

Original Article



Behavioral Prevention Strategies and Oral Health Practices Among Primary School Children in Qatar: A Qualitative Multiple Case Study

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Abstract

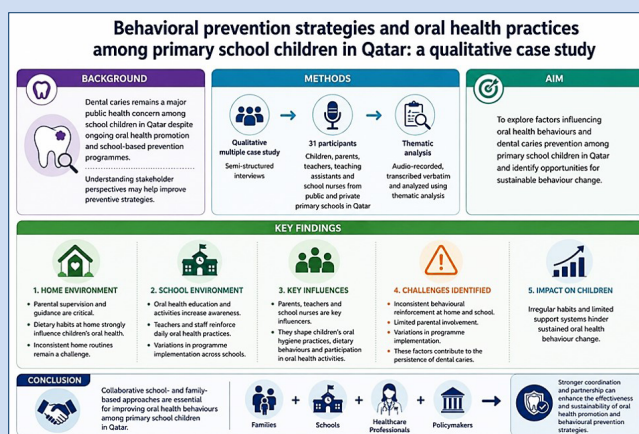
Introduction:

Dental caries remains a major public health concern among schoolchildren in Qatar despite ongoing oral health promotion and school-based prevention programs. Understanding stakeholder perspectives may help improve preventive strategies. This study explored stakeholder perspectives on factors influencing oral health behaviors among primary schoolchildren in Qatar and identified contextual opportunities to strengthen behaviors relevant to dental caries prevention.

Methods: A qualitative multiple case study design was used involving semi-structured interviews with children, parents, teachers, teaching assistants, and school nurses from one public and one private primary school in Qatar. Thirty-one participants were included. Interviews were audio-recorded, transcribed verbatim, and analyzed using thematic analysis.

Results: Both home and school environments played important roles in shaping children's oral health behaviors. Parents, teachers, and school nurses were identified as key influences on oral hygiene practices, dietary behaviors, and participation in oral health activities. Although participants generally demonstrated awareness of oral health and preventive practices, inconsistent behavioral reinforcement, limited parental involvement, and variations in program implementation were identified as challenges that participants perceived as barriers to sustaining preventive oral-health behaviors.

Conclusion: Collaborative school- and family-based approaches are essential for improving oral health behaviors among primary school children in Qatar. Strengthening coordination between parents, schools, healthcare professionals, and policymakers may improve the consistency and sustainability of school- and family-based oral-health promotion.



Introduction

Dental caries is one of the most prevalent chronic conditions affecting children and is associated with negative impacts on well-being, physical health, and academic performance.¹ In both developed and developing countries, schoolchildren are increasingly exposed to unhealthy dietary habits, including frequent consumption of sugary foods and poor oral hygiene practices.² In Qatar, rapid urbanization, lifestyle changes, and increased accessibility to sugary and processed

foods have contributed to worsening oral health among children.^{3,4} Previous research in Qatar has shown that children's oral health is influenced by sociodemographic factors, parental and educator awareness, and access to dental care services.⁵ Consequently, dental caries remains an important public health concern requiring comprehensive preventive strategies and policies.

Schools provide an important setting for promoting positive oral health behaviors because children spend substantial time in educational environments.² However,

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parents, teachers, and community stakeholders also play a significant role in shaping children's oral health attitudes and practices.^{4,6} Therefore, effective oral health promotion strategies should incorporate the perspectives and involvement of all stakeholders within the child's social and educational environment.

In Qatar, the Ministry of Public Health has implemented several initiatives to reduce dental caries among children.⁷ Despite these efforts, poor oral health among schoolchildren continues to persist, highlighting the need to evaluate and strengthen existing oral health programs and policies. A study proposed a modified Asnani School Oral Health Program (ASOHP) model to improve coverage across public and private schools.⁷ In contrast, another study reported positive parental feedback regarding the program's role in improving children's oral health behaviors.⁸

The Policy Triangle Framework⁹ was previously applied to evaluate the National Oral Health Design Project 1.9 in Qatar, focusing on policy content, context, actors, and implementation processes.¹⁰ Although the framework supported school-based oral health interventions, implementation challenges limited program coverage among school children.¹¹ Therefore, further exploration of stakeholder perspectives is needed to better understand the behavioral and contextual factors contributing to persistent dental caries among children in Qatar.

Accordingly, this qualitative multiple-case study aimed to explore stakeholder perspectives on children's oral health behaviors and the contextual factors perceived to influence oral health promotion and behaviors relevant to dental caries prevention within the two participating primary school settings in Qatar.

Methods

Study Design and Setting

A qualitative multiple-case study design informed by a constructivist paradigm was adopted to explore stakeholder perspectives on oral health behaviors and practices relevant to dental caries prevention among primary schoolchildren in Qatar.¹² Consistent with this paradigm, participants' accounts were understood as contextually situated constructions of oral health behaviors and school-based oral health practices rather than as representations of a single objective reality. Semi-structured interviews enabled participants to articulate their own meanings and experiences, while the probe sought clarification rather than relying on researcher inference. The researcher occupied an insider position through professional experience in oral health promotion in Qatar; reflexive attention therefore focused on how prior knowledge and assumptions might influence data generation and interpretation. Each participating school constituted a separate bounded case. Case 1 was one public primary school nominated by the Ministry of Education, whereas Case 2 was one private primary school selected purposively based on willingness to participate. The two schools were treated as distinct cases to examine the phenomenon within each school context

before comparing patterns across cases.

The cases were bounded by school setting, participant affiliation, primary school context, the 2018–2019 academic-year study period, and the phenomenon under investigation. The analytic focus was on stakeholder perspectives concerning children's oral health behaviors and school- and home-based behavioral practices relevant to dental caries prevention, particularly oral hygiene and dietary behaviors. Clinical dental outcomes and non-behavioral caries prevention interventions were outside the boundaries of the qualitative cases.

A case study design was selected because the phenomenon of interest—children's oral health behaviors and school-based oral health promotion—was embedded within the organizational, social, and family contexts in which these behaviors occurred. Rather than providing a context-independent qualitative description of stakeholder views, the case study approach enabled an in-depth examination of how these perspectives and practices operated within two real-world school settings. The multiple-case design further allowed patterns to be examined within each participating school and subsequently compared across the two cases.¹³

The study aimed to explore stakeholder perceptions of oral health behaviors, dental caries prevention, and factors influencing sustainable behavior change among primary schoolchildren in Qatar.

Sampling and Participants

Purposive sampling was used to select participants who could provide information-rich perspectives on school oral health behaviors and activities.¹⁴ The public school case was nominated through the Ministry of Education. After the initially nominated private school declined to participate, a replacement private school was purposively selected based on willingness to participate, and the required institutional permission was obtained. Before data collection, meetings were held with school principals and relevant school coordinators. Study information and consent materials were distributed through school personnel; the public school coordinator and the private school nurse helped inform eligible parents and school staff about the study. Interested participants received participant information and consent materials before enrolment.

Participant selection sought variations in stakeholder role and, for participating children and families, characteristics including grade, sex, nationality, upbringing in Qatar, and previous exposure to school oral health activities. Children who had recently arrived in Qatar and children or parents considered medically unfit to participate were excluded. The final sample comprised 31 participants: 15 from the public school case and 16 from the private school case. Participants included 10 children, 10 parents, 8 teachers, 1 teaching assistant, and 2 school nurses. Two participating parents were also teachers. [Table 1](#) presents the distribution of participants by stakeholder group and school case.

Table 1. Characteristics of Study Participants (n=31)

Participant Group	Public School	Private School	Total
Children	5	5	10
Parents	5	5	10
Teachers	4	4	8
Teaching Assistant	0	1	1
School Nurses	1	1	2
Total	15	16	31

Data Collection

Data were collected through semi-structured interviews conducted in Arabic or English according to participant preference. Separate interview guides were used for children, parents, teachers, and school nurses to ensure relevance to each participant group. The interview guides and study procedures were piloted before the main study, resulting in minor modifications, including the use of simpler wording for children and additional explanatory prompts. Interviews focused on oral hygiene practices, dietary behaviors, school oral health policies, access to dental care, and practices relevant to dental caries prevention. Interviews were conducted in quiet areas within the participating schools, audio-recorded with participants' consent, and supplemented by field notes. Each interview lasted approximately 20–40 minutes.

Data Analysis

Interview recordings were transcribed verbatim. Transcripts were checked against the audio recordings for accuracy and anonymized before analysis. Data were analyzed manually using thematic analysis.¹⁵ Analysis involved repeated familiarization with the transcripts, generation of initial codes through line-by-line reading, grouping of conceptually similar codes into categories, development and review of descriptive themes, and subsequent development of interpretive themes relevant to the study questions.¹⁶ Themes were reviewed against the transcripts and refined to ensure that they adequately represented participants' accounts.¹⁷ Consistent with the multiple-case study design, analysis was undertaken within each case and subsequently across the two cases to identify convergent, divergent, and context-specific patterns.¹⁸ Repeated review of transcripts and comparison of codes and themes contributed to analytical consistency and credibility.

Trustworthiness

Trustworthiness was enhanced through the inclusion of multiple stakeholder groups, maintenance of an audit trail, repeated review of transcripts and detailed descriptions of the study context and procedures.

Results

The findings identified themes relating to oral health knowledge, preventive behaviors, parental involvement, and school-based oral health promotion. Themes identified from interviews with children, parents, teachers,

and school nurses focused on oral health knowledge, preventive behaviors, school oral health promotion, parental involvement, and challenges affecting sustained oral hygiene practices.

Themes from Children's Interviews

Oral Health Awareness and Preventive Behaviors

Most children demonstrated basic awareness regarding oral health and dental hygiene. One student described oral health simply as: "It means I should not be sick." (Rayah, public school pupil)

Many participants associated good oral health with regular tooth brushing, reducing sugary food intake, and preventing tooth decay. One student explained oral health as "not being sick." Children commonly described dental caries as "holes in teeth," while another child described caries as "animals that want to eat my tooth."

Children recognized the importance of preventive behaviors, including limiting sweets, brushing teeth regularly, and attending dental visits. Several participants reported brushing their teeth two or three times daily. For example, one student stated, "I brush my teeth three times a day, after every meal," while another reported brushing "two times in the morning and one time before going to bed." However, some children reported challenges maintaining regular brushing because of tiredness, lack of motivation, or limited time.

Perceived Benefits of Oral Health Educational Programs

Children reported positive experiences with school oral health activities and government-led oral health programs. Participants viewed educational demonstrations, videos, dental screenings, and the distribution of toothbrushes and toothpaste as beneficial for oral health awareness and for encouraging preventive practices.

One participant described the program by stating:

"They showed us how to brush our teeth using a big toothbrush...they also checked our teeth and informed parents if follow-up was needed."

Participants in the public school case reported greater exposure to school oral health activities than some participants in the private school case. This observation reflects the experiences of the two participating schools and should not be interpreted as a systematic difference between public and private schools. Participants emphasized the importance of expanding oral health programs to include students, teachers, parents, and school nurses.

School-based Oral Health Promotion

Children indicated that schools played a supportive role in promoting oral hygiene through health campaigns, educational activities, and routine oral health guidance. Students noted that schools encouraged healthy eating habits and proper toothbrushing practices. However, several participants believed that oral health activities were not consistently implemented and required better coordination and continuity.

Perceptions of Dental Caries Among Peers

Many children reported observing dental problems among classmates, including tooth decay, bad breath, and tooth discoloration. Some participants stated that they encouraged peers to reduce sugary food intake and adopt healthier oral hygiene practices. Older students were also perceived as having a potential role in guiding younger students regarding oral hygiene behaviors.

Themes from Parents' Interviews

Parental Awareness and Oral Hygiene Practices

Most parents demonstrated good awareness regarding oral hygiene and dental caries prevention. Parents commonly emphasized the importance of regular tooth brushing, healthy dietary habits, and routine dental visits. Several parents believed that children learn oral hygiene behaviors primarily through parental example and reinforcement at home.

One parent stated: "It means taking care of our teeth to avoid dental caries and washing them regularly."

Parents also recognized their responsibility in promoting healthy oral hygiene practices and limiting sugary food consumption among children.

Dental Caries and Dental Follow-up

Many parents reported that their children had experienced dental caries or tooth decay and required dental follow-up. Some parents described challenges associated with children's fear of dental treatment. Nevertheless, parents generally considered dental visits important for maintaining children's oral health and preventing complications.

Impact of School Oral Health Activities

Parents generally viewed school oral health activities positively and believed that lectures, awareness campaigns, and dental visits increased children's interest in oral hygiene.

However, several parents indicated that improvements in children's oral health behaviors were sometimes temporary and difficult to sustain over time. One teacher highlighted the importance of supporting parents with practical guidance, stating: "Also guiding the parents and giving them resources to go about this topic because sometimes the children are resistant, and the parents give up after one or two attempts. If they have proper guidance, they can have good results."

One parent explained: "Initially, they get excited...then they start skipping, although I keep advising them."

Disconnection Between School and Home Oral Health Practices

Some parents expressed concern regarding inconsistency between oral health education provided at school and oral hygiene practices maintained at home. Parents reported difficulties encouraging younger children to consistently follow oral hygiene routines and suggested that schools should strengthen follow-up and motivational strategies

to support sustained behavioral change.

School Oral Health Promotion and Curriculum Integration

Parents emphasized the important role of schools and teachers in promoting oral hygiene and preventive oral health behaviors. Several participants recommended integrating oral health education into school curricula and increasing school-based oral health activities. Parents also believed that teachers could act as role models in reinforcing positive oral health practices among students.

Parental Involvement in School Oral Health Activities

Although many parents expressed interest in participating in school oral health activities, several reported limited involvement in health-related school programs. Parents said communication with schools focused mainly on academic matters rather than oral health promotion.

Previous PHCC School Dental Programs

Some parents reported positive experiences with previous PHCC school dental programs, including school dental check-ups and referral letters for follow-up care. These programs were perceived as useful in increasing children's awareness regarding oral hygiene and dental visits. However, some parents indicated limited direct involvement in the follow-up process.

Stakeholders in Oral Health Promotion

Parents and school staff emphasized that oral health promotion requires collaboration between schools, parents, nurses, healthcare professionals, and policymakers. Participants highlighted the importance of multidisciplinary and multisectoral approaches in strengthening oral health awareness and preventive practices among children.

Themes from Teachers and School Nurses' Interviews

Oral Health Awareness and Practices

Most teachers and school nurses demonstrated good awareness regarding oral hygiene, healthy dietary behaviors, fluoride toothpaste use, and the importance of routine dental visits. One school nurse explained oral health as:

"Taking care of our teeth and internal health by eating healthy food."

A teacher highlighted the broader importance of oral health: "Personally, I think that oral health means a healthy body because it is the entry point of the essential elements for the human body."

A public school nurse explained: "It means when we take care of our teeth and our internal health by eating healthy food. It means how to take care of teeth, like how to clean and types of healthy food, etc." Teachers and nurses also reported practicing regular oral hygiene behaviors, including routine toothbrushing and promoting healthy habits among students.

Concerns Regarding Dental Caries Among Students

Teachers and school nurses expressed concern regarding the high prevalence of dental caries and tooth-related complaints among students. Some participants reported regularly encountering students with tooth pain, caries, or dental abscesses.

However, views differed regarding teachers' responsibilities in oral health promotion. While some teachers believed they should guide and educate students regarding oral hygiene, others considered dental health issues outside their professional responsibilities. Table 2 summarizes the main themes and subthemes identified across participant groups.

Discussion

The findings of this study highlight stakeholder-perceived influences of oral health awareness, parental involvement, school-based oral health activities, and stakeholder support on oral health behaviors related to dental caries prevention among primary schoolchildren in Qatar. Children, parents, teachers, and school nurses generally demonstrated awareness regarding oral hygiene practices and the harmful effects of excessive sugar consumption. These findings support previous evidence that educational exposure, family practices, and institutional support systems influence oral health behaviors.

Most children in the present study recognized sugary foods and poor oral hygiene practices as major contributors to dental caries. Previous studies have reported similar findings, demonstrating a direct relationship between frequent sugar consumption and dental caries among school-aged children.^{19,20} Research conducted in Qatar also reported that increased intake of sugary snacks and beverages contributes to higher rates of tooth decay and oral infections among children.³ In the current study, children associated dental caries with "holes in teeth," bad breath, and discoloration of teeth, reflecting practical awareness of oral disease symptoms.

The findings further showed that many children understood their role in maintaining oral hygiene through regular tooth brushing and reduced sugary food intake. This is consistent with studies suggesting that self-efficacy and personal accountability positively influence oral health behaviors among children.²¹ However, some participants reported difficulties maintaining regular oral

hygiene routines because of tiredness, lack of motivation, or insufficient time. Previous research has reported similar findings, indicating that awareness alone may not lead to sustained behavioral change without reinforcement from parents and schools.²²

School-based oral health programs were perceived as beneficial in improving children's oral health awareness and preventive practices. Educational campaigns, demonstrations, videos, and dental screenings appeared to increase motivation toward oral hygiene and dental care. Previous studies have reported similar improvements in children's oral health knowledge and behaviors following school-based educational interventions.^{23,24} Nevertheless, participants' accounts indicated differences in exposure to and participation in oral health activities between the two participating schools. However, because only one public and one private school were included, these differences cannot be attributed to school sector and may instead reflect school-specific organizational and contextual characteristics. Accordingly, they should be interpreted as case-level observations rather than evidence of systematic public-private inequalities. Previous international studies have identified comparable disparities in which school type and socioeconomic factors influenced access to oral health promotion activities.²⁵

Parental influence also emerged as an important determinant of children's oral hygiene behaviors. Most parents demonstrated awareness of dental caries prevention and acknowledged their responsibility for shaping healthy oral hygiene habits in their children. These findings support previous evidence showing that parental oral health literacy and behaviors significantly affect children's oral hygiene outcomes.⁶ Parents who reinforced healthy dietary habits and regular dental visits appeared more likely to report positive oral hygiene behaviors among their children.

Teachers and school nurses were also identified as important contributors to oral health promotion within schools. Most participants demonstrated awareness regarding fluoride toothpaste use, healthy nutrition, and regular dental visits. Previous studies have reported similar findings, in which school staff helped reinforce preventive oral health practices among students.^{26,27} However, some teachers considered oral health guidance outside their professional responsibilities, indicating a

Table 2. Summary of themes and subthemes identified from interviews

Main Theme	Subthemes
Children's oral health knowledge and practices	Understanding of oral health; toothbrushing habits; awareness of dental caries; oral health messages received at school
Perceptions of school oral health programmes	Experiences with school-based oral health activities; perceived benefits of oral health education; suggestions for improvement
Parental role in oral health promotion	Supervision of toothbrushing; dietary control; dental attendance; reinforcement of oral health behaviours at home
Teachers' and school nurses' perspectives	Knowledge of oral health; perceived responsibilities; support for oral health education in schools
Home-school partnership	Communication between parents and schools; reinforcement of oral health messages; shared responsibility for children's oral health
Barriers and facilitators to effective prevention	Inconsistent implementation; varying parental engagement; need for coordination, monitoring and support

need for clearer role integration and additional training within school health promotion programs.

This study's findings have important implications for oral health policy and practice in Qatar. Effective oral health promotion requires multidisciplinary collaboration between schools, parents, healthcare professionals, and policymakers. School oral health programs should emphasize behavioral reinforcement, parental engagement, regular oral health education, and equitable access to preventive dental services across school sectors. Integrating oral health education more fully into school curricula may also support sustainable oral health behavior change from an early age.

The findings highlighted the complementary roles of parents, teachers, and school health personnel in supporting positive oral health behaviors among children. Sustainable oral health behavior change requires active collaboration between schools and families. As one school nurse summarized, "Coordination between parents, teachers, and students will make it work."

Implications for Practice

The findings highlight the importance of strengthening collaboration between schools, families, and oral health services. Clear policies, regular implementation, active parental involvement and ongoing monitoring should support school-based oral health programs. Greater integration between home and school environments may improve the sustainability of positive oral health behaviors among children.

Limitations

This study included participants from one public primary school and one private primary school in Qatar and therefore may not represent all school settings in the country. Because a single school represented each school sector, observed differences between the two cases cannot be interpreted as systematic differences between public and private schools and may reflect school-specific contextual characteristics. The findings were based on qualitative perceptions and self-reported behaviors, which may be affected by recall and social desirability bias. However, including multiple stakeholder groups provided rich, diverse perspectives on oral health promotion and dental caries prevention among primary schoolchildren. Future research should include multiple schools within each sector and incorporate longitudinal approaches and clinical oral health assessments to evaluate the outcomes of school-based oral health interventions and behavioral prevention strategies among children in Qatar.

Conclusion

This study highlights the important role of oral health awareness, parental supervision, school-based oral health activities, and stakeholder collaboration in supporting oral health behaviors related to dental caries prevention among primary schoolchildren in Qatar. Although participants generally demonstrated awareness of oral

hygiene and preventive practices, challenges remained in maintaining consistent oral health behaviors and implementing preventive measures.

The findings suggest that effective oral health promotion requires continuous collaboration between parents, teachers, school nurses, healthcare professionals, and policymakers. Schools play an important role in promoting healthy dietary habits, regular tooth brushing, and preventive oral healthcare practices among children. In addition, parental reinforcement and positive role modeling remain essential for sustaining healthy oral hygiene behaviors at home.

Strengthening school-based oral health programs, increasing parental involvement, and integrating oral health education more consistently into school activities and curricula may improve oral hygiene practices and strengthen behaviors relevant to dental caries prevention among children in Qatar. Greater collaboration between the Ministry of Education, the Ministry of Public Health, schools, and healthcare providers may further strengthen the implementation and sustainability of oral health promotion strategies targeting school children.

Authors' Contribution

Conceptualization: Najat Alyafei
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Investigation: Najat Alyafei
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Writing—Original Draft: Najat Alyafei
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Competing Interests

The author has no conflict of interests associated with the material presented in this paper.

Ethical Approval

Ethical approval for the qualitative phase of this study was obtained from Bangor University, United Kingdom (Project Application No. 2018-16171), and the Ministry of Education and Higher Education in the State of Qatar. Written informed consent was obtained from all adult participants, and parental consent was obtained for participating children.

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