimum sample size was calculated to be 250 as per study conducted in Gujarat.

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**Sampling technique**
Schools were selected conveniently and students were selected by universal sampling.

**Exclusion criteria**
- Those who were absent on the day of visit
- Those who did not consent to participate in the study

**Study variables**
Gender, Knowledge about fluoride related dental health, bleeding gums, tooth decay etc, Attitudes like regular visit to dentist, brushing etc., Practice of cleaning teeth, changing of tooth brush etc

**Data collection tool**
Semi-structured questionnaire

**Data collection method**
Semi-structured questionnaire was administered in local language

**Data analysis**
Data was coded and entered in MS Excel and analyzed using SPSS Software (Version 29). The quantitative variables were summarized as mean (standard deviation) and the qualitative variables represented as frequencies and proportion. Pre-test score and post test score was expressed as mean with standard deviation. To test whether there is a statistically significant difference between pre test and post test score, Wilcoxon sign rank test was used since the score followed non-normal distribution.

**Ethical considerations**
Permission was obtained from the principal of the educational institution. Informed consent was taken from all the participants and their parents.

**RESULTS AND DISCUSSION**
The data was collected from 262 students belonging to $8^{th}$, $9^{th}$ and $10^{th}$ standard. More than half of the study subjects (153) were males.

**Table 1. Comparative assessment of knowledge of students on oral health**

| Question Options | Correct response before training (n=262) N(%) | Correct response after training (n=262) N(%) |
|---|---|---|
| Is oral health part of general health? Yes* No Don't know | 222(84.7) | 262(100) |
| How many permanent teeth an adult is having? 10 20 28 32* | 175(66.8) | 262(100) |
| What are the most common problems affecting oral cavity? Dental caries and periodontal diseases Oral ulcers Bleeding gums All the above* | 79(30.2) | 262(100) |
| Why do we get dental problems? Not cleaning teeth regularly, Poor nutrition, Use of toothpaste without fluoride, All of the above* | 68(26) | 262(100) |

**Inference:** Before giving intervention about more than 3/4th of the participants responded that oral health is a part of general health and after giving oral health education everyone (i.e 262 of 262) responded correctly.

**Table 2. Comparative assessment of attitude of students on oral health**

| | |
|---|---|
| Q1 | Do you think maintaining oral hygiene is individual responsibility |
| Q2 | Do you think its required to visit a dentist periodically to maintain health of your teeth. |
| Q3 | Do you think evening brushing is necessary? |

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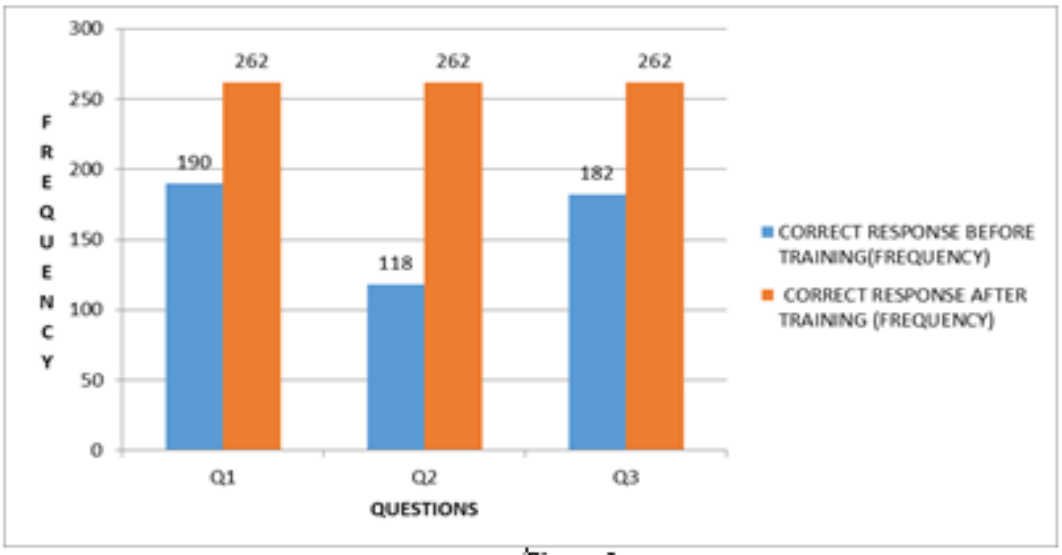


**Figure 1.**

**Inference:** In pre-test 190 participants showed positive attitude by answering that maintaining oral hygiene is individual responsibility and in post-test all of them showed positive attitude.

**Table 3. Comparative assessment of practice of students on oral health**

| Question | Correct response before training(n=262)N(%) | Correct response after training (n=262)N(%) |
|---|---|---|
| Do you brush daily? | 255(97.3) | 262(100) |
| How do you clean your teeth? | 162(61.8) | 262(100) |
| How often do you clean your teeth? | 90(34.4) | 262(100) |
| Do you brush teeth before bed time? | 67(25.6) | 114(43.5) |

In pre-test, 255 responded that they brush daily and in post-test 262 responded that they brush daily. In pre-test, 162 responded that they were cleaning the teeth properly and in post-test everyone (262) was practicing it in the right way. In pre-test, the correct response was given by 90 students and in post-test everyone responded correctly. In pre-test, 67 responded that they brush their teeth before bed time and in post-test, 114 responded that they brush their teeth before bed time.

**Table 4. Effectiveness of health education on attitude, knowledge and practice regarding oral health**

Test used was Wilcoxon signed rank test $P \leq 0.05$ is significant. On comparison of knowledge, attitude and practice score pre and post interventionally, results were found to be significant

| Variable | Before training score Mean (SD) | After training score Mean (SD) | P Value |
|---|---|---|---|
| Knowledge | 4.02(2.29) | 9.00(0.00) | <0.001 |
| Attitude | 1.87(0.94) | 3.00(0.00) | <0.001 |
| Practice | 6.06(1.78) | 9.78(1.45) | <0.001 |

**Inference:** In our study, 222(84.7%) students agreed that oral health as a part of general health during pre test and it changes to 262(100%) after post test. In a study of 205 students conducted among 13-16-year-old school children of fishermen of Kutch district, Gujarat, 106(53%) of students considered oral health as part of general health in pre test and it changed to 172(86%) after test

Among the 262 students participated in the research 79(30.2%) during the pre test and 262(100%) students after the post test had knowledge about the most common problems affecting oral cavity like that of study conducted in Tamilnadu where, 69(34,5%) students in the pre-test and 119(54.5%) students in the post test had knowledge about the most common problems affecting the oral cavity.

In our study 162(61.8%) students in the pre test and 262(100%) in post test used tooth brush and tooth paste or tooth powder to clean their teeth similar to the study conducted in Thiruvalla, where115(59%) students in the pre test and 122(62.5%) in post test answered correctly.

In our study 90(34.4%) students in the pre test and 262(100%) during the post test brushes their teeth twice a day in contrary to study conducted in Kutch District of Gujarat, where 149(74.5%) students in the pre test cleans their teeth twice a day and it changed to 180(90%) in the post test.

The mean knowledge of pre-test was 4.02 with a standard deviation of 2.29 and the mean knowledge of post-test was 9.00 with a standard deviation of 0.00 and the p value was less than 0.001.

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The mean attitude of pre-test was 1.87 with a standard deviation of 0.94 and the mean attitude of post-test was 3.00 with a standard deviation of 0.00 and the p value was less than 0.001.

The mean practice of pre-test was 6.06 with a standard deviation of 1.78 and the mean knowledge of post-test was 9.78 with a standard deviation of 0.00 and the p value was less than 0.001.

The study provides valuable information about the effectiveness of dental health education among high school children. However, there are some limitations. The present study has been conducted in a small geographic area, hence further multicentre studies are required for generalizability.

## CONCLUSION

Changing personal behavior through health promotion traditionally has been done by providing information, education and counselling. This study demonstrated that a school based, easy to organize educational intervention can be effective in improving oral cleanliness among children. This study tested the effectiveness of oral health education and found out that children after receiving the health education had significantly increased the knowledge about oral health.

### Recommendations

Similar studies should be conducted in various schools. Practice of oral hygiene should be encouraged in schools.

### Limitations

Not appropriate for individual oral hygiene status evaluation.

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