



# Knowledge about Oral Hygiene among School Children in Tamilnadu State of India- A Systematic Review

Anita M<sup>1</sup>, Bhuminathan S<sup>2\*</sup>, Suganya P<sup>3</sup>, Charumathi Dhanushkodi<sup>3</sup>, Narasimha Raghavan<sup>4</sup>

<sup>1</sup>Research Scholar, Bharath Institute of Higher Education and Research, India.

Professor, Department of Public Health Dentistry, Sree Balaji Dental College & Hospital, BIHER, India.

<sup>2</sup>Professor, Department of Prosthodontics, Sree Balaji Dental College & Hospital, BIHER, India.

<sup>3</sup>Senior Lecturer, Department of Public Health Dentistry, Sree Balaji Dental College & Hospital, BIHER, India.

<sup>4</sup>Director, RNR Research Services, India.

## Abstract

Oral hygiene among school children is a crucial aspect of their overall health and well-being. Educating children about proper oral hygiene practices early on can help instill good habits that can last a lifetime. Oral hygiene is the principal component for maintaining the general wellbeing of an individual. The adequate knowledge of oral hygiene plays a foremost essential to prevent the disease occurrence at earliest stage. Hence, the present study aims to assess the knowledge about oral hygiene among school children in Tamilnadu state of India by performing a systematic review. The data regarding knowledge of oral hygiene was obtained from electronic databases including Scopus, PubMed and Wiley Online Library by using appropriate keywords knowledge, oral hygiene, oral health, school children and Tamilnadu. Finally, five articles appropriate for the study were recruited by PRISMA guidelines. Bias assessment of the articles were done by Modified New Castle Ottawa Scale. Among the five studies; four studies were conducted in Chennai city and one study was done in Chengalpattu. The overall analysis reported that school children had only an average knowledge on oral hygiene and there was significant difference between genders. Furthermore, studies should be performed in other districts of Tamilnadu for generalization of the outcome. Overall, instilling good oral hygiene habits in school children requires a combination of education, reinforcement, and access to dental care services. By teaching children proper oral hygiene practices early on and encouraging regular dental visits, we can help them maintain healthy smiles for years to come.

**Keywords:** Oral hygiene, Knowledge, Tamilnadu, School children, Oral health

**Full length article** \*Corresponding Author, e-mail: [phdsbdch@gmail.com](mailto:phdsbdch@gmail.com)

## 1. Introduction

Oral health is defined as the absence of conditions that affect the oral cavity, such as chronic pain in the mouth and face, oral or throat cancer, sores in the mouth, tooth decay, tooth loss, and other conditions [1]. Poor oral health results in altered Oro-facial form and function, such as difficulty in speaking or masticating, etc. Consequently, an individual's social well-being or quality of life is hampered, either directly or indirectly. The prevalence of dental caries among school going children aged between 12-15 years in the rural and urban areas of TamilNadu was 61.4% with an average DMFT score of 2.03 [2]. Periodontal disease is common in children, with most showing some form of plaque accumulation, gingival inflammation, or calculus. Malocclusion is also common in children, and most countries have reported an increase in malocclusion or, at the very least,

an increase in the demand for orthodontic treatment [3]. Dental problems in children are associated with significant reductions in school attendance and parental working days. It has an impact on a child's functional, psychological, and social well-being. Oral pain causes sleep loss, poor growth, behavioural problems, and poor learning in children. Communication, socialization, and self-esteem are all developmental processes that are impacted [4]. Oral diseases produce many symptoms in children, resulting in physical, social, and psychological effects that affect their day-to-day living or quality of life [3]. Children with poor oral health are 12 times more likely than those who do not have restricted days, including missing school. Many children and adults experience pain, discomfort, sleepless nights, and missed school or work. Every year, more than 50 million school hours are lost due to oral diseases [5]. Schools reach over one

billion children worldwide and provide a valuable platform for children's oral health promotion [6]. Oral health knowledge is regarded as a prerequisite for health-related behavior. It is a well-known fact that poor oral hygiene practices contribute to the development of oral diseases. Oral self-care habits such as brushing, flossing, and visiting the dentist on a regular basis should be instilled in children as early as possible. The majority of health problems affecting schoolchildren are preventable by promoting oral health care practices through health education by teachers, who are the first point of contact. Teaching children the importance of good oral hygiene can help them develop habits that will benefit their health for the rest of their lives [7]. Understanding the existing knowledge of oral health in school going children is necessary to commence any oral health promotion program in schools [8]. Hence, a comprehensive evaluation of assessing the recent knowledge on oral health appears to be justified, as it is necessary to update the current understanding of school children on oral health and oral diseases to give a solid base for the dentist who gives oral health promotion for school children. As a result, the goal of this study was to conduct a systematic evaluation of prevalence studies assessing the knowledge, attitude and skills of oral health among school going children in Tamilnadu.

## **2. Materials and Methods**

In this research, the systematic review analysis was done to assess the status of oral hygiene among school going children in Tamilnadu state of India.

### **2.1. Search Strategy**

The articles related to the oral hygiene status were hand searched using electronic databases such as PubMed, Wiley Online Library, Scopus. The articles were retrieved from each database based on the Keywords and MeSH terms which includes Oral health, oral hygiene, school children and Tamilnadu.

### **2.2. Inclusion Criteria**

Original articles. Only articles related to the oral hygiene status of school children were chosen. Cross-sectional studies. In vivo studies.

### **2.3. Exclusion Criteria**

Articles with no full text are excluded. Articles published in other than English language are excluded. Those articles with no open access are excluded.

## **3. Results and discussion**

This study systematically reviewed five studies on assessing the knowledge of school going children on oral hygiene in Tamil Nadu. Ganesh et al [9] in the year 2019 conducted a descriptive cross-sectional study among 1600 children from various schools in Chennai to assess the dental knowledge, oral hygiene, oral hygiene practices and eating habits. The study samples were school going children aged 12 and 15 years old. Close ended questionnaire to assess Anita et al., 2024

demographic data, oral health knowledge, practices and dental problems was self-designed by the authors and it was pretested and validated. Oral hygiene was evaluated using Oral Hygiene Index- Simplified. The results of the study stated that 80% and 68% had the right knowledge concerning dental caries and gum infection respectively. Twelve-year-old school children have better oral hygiene compared to fifteen year old school children which is in contrast with the study results of Abhishek where the 12 year old schoolchildren knowledge, attitude and practices regarding oral health was poor. [21]. 64% of the children had a fair level of oral hygiene; 34% of government school children had poor oral hygiene and 7.6% of private schoolchildren had poor oral hygiene. The study concluded that overall knowledge on oral health was good among the school going children. A pilot cross sectional study was conducted by the author Kuppuswamy et al [10] to assess the oral hygiene knowledge, perceptions, practices and oral hygiene status among school settings in rural Chennai. Convenience sample of 100 school students was taken. The previously validated questionnaire was modified to obtain information regarding socio-demographic characteristics, oral hygiene knowledge, perceptions, and practices. Oral hygiene status was evaluated using Oral hygiene Index- Simplified. The results of the study stated that females had more knowledge, perceptions and practices than males which was similar with the study results of El-Qaderi and Taani [16] and Beiruti et al [18] Nineteen percent of the participants knew that teeth need to be cleaned with toothbrush and toothpaste. The percentage of children using tooth brush was less when compared to the study conducted by WHO in a rural population of Uttaranchal state where 83% of the children used brush to clean their teeth [19] and in the study conducted by Punitha and Sivaprakasam 62.96% of the children used tooth brush to clean their teeth [20]. This can be due to the socioeconomic background of the students and their affordability in the rural area. Oral hygiene status was fair among 45 % of the participants. The author concluded that there was a dissimilarity between the oral hygiene knowledge, status and eating patterns with the school grades. Recently in the year 2022; the author Indrapriyadharshini et al [11] conducted a cross sectional study to assess the oral hygiene practices among 10-15 years of old government school going children. Multistage random sampling of 1500 government school children was recruited for the study. Two-part questionnaire was used for the data collection. The first part obtains information on demographic data and the second part contains close ended 11 questions related to oral hygiene practices. The questionnaire was validated with good internal consistency. The results was 86.1% of the study participants used tooth brush and tooth paste to clean their tooth, 59% of the participants brushes one time in the morning. The literature agrees that meticulous tooth brushing once a day is enough to maintain oral health and prevent caries and periodontal diseases. However, most people are unable to achieve optimal plaque removal. Therefore, many dentists recommend brushing the teeth twice daily to improve plaque control [14]. Only 28.5% of the participants had dental visit during last 6 months. It is also possible that high cost of dental treatment has limited the availability of dental care. The male children had enhanced oral hygiene practices compared to females which is in contrast with the results of the author Kuppuswamy et al.

**Table 1.** Characteristics of the Study

<b>Author name</b>	<b>Type of study</b>	<b>Place</b>	<b>Sample size</b>	<b>Age group</b>	<b>Referral source</b>
Ganesh et al; 2019 [9]	Cross sectional study	Chennai	1600	12 years and 15 years	Schools
Kuppuswamy et al; 2014 [10]	Pilot Cross sectional study	Chennai	100	10-16 years	Schools
Indrapriyadharshini et al; 2022 [11]	Cross sectional study	Chengalpattu	1500	10-15 years	Schools
Kanagavelu et al; 2020 [12]	Cross sectional study	Chennai	210	10-13 years	Schools
Priya et al; 2013 [18]	Cross sectional study	Chennai	592	10-16 years	Schools

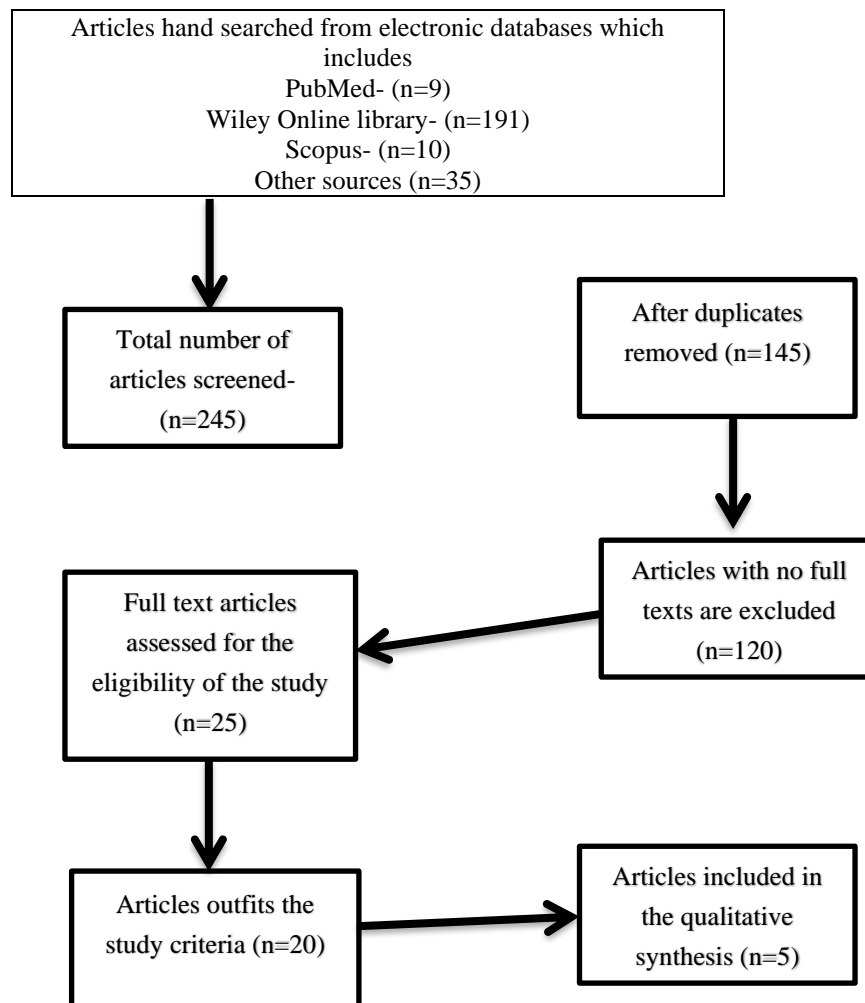
**Table 2.** Interventions and Outcome of the Study

Author	Patient characteristics	Sampling method	Evaluation	Outcome	P-value
Ganesh et al; 2019 [9]	School children of aged 12 and 15 years were obtained from both private and government schools	Stratified random sampling method	Oral hygiene knowledge, practices was assessed by questionnaire. Oral hygiene level- Oral hygiene index simplified	80.3% people had good knowledge on dental caries and 68% children had good knowledge on gingival infection	Significant
Kuppuswamy et al; 2014 [10]	School children of aged 10-16 years were obtained from schools	Simple random sampling method	Questionnaire was used to assess the oral hygiene knowledge and practice. The OHI-S index was evaluate the oral hygiene level	Females had good knowledge on oral hygiene than males. Almost 45% individuals had fair oral hygiene	Significant
Indrapriyadharshini et al; 2022 [11]	Government School children aged 10-15 years were selected from various schools	Multistage random sampling technique	Questionnaire was used to assess the oral hygiene knowledge and practice.	Oral hygiene practices was more adequate among males than the females	Significant
Kanagavelu et al; 2020 [12]	Private school children aged 10-13 years were chosen from various parts of chennai city	Simple random sampling method	Questionnaire was used to assess the oral hygiene knowledge and practice.	Oral hygiene knowledge and practice was good among girls than boys	Significant
Priya et al; 2013 [13]	School children of aged 10-16 years were from chosen from five government schools and five private schools in various parts of Chennai city	Convenience sampling method	A 33 item questionnaire was used to assess the knowledge and practices of oral hygiene level	Oral hygiene knowledge was low	Significant

**Table 3.** Bias Assessment

Author name	Selection				Comparability	Outcome/Exposure	
	Sample representation	Sample size	Non-respondents	Risk factor		Assessment of outcome	Statistical Test
Ganesh et al; 2019 [9]	*	*	-	-	*	*	*
Kuppuswamy et al; 2014 [10]	*	-	-	-	*	*	*
Indrapriyadharshini et al; 2022 [11]	*	*	-	*	-	*	*
Kanagavelu et al; 2020 [12]	*	-	-	-	-	*	*
Priya et al; 2013 [13]	*	-	-	-	-	*	*

\* indicates low risk bias; - indicates high risk bias



**Figure 1.** PRISMA flowchart of articles related to oral hygiene status of school children in Tamilnadu

The study concluded that oral hygiene practices among schoolchildren were poor; children in government schools could attribute this to a lack of awareness, affordability, or non-utilization of dental care facilities. A cross sectional study was conducted by the author Kanagavelu et al [12] in the year 2020 to assess the oral health knowledge and practice among 10-13 years old school children. Random selection of students was done. A three-part questionnaire was used to conduct a study. The first part contains demographic data, the second part includes questions on oral practice habits and the third part contains questions on oral health knowledge. The results of the study were 1/3<sup>rd</sup> of the participants used both brush with toothpaste and dental floss to clean their teeth. The author concluded that better oral hygiene practices and knowledge were noted among the study participants. Here female participants had better oral hygiene knowledge and practices which was similar with the study results of Kuppuswamy et al, El-Qaderi and Taani [16] and Beiruti et al [17]. This disparity can be attributed to females' greater concern for personal hygiene and health care. Investigation on dental health attitudes, knowledge and practices was done among school children by the author Priya et al [13] in the year 2013. Self-structured questionnaire was used among 592 study participants. The questionnaire included 33 items that obtained information on demographic background, oral health knowledge, attitudes, and practices. The results of the study stated that 58.3% of the participant brushes their teeth twice daily, which was contrast to the study conducted in Gujarat, stated that 70% of the study participants had the habit of brushing their teeth once daily [18] and 90 % of the participants used toothbrush and toothpaste to clean their teeth. Female children had regular dental visits. But the overall level of oral health knowledge among the surveyed children was low, concluded by the study author. This lack of oral health related KAP must be addressed and prioritized as an essential component of any comprehensive school oral health program.

#### 4. Conclusions

This current review states that the oral hygiene knowledge and attitude was low in the rural school children when compared to urban. The better oral hygiene practices were seen among females compared to males. However the understanding of the knowledge alone sounds incomplete, the relevant health authorities should develop additional community-oriented health care programme strategies. It is necessary to implement a multifaceted, multilevel public health intervention that integrates oral health into the school curriculum beginning in early childhood.

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