

Exploring Secondary School Teachers' Knowledge, Awareness, and Practices Regarding Periodontal Disease

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Abstract

Untreated periodontal disease can lead to tooth loss and systemic inflammation. Early detection and treatment of gingivitis, along with better oral hygiene practices, can prevent the disease from affecting the deeper gum structures. Teachers play a key role in influencing students' development, and their awareness of oral health can have a significant impact on the younger generation. This cross-sectional study aimed to assess the knowledge, awareness, and practices (KAP) regarding periodontal disease among 300 secondary school teachers. The questionnaire consisted of 20 questions in three KAP sections. The teachers completed the questionnaire through individual interviews, supervised by a research assistant. The collected data were analyzed using statistical software, with descriptive statistics and a P-value of 0.05. The Chi-square test was used to analyze the responses related to the three KAP domains. Of the 300 participants, 178 (59%) were male, and 122 (41%) were female. Although most teachers demonstrated sufficient knowledge about the causes and prevention of gingivitis, their awareness, and practices were found to be lacking. The findings indicate that while the teachers' knowledge of oral health was satisfactory, their awareness and practice of oral care were inadequate. It is suggested that oral health topics be incorporated into school curricula, and teachers should be educated on oral health maintenance to pass this knowledge on to students, ultimately improving the general and oral health of future generations.

Keywords: Knowledge, Periodontal disease, Awareness, Practices, School teachers

Introduction

Periodontal diseases are conditions that affect the supporting structures of the teeth, including the gums, cementum, alveolar bone, and periodontal ligament [1-3]. These diseases typically begin as gingivitis, which is a mild and reversible inflammation of the gums, affecting a large portion of the population (approximately 90%).

However, if left untreated, gingivitis can progress to periodontitis, a more severe, chronic, and irreversible condition that causes inflammation, tissue destruction, and systemic effects. Periodontitis, initiated by dental plaque and the body's immune response, leads to the breakdown of the periodontal tissues [4]. If untreated, this condition can result in tooth loss and severely affect an individual's quality of life [5-7]. Early intervention to treat gingivitis and maintain good oral hygiene can prevent the progression of more severe periodontal diseases [8-11]. A study by Janakiram *et al.* indicated that 51% of Indian adults had periodontitis, and 47% had gingivitis [9].

Teachers play a pivotal role in shaping the behaviors and knowledge of students, particularly regarding health-related practices. Their awareness and understanding of

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periodontal diseases can directly influence the students' oral health habits. Teachers should be equipped with basic knowledge about oral health and hygiene practices, which they can pass on to students. There is a growing need for periodontal health education, particularly in India, and school teachers can be instrumental in promoting these practices. This study aims to evaluate the awareness, knowledge, and practices concerning periodontal diseases among secondary school teachers.

Materials and Methods

Study design

This observational cross-sectional study was conducted among secondary school teachers in Karad city, Maharashtra, India, using a structured, self-administered questionnaire. Ethical approval was granted by the Institutional Ethical Committee of Krishna Institute of Medical Sciences Deemed to be University (KIMSUDU), Karad (Ref. No. KIMSUDU/IEC//08/2018, dated 17/11/2018). Before participation, teachers were informed about the study's purpose, and written consent was obtained. The research was conducted over a period spanning from April 2019 to December 2019.

Sample size determination

The required sample size was estimated using the formula:

$$N = Z^2 pq/d^2 \quad (1)$$

where 'p' represents the estimated knowledge of periodontal diseases, derived from a preliminary study. To account for a 5% margin of error, the final sample size was determined to be 300 participants.

Eligibility criteria

Inclusion: Teachers who consented to participate and provided written informed consent.

Exclusion: Teachers with communication difficulties or those unwilling to participate.

Data collection process

The questionnaire was developed in English, Hindi, and Marathi (local language) to ensure accessibility. It was selected as the preferred data collection tool to facilitate standardized responses. Comprising 20 structured questions, the questionnaire was divided into three sections to assess knowledge, awareness, and practices related to periodontal disease. The instrument underwent

validation for content, reliability, and consistency through a pilot test involving 30 participants [10]. Teachers completed the questionnaire under the guidance of a research assistant via one-on-one interviews, and responses were collected immediately.

Data analysis

Responses were entered into Microsoft Excel 2010 and analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. Descriptive statistics (frequency and percentage) were calculated. A Chi-square test was employed to examine the relationship between responses in the three study domains—knowledge, awareness, and practices. A P-value of less than 0.05 was considered statistically significant.

Results and Discussion

A total of 300 secondary school teachers from Karad city participated in the study, comprising 178 males (59%) and 122 females (41%).

Knowledge-based responses

Most participants (n = 258 (86%)) were familiar with gum diseases. A substantial proportion (n = 207 (69%)) recognized that improper tooth brushing techniques could negatively impact periodontal health. Nearly all respondents (n = 279 (93%)) believed that adhering to a dentist's instructions could help prevent gum diseases. However, a smaller group (n = 51 (17%)) lacked awareness that maintaining proper oral hygiene could effectively control gum disease.

A majority (n = 228 (76%)) understood that cavities and gum disease result from infections within the oral cavity. Furthermore, a large number (n = 267 (89%)) identified bleeding gums and bad breath as common indicators of gum disease. However, a notable portion (n = 111 (37%)) were unaware that the accumulation of soft deposits on teeth could lead to gum disease.

More than half of the participants (n = 171 (57%)) did not recognize the potential link between gum disease and systemic health conditions. Similarly, 135 teachers (45%) were unaware that untreated gum disease could progressively result in tooth loss. Half of the respondents (n = 150 (50%)) did not realize that periodontal disease could have an impact on overall health. Encouragingly, nearly all participants (n = 279 (92%)) acknowledged that early detection and treatment of gum disease could mitigate its severity (**Table 1**).

Table 1. Knowledge levels among study participants; knowledge assessment (n = 300)

Question	Yes (n (%))	No (n (%))	Chi-square value (χ^2)	P-Value
Have you ever heard of gum diseases?	258 (86%)	42 (14%)	155.5	< 0.001**
Do you believe improper tooth brushing can impact periodontal health?	207 (69%)	93 (31%)	43.32	< 0.001**
Are you aware that following a dentist's guidance can help prevent gum disease?	279 (93%)	21 (7%)	221.8	< 0.001**
Do you think maintaining good oral hygiene can help control gum disease?	249 (83%)	51 (17%)	130.6	< 0.001**
Do you believe that infections in the oral cavity contribute to cavities and gum disease?	228 (76%)	72 (24%)	81.1	< 0.001**
Are bleeding gums and bad breath common symptoms of gum disease?	267 (89%)	33 (11%)	182.5	< 0.001**
Can the accumulation of soft deposits on teeth lead to gum disease?	189 (63%)	111 (37%)	20.28	< 0.001**
Do you think gum disease can be linked to other systemic health conditions?	129 (43%)	171 (57%)	5.88	0.015*
If left untreated, can gum disease result in tooth loss over time?	165 (55%)	135 (45%)	3.0	0.083
Do you believe gum disease affects overall health?	150 (50%)	150 (50%)	0.0	1.000
Can early diagnosis and treatment reduce the severity of gum disease?	276 (92%)	24 (8%)	211.6	< 0.001**

Interpretation: P > 0.05: not significant, P < 0.05: statistically significant (*), and P < 0.001: highly significant (**)

This table summarizes the knowledge levels of the study participants regarding periodontal disease. It highlights the statistical significance of responses to various questions related to gum health awareness.

Response to awareness questions

A considerable number of participants, 117 (39%), reported not adhering to their dentist's instructions, while

249 (83%) believed they did not have gum disease. A large proportion, 249 (83%), were unaware of issues related to bleeding gums. Additionally, the majority, 231 (77%), did not experience concerns about loose teeth. Only a small fraction, 33 (11%), had attended awareness sessions or health talks regarding gum health (**Table 2**).

Table 2. Awareness levels among study participants

Awareness (n = 300)	Yes (n (%))	No (n (%))	Chi-square test value	P-value
Have you been following your dentist's recommendations?	117 (39%)	183 (61%)	14.52	< 0.001**
Do you believe you have gum disease?	51 (17%)	249 (83%)	130.6	< 0.001**
Do your gums bleed while brushing your teeth?	51 (17%)	249 (83%)	130.6	< 0.001**
Have you ever experienced loose teeth without any injury (excluding baby teeth)?	69 (23%)	231 (77%)	87.4	< 0.001**
Have you ever attended an awareness session on gum health?	33 (11%)	267 (89%)	182.5	< 0.001**

*P > 0.05: not significant, *P < 0.05: significant, **P < 0.001: highly significant difference

Practice-related responses

All 300 (100%) participants reported brushing their teeth daily. However, a significant proportion of the subjects, 198 (66%), did not brush after every meal. Nearly half of

the teachers, 156 (52%), had never visited a dentist for a routine check-up. Additionally, a majority of the teachers, 162 (54%), had never received scaling, root

planing, surgery, or any other treatment for gum disease (Table 3).

Table 3. Oral hygiene practices among study participants

Practice (n = 300)	Yes (n (%))	No (n (%))	Chi-square test value	P-value
Do you brush your teeth daily?	300 (100%)	0 (0%)	0.0	1.00
Do you brush your teeth after every meal?	102 (34%)	198 (66%)	30.72	< 0.001**
Have you ever visited a dentist?	156 (52%)	144 (48%)	0.48	0.488
Have you ever undergone scaling, root planing, surgery, or other treatment for gum disease?	138 (46%)	162 (54%)	1.92	0.166

*P > 0.05: not significant, *P < 0.05: significant, *P < 0.001: highly significant difference

Teachers play a crucial role in shaping students' overall development. Beyond academics, they can instill awareness about general and oral health, encouraging students to adopt proper hygiene practices. This highlights the need to assess whether teachers receive sufficient training and possess adequate knowledge about oral health education. Globally, school teachers are among the most accessible health promoters who can educate students about health and stay informed on current oral health concepts. The present study aimed to evaluate the knowledge, awareness, and practices related to periodontal disease among secondary school teachers. Findings from this study indicate that most teachers were aware of gum disease, aligning with the results of Azodo and Umoh [12], where a majority of participants had prior knowledge of periodontal disease. The increased awareness may be attributed to various information sources, including electronic media, television, magazines, and social media, which serve as significant platforms for health-related information. Additionally, most respondents recognized that improper tooth-brushing techniques could negatively impact periodontal health and understood that maintaining good oral hygiene could help prevent gum disease. These results are consistent with studies by Abdulaziz-Albwardi and Shetty [13] and Aljanakh *et al.* [14], which found that 88.6% and 97.3% of participants, respectively, believed that regular brushing helps prevent gingival disease.

In this study, an equal number of participants acknowledged the link between gum disease and overall health. Furthermore, most agreed that early diagnosis and timely treatment could mitigate the severity of periodontal disease and that adhering to a dentist's recommendations could help prevent gum issues. These findings align with a study conducted by Singh *et al.* [15], which emphasized that most individuals recognized the

connection between oral health and general well-being, as well as the importance of dental care alongside other medical treatments.

The majority of participants believed that cavities and gum diseases are caused by infections in the mouth, which contradicts a study by Azodo and Umoh [12], where only a small number of participants recognized that plaque or oral infections lead to periodontal disease and dental caries. A significant portion of participants were aware that bleeding gums and bad breath are common signs of gum disease, consistent with the study by Abdulaziz-Albwardi and Shetty [13], which found most teachers recognized that gum bleeding is caused by gum inflammation.

Most participants also understood that soft deposits on the teeth could cause gum disease, although this contradicts findings from Abdulaziz-Albwardi and Shetty [13] and Manjunath and Kumar [16], where few participants acknowledged that plaque buildup leads to inflamed gums. This lack of knowledge suggests insufficient oral health education in certain regions. In contrast, only a few participants in this study were aware that gum disease can affect overall health, while Zhu *et al.*'s study [17] found that most participants believed oral health contributes to overall well-being.

A significant proportion of the teachers did not follow the dentist's advice. However, overall knowledge about periodontal disease among the teachers was relatively high, likely because of their profession, which involves frequent access to updated information. Despite this, many were unaware of bleeding gums or their gum disease status. This contrasts with findings from Singh *et al.* [15] and Manjunath and Kumar [16], where a larger percentage of teachers identified gum bleeding as a sign of gum inflammation. While only a few teachers reported tooth mobility, most agreed that untreated gum disease

can result in tooth loss. This is contrary to Azodo and Umoh's [12] study, where only a small group of participants acknowledged periodontal disease as a leading cause of tooth loss.

In terms of practices, all teachers reported brushing their teeth daily, but fewer brushed after every meal. Many had visited a dentist, but fewer had undergone treatments such as scaling or root planning. The overall oral health practices were suboptimal, likely due to a lack of awareness about the importance of periodontal health and treatments.

Conclusion

While most teachers demonstrated adequate knowledge about the causes and prevention of gingivitis, their awareness and practices were found to be lacking. Overall, the oral health knowledge among secondary school teachers was satisfactory, but there is a significant gap in awareness and practices related to periodontal diseases. To address this, it is essential to enhance oral health education among school teachers, particularly regarding the prevention of periodontal diseases.

It is recommended that school curricula include topics on oral health and diseases, equipping teachers with the necessary information to promote proper oral health maintenance. Teachers can then pass this knowledge on to their students, helping to improve the oral and overall health of future generations.

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