

Promoting Oral Health Among Kindergarten Students in Rural Areas: The Role of Educational Interventions

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Abstract Oral and dental health are essential components of overall well-being. Maintaining proper oral hygiene is crucial for individuals of all ages, including young children in rural communities. However, awareness and practices related to oral and dental care—particularly effective toothbrushing techniques—remain limited among kindergarten students in these areas, such as those attending Jatisarono Kindergarten. To address this issue, educational interventions are necessary to improve both knowledge and daily habits. This community service-based study examined the effectiveness of a multi-method educational strategy that integrated Action Research with a Community-Based Participatory Approach (CBPA), engaging both school personnel and families. The Action Research component employed interactive lectures, demonstrations, Q&A sessions, singing, games, rewards, and guided toothbrushing practice to build students' knowledge and skills. Simultaneously, the CBPA involved teachers and parents in actively supporting and supervising students' oral hygiene routines at home. The evaluation revealed significant improvements: students' oral health knowledge and skills increased from 40% to 85%, and 70% of them demonstrated the ability to brush their teeth correctly. These findings highlight the effectiveness of a multi-method approach in promoting oral health among young learners and suggest its potential for replication in similar educational contexts.

1. INTRODUCTION

Maintaining good oral and dental health is essential to ensuring the overall well-being of children, particularly during early childhood. One of the most common dental issues affecting young children is dental caries, a condition that can adversely impact their physical growth and developmental outcomes. This problem is also prevalent among students at Jatisarono Kindergarten (TK Jatisarono) in Kulon Progo Regency, Indonesia.

TK Jatisarono is a village-owned school staffed by three teachers and one janitor. It serves 41 students whose parents—primarily farmers and laborers—often have limited awareness and understanding of

dental health. The student body is divided into two groups: Class A, comprising 21 students aged 4 to 5 years, and Class B, consisting of 20 students aged 5 to 7 years preparing to enter primary school. Observations at the school reveal that many of the children suffer from poor dental conditions, including severe tooth decay caused by inadequate oral hygiene practices. In response, a community service program was initiated with a focus on dental health education and the development of proper toothbrushing habits. While the primary audience was the kindergarten students, the initiative also engaged teachers and parents as key secondary stakeholders.

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According to Indonesia's 2018 Basic Health Research data, approximately 45.3% of children nationwide experience dental cavities (Tim Rskesdas 2018, 2019). This high prevalence emphasizes the urgent need for greater awareness and the implementation of preventive measures to improve children's oral health (Abdat & Ramayana, 2020). The dental health conditions observed at TK Jatisarono reflect this broader national trend and reinforce the importance of early educational interventions in oral hygiene.

Poor dental health has physical, psychological, and social consequences for children. It can lead to pain, eating difficulties, and a decline in self-confidence (Ngatemi et al., 2022). Furthermore, dental problems during childhood often persist into adulthood, making early prevention a critical component of lifelong health (Khairuddin, et al., 2025). Educating children about oral hygiene and instilling good brushing habits at a young age is therefore a vital preventive strategy.

To ensure that young children understand and consistently practice good oral hygiene, effective teaching strategies are crucial. Research supports the use of interactive and engaging methods to enhance both comprehension and motivation (Cahyani & Sudaryanto, 2024). Demonstrations and question-and-answer (Q&A) sessions are particularly effective, as they allow students to observe, participate, and practice, thereby strengthening their understanding and skillsets (Halim et al., 2023; Sari & Putri, 2021). Krisdianto et al. (2023) found that health education using demonstration techniques significantly improves children's ability to brush their teeth correctly.

Demonstrations enable educators to offer direct feedback, allowing students to correct errors and build practical skills (Dewi et al., 2023). They also facilitate the visual presentation of proper brushing techniques, which helps students better understand and internalize the procedures. By simplifying complex concepts, demonstrations contribute to clearer comprehension, while Q&A sessions promote active engagement and provide opportunities for clarification (Istichomah, 2020). These sessions also serve as informal assessments that guide educators in adapting their methods for improved learning outcomes (Halim et al., 2021). Active participation in Q&A exchanges enhances memory retention and fosters a positive, interactive classroom environment (Prasetyo et al., 2023).

In addition to these strategies, the use of physical teaching aids, such as dental models, plays a crucial role in dental education. These tools boost engagement and facilitate understanding by making abstract concepts tangible and easier to grasp (Akera et al., 2022). In this initiative, the program utilized phantom tooth models to illustrate dental anatomy and demonstrate brushing techniques. These models helped children better imitate proper brushing motions and supported explanations of healthy eating habits and the importance of regular dental check-ups (Febria & Meiandari, 2022; Putri et al., 2021; Sari & Putri, 2021). Evidence suggests that teaching aids

significantly enhance students' motivation and ability to retain knowledge in dental health education (Fitri et al., 2023).

Beyond teaching tools, play-based learning and music have proven highly effective in early childhood dental education. Play-based methods not only promote active learning but also improve comprehension, motor skills, and social development (Widayati et al., 2023). Singing, with its use of catchy melodies and lyrics, aids in memory retention and makes learning enjoyable (Zein et al., 2023). Educational games reinforce brushing habits and enhance oral health awareness, making the experience more engaging and sustainable (Nurjayadi et al., 2022; Wahyuni & Azizah, 2020). Compared to traditional methods, play-based learning has been shown to yield longer-lasting knowledge and motivation (Pargaputri et al., 2023; Rahmi & Hijriati, 2021).

Incorporating rewards is another effective strategy for increasing student participation and enthusiasm. Studies show that verbal praise and small, healthy incentives help reinforce positive behavior and encourage continued learning (Matje, 2022; Nursaadah, 2023). A well-designed reward system fosters a supportive learning environment and motivates children to adopt healthy habits (Manto & Islamiyat, 2020). Moreover, the active involvement of both teachers and parents is essential in reinforcing educational messages and ensuring the long-term success of dental health initiatives (Lee et al., 2020; Tresnowati & Sunarto, 2022).

This study underscores the effectiveness of combining interactive strategies—such as demonstrations, discussions, singing, games, and rewards—with strong family and teacher involvement to enhance oral health education. The program conducted at TK Jatisarono in the Nanggulan District of Kulon Progo Regency demonstrates that early childhood dental health education can be significantly improved through community-based, participatory efforts.

2. METHOD

This study employed a structured qualitative approach to promote dental health education, incorporating two complementary methodologies: Action Research and the Community-Based Participatory Approach (CBPA). The Action Research component was conducted directly with students at TK Jatisarono, the primary target group. It addressed oral hygiene issues through well-designed interventions and reflective practices aimed at continuous improvement. As a cyclical process, Action Research involves a sequence of planning, action, observation, and reflection, culminating in outcome evaluations that inform subsequent steps (Seema, 2021). This iterative model aligns with research highlighting the value of repeated, adaptive educational strategies in improving both learning outcomes and health literacy (Ahmad et al., 2021).

In parallel, the CBPA methodology positioned the community as active partners in the intervention (Messina et al., 2024). Teachers served as facilitators by encouraging parental involvement—parents being the secondary target

group—in supporting children's oral hygiene routines at home (Nghayo et al., 2024). This collaborative model linked the school and family environment, reinforcing the shared responsibility of promoting health behaviors beyond the classroom. Parental involvement is widely recognized as critical in shaping children's hygiene practices, as parents often serve as primary educators during early childhood (Haryani et al., 2023). Prior studies suggest that educational interventions yield better health outcomes when schools and families work in tandem (Andriani et al., 2021).

Within the Action Research framework, dental health education was delivered at school through a range of interactive methods, including lectures, demonstrations, games, singing, rewards, and supervised toothbrushing practice. The lecture session lasted approximately 60 minutes and adopted a participatory format. To foster engagement among the young learners, the facilitators used simple, interactive, and child-friendly language. This was complemented by Q&A segments and the use of educational visual aids, such as dental models, toothbrushes, and fluoride toothpaste. Employing a diverse mix of teaching methods has been shown to significantly improve engagement and knowledge retention among children in health education contexts (Pargaputri et al., 2023).

In the CBPA component, researchers engaged teachers to send out a series of digital messages to parents three days prior to the educational session. These messages, which contained both general announcements and oral health advice, were distributed via WhatsApp to all 41 parents or guardians. Leveraging a widely used communication platform allowed teachers to disseminate information efficiently and encourage parental involvement (Perpelea et al., 2024).

The messages were delivered in three stages. The first message served as an initial announcement of the upcoming oral and dental health education activity. The second message reiterated this announcement and included additional key points about the importance of dental hygiene for children. The third message functioned as a final reminder and was accompanied by a formal written notice. This notice also requested that parents ensure their children brought a toothbrush to school on the day of the activity.

To assess the effectiveness of the CBPA strategy, the researchers asked the teacher to document both the quantity and nature of responses received from parents. This feedback offered valuable insight into levels of parental engagement and the communication method's success in fostering collaboration between home and school.

3. RESULT AND DISCUSSION

The community engagement initiative conducted at TK Jatisarono was designed to enhance young children's knowledge and skills related to proper toothbrushing, with the students serving as the primary target group. As part of the Action Research framework, researchers assessed the program's effectiveness by administering both pre- and post-tests in the form of simple verbal questions. These

were adapted to suit the developmental stage of preschool-aged children, with researchers carefully adjusting their language, pace, tone, and interaction style to create a supportive and accessible learning environment.

Previous studies have shown that effective communication strategies—characterized by a friendly tone and nurturing approach—can significantly support language and cognitive development in young learners (Leyva et al., 2022). In this program, such strategies proved crucial in ensuring student comprehension and engagement during both the assessment and instructional phases.

The assessment questions focused on basic knowledge of oral and dental hygiene, with particular emphasis on correct toothbrushing practices. Pre-test results revealed that only 40% of the children demonstrated an awareness of the importance of oral hygiene. However, following the educational intervention, this figure rose dramatically to 85%, marking a 112.5% increase in knowledge.

This improvement aligns with findings from prior research that underscore the effectiveness of well-structured health education programs in increasing awareness and understanding of oral health practices (Putri et al., 2023). The substantial gain in knowledge can be attributed to the program's highly interactive approach, which enabled students to actively engage with the material, ask questions, and receive immediate feedback from facilitators.

The use of varied and enjoyable methods—including games, singing, rewards, visual aids, and Q&A sessions—contributed to an engaging learning atmosphere that enhanced understanding and memory retention. Singing and educational games, introduced after the demonstration segment, created a fun and relaxed setting that reinforced the importance of maintaining good oral hygiene in a way that was both age-appropriate and memorable for the students.

In addition to the knowledge assessment, direct observation of the children's toothbrushing practice provided insight into skill acquisition. Following the educational session, 70% of the students were able to demonstrate proper brushing techniques. This outcome highlights the effectiveness of experiential learning methods—particularly live demonstrations and visual modeling—in fostering active participation and translating knowledge into practice (Pitoy et al., 2021).

Figure 1 illustrates the students engaged in toothbrushing exercises under the supervision of the community service team, showcasing the tangible impact of the program on daily hygiene behavior.

Meanwhile, the secondary target of the program was the parents, who were engaged through the Community-Based Participatory Approach (CBPA) using both WhatsApp messages and printed letters. The aim was to secure parental support for reinforcing their children's oral and dental health education at home. The first WhatsApp message functioned as a simple notification about the upcoming school-based activity and received responses from 38 parents or guardians. A second message followed, expanding on oral health content—emphasizing

the importance of brushing teeth at least twice daily (after breakfast and before bedtime), limiting sugary food and drinks, increasing water intake, and attending regular dental check-ups.



Figure 1. Kindergarten children practice brushing their teeth in the front yard of the school

Since the second message did not elicit complete responses, a third and final reminder was sent by the teacher. This message reiterated the key health messages and was accompanied by a formal written notice asking parents to send a toothbrush with their children for the educational session. Following this third message, all 41 parents responded positively. Printed letters reinforced the WhatsApp messages, delivered one day before the activity via students, requesting that parents prepare toothbrushes for their children.

The effectiveness of the CBPA strategy was assessed through teacher reports on the quantity and quality of parental responses. Furthermore, the success of parental engagement was evident in the fact that all students from both Class A and Class B brought their toothbrushes on the day of the activity—demonstrating full parental cooperation.

This outcome aligns with the World Health Organization's (WHO) recommendations, which emphasize that early dental health education is critical for preventing oral diseases. Collaborative efforts between schools and families are fundamental in creating supportive environments for children's health. Parental involvement has a profound influence on children's hygiene routines, as prior research confirms that parents' attitudes and knowledge significantly shape their children's dental care behaviors (Mangoyana et al., 2022). Thus, the program not only improved children's knowledge and skills but also empowered both parents and teachers to support healthier behaviors at home and at school.

Parental and teacher involvement was further strengthened through workshops and discussion sessions. During these sessions, parents received targeted guidance on how to support and reinforce toothbrushing habits at home. Post-program feedback showed that 90% of parents informed teachers they had become more involved in supervising and encouraging their children's oral hygiene routines.

The improvement in both knowledge and practices among TK Jatisarono's kindergarten students illustrates

the effectiveness of structured oral health education when supported by multi-stakeholder engagement. These findings are consistent with prior studies that demonstrate how involving communities—including parents and teachers—enhances children's oral health outcomes (Mangoyana et al., 2022).

A key factor contributing to the program's success was the use of interactive and engaging teaching methods. Direct involvement of students in learning activities improved their understanding and participation. Teaching aids also played an important role in capturing students' attention and simplifying complex concepts (Pitoy et al., 2021). Additionally, involving parents and teachers as active partners proved essential, as they serve as daily supervisors and motivators of oral hygiene behavior (Santoso et al., 2020).

Despite the program's success, several challenges emerged, particularly the limited time allocated for each session. This constraint may have restricted the depth of material delivered. Future initiatives should consider extended or follow-up sessions to reinforce knowledge and support behavioral change over time. Literature indicates that long-term application of health knowledge is often influenced by environmental and social factors, including ongoing family support (Ghanbarzadegan et al., 2021).

The oral health education program at TK Jatisarono not only succeeded in improving children's knowledge and tooth-brushing habits but also raised awareness among parents and teachers about the importance of dental care. These outcomes underscore the necessity of sustained programs that engage all stakeholders to achieve optimal community-wide oral health.

The program's implementation of a multi-method approach – Including interactive lectures, participatory demonstrations, games, singing, rewards, and hands-on practice – proved effective in enhancing the knowledge of students as the primary target of the intervention. This varied and engaging strategy successfully captured the children's attention and deepened their understanding of oral hygiene (Lestari, et al., 2023). For the secondary target group, written communication via WhatsApp was employed to inform teachers, who then helped relay essential messages to parents. This approach aimed to ensure ongoing parental support in reinforcing children's consistent oral hygiene routines (Sihombing et al., 2023).

Parental involvement plays a crucial role in maintaining children's oral health and is a key factor in the success of such initiatives. Evidence suggests that parents' knowledge and attitudes significantly influence their children's dental care behaviors (Ermawati, 2023). By engaging both parents and teachers, the program fostered a synergistic effort to support children's oral health.

Research also indicates that parental support in oral health education has a strong impact on children's dental hygiene practices (Mareta et al., 2023). Therefore, continuous communication through WhatsApp with both teachers and parents is essential to reinforce the importance of guiding children in maintaining good oral hygiene.

Despite the program's positive results, several challenges emerged during its implementation. A primary limitation was the restricted time allocated for each session, which may have constrained the depth and comprehensiveness of the material delivered. Consequently, future initiatives are encouraged to incorporate more extensive follow-up activities to reinforce and expand oral health education.

In summary, the oral health education program at TK Jatisarono effectively achieved its goals: increasing students' oral health knowledge and toothbrushing skills while simultaneously raising parental and teacher

awareness. The number of students demonstrating good oral hygiene knowledge rose from 40% to 85%, representing a 112.5% improvement. Moreover, 70% of students were observed brushing their teeth properly during practical sessions. These outcomes were likely supported by parental involvement, encouraged through CBPA strategies such as message dissemination and printed communication.

The CBPA method's effectiveness is further reflected in the parental response rate across the three rounds of WhatsApp communication, which averaged 95.93%. This is summarized in Table 1.

Table 1 . Number of parents responding via Whatsapp channel on oral and dental health

No Messages	Positive Response	Category		%
		%	Gave no response	
1 Educational Activity Notification	39	95.12%	2	4.88%
2 Oral and Dental Health Education	38	92.68%	3	7.32%
3 Activity Reminder and Oral Health Message	41	100.00%	0	0.00%
Average	39.33	95.93%	0.71	1.74%

The number of parents who responded to the first WhatsApp message was 39, representing 95.12% of the total parent population. As the response was not yet complete, the teacher sent a second message that not only reiterated details about the upcoming activity but also provided key oral health messages. However, this second message still failed to achieve a full response rate. Consequently, the researchers requested that the teacher send a third reminder, accompanied by a written notification asking parents to ensure that their children brought a toothbrush on the day of the oral health activity.

The implementation of the CBPA method yielded highly positive results. Following the third message, all 41 parents responded, and every student at TK Jatisarono brought a toothbrush to school for the educational session. This demonstrated that parents had attentively received and acted upon the communication from the teacher. To further assess the impact of the CBPA approach, researchers conducted an informal classroom check, asking students whether their parents had reminded them to practice good oral hygiene at home. All students raised their hands in response, indicating that their parents had provided such reminders. These results offer strong evidence of the effectiveness of the CBPA method in supporting oral and dental health education efforts.

These findings are consistent with previous research, which emphasizes that involving parents in health education initiatives can significantly improve children's independence in practicing toothbrushing (Astuti et al., 2023). The researchers suggest that extending the duration of parental engagement could yield even greater long-term benefits. In line with this, other studies have indicated that collaborative approaches not only impart knowledge but also help reinforce and internalize positive hygiene behaviors among young children (Purnama et al., 2020).

With respect to practical skill acquisition, 70% of the students were observed to perform proper toothbrushing techniques. Most of these students were from Class B,

who were older and generally more capable of independent self-care. In contrast, younger students in Class A, while knowledgeable about the importance of oral hygiene, still required adult guidance and support to execute proper brushing techniques. These observations align with findings by Dumitache et al. (2021), who reported that consistent parental involvement significantly increases the likelihood of children adopting and maintaining effective daily dental care routines.

Overall, the oral health education program at TK Jatisarono—which combined the strengths of Action Research and the Community-Based Participatory Approach—was successfully implemented. Students' knowledge of oral and dental health increased from 40% in the pre-test to 85% in the post-test, representing a 112.5% improvement. Additionally, 70% of students were able to demonstrate correct toothbrushing techniques by the end of the program. These outcomes are consistent with earlier studies affirming that well-designed health education interventions can significantly enhance public awareness and understanding of oral health practices (Putri et al., 2023).

4. CONCLUSION

This study, conducted as a community service initiative focused on oral and dental health education at Jatisarono Kindergarten, concludes that a mixed-method approach—integrating Action Research and the Community-Based Participatory Approach (CBPA)—is effective in enhancing young children's knowledge of oral health and improving their toothbrushing skills. The findings revealed a substantial increase in students' oral health knowledge, rising from 40% to 85%, representing a 112.5% improvement. Additionally, 70% of students demonstrated the ability to perform proper toothbrushing during supervised practice sessions.

This research offers a valuable contribution by

implementing a comprehensive multi-method strategy for early childhood oral health education. It highlights the potential of combining interactive, school-based learning with parental engagement to produce meaningful behavioral change. The findings provide a practical foundation for schools, families, and oral health educators seeking to strengthen dental health education among young children, and the approach may be adapted for use in other settings and among diverse target groups.

However, the study also presents several limitations. It did not include an in-depth assessment of parental knowledge regarding oral and dental health, nor did it explore the specific ways in which parents educate their children about oral hygiene at home. Future research is recommended to address these gaps by involving a broader range of schools and assessing the long-term effects of such interventions on sustained behavioral outcomes.

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CONFLICT OF INTERESTS

The authors declare no conflicts of interest related to the publication of this article. They affirm that there are no financial, professional, or personal relationships that could have influenced or biased the content and findings presented in this study.

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