Original

A Qualitative Study of Secondary School Students' Knowledge, Attitudes, and Practices towards Prevention of Dental Caries in Kigali, Rwanda

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Cite as: Mamani JTS, Uwambaye P, Mukamurigo J, Andegiorgish KA. A Qualitative Study of Secondary School Students' Knowledge, Attitudes, and Practices towards Prevention of Dental Caries in Kigali, Rwanda. Rwanda J Med Health Sci. 2025;8(3): 565-577. https://dx.doi.org/10.4314/rjmhs.v8i3.10.

Abstract

Background
Dental caries is common among secondary school students. This qualitative study explored their knowledge, attitudes, and oral health practices related to preventing dental caries in Kigali City, Rwanda.

Methods
This research was conducted among secondary school students aged 12–21 years in Kigali. Purposive sampling was used to recruit participants. Eight focus group discussions were held, with field notes and audio recordings used to gather information. Initial codes were set through deductive coding, followed by inductive coding methods. A thematic data analysis approach was employed.

Results
Three themes emerged: "Understanding of dental and its determinants," "Attitude towards prevention of dental caries," and "Oral health practices on prevention of dental caries." A lack of understanding of the causes of dental caries was evident. There was also a gap in proper preventive measures and negative attitudes regarding prevention. Students held misconceptions about the importance of dental care and the consumption of sugary foods, reflecting a lack of knowledge about oral hygiene.

Conclusion
This study revealed that secondary school students in Kigali have poor understanding, negative attitudes, and inadequate practices for preventing tooth decay. This study recommends implement comprehensive oral health education.

Rwanda J Med Health Sci 2025;8(3):565-577

Keywords: Attitudes, Dental caries, Knowledge, Qualitative study, Rwanda

Background

Dental caries is one of the oral diseases that affects 60%–90% of schoolchildren in both developed and low-income countries.[1] Dental caries is an infectious dental disease resulting from acid produced by bacteria (mutants Streptococci and lactobacilli bacteria) and the formation of tooth cavities.[2] It has been reported that 90% of dental caries remain untreated due to poor knowledge, attitudes, and oral health practices related to the prevention of dental caries among secondary school children.[3–5] These children increase their independence from their parents, which results in changes in behaviours and lifestyles that also affect their oral health status.[5] Yet the majority of these children have a significant increase in caries activity due to a lack of prevention of dental caries.[7,8] However, good knowledge, attitudes, and practices toward the prevention of dental caries are fundamental for reducing the burden of dental caries among secondary school students and later adults.[8,9]

Despite improvements in the oral healthcare system, the incidence of dental caries remains high among secondary school students.[10,11] In developed countries such as Kuwait,[12] India,[13] and China,[14] secondary school students demonstrated good knowledge, attitudes, and practices. The information related to oral health was acquired from oral health promotion programs embedded at the school level.[12–14] In low-income countries, low knowledge, attitudes, and poor oral health practices were evident.[5, 15–17] Studies done in sub-Saharan countries have shown that secondary school students had no correct information regarding sugary foods or beverages consumption and oral health practices.[5, 15–17] On the other hand, these students were less likely to visit a dentist for a check-up.[18] Uganda's study revealed that most adolescents possessed basic knowledge about dental caries prevention, yet they consumed a high amount of sugary foods.[16]

A recent study conducted in Rwanda revealed a lack of knowledge about oral health practices, with unsatisfactory brushing habits, and a tendency to consume cariogenic foods frequently.[18] Yet good knowledge and positive attitudes are found to be crucial for good oral health practices.[19] Thus, oral health education has a direct relationship with improved oral health practices, which in turn lead to reduced dental caries.[20,21] The majority of existing studies done in Rwanda explored dental caries, which were limited to quantitative studies.[22,23] These studies provide numbers and correlations, but further explorations of knowledge and oral health practices are needed to provide comprehensive information on how dental caries can be effectively prevented in secondary school students. Therefore, the current qualitative study aimed to explore secondary school students' knowledge, attitudes, and oral health practices related to dental caries prevention in Kigali.

Methods

Study design and study setting

A qualitative study design was employed to explore students' knowledge about dental caries, attitudes, and oral health practices towards the prevention of dental caries. This study was conducted in secondary schools in the city of Kigali in both urban and rural areas.

Study population and inclusion criteria

This study was conducted among secondary school students aged 12 to 21 years old from both private and public schools. The selected schools were from three districts of the city of Kigali, namely Kicukiro (GS. Gahanga, GS. APADE), Gasabo (GS. Rutunga, GS. Bumbogo, GS.Gisozi), and Nyarugenge District (APACE, GS. Butamwa, GS. Kanyinya). The schools were selected from both urban and rural areas to ensure the participation of study participants. On the other hand, public and private schools were represented from each district.

All secondary school students who were present during data collection were eligible to participate in this study. On the other hand, participants who were not willing to respond to the questions were excluded from this study. Participants who did not consent to participation will also be excluded. The selection of this age range is preferred by the WHO classification and comparison for dental caries surveillance.[24]

Sample size

The total sample size for this study consisted of 64 students, achieved through the organization of eight focus group discussions. Each focus group discussion comprised eight participants. This structured approach allowed for a rich exchange of ideas and perspectives among the students and facilitated a deeper understanding of the topics under investigation. Data saturation was reached after conducting these eight focus groups, indicating that no new themes or insights were emerging from the discussions, thereby confirming that all relevant dimensions of interest had been thoroughly explored. The stratified groups by age and by gender for achieving saturation involved two focus groups per stratum. This reduced variability and increased the likelihood that no new themes would emerge after 8 focus groups. Group sizes of 8 participants were optimal to foster dynamic interaction while ensuring individual voices are heard meaningfully. This range supports rich discussion and deeper thematic development, essential for data saturation.[25]

Sampling strategies

The sample size for this study was allocated proportionately across three districts of Kigali. To ensure that each district was adequately represented in this research, purposive sampling strategies were used to select eight schools for participation. Two schools from the Kicukiro district, representing both urban and rural areas. However, based on enrolled schools, three schools were ultimately chosen from the Nyarugenge and Gasabo districts, respectively. To ensure the adequacy of information, one private school was selected from each district. To recruit the study participants for data collection, a stratified sampling strategy was employed in order to ensure fair distribution of students from each level. The class rosters provided by the school administration were used as the sampling frame for the operational representation of the target population. This combination of proportional allocation and stratified sampling reflected a strategic approach to balance logistical considerations with the need for diverse perspectives from the selected schools.[26]

Data collection

Before data collection, an information sheet regarding this research was sent to parents with help from students who were younger than 18 years. Data collection was done from September 2023 to October 2023. The research tool was adapted from other previous studies.[12, 16] Only a few changes were made to meet the local context of study participants. Consent was granted before conducting focus groups for the interviews. A researcher informed the participants about the format of the focus group and recording procedures before starting each focus group discussion. Each focus group discussion lasted 30-50 minutes, and students were seated in circles to promote active listening and engagement. The focus group discussion method was used to help create safe spaces for the participants to express and engage themselves.[25] During the focus group discussion, a class teacher stayed with the participants to facilitate participation and minimize disturbances. [27]Two researchers who participated in the interview were experienced in collecting data from young people, and they have expertise in oral health. Field notes and audio recordings were used to record the information as a triangulation method. The permission was before starting recording. The interview guide was prepared before conducting the focus group discussion in English and then translated into Kinyarwanda as a convenient language for study participants.

The validation of an interview guide was done to ensure the reliability and relevance of the findings. The principal investigator engaged an oral health expert to review the questions for clarity, relevance, and comprehensiveness. Then, pilot testing was conducted with 10 participants. The feedback was analysed and the interview guide was refined accordingly. Knowledge questions were designed to assess the understanding of the causes of dental caries, such as the role of sugar consumption and oral hygiene practices. Attitudinal questions explored the perceptions of the severity of dental caries, including beliefs about its impact on overall health and well-being. Furthermore, questions about practices focused on the frequency of dental visits, adherence to recommended brushing and flossing routines, and use of fluoride products. The following was the interview guide:

Knowledge of dental caries

1. How do you understand dental caries in your own words?
2. Have you heard of any ways to prevent tooth decay? Can you share what you know about how to prevent dental caries in your teeth?
3. What do you know about the signs or symptoms of someone who has tooth decay?

Attitude towards dental care

1. Why do you think it is important to care for your teeth?
2. How do you feel about your dental health when you are eating sugary foods and drinks?
3. What do you think about going to the dentist?

Oral health practice

1. When was your last dental visit? What was the experience during the visit?
2. Can you describe how you brush your teeth?
3. When and how do you use fluoridated toothpaste?

Data Analysis

Thematic data analysis was used for data analysis, and it was suitable for this data. [25, 27] Atlas. Ti software version 24 was used for data analysis. The verbatim transcription was used, and accuracy was checked by reading the transcript while listening to the audio. The process of developing themes was done deductively, based on pre-existing hypotheses, and inductively, arising spontaneously from the facts about dental caries. Three main themes were used for the data analysis: (1) Understanding dental caries, (2) attitudes towards dental care, and (3) oral hygiene practices. The process of forming themes emerged from transcripts, including coding of data segments, and these codes were subsequently grouped into sub-themes and more general themes that identified major patterns in the entire data set. This combination allowed structured analysis while discovering novel insights. The final themes were formed during the interpretation of the findings from the focus group transcripts.

The process of data familiarization, it was achieved after acquiring field transcripts for a more comprehensive understanding of the data. The second step involved the systematic relevant features and the generation of initial codes. The codes, such as definition, prevention, and symptoms of tooth decay, were attached with labels for the knowledge of tooth decay. The codes related to attitudes towards the prevention of tooth decay were taking care of teeth, eating sugary foods, and visiting a dentist. Codes related to oral health practices were brushing teeth and experience at the last visit. Then, the researchers identified similarities among the codes to search for themes. The fourth step involved organizing and reviewing the themes to ensure data accuracy. During the fifth step, the themes were confirmed, defined, and given clear and summarizing names. Finally, the researchers organized the themes into a coherent narrative to address the research objectives. The Consolidated criteria for reporting qualitative research (COREQ) were used for reporting the results.[28]

Ethical clearance

This study was approved by the IRB-CMHS/UR with the following approval notice: No. 247/CMHS IRB/2023. For secondary school students below 18 years, consent was provided by the parents after receiving information about the potential risks and benefits of the research for their children. However, assent was sought from those students. Participants who were aged 18 years and above provided their consent. Participants were assured that they might leave the focus group at any time. No potential risk was identified in this research, and confidentiality of information was ensured. Only the research team was able to access the data.

Reflexivity

To ensure credibility in this study, research members involved in checking and verifying interpretations to ensure accuracy. Peer debriefing strategy and consultation with peers and advisors were used to review and refine the research process. Dependability in this study was related to the stability and consistency of the research findings. It was ensured by using an audit trail strategy, which maintains clear documentation of the entire research process. Confirmability was ensured by an analysis strategy that involved actively seeking evidence that contradicts the study findings to ensure a balanced interpretation. Therefore, transparency on how data was collected, analysed, and interpreted was guaranteed. Transferability in this study involved the extent to which findings applied to other contexts or populations. It was ensured by using a thick description strategy, which provided rich, detailed descriptions of the research context, participants, and methods to facilitate assessment of transferability. A comparative analysis strategy was used to compare the findings with existing literature or similar studies to assess similarities and differences in different contexts.[29,30]

Results

This qualitative study involved, 64 secondary school students between the ages of 12 and 21. These participants had a wide age range allowing for in-depth conversations about their knowledge, attitudes, and practices related to oral health. Three themes had emerged from this study.

Theme 1. Understanding dental caries

The majority of secondary school students demonstrated a basic awareness of dental decay and preventative strategies. Participants' understanding of dental caries varied, but highlighted dental caries as a cause of damage or discomfort in the teeth.

Sub-theme1. Cause of tooth decay

The majority of students were not aware of the details of tooth decay, generally characterizing it simply as a cavity, a hole in the tooth, or tooth-related pain. As quoted by some participants, dental caries is a form of "itchiness" or unpleasant sensation in the tooth, such as Participant 1 (female, 15 years), who said, "dental caries is when the tooth has too much discomfort." Others noticed it more negatively, with Participant 3 (female, 13 years) simply stating, "dental caries is a bad decay." Dietary habits, particularly sugar consumption, were frequently linked to tooth decay. Participant 4 (male, 17 years) described it as caused by eating "something sweet and you eat them frequently, then you get some dental caries." Participant 6 (female, 18 years) explained that dental caries happens when the tooth "receives a lot of sugar or sweetness," causing it to become hollow and painful, especially with hot or cold food.

Sub-theme 2. Prevention of dental caries

The majority of the students were not able to recognize the proper methods for preventing dental caries. Students effectively articulated their understanding of the negative consequences associated with poor oral health practices concerning dental caries. Their understanding of dental caries had a considerable impact on their tooth brushing practices, revealing a clear link between oral health knowledge and preventive dental care behaviours.Prevention strategies were dominated by emphasis on brushing habits.

Multiple participants highlighted brushing teeth regularly, particularly after meals or sweets. For example, Participant 01 (male, 18 years) recommended brushing *"like thirty minutes after consuming foods harmful for teeth*". Participant 03 (female, 15 years) *"advised brushing three times daily for two to four minutes, depending on the food consumed".*

The participants also mentioned visiting the dentist regularly and changing toothbrushes every three months for effective cleaning. Participant 5 (male, 15 years) briefly stated, *"whenever you eat candies, you should not eat much sugar," but also the students described ways to prevent tooth decay by stating the quotes such as "I brush my teeth by using toothpaste and a toothbrush". Participant 011, A male student, 17 years, and "I brush my teeth several times."* Participant 016, a 15-year-old female student. Participants also expressed concern that poor oral hygiene leads to dental caries, such as *"making a hole in the tooth". On the other hand, a few students described avoiding sugary foods as "avoiding eating sweet food".* Participant 025, male student, 17 years) The majority of the students did not recognize the role of oral health professionals or regular dental check-ups that could help identify any early signs of tooth decay or other dental issues, as mentioned by the participants, *"I visit a dentist to meet with a doctor for more information and advice"* (Participant 023, male student, 17 years). But also noted by another participant, *"I visited a dentist to meet with the dentist"* (Participant 028, Female student, 19 years).

Sub-theme 3. Signs and symptoms of dental caries

When it comes to signs and symptoms, participants frequently mentioned tooth pain and sensitivity. Several described pain triggered by hot or cold stimuli as well as pain during brushing, such as Participant 4, who noted, "*when they are brushing, they feel pain,"* and Participant 6, who detailed *"severe pain due to contact with food or something cold or hot."*

Visible signs such as holes, black spots, and bleeding during brushing were also common observations, indicating participants' ability to recognize dental caries as the presence of pain and holes in the teeth. For example, one 17-year-old student explained, "When I have pain in the teeth and a hole inside,*" while a 15-year-old female student noted, "When there is a hole in the tooth, you can say it is tooth decay."*

Theme 2. Attitude to dental care

The majority of students had poor opinions regarding avoiding dental decay. They reported misconceptions about the importance of dental care and the consumption of sugary foods, demonstrating a lack of awareness of fundamental oral hygiene practices and the effect of sugar on dental health.

Sub-theme 1: Taking care of teeth

The importance of taking care of teeth emerged strongly as a key theme in the analysis. Participants emphasized oral care primarily to prevent bad breath, a common social and health concern that can negatively affect personal confidence. Avoiding tooth decay and pain was another critical sub-theme, as participants recognized the direct link between regular dental hygiene and preventing these unpleasant conditions. Maintaining an attractive, bright smile was also frequently mentioned, reflecting the social and psychological value placed on dental aesthetics. Participants associated a healthy smile with self-confidence and positive social interactions. They positioned oral care as essential not just for physical health but also for emotional well-being and social acceptance. Moreover, the prevention of dental caries through routine brushing and flossing was seen as vital to avoid more invasive and costly dental procedures in the future. They expressed in the following quotes, such as *"I brush my teeth for whitening them and preventing dental diseases from the teeth"*, Participant 055, a 14-year-old boy, and *"I brush my teeth to have good and strong teeth, and it helps to avoid bad smells".* Participant 056, Student, 19-year-old girl.

Sub-theme 2: Eating sugary foods

The majority of respondents reported poor attitudes toward restricting sugary food consumption or drinks, and the reasons for not eating or drinking sugary foods were that they were wrong. While participants mostly enjoyed sugary foods, they didn't recognize that excess consumption could lead to dental problems and emphasized the need for careful brushing to mitigate these effects. They highlighted in the following quotes: *"From my understanding, it is good to consume sugars and there is no risk."* Participant 059, Student, 14-year-old girl. Another participant highlighted the effects of sugary foods: *"It causes tooth decay because there is pain when you are eating that. "*Participant 057, Student, a 14-year-old girl

Sub-theme 3: Visiting a dentist

The majority of students had poor feelings regarding seeing the dentist. The majority of participants mentioned worry or anxiety regarding dental visits, commonly as a result of previous bad experiences or general discomfort with dental operations. This anxiety was mostly related to injections, tooth extractions, and pain experiences. Some students thought dental appointments were unnecessary unless they experienced discomfort or apparent tooth problems. These were highlighted in the following quotes below: *"For me, it's very scary because they have materials that are very bad"* Participant 015, a Student aged 17 years old female. And "Sometimes I feel scared because once I went to the dentist and then I got an injection and it hurt". Participant 05, a male student aged 15 years. One participant mentioned how the tool used in dental settings scared these participants, *"I feel scared because of the tools the dentist used."* Participant 05, a male student aged 15 years.

Theme 3. Oral health practices

This thematic analysis explores participants' narratives concerning their recent oral health practices, such as dental visits, tooth brushing habits, and their views on the optimal timing for brushing. Their descriptions of tooth brushing practices highlighted differing levels of knowledge and attention to technique, duration, and areas of focus. Additionally, consensus emerged around the best times to brush, with recognition of morning and evening routines as crucial for maintaining oral hygiene and preventing disease.

Sub-theme 1: Brushing techniques and duration

Most students revealed their daily tooth-brushing routine with fluoridated toothpaste. Students also indicated that they brushed their teeth in the morning and at night. Most of the students reported brushing all surfaces of their teeth and tongue correctly. Moreover, a few students mentioned their mouth-rinsing routine after eating. Most of the students understood the importance of tooth brushing. The majority of the students explained the impact of brushing their teeth every morning and night to prevent tooth decay, as illustrated below: *"The way I brush my teeth I take a toothbrush with toothpaste, I brush the front teeth up and down and side back teeth and in between the teeth and even the tongue"* Participant 05, a male student aged 15 years.

Certain students misunderstood effective tooth-brushing practices and the reasons for brushing their teeth. However, they ignored important routines, such as brushing procedures and changing toothbrushes. These misunderstandings can potentially lead to dental problems, as depicted here *"I brush my teeth in three minutes or four minutes depending on what I ate sweet, I brush more because stickiness gets out down around to the left and right"* Participant 05, a male student aged 15 years.

Sub-theme 2: Dental visit experience and Reasons for last visit

Participants' accounts of their last dental visits reveal varied experiences largely centred on treatment for dental issues rather than routine check-ups.

The majority of the students acknowledged their dental appointments, which were mostly for tooth extraction due to dental caries. Pain and fear were common emotional responses linked to these visits, particularly when extractions were involved. Despite the importance of the visit, a significant proportion acknowledged being apprehensive about it. This emotion was most likely influenced by a variety of factors, including uncertainty about the procedure, anticipation of discomfort from the injection, and dental phobia, as related here, *"I went to the dentist three months ago to remove the tooth; of course, it was painful and scary."* Participant 05, a male student aged 15 years. Similarly, another participant expressed that *"When I was in year 4 I had tooth extraction and it was a scaring moment at that time"* Participant 057, Student, a 14-year-old girl.

Sub-theme 3: Timing for brushing and its importance

There was consensus among participants that the best times to brush are in the mornings upon waking and in the evenings before bed. This practice was primarily motivated by the desire to prevent bad breath, remove food debris, and avoid dental problems. They linked the timing of brushing to both oral health and social well-being, highlighting how neglecting to brush leads to bad breath that can affect interpersonal communication and confidence. Evening brushing was emphasized as critical to prevent bacterial accumulation overnight, while morning brushing was seen as refreshing and necessary after sleep.Some participants also mentioned brushing after meals as beneficial for reducing pain and protecting teeth from decay. As noted by participants, *"The best time to brush is in the morning when you wake up to avoid bad breath, and again in the evening before sleep because food left on the teeth overnight can cause tooth decay."* Participant 40, a female student,17 years old. Additionally, it was reported by another participant. *"Brushing after meals, especially after eating sweets, helps remove food stuck between teeth and prevents pain and decay. Brushing both morning and night keeps my mouth clean and my smile fresh."* Participant 30, male student, 18 years.

Discussion

This qualitative study aimed to explore the knowledge, attitudes, and practices regarding dental caries among secondary school students in Kigali, Rwanda. A total of 64 secondary school students aged 12 to 21 participated in eight focus groups exploring their knowledge, attitudes, and practices related to dental caries and oral hygiene. This thematic analysis revealed three major themes: understanding dental caries, attitudes towards dental care, and oral health practices. Most students showed a basic knowledge of dental caries, often describing it as tooth pain or cavities linked to sugary diets, though detailed knowledge about the causes and prevention of dental caries was limited. Attitudes towards dental care were mixed, with many emphasizing the importance of brushing and maintaining a happy smile, but also displaying misconceptions about sugary food consumption and dental visits, which were often associated with fear and anxiety. Oral hygiene practices varied, with most students recognizing the importance of brushing at least twice daily and focusing on technique and timing. Consensus identified morning and evening as the best times for brushing to prevent bad breath and dental caries. However, gaps in knowledge about regular dental check-ups and effective prevention methods were evident.

The current results were being similar to those of other studies done in low-income countries in secondary school students, in Zambia,[6] and Nigeria.[33] Their understanding of oral health knowledge, attitudes, and practices towards the prevention of dental caries was insufficient. The majority of Zambian secondary students knew that frequent eating of sugary foods more than six times and not brushing with fluoridated toothpaste caused tooth decay.

On the other hand, the majority of students knew that cavities on teeth, pain, and sometimes swelling are symptoms of dental caries, and prevention might be achieved by avoiding sweets and brushing with fluoridated toothpaste.[6,11] A study done in Uganda found that the majority of secondary school students had fair knowledge, with good attitudes but poor oral practices.[34] And it was similar to another study conducted in Tanzania.[35] In Rwanda, a recent study reported that half of the students had low knowledge. Additionally, secondary students who had visited a dentist were those who had pain due to dental caries. [19 These findings might be attributed to delayed treatment demand and limited access to dental care among adolescents from low-income countries.[35]

The results contrasted with other studies done in developed countries, such as India,[31,32] and China,[33] secondary school students had a good knowledge about preventive measures for dental caries, and they were able to recognize the frequency of sugary food consumption as the cause of tooth decay. This difference was attributed to good access to and use of dental services, which was the source of information in developed countries.[14] Interestingly, there were also differences in attitudes to dental care when compared to the current study findings. The majority of students demonstrated a clear understanding that sweets and sticky foods contribute to dental caries. Dental visits were frequently reported and considered a valuable source of information among secondary school students from developed countries. Conversely, while most students recognized the importance of proper tooth brushing in preventing dental caries, there appeared to be a notable gap in their oral health knowledge regarding the protective role of fluoride in tooth decay prevention,[31, 33] which contradicted the current results.

This difference in understanding might be attributed to poor access to oral health education, socioeconomic barriers, and insufficient dental public health activities. [34]

These differences might be attributed to socioeconomic characteristics and culture inherent in different societies. Most students demonstrated misconceptions about the importance of dental care and the consumption of sugary foods. They also demonstrated a lack of dental visits. His findings were similar to those of other studies in Zambia,[5] Uganda,[16] and Tanzania. [35] This was attributed to the lack of dental facilities in low- to middle-income countries, which delays seeking dental services. On the other hand, this might be attributed to a lack of parental concern about oral health and encouragement for their secondary school children.

The current study findings indicate that most students recognize the importance of brushing teeth at least twice daily, with morning and evening as optimal brushing times to prevent bad breath and dental caries. However, regular dental check-ups and effective prevention methods were lacking. This aligns with other studies done among school students from low-income countries,[36] which reported that while brushing twice or more daily was common, few students visited a dentist regularly, and oral health preventive behaviours were insufficient.[37] Some studies also point out the differences between reported knowledge and actual brushing practices. Likewise, the lack of knowledge of detailed technique, with low use of recommended brushing patterns such as circular strokes or tongue cleaning, have also been evident.[38] This was supported by another study with quite low actual compliance with brushing twice daily, with most brushing once daily and for shorter than recommended durations, highlighting a discrepancy between knowledge and behaviour.[36] On the other hand, visiting a dentist was primarily seeking care after pain or dental issues rather than for prevention, indicating knowledge gaps and a different attitude toward oral health prevention.

Limitations and strengths

The primary limitations of this study were related to its scope and the characteristics of the sample, which could impact the transferability of the study findings. Initially, the research was restricted to secondary school students in Kigali, which impaired the applicability of the results to similar urban schools. Furthermore, the presence of teachers during focus group discussions might have affected students' willingness to openly share their perceptions and experiences, possibly resulting in social desirability bias or limited responses. In terms of participant selection, purposive sampling was used to recruit individuals who met criteria pertinent to the research objectives, focusing on depth and relevance rather than random representation. Despite these constraints, a significant strength of this study is its use of focus group discussions, which encouraged open expression and provided rich qualitative insights into students' views on dental caries.

Conclusion

The research highlights a gap in the understanding of dental caries and their causes among secondary school students in Kigali. Secondary school students are not well-informed about effective prevention strategies of dental caries. There is a widespread lack of knowledge regarding ideal dental hygiene practices, with most students holding misconceptions about preventing dental caries. The majority of students displayed poor attitudes towards avoiding dental caries, often misunderstanding the importance of dental care and the role of frequent consumption of sugary foods. However, most students recognized the importance of brushing their teeth daily with fluoridated toothpaste for maintaining oral health.

Policy makers are recommended to focus on oral health promotion and prevention initiatives in the national education and health frameworks. These policies should recommend public oral health education campaigns to dispel myths about dental caries and advocate for evidence-based preventive measures, such as using fluoridated toothpaste and maintaining regular dental appointments. Finally, the schools should actively integrate oral health education into their curricula, ensuring that students receive accurate, age-appropriate information about the causes and prevention of dental caries, as well as oral hygiene practices. Researchers are advised to broaden their studies to encompass a variety of populations beyond urban areas to gain a better understanding of regional differences in oral health knowledge, attitudes, and practices towards dental caries. Longitudinal studies could provide insights into changes over time and the effects of interventions on behaviour. Further investigation on the barriers to regular dental visits and the effective use of fluoride, including parental attitudes and socioeconomic influences, is also recommended.

Acknowledgment

The authors wish to acknowledge the role of the administration of the city of Kigali and the head teachers who facilitated data collection. We also want to thank the research participants for their valuable time during data collection.

Authors contribution

SJTM, PU, JM, and AKA contributed equally to developing, data collection, data analysis, and manuscript development.

Funding

None

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