

Original Research

Oral health awareness among primary and middle school teachers in Lucknow city, Uttar Pradesh, India– a cross-sectional questionnaire based study

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ABSTRACT:

Introduction: Oral health is an essential component of general health and well-being. Teachers play a vital role in shaping the habits of schoolchildren, as schools are the primary setting where children spend most of their formative years. Assessing the knowledge, awareness, and practices of schoolteachers regarding oral health is crucial, since their influence can directly impact the oral health behavior of children. The present study aimed to evaluate oral health awareness and practices among primary and middle school teachers in Lucknow city, Uttar Pradesh, India. **Materials and Methods:** This cross-sectional questionnaire-based study was conducted in 2023 among 100 primary and middle school teachers in Lucknow city. Ethical approval was obtained from the Institutional Ethical Committee (PG/222353/IEC/SPPGIDMS). A self-administered, prevalidated Google Form questionnaire consisting of 15 multiple-choice questions was distributed to the participants. Responses were collected, tabulated, and analyzed using the Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics were expressed as frequencies and percentages. Knowledge and practice scores were compared across gender and teaching experience using appropriate statistical tests. **Results:** Among the participants, 51% were male and 49% female. A majority (66%) brushed their teeth twice daily, and 96% used toothbrush and paste for cleaning. About 59% visited the dentist once in six months, while high cost (41%) was the main reason for not seeking dental care. Most teachers (91%) recognized the link between oral and general health, and 85% reported imparting oral health education to students. Female teachers had significantly higher knowledge scores than males ($p < 0.05$), while no significant gender difference was observed in practice scores. Teaching experience did not significantly influence knowledge or practices. **Discussion and Conclusion:** The study findings highlight satisfactory oral health awareness and favorable hygiene practices among schoolteachers, with females exhibiting better knowledge levels. However, gaps were noted in awareness of oral hygiene aids, frequency of dental visits, and appropriate toothpaste use. Teachers demonstrated willingness to impart oral health education to students, indicating their potential as effective facilitators of school-based oral health promotion. Strengthening teacher-focused training programs and addressing barriers to dental care are necessary to enhance the overall impact of oral health education in schools.

Keywords: Oral health awareness, schoolteachers, oral hygiene practices, dental education, Lucknow

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INTRODUCTION

Oral health is an integral and indispensable component of general health and well-being, directly influencing quality of life [1]. The importance of instilling oral hygiene practices early in childhood is well recognized, as healthy behaviors established in

formative years often continue into adulthood. Schools represent one of the most effective platforms for health education because children spend a significant portion of their lives there, and the values, attitudes, and habits they acquire during this period profoundly shape their future health behaviors [2,3].

Teachers, in particular, play a pivotal role in the physical, social, and behavioral development of children. As children spend the most significant part of their developmental years at school, teachers act not only as academic instructors but also as role models and influencers of lifestyle choices [4]. The concept of “health-promoting schools,” endorsed by the World Health Organization (WHO) in 1995, emphasized schools as ideal settings for promoting health awareness among students, teachers, parents, and the broader community [4]. Within this framework, oral health promotion in schools is both feasible and impactful, as it allows for integration of oral health messages into daily activities at relatively low cost [5].

In India, the importance of oral health promotion was highlighted with the launch of the National Oral Health Care Programme in 1998 by the Director General of Health Services (DGHS) and the Ministry of Health and Family Welfare. The program envisioned achieving optimal oral health for all Indians by the year 2020 [6]. Teachers, as community-based influencers, are ideally positioned to support such national goals by ensuring that students not only receive education but also develop sustainable health behaviors.

However, the effectiveness of teachers in delivering oral health education depends significantly on their own level of knowledge, awareness, and practices. Several studies have shown that while teachers can be important facilitators of preventive health, their ability to impart accurate oral health knowledge is limited by insufficient training [3,6,7]. A lack of familiarity with preventive dentistry and oral hygiene principles may reduce the impact of oral health education programs when delivered by teachers alone [8]. On the other hand, teachers who are well-informed can provide continuity of instructions, integrate oral health into general health promotion, and act as credible role models for their students [5,8,9].

Furthermore, oral health education through teachers offers several advantages, including cost-effectiveness, broad reach, and sustainability within the school environment. Yet challenges such as inadequate training opportunities and mismatch between teachers’ own oral health practices and professional recommendations may hinder the effectiveness of such interventions [3,6]. Previous studies in India and other countries have highlighted variability in the knowledge and attitudes of teachers regarding oral health, underscoring the need for systematic assessment and targeted interventions [2,8].

Given the critical role of teachers in shaping the habits of schoolchildren, evaluating their awareness and practices is essential. Understanding their level of oral health knowledge and identifying gaps can guide the design of teacher-focused training modules, which in turn would ensure the success of school-based oral health promotion programs. Keeping this in mind, the

present study was conducted to assess oral health awareness and practices among primary and middle school teachers in Lucknow city, Uttar Pradesh, India.

MATERIALS AND METHODS

Study Design and Setting

This study was designed as a cross-sectional, questionnaire-based survey conducted among primary and middle school teachers in Lucknow city, Uttar Pradesh, India, during the year 2023. The primary objective was to assess the level of oral health awareness and practices among teachers who play a critical role in shaping the health-related behaviors of schoolchildren.

Ethical Approval and Permissions

Prior to the commencement of the study, ethical clearance was obtained from the Institutional Ethical Committee of Sardar Patel Post Graduate Institute of Dental and Medical Sciences (Approval No. PG/222353/IEC/SPPGIDMS).

Necessary administrative permissions were also secured from the principals of the selected schools. Teachers were provided with detailed information about the study, and informed written consent was obtained from all participants. Confidentiality of responses and anonymity were assured throughout the study.

Study Population and Sample Size

The study population comprised teachers working in primary and middle schools located in and around Lucknow city. A sample size of 100 teachers was considered adequate based on feasibility and comparable previous literature. Participants were recruited through purposive sampling from schools that consented to participate.

Inclusion Criteria

- Teachers employed in primary or middle schools in and around Lucknow city.
- Teachers who were willing to voluntarily participate and provided written informed consent.

Exclusion Criteria

- Teachers who were absent during three consecutive school visits.
- Teachers who submitted incomplete responses to the questionnaire.

Study Instrument

Data were collected using a self-administered structured questionnaire developed in Google Forms. The questionnaire consisted of 15 validated multiple-choice questions (MCQs), adapted from previously published studies on teacher oral health awareness [2,3,6,8]. The questionnaire included items covering:

- Knowledge of oral hygiene practices.
- Awareness of common oral diseases.

- Attitudes towards oral health promotion in schools.
- Practices regarding oral health education imparted to children.

Prior to distribution, the questionnaire was reviewed for clarity, and a pilot test was carried out among a small group of teachers to ensure comprehensibility.

Data Collection Procedure

The Google Form questionnaire was distributed electronically among schoolteachers using email and messaging platforms. Responses were collected over a defined period. Reminders were sent to maximize participation. Teachers who met the inclusion criteria and submitted complete responses were included in the final analysis.

Data Management and Statistical Analysis

The responses were automatically collated via Google Forms and exported into Microsoft Excel for preliminary tabulation. Results were expressed as frequencies and percentages for categorical variables. Graphical representation of data was performed using Microsoft Excel. For statistical analysis, the Statistical Package for the Social Sciences (SPSS) version 21.0

(IBM Corp., Armonk, NY, USA) was used. Descriptive statistics were primarily employed to summarize the findings, and results were presented in the form of tables and graphs for clarity.

RESULTS

A total of 100 responses were collected and analyzed. The descriptive statistics of the study population and their responses to the questionnaire are presented in Tables 1–4, with corresponding graphs for clarity. Most respondents brushed twice daily (66%), and 59% visited dentists once in six months, reflecting positive practices as seen in Table 1. Nearly all (91%) acknowledged the role of oral health in general health. While 78% recognized that irregular brushing causes multiple oral problems, 60% attributed dental problems specifically to improper brushing. A majority (77%) felt that prevention required a combination of practices. Nearly all used a toothbrush and paste (96%), and more than half changed brushes every three months. Encouragingly, 85% of teachers reported giving oral health education to students, primarily about brushing, diet, and habits (58%). However, high cost (41%) and multiple visits (28%) were the most cited barriers to seeking dental care.

Table 1. Descriptive statistics of study population according to questionnaire items

| Questionnaire Item | Options | Number of responses | % |
|--|--------------------------------|---------------------|-----|
| 1. How many times do you brush? | Once a day | 30 | 30% |
| | After every meal | 4 | 4% |
| | Twice | 66 | 66% |
| | I don't brush | 0 | 0% |
| 2. How often do you visit dentists? | Once a month | 9 | 9% |
| | Once in 6 months | 59 | 59% |
| | Once in 3 months | 13 | 13% |
| | Once in 10 years | 19 | 19% |
| 3. Has oral health got any role in general health? | Yes | 91 | 91% |
| | No | 5 | 5% |
| | Don't know | 4 | 4% |
| 4. What does irregular tooth brushing cause? | Decay | 7 | 7% |
| | Gum diseases | 6 | 6% |
| | Bad breath | 3 | 3% |
| | Stains on teeth | 6 | 6% |
| | All | 78 | 78% |
| 5. Why do we get dental problems? | Eating sweets/ice creams | 17 | 17% |
| | Not brushing properly | 60 | 60% |
| | Not rinsing mouth | 4 | 4% |
| | Not visiting dentist regularly | 19 | 19% |
| 6. How can you prevent dental problems? | Avoid sweets/sticky foods | 5 | 5% |
| | Brushing properly | 11 | 11% |
| | Mouth rinsing after meals | 4 | 4% |
| | Regularly visiting a dentist | 3 | 3% |
| | All of the above | 77 | 77% |
| 7. How do you clean your teeth? | Toothbrush + paste | 96 | 96% |
| | Toothbrush + powder | 3 | 3% |
| | Finger/neem sticks | 1 | 1% |
| 8. How often do you change your brush? | Once in 3 months | 51 | 51% |
| | Once in 6 months | 23 | 23% |
| | Once yearly | 5 | 5% |

| | | | |
|---|--|----|-----|
| | When bristles fray | 21 | 21% |
| 9. Amount of paste used | Full length | 20 | 20% |
| | Half length | 47 | 47% |
| | Pea sized | 33 | 33% |
| | | | |
| 10. Do you rinse your mouth after meals? | Yes | 77 | 77% |
| | No | 6 | 6% |
| | Sometimes | 17 | 17% |
| 11. How do you clean your tongue? | Tongue cleaner | 91 | 91% |
| | Fingers | 1 | 1% |
| | Toothbrush | 8 | 8% |
| 12. Do you know any other oral hygiene aid? | Yes | 75 | 75% |
| | No | 25 | 25% |
| 13. Have you given oral health education to students? | Yes | 85 | 85% |
| | No | 15 | 15% |
| 14. If yes, what type of oral health education? | Teeth, function, structure | 15 | 15% |
| | Brushing, diet, habits | 58 | 58% |
| | Tooth decay, gum diseases, irregular teeth | 27 | 27% |
| 15. Reason for not visiting dentist | Long waiting hours | 21 | 21% |
| | Long treatment time | 10 | 10% |
| | Multi-visits | 28 | 28% |
| | High cost | 41 | 41% |

The gender distribution of the sample was nearly equal. Most teachers (58%) had 6–10 years of experience, while only 15% had more than 10 years of teaching experience as seen in Table 2.

Table 2. Distribution of study population according to gender and teaching experience

| Variable | Category | n | % |
|---------------------|------------|----|-----|
| Gender | Male | 51 | 51% |
| | Female | 49 | 49% |
| Teaching Experience | ≤ 5 years | 27 | 27% |
| | 6–10 years | 58 | 58% |
| | > 10 years | 15 | 15% |

The mean knowledge score of females (3.61 ± 0.67) was significantly higher than males (3.23 ± 0.86 , $p < 0.05$). However, while female practice scores were slightly higher, the difference was not statistically significant as seen in Table 3.

Table 3. Correlation of knowledge and practices with gender

| Variable | Gender | n | Mean ± SD | p-value |
|-----------------|--------|----|-----------------|-----------|
| Knowledge score | Male | 51 | 3.23 ± 0.86 | 0.017, S |
| | Female | 49 | 3.61 ± 0.67 | |
| Practices score | Male | 51 | 4.41 ± 1.17 | 0.566, NS |
| | Female | 49 | 4.53 ± 0.87 | |

Knowledge scores showed a decreasing trend with increasing teaching experience, but the difference was statistically insignificant ($p > 0.05$). Similarly, practice scores did not differ significantly across experience groups as seen in Table 4.

Table 4. Correlation of knowledge and practices with teaching experience

| Variable | Experience | n | Mean ± SD | p-value |
|-----------------|------------|----|-----------------|-----------|
| Knowledge score | ≤ 5 years | 27 | 3.62 ± 0.63 | 0.087, NS |
| | 6–10 years | 58 | 3.41 ± 0.82 | |
| | > 10 years | 15 | 3.07 ± 0.88 | |
| Practices score | ≤ 5 years | 27 | 4.59 ± 1.08 | 0.718, NS |
| | 6–10 years | 58 | 4.45 ± 0.97 | |
| | > 10 years | 15 | 4.33 ± 1.17 | |

Overall, the majority of teachers demonstrated good oral hygiene practices, such as brushing twice daily and rinsing after meals. Most teachers (91%) understood the link between oral and general health. Awareness of preventive measures was high, although barriers such as cost and time limited dental visits. Female teachers showed significantly higher knowledge scores compared to males. Experience did not significantly influence knowledge or practice scores. Encouragingly, 85% of teachers had attempted to impart oral health education to their students, indicating strong potential for teacher-led oral health promotion.

DISCUSSION

This cross-sectional survey evaluated the oral health awareness and practices of 100 primary and middle school teachers in Lucknow city, Uttar Pradesh. The findings highlight both encouraging trends in daily oral hygiene practices and important gaps in knowledge and preventive behavior.

Gender distribution - In our study, 51% of participants were male and 49% were female. This distribution differs from the findings of Manjunath and Kumar [10], who reported a higher proportion of female teachers, but is consistent with Kumar et al [6], who found a greater percentage of male teachers. The near equal distribution in the present study allows for meaningful gender-based comparisons.

Brushing Practices - Two-thirds (66%) of participants reported brushing twice daily, and the majority (96%) used toothbrush and paste for cleaning. These results are in agreement with Zhu et al. [11] and Gautam et al. [12], who also found high reliance on brush and paste. However, compared to other studies, the proportion brushing twice daily in our study was somewhat lower, reflecting scope for further improvement.

Knowledge of consequences of irregular brushing - Seventy-eight percent of teachers recognized that irregular brushing leads to multiple oral health problems. This aligns with Nyandindi et al. [13] and Khan et al. [14], but contrasts with Lang [15] and Gautam et al [12], who found lower awareness. Such findings underline the variability of teachers' oral health knowledge across regions.

Tongue cleaning and rinsing habits - In our study, 91% of teachers reported cleaning their tongue, and 77% rinsed their mouth after meals. Kompalli [16] and Vanka et al. [17] documented similar practices, with 78% of teachers cleaning their tongue and 87% rinsing. However, Chopra et al. [9] and Gautam et al. [12] observed considerably lower figures, suggesting cultural or regional differences in daily hygiene behaviors.

Awareness of oral hygiene aids - While 75% of teachers were aware of additional oral hygiene aids, 25% lacked such knowledge. This finding contrasts with Gautam et al. [12], where 88% of respondents reported awareness. The lack of familiarity with supplementary aids such as dental floss or mouth rinses represents a missed opportunity in preventive care education.

Toothbrush replacement practices - More than half (51%) of participants replaced their brushes every three months, 23% every six months, 5% yearly, and 21% only when bristles frayed. Compared with Zhu et al. [11] and Kumar et al [6], our study shows higher compliance with the recommended three-month replacement. Gautam et al. [12] also reported a similar trend, with 57% of teachers replacing their brushes every three months. Since frayed bristles reduce cleaning efficacy, periodic replacement remains an important preventive measure.

Use of toothpaste - In our study, 47% of teachers applied toothpaste to half the bristle length, 33% used a pea-sized amount, and 20% covered the full bristle length. These results differ from Gautam et al. [12], where nearly half (47%) used full bristle length and only 11% used pea-sized amounts. Given that excessive use does not enhance cleaning efficiency and increases cost, awareness on correct quantity of toothpaste should be reinforced.

Awareness of oral general health link - An encouraging 91% of teachers in our study were aware of the relationship between oral health and overall health. This proportion is considerably higher than Vanka et al. [17], where only half of teachers expressed such awareness, and Gautam et al. [12], where just 37.6% recognized the link. This difference highlights growing understanding of oral-systemic connections, though consistent reinforcement is still needed.

Dental Visits and Barriers - While 59% of teachers reported visiting dentists once every six months, a substantial proportion admitted visiting only when symptoms occurred. This aligns with Gautam et al. [12], who also found irregular patterns of dental visits in schoolteachers. High cost (41%), multiple visits (28%), and long waiting times (21%) emerged as the most important barriers, consistent with findings by Gautam et al. [12]. Such barriers reflect broader systemic challenges in India, including limited public health infrastructure and lack of insurance coverage.

Gender and knowledge – practice correlation - Female teachers in our study demonstrated significantly higher knowledge scores compared with males ($p < 0.05$). Similar trends were reported by Ahmad [18], who found better oral health knowledge among female teachers. However, oral health

practices did not differ significantly by gender, which concurs with Chopra et al.[9]. This suggests that although knowledge levels differ, practices may be shaped by broader cultural and environmental factors. Importantly, 85% of teachers in this study reported giving oral health education to their students, primarily related to brushing techniques, dietary habits, and prevention of dental diseases. Teachers' knowledge was also positively associated with their practice of imparting education, reinforcing the need for continuing education interventions targeted at teachers. As previous authors have highlighted, increasing teachers' awareness directly improves their ability to educate children effectively.

CONCLUSION

Overall, our study demonstrates that schoolteachers in Lucknow have satisfactory oral health awareness and favorable daily hygiene practices. Nonetheless, gaps exist in knowledge about oral hygiene aids, frequency of dental visits, and appropriate use of toothpaste. Female teachers were found to be more knowledgeable than their male counterparts, but practice levels remained similar. Addressing barriers such as treatment cost and reinforcing oral health education for teachers are vital steps for strengthening school-based oral health promotion programs.

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