World Journal of Biology Pharmacy and Health Sciences
eISSN: 2582-5542
Cross Ref DOI: 10.30574/wjbphs
Journal homepage: https://wjbphs.com/

(RESEARCH ARTICLE)

AWARENESS AND KNOWLEDGE OF ORAL HYGIENE AND ITS ROLE IN GENERAL HEALTH AMONG SCHOOLCHILDREN AGED 9 – 15 YEARS IN PATHANAMTHITTA DISTRICT, KERALA

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World Journal of Biology Pharmacy and Health Sciences, 2026, 28(01), 136–141

Publication history: Received on 15 September 2026; revised on 21 October 2026; accepted on 23 October 2026

Article DOI: https://doi.org/10.30574/wjbphs.2026.28.1.0519

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ABSTRACT

Oral hygiene in childhood plays an important role in preventing dental problems and promoting general health later in life. This study assessed the level of awareness and knowledge regarding oral hygiene and its role in general health among schoolchildren in Pathanamthitta district, Kerala. A school-based pre- and post-intervention study was conducted among 500 children aged 9-15 years from randomly selected schools. Data were collected using a self-administered questionnaire that assessed knowledge of basic oral anatomy, preventive oral hygiene practices, and the relationship between oral health and general health, before and after a structured oral health education session, and were analysed descriptively. Baseline knowledge varied considerably across topics. Children showed better awareness of the number of adult teeth, recommended brushing frequency, and the importance of oral health for overall health. In contrast, knowledge of tooth functions, the supporting structures of teeth, appropriate brushing practices and duration, early signs of tooth decay, and the limitations of rinsing alone was relatively low. Males reported slightly higher proportions of favourable baseline oral hygiene practices than females, although this was not statistically tested. Knowledge improved substantially across all assessed domains following the education session; however, because the post-test was administered immediately and there was no control group, these short-term gains require confirmation through longer-term follow-up. The findings highlight the need for regular school-based oral health education programmes, supported by parental involvement, to strengthen children's awareness and promote healthy oral hygiene behaviours.

Keywords: Oral Health, Oral Hygiene Practices, School-Aged Children, Oral Health Awareness, Dental Caries, Preventive Dentistry.

1 INTRODUCTION

Oral health is integral to overall well-being, supporting mastication, speech, and social interaction, and often reflects systemic conditions such as nutritional or immune disorders. [1] Untreated dental caries is the most common health problem worldwide, impacting the lives of millions. Dental caries affects approximately 60-90% of schoolchildren

worldwide, [2] while its reported prevalence in India varies across population and studies. [3] In Kerala, dental caries, gingivitis and other oral health problems remain important concerns among schoolchildren. [4]

Oral diseases do not just affect the mouth, they are connected to health issues like heart disease and diabetes. For children, these problems can cause pain, make it harder to eat well, and lead to missing school, which impacts both learning and friendships. How often kids brush their teeth, what they eat, use of fluoride toothpaste, [5] and encouragement from parents [6] all play a big role, especially since habits formed in childhood can last a lifetime. School programs help close knowledge gaps, [7] and pharmacists are now seen as important partners in promoting good oral health.

Studies have reported inadequate or moderate level of oral hygiene knowledge among schoolchildren in India and elsewhere, [8],[9] with limited data from Kerala. This study was undertaken to assess awareness and knowledge of oral hygiene and its role in general health among schoolchildren aged 9 – 15 years.

Objective

To assess the level of awareness and knowledge regarding oral hygiene and its importance in maintaining general health.

2 MATERIALS AND METHODOLOGY

A community-based study with a pre- and post- educational assessment was conducted to assess oral hygiene practices and the level of oral health awareness among 500 school children aged 9–15 years in randomly selected schools in Pathanamthitta district, Kerala. The study was approved by the Institutional Review Board of Nazareth College of Pharmacy and was carried out over a period of six months from April 2025 to September 2025. Students studying in lower primary, upper primary, and high school who were willing to participate and able to read and understand English or Malayalam were included in the study. Students who were unwilling to participate, absent on the day of data collection, or submitted incomplete responses were excluded. Data were collected using a self-administered questionnaire containing demographic details and questions related to oral health knowledge, attitudes, and hygiene practices. Permission was obtained from the respective school authorities before conducting the study, and informed consent was obtained from the participants parents. The questionnaire was distributed to the students, and necessary explanations were provided whenever required. A structured oral health education session was conducted using a PowerPoint presentation, followed by administration of a post-education questionnaire to assess the students' understanding of oral health concepts. The collected data were entered into Microsoft Excel, and descriptive statistical analysis was performed. Results were presented in the form of tables.

3 RESULTS

3.1 Socio-demographic profile

Table 1: Socio-demographic characteristics of the study participants (N = 500)

Characteristics	Category	N	%
Age group (years)	9 – 10	76	15.2
	11 – 12	134	26.8
	13 – 14	184	36.8
	15 – 16	106	21.2
Gender	Male	226	45.2
	Female	274	54.8
Class range	Class IV–X	500	100.0

Out of the 500 students who participated in the study, the largest proportion was in the 13 – 14 years age group (36.8%), followed by 11 - 12 years (26.8%), 15 – 16 years (21.2%), and 9-10 years (15.2%). Female participants constituted 54.8% of the study population, while male participants were 45.2%. The study included students from Class IV to Class X, representing a broad range of school-age children. This distribution ensured adequate representation of different age groups and both genders, providing a comprehensive assessment of oral health knowledge among school children.

3.2 Assessment of knowledge regarding oral anatomy and physiology

Table 2: Pre- and post– test assessment of knowledge regarding basic oral anatomy and physiology

Knowledge parameters	Correct response (Pre - test) %	Correct response (Post - test) %
Number of adult teeth (32)	77.8	97.2
Hardest substance in the human body (enamel)	59.6	95.8
Teeth used for cutting (incisors)	41.4	93.0
Teeth used for tearing (canines)	37.8	94.4
Teeth used for grinding (molars)	32.4	90.6
Last set of teeth to erupt (wisdom teeth)	52.0	99.0
Structures holding teeth in place (jawbone)	15.8	97.0
Nutrients essential for strong teeth (calcium and fluoride)	56.2	97.2

Pre-test assessment of basic oral health knowledge among 500 participants. While 77.8% correctly identified 32 as the normal number of adult teeth and 52.0% recognized wisdom teeth as the last to erupt, only 59.6% knew enamel is the hardest substance in the human body. Moreover, only 15.8% identified the jawbone as the primary support structure of teeth. Knowledge of tooth-specific functions was also inconsistent: 41.4% identified incisors for cutting, 37.8% identified canines for tearing, and 32.4% identified molars for grinding. Only 56.2% correctly identified calcium and fluoride as essential nutrients for strong teeth.

3.3 Awareness of preventive oral hygiene practices

Table 3: Pre- and post– test assessment of knowledge regarding preventive oral hygiene practices.

Knowledge components	Correct/desired response (Pre-test) %	Correct/desired response (Post-test) %
Recommended brushing frequency (twice daily)	75.8	99.4
Recommended toothbrush replacement (every 3 months)	46.4	92.6
Brushing twice daily prevents tooth decay	72.2	98.8
Fluoride helps prevent cavities	58.4	98.8
Correctly disagreed that hard brushing is better than gentle brushing	30.4	96.6
Awareness of recommended 2-minute brushing duration	40.2	99.4
Sugary snacks increased risk of cavities	60.4	98.6
Awareness of harmful effects of tobacco	55.4	100.0
Correctly disagreed that rinsing alone is sufficient	39.0	98.4
Awareness of early signs of tooth decay	41.6	96.8
Awareness of safe mouthwash options for children	43.6	97.8
Oral health is integral to overall general health	78.6	100.0

Regarding knowledge of preventive practices, 75.8% of participants at baseline correctly identified twice-daily brushing as the recommended frequency, and 46.4% correctly identified three months as the recommended toothbrush replacement interval. Awareness that brushing twice daily helps prevent decay was reported by 72.2% and 58.4% were aware that fluoride helps prevent cavities. Notably, only 40.2% agreed with the recommended two-minute brushing duration, and only 30.4% correctly disagreed with the statement that hard brushing is better than gentle brushing. Furthermore, 60.4% recognized that sugary snacks increase the risk of cavities, 55.4% were aware of the harmful effects of tobacco on oral health, and 41.6% could identify early sign of tooth decay. Only 39.0% correctly disagreed that rinsing alone is sufficient for oral hygiene, while 43.6% were aware of safe mouthwash options for children. Awareness that oral health is integral to overall health was comparatively higher, at 78.6%.

3.4 Gender-wise difference in knowledge and practice

Table 4: Gender-wise distribution of self-reported oral hygiene practice, pre- and post- test (n=226 males, n=274 females)

	Correct response (Pre- test) %		**Correct response (Post- test) %**	
	Male (n=226)	Female (n=274)	Male (n=226)	Female (n=274)
Tooth-brushing frequency	76	70	98	98
Two-minute brushing consistency	68	60	98	100
Tongue cleaning practice	81	78	98	100
Brushing after meals (30 minutes after eating)	97.3	91	98	99

Among the 500 students, female participants constituted a higher proportion of the study population (54.8%) than males (45.2%). Gender-wise comparison of pre-test responses showed differences in oral hygiene knowledge and practices, with males although statistical significance was not assessed, including twice-daily brushing, brushing 30 minutes after eating, and tongue cleaning. Following counselling, both genders showed marked improvement, with high proportions reporting appropriate oral hygiene practices in the post-test. Overall, the counselling intervention was associated with improved oral hygiene knowledge and practices among both male and female participants.

4 DISCUSSION

This study assessed awareness of oral hygiene and its role in general health among 500 schoolchildren aged 9-15 years in Pathanamthitta district, Kerala. At baseline, children showed a reasonable foundational understanding, but knowledge of specific preventive practices was limited. Although lower than the reported among 8-10-year-olds in Kancheepuram [11], although differences in age group and data collection method limit direct comparison. Awareness that oral health is integral to general health was high at baseline (78.6%), compared with 42.2% among 1,000 children aged 5-12 from lower socioeconomic strata in Pune, of whom only 16.3% were totally aware of dental hygiene [14]. Awareness of the two-minute brushing duration (40.2%), early signs of tooth decay (41.6%) and the insufficiency of rinsing alone (39.0%) was low in the present study. A study of school-leaving children in rural Andhra Pradesh found that few actually brushed twice daily (27.6%) or replaced their toothbrush every three months (11.7%) [12]. Although that study measured practice rather than awareness, it suggests that knowing recommended behaviours does not necessarily lead to doing them. At baseline, males reported slightly better practices than females (e.g., twice-daily brushing 76% vs 70%), although this difference was not statistically tested.

Knowledge improved markedly across all assessed domains after a single structured session, with post-test scores generally between 90% and 100%. School-based education has been shown to improve oral hygiene behaviours in schoolchildren [7], and short-term programmes have reduced plaque and gingival scores in 12- and 15-year-olds [16]. However, the post-test was administered immediately and there was no control group, so these gains reflect short-term recall and cannot confirm lasting knowledge or behaviour change. The baseline gaps in brushing duration, recognition of early decay and the rinsing misconception would need to be reinforced for children to remain protected against preventable oral disease. Repeated, school-based education supported by parental involvement is a promising approach, and future studies should include a control group, delayed follow-up and clinical outcomes.

5 CONCLUSION

A pre- and post- test educational intervention study conducted among 500 school children aged 9 to 15 years in the Pathanamthitta district of Kerala found that, although there was a general awareness of oral hygiene and its significance for overall health, knowledge was inconsistent. Notable deficiencies were observed in the understanding of specific prevention practices, despite a generally positive attitude and broad recognition that oral health influences general health. The implementation of a single structured oral health education session was associated with marked improvement in knowledge across most areas assessed, indicating that targeted interventions can effectively address these gaps. These findings support the integration of regular, structured oral health education programmes into the school curriculum, along with parental involvement and periodic dental screening, to enhance children's oral hygiene knowledge and reduce the long-term burden of preventable oral disease among school children.

Limitations

The study has a short duration, which limited the opportunity for recruitment and prevented assessment of sustainability of knowledge gains. Since the children gave their own accounts of the responses, the possibility that participants misunderstood the questions or provided socially desirable response cannot be excluded. In future research it is necessary to use larger, multi-site samples, extend the assessment to include a wider age range, and carry out longitudinal follow-up to assess the sustainability of both the knowledge and behaviour changes.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Acknowledgments

The authors would like to extend their sincere gratitude to the staff of Nazareth College of Pharmacy and the institutions that consented to participate in the study for their kind support in this research.

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

The authors certify that they have obtained consent from the participants in this study, and their details will be kept confidential with due diligence

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