International Journal of Basic and Applied Sciences, 14 (6) (2025) 71-79

International Journal of Basic and Applied Sciences

Website: www.sciencepubco.com/index.php/IJBAS
https://doi.org/10.14419/zwedkg50
Research paper

Barriers, Facilitators, Scope, And Feasibility of Integrating Oral Health into School Health Programs: A Qualitative Study in Bengaluru, India

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Received: July 22, 2025, Accepted: August 30, 2025, Published: October 5, 2025

Abstract

This qualitative research study explored the barriers and facilitators, scope, and feasibility of integrating oral health into school health programs in Bengaluru, India. Findings indicate that barriers such as resource constraints, curriculum gaps, awareness and engagement deficits, environmental, structural, geographic , and socioeconomic barriers, poor resources, inadequate curriculum, and limited awareness among key stakeholders contribute to the significant hurdles in incorporating oral health into such programs. On the other hand, facilitators emerged, such as administrative commitment, community collaboration, school children-centric engagement, support from strong administrators, coordination with the community, and active involvement of school children, all of which can increase the feasibility of such initiatives. It further emphasizes the role of innovative teaching methods and comprehensive health curricula in fostering sustainable oral health practices. The study provided recommendations to design effective oral health programs, which can be adapted for use in other urban contexts to promote lifelong health benefits and reduce future healthcare costs.

Keywords: *School Oral Health Integration; Oral Health Promotion; Barriers and Facilitators; Qualitative Study; School-Based Oral Health Initiatives; Health Education Frameworks.*

1. Introduction

Integrating Oral health into school-based health initiatives is essential for enhancing the overall health of school children (WHO, 2019). Children's oral health status profoundly influences multiple facets of their lives, including their ability to learn, communicate, and perform everyday activities (Sheiham et. al, 2005). However, despite its fundamental importance, oral health is often overlooked in educational health initiatives (Petersen 2004). This study investigated the barriers and facilitators of integrating oral health into school health initiatives, specifically focusing on Bengaluru, India. In a study conducted in Bengaluru (Priyadarshini et. al), there 94.3% prevalence of dental caries among school girls and boys. Employing qualitative methodologies, such as in-depth interviews, this study aims to elucidate the challenges involved and identify strategies for effective implementation (Ehizele et. al, 2011). Oral health significantly influences children's development, school attendance, and academic performance. Dental issues can result in discomfort, infections, and difficulties in eating and speaking, potentially affecting concentration and educational outcomes (Jackson et. al, 2010). Given the substantial duration that children spend in academic institutions, these environments present optimal conditions for promoting health and incorporating dental health initiatives as part of a comprehensive approach to wellness (Lee, 2009). This study evaluated the existing barriers and opportunities for such integration in Bengaluru to enhance health outcomes for school-age children (Sacco-Manno et al., 2023). The integration of oral health into school health initiatives yields benefits that extend beyond immediate health improvements. Such programs have the potential to foster lifelong healthy habits, prevent oral conditions that affect overall well-being, and reduce future health care costs (Vonk et. al, 2024). Educational institutions provide an optimal setting for early health education and intervention, which is crucial for promoting comprehensive wellness (Pulimeno et. al, 2020). This study offers valuable insights for policymakers, educators, and public health experts, particularly in urban areas such as Bengaluru, to enhance children's health and academic performance (Barton, 2020). Although school health programs have

been demonstrated to enhance various aspects of well-being, including physical activity, nutrition, and mental health, oral health is frequently overlooked (Corbin, 2008; Tong, 2007). Research has indicated that school-based oral health interventions can significantly reduce dental caries and promote improved dental hygiene practices. Despite these benefits, several challenges impede the integration of oral health into comprehensive school health programmes. These include limited resources, insufficient training for educators, and low priority for oral health in educational environments (Hennick, 2024). Furthermore, there is a paucity of qualitative studies exploring the challenges and opportunities encountered by school staff in implementing oral health programs, particularly in resource-constrained settings (Smith2024).

Integrating Oral health into school-based health initiatives is essential for enhancing the overall health of school children (WHO, 2019). Children's oral health status profoundly influences multiple facets of their lives, including their ability to learn, communicate, and perform everyday activities (Sheiham et. al, 2005). However, despite its fundamental importance, oral health is often overlooked in educational health initiatives (Petersen 2004). This study investigated the barriers and facilitators of integrating oral health into school health initiatives, specifically focusing on Bengaluru, India. Employing qualitative methodologies, such as in-depth interviews, this study aims to elucidate the challenges involved and identify strategies for effective implementation (Ehizele et. al, 2011). Oral health significantly influences children's development, school attendance, and academic performance. Dental issues can result in discomfort, infections, and difficulties in eating and speaking, potentially affecting concentration and educational outcomes (Jackson et. al, 2010). Given the substantial duration that children spend in academic institutions, these environments present optimal conditions for promoting health and incorporating dental health initiatives as part of a comprehensive approach to wellness (Lee, 2009). This study evaluated the existing barriers and opportunities for such integration in Bengaluru to enhance health outcomes for school-age children (Sacco-Manno et al., 2023). The integration of oral health into school health initiatives yields benefits that extend beyond immediate health improvements. Such programs have the potential to foster lifelong healthy habits, prevent oral conditions that affect overall well-being, and reduce future health care costs (Vonk et. al, 2024). Educational institutions provide an optimal setting for early health education and intervention, which is crucial for promoting comprehensive wellness (Pulimeno et. al, 2020). This study offers valuable insights for policymakers, educators, and public health experts, particularly in urban areas such as Bengaluru, to enhance children's health and academic performance (Barton, 2020). Although school health programs have been demonstrated to enhance various aspects of well-being, including physical activity, nutrition, and mental health, oral health is frequently overlooked (Corbin, 2008; Tong, 2007). Research has indicated that school-based oral health interventions can significantly reduce dental caries and promote improved dental hygiene practices. Despite these benefits, several challenges impede the integration of oral health into comprehensive school health programmes. These include limited resources, insufficient training for educators, and low priority for oral health in educational environments (Hennick, 2024). Furthermore, there is a paucity of qualitative studies exploring the challenges and opportunities encountered by school staff in implementing oral health programs, particularly in resource-constrained settings (Smith2024).

This study distinguishes itself through its concentrated analysis of Bengaluru, a metropolis experiencing accelerated urbanization and grappling with unique socioeconomic challenges. By pinpointing specific barriers and prospects within this urban context, the study offers valuable insights for enhancing the effectiveness of school-based health initiatives (Morel et. al, 2022). The research outcomes will generate pragmatic recommendations for policymakers and educators, contributing to a comprehensive framework for integrating oral health into academic health programs. This framework has the potential for adaptation across diverse urban settings in India and internationally (Carman, et. al, 2013).

Aim: This study aimed to explore the barriers, facilitators, scope, and feasibility of integrating oral health into school health programs in Bengaluru, India.

Research Questions:

1) Barriers
2) Facilitators
3) Scope
4) Feasibility

2. Methodology

2.1. Qualitative study design

This study employed a qualitative exploratory study using in-depth face-to-face interviews and interviews to deeply explore key stakeholders' perspectives, experiences, and practices in defining, identifying, and addressing barriers to integrating oral health into school health programs (Jackson et. al, 2007; Guarzino et. al, 2012). This provided the opportunity to explore stakeholder viewpoints from diverse settings applicable to schools, offering the widest possible range of relevant insights into the integration of oral health into existing frameworks for school health promotion.

2.2. Study sample and recruitment

Purposive sampling was used to ensure the participation of various stakeholder groups, including school administrators, educators, health professionals, and community health representatives. The sampling method used here was designed for information-rich cases that are relevant to the study's objectives. The inclusion criteria were that the participants should have a minimum of 1-2 years of experience in school health or oral health programs to ensure a good understanding of health initiatives within the school environment (O'Connell et. al, 2013). Part-time employees were excluded, thereby engaging only the stakeholders directly connected to the program's implementation (National Academies Press, 2018). All recruitments were by professional networking, institutional connections, and academic networking environments, but saturation of data occurred once 30 interviews were conducted for this research, yielding nothing different.

Table 1: Heterogeneous Combination of School Stakeholders for In-Depth Interview

Stakeholder Category	Key Informants for In-Depth Interview	Examples of Stakeholders to Include	Number of Interviews
School Teachers/Heads	School administration and teaching staff	Teachers, Principals, Health Coordinators	10
Dental Professionals	Oral health service providers	Dentists, Dental Hygienists, Community Dental Workers	01

NGO Representatives	Representatives from health-focused NGOs	NGO Project Managers, Health Program Officers	05
RBSK Representatives	Child health program personnel	RBSK Program Coordinators, Health Officers	02
Block Education Officers (BEOs)	District-level education administration	BEOs, Health Education Supervisors	02
Medical professional	Pediatrician		01 Total = 21

Data Collection and Data Recording The face-to-face in-depth interviews allowed the respondents to reflect on their experiences and perspectives regarding the integration of oral health into school activities/ oral health programs (Diao, et. al, 2019). It was planned to conduct a minimum of 25 interviews, and in total, 21 interviews were conducted until data saturation was reached in person at different schools in Bengaluru, and each lasted 97 minutes and 35 seconds. All the interviews were audio-recorded with some field notes taken during the interview to capture a bit of contextual detail and non-verbal cues that would add even more depth to the data interpretation (Laursen et. al, 2021). To refine the interview guide, pilot interviews were conducted with a small sample of stakeholders, including school administrators, teachers, and a health professional. These initial interactions allowed for feedback on question clarity, relevance, and structure, ensuring that questions were sufficiently open-ended to allow stakeholders to share their unique perspectives and experiences. Based on pilot feedback, adjustments were made to enhance the guide's effectiveness in capturing comprehensive data across diverse stakeholder roles.

3. Data Analysis

Data were analysed based on Braun and Clarke's thematic analysis framework [34]. This consisted of the following steps: 1. Transcription and Verification: Audio recordings were transcribed verbatim and then verified against the recordings to check accuracy. 2. Open Coding: Two researchers worked separately to find the central idea of open coding. 3. Group Discussion: The research team met and agreed on the preliminary list of initial codes developed, which were finalized upon consensus. Thereafter, a preliminary codebook was developed. 4. Iterative Coding: For the rest of the responses, the coding structure applied iteratively gave rise to new codes wherever necessary. 5. Theme Synthesis and Subtheme inter-relationship: Syntheses that interrelate were provided by finalizing the coding framework, so there would be an orderly sense and interpretation of the findings.
After thorough transcription, the data collected were then transferred to Microsoft Excel, followed by analysis using data analysis on ATLAS. ti Software web version 5.8.0. ensuring that data storage and retrieval of analysis are properly oriented.

4. Results

The study provides a crucial understanding of the elements that discuss the barriers, facilitators, scope, and feasibility of oral health integration into school health promotion across Bengaluru. Examination of interviews with key stakeholders revealed major barriers to successful oral health programs, such as limited resources, insufficient curriculum content, and challenges in program implementation. The efficacy and reach of these initiatives were also hampered by minimal awareness and engagement, along with physical and psychological environmental limitations. On the other hand, stakeholders identified several factors that could boost oral health education efforts, including administrative backing, participation from school children and parents, collaborations with community groups, and a supportive school environment. Together, these insights offer a comprehensive view of the challenges and opportunities affecting oral health promotion activities and establish a foundation for developing focused and long-lasting health interventions within educational institutions.
Resource Constraints: Limited budgets, lack of dental professionals, insufficient training, and packed curricula restrict effective oral health program implementation. Curriculum Gaps: Inadequate integration of oral health education into existing school programs. Awareness and Engagement Deficits: Low awareness among school children, teachers, and parents; insufficient engagement hinders success. Environmental and Structural Barriers: Lack of hygiene facilities and the impact of psychosocial factors like self-esteem related to dental issues. Administrative Commitment: School leadership plays a crucial role in promoting and sustaining health initiatives. Community Collaboration: Partnerships with NGOs, local clinics, and community organizations enhance program feasibility. School children-Centric Engagement: Empowering school children through roles in health promotion fosters sustainability.

4.1. Minor themes

Geographic and Socioeconomic Barriers: Access challenges in underserved areas. Interactive Educational Materials: The need for innovative, age-appropriate resources. Health Committee Role: Formation of committees involving parents, teachers, and school children to oversee initiatives. Regular Feedback and Iteration: Community feedback mechanisms to refine program strategies. Integration with Broader Health Initiatives: Leveraging existing health programs for synergy.

4.2. Resource constraints

The study identifies resource limitations as a primary barrier to integrating oral health into school programs. Financial constraints impede the allocation of sufficient resources, such as educational materials and the recruitment of trained dental professionals. Educators are often inadequately prepared to address oral health issues due to insufficient training. The challenge is exacerbated by saturated curricula that deprioritize health education. "There's also a lack of resources, such as oral health hygiene tools like toothbrushes and toothpaste, educational materials, and trained professionals who can provide accurate information." (ST-02). "One of the main barriers is time. With an already packed curriculum, it's challenging to allocate time specifically for oral health education." (ST-01) Curriculum Gaps: Oral health education is poorly integrated

Table 2: Major Themes from the Thematic Analysis

Major Theme	Sub-themes	Supporting Quotations (Reference)
Resource Constraints	Limited budgets, lack of dental professionals, insufficient training for educators, and packed curricula.	- "Our budget is limited." (ST-06) - "We don't have a dedicated dental professional available." (ST-07) - "One of the main barriers is time." (ST-01)
Curriculum Gaps	Inadequate integration of oral health education into existing school programs.	- "Oral health is touched upon, but not as extensively as it should be." (ST-08) - "The current programs do not provide detailed education on oral hygiene." (ST-03)
Awareness and Engagement Deficits	Low awareness among School children, teachers, and parents; insufficient engagement hinders success.	- "Limited awareness of oral health issues among both staff and School children." (ST-04) - "Some parents are not fully aware of the importance of oral hygiene." (ST-05)
Environmental and Structural Barriers	Lack of hygiene facilities, psychosocial impacts on School children, such as self-esteem issues related to dental problems.	- "We don't have dedicated areas for School children to wash their hands or brush their teeth." (ST-07-IDI) - "School children are often self-conscious about their smiles." (ST-07)
Administrative Commitment	Role of school leadership in promoting and sustaining health initiatives.	- "The principal actively supports initiatives aimed at promoting school well-being." (ST-04)
Community Collaboration	Partnerships with NGOs, local clinics, and community organizations.	- "These efforts create a more accepting environment." (ST-07-IDI) - "An ambulance is stationed at our school to provide free treatment." (ST-02)
School Children-Centric Engagement	Empowering School children through leadership roles in health promotion fosters sustainability.	- "Empowering School children to take leadership roles in these programs could foster continuity." (ST-IDI-03)

Into existing school programs. Stakeholders emphasized the necessity for more comprehensive health curricula that prioritize preventive care. "Oral health is touched upon, but not as extensively as it should be." (ST-08) "The current programs do not provide detailed education on oral hygiene or the importance of regular dental check-ups." (ST-03)

4.3. Awareness and engagement deficits

A deficiency in awareness among School children, staff, and parents emerged as a critical barrier. Parental insufficient comprehension of oral hygiene's significance reduces their support for school health initiatives. This lack of engagement impedes the implementation of effective programs. "Limited awareness of oral health issues among both staff and School children." (ST-04) "Some parents are not fully aware of the importance of oral hygiene, which affects school children's engagement." (ST-05)

4.4. Environmental and structural barriers

Physical and psychosocial factors significantly impact oral health promotion. Schools often lack the necessary infrastructure, such as designated hygiene areas. Additionally, psychosocial issues, including low self-esteem associated with dental problems, inhibit school participation. "We don't have dedicated areas for School children to wash their hands or brush their teeth." (ST-07-IDI) "School children are often self-conscious about their smiles, especially if they have dental issues... it can lead to decreased self-esteem." (ST-07)

4.5. Administrative commitment

The commitment of school leadership was identified as a crucial facilitator. Proactive administrators can allocate resources, create a supportive environment, and establish health promotion as a priority. "The principal actively supports initiatives aimed at promoting school well-being." (ST-04)

4.6. Community collaboration

Collaborations with NGOs, clinics, and other organizations enhance the feasibility of health initiatives by providing additional resources and expertise. "These efforts facilitate a more inclusive environment." (ST-07-IDI) "An ambulance is stationed at our educational institution to provide complimentary medical treatment, medications, and general health examinations." (ST-02)

4.7. School children-centric engagement

Empowering school children to assume active roles in health initiatives fosters ownership and sustainability. Leadership positions encourage peer-led education and enhance overall program engagement. "Empowering school children to assume leadership roles in these programs could foster continuity." (ST-IDI-03)

4.8. Geographic and socioeconomic barriers

- Access Challenges: Stakeholders emphasized educational institutions' significant challenges in low-income and semi-urban areas, particularly regarding access to oral health services. Transportation issues and socioeconomic disadvantages present considerable barriers to implementing effective programs. "The distance is because we usually cater to these very poor and low socioeconomic, semi-urban and rural schools" (HCW-IDI).
- Government Support: Insufficient government involvement and partnerships limit resource availability and the scope of interventions in underserved regions. "We are currently limited in terms of government program support" (ST-IDI-03).
- Resource Allocation: Time constraints and staffing shortages further exacerbate disparities, impeding the implementation of comprehensive oral health programs. "Time constraints and maybe hands" (Table 2, Dental 5-IDI).

4.9. Interactive educational materials

- Engaging Resources: Participants underscored the necessity for innovative, age-appropriate materials to effectively communicate health information. Interactive games and visual aids were identified as particularly effective in enhancing engagement and comprehension among School children. "Creating engaging educational materials for school children that are age-appropriate" (ST-02).
- Innovative Teaching: Creative methods, such as utilizing games to identify healthy and unhealthy practices, were commended for their capacity to foster enthusiasm and understanding in School children. "We used to play that game where they have to identify which item should go to the good tooth bag or should go to the bad tooth bag" (Table 4, Dental 5-IDI).

4.10. Role of health committees

- Stakeholder Inclusion: Establishing health committees involving teachers, parents, and school children ensures shared responsibility and diverse representation, enhancing the relevance and effectiveness of health programs. "Having a health committee involving teachers, parents, and school children would help oversee the integration of oral health initiatives" (ST-IDI-03).
- Oversight and Planning: Health committees provide a platform for collaborative planning and evaluation, allowing for tailored solutions that meet the specific needs of schools. "This committee can serve as a platform for collaborative planning and evaluation of health programs" (ST-IDI-03).

4.11. Regular feedback and iteration

- Community Involvement: Gathering feedback from School children, parents, and school staff ensures that health initiatives remain responsive to the unique needs of the community and maintain their relevance. "Regular feedback from the school community will also help us adapt and improve our strategies" (ST-02).
- Iterative Processes: Incorporating feedback into program strategies helps address challenges effectively and refine objectives to align with evolving requirements. "Creating awareness... we can bring the desirable change and disagree

Table 3: Minor Themes and Subthemes from the Thematic Analysis

Minor Theme	Subthemes	Key Quotations
Geographic and Socioeconomic Barriers	Access challenges in underserved areas	"The distance is because we usually cater to these very poor and low socioeconomic, semi-urban and rural schools" (HCW-IDI).
	Limited government support and collaboration	"We are currently limited in terms of government program support" (ST-IDI-03).
	Resource allocation disparities	"Time constraints and maybe hands" (Table 2, Dental 5-IDI).
Interactive Educational Materials	Development of age-appropriate materials	"Creating engaging educational materials for school children that are age-appropriate" (ST-02).
	Use of innovative teaching methods	"We used to play that game where they have to identify which item should go to the good tooth bag or should go to the bad tooth bag" (Table 4, Dental 5-IDI).
Health Committee Role	Involvement of diverse stakeholders	"Having a health committee involving teachers, parents, and school children would help oversee the integration of oral health initiatives" (ST-IDI-03).
	Platform for collaboration and evaluation	"This committee can serve as a platform for collaborative planning and evaluation of health programs" (ST-IDI-03).
Regular Feedback and Iteration	Community feedback mechanisms	"Regular feedback from the school community will also help us adapt and improve our strategies" (ST-02).
	Iterative refinement of programs	"Creating awareness... we can bring the desirable change and disagree completely with that" (Table 2, NGO-IDI-01).
Integration with Broader Health Initiatives	Synergy with existing health programs	"Leveraging existing health programs would streamline efforts and enhance efficacy" (Table 4, Dental 5-IDI).
	A Comprehensive approach to health education	"Once in a year, we do an oral health education program... we address not just oral health" (Table 2, Dental 5-IDI).

Completely with that" (Table 2, NGO-IDI-01).
Integration with Broader Health Initiatives

- Existing Frameworks: Leveraging established health programs minimizes redundancies, optimizes resource use, and streamlines efforts, thereby enhancing program efficiency.

"Leveraging existing health programs would streamline efforts and enhance efficacy" (Table 4, Dental 5-IDI).

- Holistic Wellness: Embedding oral health education within broader topics, such as nutrition and mental health, promotes a comprehensive approach to school wellness and highlights the interconnected nature of health issues.

"We conduct an annual oral health education program... addressing not only oral health" (Table 2, Dental 5-IDI).

5. Discussion

Resource limitations emerged as a critical barrier to integrating oral health into school health programs in Bengaluru. Respondents highlighted inadequate budgets, lack of educational materials, and shortage of trained dental professionals as major hindrances. These findings echo earlier Indian studies, which emphasized that financial constraints and scarcity of oral health staff limit effective program delivery in both urban and rural schools (Chakraborty et al., 2024; Gambhir et al., 2013; Chandrashekar et al., 2014). Moreover, time pressures within already packed curricula often lead to oral health being deprioritized, a challenge also reported in similar low-resource settings across India (Dangi et al., 2025; Sharma et al., 2025). These parallels underscore the need for innovative, low-cost models that can function despite systemic limitations.

Stakeholders consistently pointed to insufficient integration of oral health within the school curriculum. Oral health is addressed only superficially, failing to instill preventive knowledge and lifelong hygiene habits. These findings align with national and international evidence that highlights weak curricular emphasis as a missed opportunity for sustainable health gains (Jawdekar, 2013; Hopper & Brake,

2018; Rajan et al., 2017). Recent Indian research also suggests that teachers can serve as effective agents of oral health promotion if equipped with structured curricula and training (Dangi et al., 2025; Purohit et al., 2024). This reinforces the argument for integrating structured oral health modules into school syllabi to ensure long-term behavioral change.

Limited awareness among parents, children, and school staff emerged as a recurring challenge. Parental disengagement was particularly noted as a barrier, consistent with studies from Shimla and other Indian cities, where lack of parental reinforcement weakened program outcomes (Shailee et al., 2012; Shailee et al., 2013). The stigma surrounding dental issues, which prevents open discussions, also mirrors findings from Gambhir et al. (2013), who observed that cultural and social perceptions strongly shape oral health behaviors. Strengthening parental engagement and community-driven awareness campaigns could therefore be pivotal for sustained impact.

Respondents identified the absence of dedicated infrastructure—such as handwashing or toothbrushing stations—as a barrier to effective program delivery. The psychosocial burden of dental problems, including low self-esteem and reduced participation, was also emphasized. These observations are supported by Indian evidence demonstrating that infrastructural deficits in schools directly compromise oral hygiene practices and health-seeking behaviors (Narayan et al., 2023; Chandrashekar et al., 2014). Similar patterns have been reported internationally, reinforcing the universality of environmental barriers (Seirawan et al., 2012; NJ et al., 2011).

Strong administrative support was described as a crucial facilitator. School principals who prioritized child health created enabling environments for successful initiatives. Similar findings have been documented in India, where leadership commitment significantly influenced program sustainability (Haleem et al., 2012; Dangi et al., 2025). International evidence also validates this, demonstrating that engaged leadership fosters resource allocation and long-term integration of health within educational frameworks (Jackson et al., 2011; Ghasemi et al., 2024).

Collaborations with NGOs, dental colleges, and health services emerged as a major facilitator, providing schools with additional expertise and resources. These partnerships align with successful Indian models where NGO-supported initiatives delivered preventive services and awareness campaigns in low-resource schools (Chandrashekar et al., 2014; Gambhir et al., 2013). Such findings are consistent with international evidence that highlights the role of cross-sectoral collaboration in ensuring continuity of health programs (Allensworth et al., 1997; Chew et al., 2024).

Empowering students through peer-led and participatory approaches was identified as a promising strategy. Respondents noted that when children took leadership roles, oral health practices were more consistently adopted and sustained. Evidence from India supports this, with studies showing that child-driven activities significantly improved oral health knowledge and practices (Narayan et al., 2023; Chandrashekar et al., 2014). Peer influence has also been widely recognized as a strong determinant of health behavior change globally (Diao et al., 2019; Elsadek et al., 2023). This suggests that child-centered interventions may offer scalable and sustainable pathways for oral health promotion.

6. Limitations and Future Research Recommendations

This study was limited by the focus on qualitative data from a select group of stakeholders within schools in Bengaluru, potentially limiting the generalizability of findings to other regions or contexts. At the same time, some logistical constraints, such as limited access to diverse schools across socioeconomic settings, may have restricted the breadth of perspectives captured. Future research should consider expanding the sample size and diversity to encompass a broader range of schools, particularly from under-resourced areas. Moreover, longitudinal studies could provide insights into the long-term effectiveness of integrated oral health programs in improving school health outcomes and reducing absenteeism. Investigating the impact of specific facilitators, such as community partnerships and administrative support, in diverse contexts could further enrich understanding and provide a framework for scaling these initiatives regionally.

Although this study is rooted in Bengaluru's urban schools, it essentially deals with oral health challenges among school-aged children. The prevalence of dental caries and poor hygiene practices has shared epidemiological patterns, and are not exclusive to Bengaluru. Many Indian states have these issues in common, as well as in low-and middle-income countries (LMICs). Also, the school health promotion used in this study is transferable across schools, while embedding preventive care and health education. Indian states and other LMICs face comparable barriers to oral health, increasing the external validity of findings. Moreover, utilizing a global framework of the WHO contributes to generalizability across geographies despite limitations. Again, the study's inclusion of community and administrative partnerships has the potential of being replicated even in rural district schools of India. Thus, these strategies can be leveraged

7. Conclusion

This study reveals critical insights into the potential and challenges of integrating oral health education within school health programs in Bengaluru, highlighting both barriers and promising facilitators that shape feasibility. Barriers such as resource constraints, limited curriculum space, and inadequate stakeholder awareness underscore the complexity of implementing comprehensive health initiatives. However, significant facilitators, including strong administrative commitment, active parental and school engagement, and support from local health organizations, demonstrate that meaningful, sustained oral health promotion within schools is achievable.

Given the scope for impact on school health and attendance, embedding oral health into school health frameworks has significant potential to transform school environments into holistic health-promoting spaces. Addressing oral health as an essential component of general health enhances school well-being and supports broader educational objectives by improving attendance and engagement. For policymakers, educators, and community stakeholders, these findings underscore the importance of a collaborative, structured approach to integrating oral health into school health programs, positioning oral health as a vital, foundational aspect of youth development and overall public health.

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Annexures

Annexure 1

Stakeholders selected	Code
School teacher	ST
Dental Professionals/Health care workers	HCW
NGO Representatives	NGO
RBSK Representatives	RBSK
Block Education Officers (BEOs)	BEO

Annexure 2
Interview guide
Components of Interview Guide:

1) Challenges to the Integration of Oral Health
- What are the significant challenges your school faces in delivering oral health services or integrating oral health education?
- To what extent have resource constraints, including funding and materials, constrained the integration of oral health into existing programs at your school?
- Do policies or legal provisions hinder the integration of oral health into the health programs offered at your school? To what extent?

2) Oral Health Enablers Implementation
- What do you think have been some of the resources or initiatives that are supporting your school in promoting oral health among School childrento date?
- Have there been any successful initiatives or collaborations that have helped in bringing forth oral health promotion in your school?

3) Oral Health Implementation Potential
- How do you envision the fit of oral health into the current health programs or services offered by your school?
- What do you think nutrition, physical environment, or existing health education programs contribute to oral health in school?

4) Feasibility of Integration
- What kind of support (e.g. training of staff, funding, partnerships) would make oral health programs easier to be integrated in your school?
- How prepared is your school staff for the oral health program? Do you think there is specific training that could facilitate this integration?
- How would you assess the community's involvement in favor of oral health programs at your school? Are there partnership opportunities that can be friendly?

Table 1: Interview Guide

Component	Interview Guide Questions
Questions related to challenges and barriers faced by schools in oral health integration	
Challenges in Delivering Oral Health Services	1.1 What are the main obstacles to providing or incorporating oral health education and services at your school?
Resource Constraints	1.2 How have limited resources (e.g., funding, materials) affected oral health integration in your programs?
Policy and Legal Barriers	1.3 Are there any policies or legal issues that hinder oral health inclusion in your school's health programs? If so, how?
Questions Related to Oral Health Enablers and Implementation in Schools	
Supporting Resources and Initiatives	2.1. What do you think have been some of the resources or initiatives that are supporting your school in promoting oral health among School childrento date?
Successful Initiatives and Collaborations	2.2. Have there been any successful initiatives or collaborations that have helped in bringing forth oral health promotion in your school?
Questions Related to Oral Health Implementation Potential in Schools	
Integration with Current Health Programs	3.1. How do you envision the fit of oral health into the current health programs or services offered by your school?
Contributions of Existing Programs to Oral Health	3.2. What do you think nutrition, physical environment, or existing health education programs contribute to oral health in school?
Questions Related to the Feasibility of Integrating Oral Health Programs in Schools	
Support for Program Integration	4.1. What kind of support (e.g., training of staff, funding, partnerships) would make oral health programs easier to integrate in your school?
Staff Preparedness and Training Needs	4.2. How prepared is your school staff for the oral health program? Do you think there is specific training that could facilitate this integration?
Community Involvement and Partnerships	4.3. How would you assess the community's involvement in favor of oral health programs at your school? Are there partnership opportunities that can be friendly?