



Effectiveness of “Kartu Gigiku” in Enhancing Elementary School Students’ Ability to Detect Oral Cavity

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Track Record Article	Abstract
Revised: 19 July 2026 Accepted: 12 August 2026 Published: 25 September 2026 How to cite : Mayasari, Y., Mersil, S., Ruslan, M. R. R., & Wening, G. R. S. (2026). Effectiveness of “Kartu Gigiku” in Enhancing Elementary School Students’ Ability to Detect Oral Cavity. <i>Contagion : Scientific Periodical of Public Health and Coastal Health</i>, 8(3), 97–111.	<i>Oral diseases among school-aged children remain highly prevalent, partly due to limited early detection skills and low oral health literacy. Effective promotive and preventive strategies in school-based health education require educational media that are accessible, engaging, and developmentally appropriate for children. Kartu Gigiku ” is a visual educational tool designed to facilitate students’ independent recognition of oral disease. This study aims to evaluate the effectiveness of “Kartu Gigiku” in improving elementary school students’ ability to detect oral diseases compared with conventional health education methods. This study was conducted at State Elementary School 01 Pondok Ranji, South Tangerang, Indonesia using a quasi-experimental pretest–posttest control-group design. A total of 200 elementary school students were randomly assigned to either an intervention group (n = 100) or a control group (n = 100). The intervention group received education using “Kartu Gigiku ”, while the control group received conventional health education. Oral disease detection ability was assessed using a validated and reliable observation checklist. Data were analyzed using the Mc Nemar and Chi-square test with a significance level of $p < 0.05$. The intervention group demonstrated a significant improvement in detection ability, increasing from 61% at pretest to 78% at posttest ($p = 0.014$). In contrast, the control group showed no significant change, remaining at 61% in both the pretest and posttest assessments ($p = 0.821$). Posttest comparisons revealed significantly higher detection ability in the intervention group than in the control group ($p = 0.014$). The “Kartu Gigiku ” effectively enhances elementary school students’ ability to independently detect oral cavity and may serve as a valuable adjunct to school-based oral health education programs. Its integration into the School Dental Health Program (UKGS) may strengthen early detection efforts and promote oral health awareness among elementary school children.</i> Keywords: <i>Dental Caries, Health Education, Oral Health, Students</i>

INTRODUCTION

Oral health is an essential component of overall health and has a substantial impact on quality of life, particularly among elementary school-aged children (Dumitrescu et al., 2022; Kumar et al., 2020; Warreth, 2023). Children aged 9 to 11 years undergo rapid physical and psychological development, highlighting the importance of establishing healthy behavioral habits that can persist into adulthood. Nevertheless, the prevalence of oral diseases in Indonesia remains high. According to the 2023 Indonesian Health Survey (*Survei Kesehatan Indonesia*, SKI), the prevalence of dental caries among Indonesian children aged 5–9 years was 49.9%,

indicating that oral diseases continue to be a major public health concern requiring effective preventive measures and early detection strategies (Survei Kesehatan Indonesia, 2023).

The 2023 Indonesian Health Survey (Survei Kesehatan Indonesia, SKI) further reported that oral diseases, particularly dental caries, remain a significant public health problem among Indonesian children. These findings underscore the need to strengthen preventive and early detection efforts within school settings. However, early detection of oral diseases remains inadequate in many schools. One major factor contributing to this problem is the limited availability of oral health personnel.

The School Dental Health Program (Usaha Kesehatan Gigi Sekolah, UKGS), initiated by the government to improve children's oral health through regular examinations and educational activities, has encountered several implementation challenges (Survei Kesehatan Indonesia, 2023). These challenges include limited human resources, lack of program continuity, and insufficient engagement from both teachers and students. Consequently, early detection of oral diseases in school settings remains inadequate (Ari Agung & Triadnya Palgunadi, 2022; Ramadhani et al., 2022). Therefore, innovative educational strategies are needed to encourage students to take a more active role in maintaining and monitoring their oral health.

One strategy introduced in this study is *Kartu Gigiku* (My Dental Card), a simple educational tool that serves as a visual guide for students to examine their own oral cavity. Through the use of this card, students can identify early signs of oral abnormalities, including dental caries, gingival bleeding, and tooth discoloration. Accordingly, *Kartu Gigiku* functions both as a learning aid and as a school-based self-screening instrument.

This strategy aligns with the promotive and preventive paradigm in community oral health care. Educational interventions that encourage active student participation can improve oral health literacy, reinforce preventive behaviors, and reduce dependence on oral health professionals. Previous study, such as those conducted by Subedi et al. (2021) and Geetha Priya et al. (2019), have demonstrated the effectiveness of school-based educational programs in improving children's oral health knowledge and behaviors (Geetha Priya et al., 2019; Subedi et al., 2021).

However, previous studies have primarily focused on oral health knowledge, attitudes, and behavioral outcomes rather than on practical skills related to the independent detection of oral health problems. Therefore, this study seeks to address this gap by evaluating the effectiveness of *Kartu Gigiku* in improving elementary school students' ability to detect oral diseases. The novelty of this study lies in its interactive self-detection approach, utilizing a

simple visual medium that has received limited attention in both Indonesian and international research contexts.

This study has practical relevance for national health initiatives, including the strengthening the UKGS program and the Healthy Living Community Movement (*Gerakan Masyarakat Hidup Sehat*, GERMAS). By encouraging children to conduct self-examinations using educational media, it is expected that oral health awareness and self-reliance can be cultivated from an early age, thereby contributing to long-term reductions in dental caries and other oral diseases.

Conceptually, this study is grounded in Nola J. Pender's Health Promotion Model, which posits that the development of healthy behaviors depends not only on knowledge acquisition but also on direct experience and self-efficacy (Rojas-torres et al., 2025). Through the use of *Kartu Gigiku*, children move beyond passive receipt of information and actively observe and recognize conditions within their own oral cavity. This experiential learning approach is expected to generate sustainable positive effects on oral health behaviors (Abdelaziz, 2023; Rojas-torres et al., 2025).

Unlike previous school-based oral health education interventions, which primarily focused on improving oral health knowledge, attitudes, or tooth-brushing practices, this study specifically evaluates children's ability to independently detect oral diseases through guided self-examination using *Kartu Gigiku*. The intervention integrates visual learning, structured self-assessment, and immediate comparison with a gold-standard clinical examination performed by a dentist.

This approach enables an objective assessment of children's oral disease detection ability rather than relying solely on knowledge-based outcomes. Furthermore, this study proposes a theory-based framework grounded in the Health Promotion Model to explain the behavioral mechanisms underlying the intervention. These distinctive features provide a novel contribution to school-based oral health promotion by emphasizing early self-detection as an essential component of preventive oral healthcare.

The primary objective of this study was to evaluate the effectiveness of *Kartu Gigiku* in enhancing elementary school students' ability to independently detect oral diseases. It was hypothesized that students who used *Kartu Gigiku* would demonstrate significantly greater improvement in oral disease detection ability than students in the control group who received only conventional health education.

METHOD

This study followed a quantitative, quasi-experimental design with a pretest–posttest control-group model. This approach enabled comparison of changes in students' ability to detect oral diseases before and after the intervention between two groups: an intervention group that received education using the *Kartu Gigiku* and a control group that received conventional education via PowerPoint presentations. The study was conducted at State Elementary School 01 Pondok Ranji in South Tangerang, Indonesia which possesses relatively homogeneous socioeconomic characteristics and student demographics.

The study was carried out over a three-week period, encompassing preparation, intervention implementation, and evaluation phases. The study population comprised all first-grade students (aged 6–7 years) enrolled at State Elementary School 01 Pondok Ranji, South Tangerang, Indonesia, totaling 200 students. The required sample size was calculated using a two-mean difference formula (power = 80%, $\alpha = 0.05$, $\Delta = 20\%$). Since the total eligible population consisted of 200 students, all eligible students who met the inclusion criteria were recruited using total sampling. Participants were then randomly allocated into an intervention group ($n = 100$) and a control group ($n = 100$).

The instrument for this study was the *Kartu Gigiku*, an interactive visual educational medium designed to guide children in self-examining the oral cavity. Supplementary materials included a dental mirror, a headlamp flashlight, and an observation checklist for assessing detection ability. Detection ability was evaluated using a standardized assessment form, validated by three community dentistry experts. (Foros et al., 2021; Macey et al., 2022) The intervention consisted of two training sessions, each lasting approximately 30 minutes and conducted one week apart. The sessions were delivered by trained researchers using the *Kartu Gigiku* educational medium.

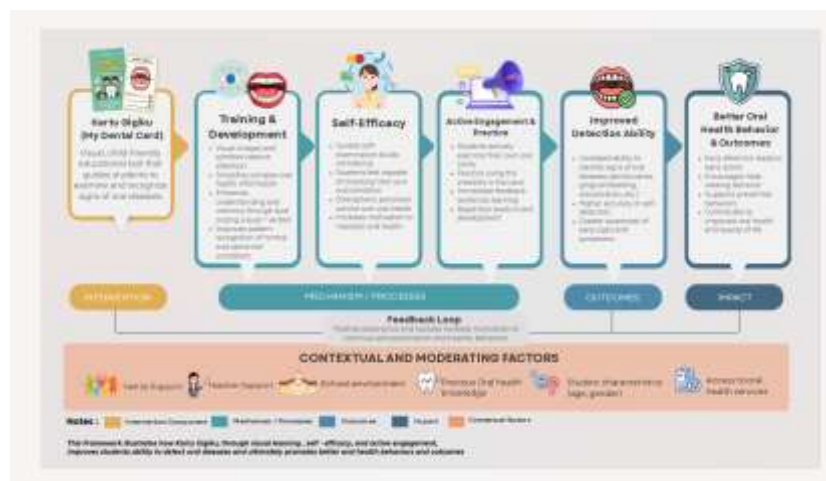


Figure 1. Conceptual framework of *Kartu Gigiku* intervention

This framework illustrates how the *Kartu Gigiku* intervention enhances students' ability to detect oral diseases through three main mechanisms: visual learning, self-efficacy, and active engagement. Visual stimuli facilitate cognitive processing and pattern recognition, while guided self-examination strengthens self-efficacy. These processes lead to improved detection ability, which subsequently contributes to better oral health behaviors and outcomes. Contextual factors such as family support, school environment, and prior knowledge may influence the effectiveness of the intervention (Fig.1).

The study procedure comprised several stages. The preparation phase involved coordination with school authorities and parents, as well as examiner calibration. A baseline assessment (pretest) was then conducted to evaluate students' initial ability to detect oral diseases. Oral disease detection ability was operationally defined as the student's ability to correctly identify the presence or absence of dental caries (cavitated lesions) through self-assessment using *Kartu Gigiku*. The assessment instrument consisted of three structured questions addressing signs and symptoms associated with dental caries, namely: (1) the presence of a visible dark line or cavity on the teeth in each dental region, (2) whether food frequently became trapped between the teeth during eating, and (3) whether the student had ever experienced toothache. Only the student's identification of visible dental cavities was used as the outcome measure because it could be directly compared with the clinical examination performed by the gold-standard examiner (dentist). Students' responses were compared with the clinical findings, and each response was coded as 1 (correct) or 2 (incorrect).

Based on expert validation by dentist, students who correctly identified the presence or absence of dental cavities were considered to have adequate oral cavity detection ability. During the intervention phase, the intervention group received training with the *Kartu Gigiku* across two sessions, while the control group received conventional education via PowerPoint presentations. A posttest was subsequently administered to assess changes in detection ability following the intervention. The intervention consisted of two training sessions (pre and post test), each lasting approximately 30 minutes and conducted one week apart.

Data analysis was conducted using statistical software to evaluate the effect of the intervention on students' ability to detect oral diseases. The outcome variable was categorical, with students' responses classified as correct or incorrect based on comparison with the gold-standard clinical examination. Within-group changes in detection ability between pretest and posttest were analyzed using the McNemar test because the measurements were

paired within the same participants. Between-group differences in posttest detection ability were analyzed using the Pearson Chi-square test because the intervention and control groups were independent. Statistical significance was set at $p < 0.05$. This study has received ethical approval from the Ethics Committee, Faculty of Dentistry UPDMB, with approval number 91/RKPEPK/VIII/2025.

RESULTS

The study included 200 elementary school students divided into two groups: an intervention group trained with *Kartu Gigiku* ($n = 100$) and a control group receiving conventional education ($n = 100$). Oral disease detection ability was measured using a standardized observation checklist validated for reliability and validity. A posttest was subsequently administered to assess changes in detection ability following the intervention. The intervention consisted of two training sessions (pre and post test), each lasting approximately 30 minutes and conducted one week apart. Data were analyzed using the McNemar and Chi-square test to assess differences in the proportion of detection ability before and after the intervention, as well as differences between the intervention and control groups.

The majority of participants were female (126 students; 63%), while 74 students (37%) were male. Based on oral examinations, most students (168 students; 84%) had dental caries, whereas 32 (16%) were caries-free. The descriptive characteristics of the study sample are presented in Table 1.

Table 1. Baseline characteristics of participants (n=200)

Variable	F	%
Sex		
Male	74	37
Female	126	63
Dental caries status		
With caries	168	84
Without caries	32	16

In the intervention group, pretest results showed that 28 students (28%) correctly detected dental caries, while 72 students (72%) made errors in assessing oral conditions. Following training using *Kartu Gigiku*, the number of students who correctly detected dental caries increased to 73(73%), while the number of incorrect assessments decreased to 42 (42%). The McNemar test demonstrated a statistically significant difference between pretest and posttest results in the intervention group ($p = 0.000$), indicating that the use of *Kartu Gigiku* significantly improved students' ability to independently detect oral diseases. In the control group, pretest results indicated that 27 students (27%) correctly detected oral disease, while 73

students (73%) made incorrect assessments. Following conventional education without the use of *Kartu Gigiku*, posttest results indicated that 61(61%) correctly detected dental caries. The McNemar test revealed no statistically significant difference between pretest and posttest results in the control group ($p = 0.230$). These results suggest that conventional education without interactive visual media was ineffective in enhancing elementary school students' ability to detect dental caries (Table 2).

Table 2. Within-group comparison of caries detection ability before and after intervention (n=100)

Group	Pre-test Correct n(%)	Post test correct n(%)	p-value
Intervention	28(28%)	73(73%)	0.000
Control	27(27%)	61(61%)	0.230

Posttest results showed a significant difference in detection ability between the intervention and control groups. In the intervention group, 73 students (73%) correctly identified dental caries. Incorrect responses were lower in the intervention group (27%) compared to the control group (39%). The Chi-square test indicates that the difference between the two groups was statistically significant ($p = 0.014$). The results are presented in Table 3.

Table 3. Between-group comparison of caries detection ability after intervention (n=100)

Group	Correct n(%)	Incorrect n(%)	p-value
Intervention	73(73%)	27(27%)	0.014
Control	61(61%)	39(39%)	

The findings demonstrate that *Kartu Gigiku* is more effective than conventional education in enhancing elementary school students' independent ability to detect oral diseases. Its visual, simple, and user-friendly design improves students' understanding of dental caries and promotes active participation in self-examination. This enhanced detection capability may facilitate early identification of oral diseases and support the optimization of school-based oral health initiatives, including the School Dental Health Program (UKGS).

DISCUSSION

The high prevalence of dental caries observed in this study (84% of participants) underscores that oral health problems remain a significant concern among elementary school students. This finding is consistent with global evidence indicating that dental caries is the most prevalent chronic disease in school-aged children. A meta-analysis conducted in several Eastern Mediterranean countries reported a caries prevalence of approximately 66% among children aged 6 to 15 years, with rates near 61% at age 12 and increasing during adolescence (Kale et al., 2020). Variations in prevalence across countries are influenced by socioeconomic conditions, oral hygiene practices, and access to dental care services.

Similarly, studies in Latin America among children aged 6 to 12 years have reported persistently high caries prevalence in both urban and rural settings, particularly among populations with low oral health literacy and irregular toothbrushing habits(Kale et al., 2020). These results highlight the importance of early detection and school-based oral health education as key strategies to reduce dental caries. In African countries, recent systematic reviews have likewise confirmed that dental caries remains a major public health concern among of 12-year-old children(Chan et al., 2025). Although some countries show declining trends, overall prevalence remains high. Regional variations are linked to dietary sugar intake, fluoride exposure, and the presence of school-based oral health programs. Compared to these findings, the 84% caries prevalence observed in this study is notably high, highlighting the need for intensified promotive and preventive interventions targeting elementary school children. This elevated prevalence further emphasizes the importance of employing effective educational media to enhance early detection and raise students' oral health awareness.

This study demonstrated that the use of *Kartu Gigiku* significantly improved elementary school students' ability to independently detect oral cavity compared with conventional education. The magnitude of improvement observed in the intervention group highlights the importance of integrating interactive, visually guided tools into school-based oral health education. Unlike traditional didactic approaches, which primarily enhance declarative knowledge, the intervention in this study appears to facilitate the development of practical diagnostic skills, an outcome that remains underexplored in previous literature.

The intervention was designed based on the Health Promotion Model, which proposes that health behaviors are influenced by cognitive, motivational, and environmental factors. They did not only function as an educational tools but also as a behavioral empowerment strategy that encourages children to actively participate in monitoring their own oral health. The visual design of *Kartu Gigiku* , including illustrations and simple instructions, facilitates visual learning by helping children recognize normal and abnormal tooth conditions easily. This independent oral self-examination is expected to improve comprehensive, increase attention and memory retention, also strengthen students' confidence (self-efficacy). Improved detection ability is expected to increase children's awareness of their oral health status, promote appropriate help-seeking behavior, and encourage the adoption of preventive oral health practices. The framework also acknowledges that the effectiveness of the intervention may be influenced by contextual and moderating factors, especially the school environment.

School-based programs that incorporate interactive educational tools are anticipated to contribute to a long-term reduction in caries prevalence.(Arora et al., 2022; Balasubramanian

et al., 2023; Yazdani et al., 2020) The results of this study indicate that the use of *Kartu Gigiku* significantly enhanced elementary school students' ability to independently detect oral diseases compared to conventional education methods. The notable improvement in the intervention group suggests that visual, interactive, and easily comprehensible educational media more effectively enhance children's understanding of oral health conditions (K et al., 2022). This outcome aligns with participatory health education approaches that emphasize active learner engagement to improve knowledge and health-related skills.

School-based oral health education is widely recognized as a key strategy for preventing dental diseases in children. Recent meta-analyses demonstrate that such programs improve knowledge, oral hygiene behaviors, and reduce the incidence of dental caries compared to conventional lecture-based methods. Interventions incorporating supplementary media, including posters, educational cards, games, or visual aids, yield superior outcomes by enhancing students' attention and engagement during the learning process (Das et al., 2024; Nazari et al., 2025). The improvement in caries detection ability observed in the intervention group may be attributed to the concrete visual stimuli provided by *Kartu Gigiku*, which facilitates recognition of early signs of oral disease.

Elementary school children, in the concrete operational stage of cognitive development, are more likely to comprehend information presented through images, symbols, and visual aids than through verbal explanations alone. In addition, recent studies on oral health literacy interventions demonstrate that enhanced oral health literacy is directly associated with children's capacity to perform self-care and independently recognize oral health problems (Adil et al., 2020; Baskaradoss, 2018). This indicates that structured school-based oral health education programs utilizing educational media have been shown to significantly improve knowledge, attitudes, and oral health behaviors.

The lack of significant improvement in the control group suggests that conventional educational methods have limitations in enhancing students' practical skills. Unidirectional teaching approaches often improve short-term knowledge but are less effective in developing applied competencies. Recent systematic reviews demonstrate that lecture-based methods without interactive media are less effective than approaches incorporating activities, games, or visual tools. This difference may be attributed to children's learning processes, which require multisensory stimulation to enhance comprehension and information retention (Kozanitis & Nenciovici, 2023).

The study demonstrated a significant difference in posttest outcomes between the intervention and control groups. This result supports the hypothesis that educational media-

based interventions enhance the effectiveness of school-based oral health promotion programs. Randomized controlled trials have indicated that structured educational interventions combined with learning media improve oral health status and reduce caries incidence compared to standard education alone. Programs systematically implemented within the school environment are particularly effective because children receive repeated behavioral reinforcement (Gurav et al., 2022). *Kartu Gigiku* functions as a simple yet practical educational tool that enables students to conduct direct self-examinations. This approach aligns with the concept of empowerment in health promotion, which seeks to enhance individuals' capacity to recognize health problems and take independent action. Empowerment-based strategies are particularly important in school oral health programs, where workforce and resource limitations often restrict routine dental examinations. Enhancing students' early detection abilities facilitates earlier identification of oral health problems, allowing timely intervention before conditions worsen (Abdelaziz, 2023).

Moreover, these findings are relevant to the concept of oral health literacy, defined as an individual's ability to understand health information and use it to make appropriate oral health decisions (Chawłowska et al., 2022). Previous studies have proven that low oral health literacy among children is associated with higher caries prevalence, poorer oral hygiene behaviors, and fewer dental visits (Adil et al., 2020; Mialhe et al., 2022). Therefore, interventions aimed at improving oral health literacy through educational media are particularly important during the elementary school years, a critical period for establishing long-term health behaviors.

The School Dental Health Program (*Usaha Kesehatan Gigi Sekolah*, UKGS) in Indonesia could benefit from innovative tools, such as My Dental Card, to enhance early detection in schools. The implementation of UKGS frequently encounters challenges, such as limited personnel, time constraints, and insufficient resources, which impede routine dental examinations for all students. Employing self-assessment tools may alleviate the workload of health personnel and expand early detection coverage. This strategy aligns with recent recommendations indicating that school-based oral health programs achieve greater effectiveness when they actively engage students and incorporate interactive learning methods (Arora et al., 2022; Preshaw et al., 2022).

The findings also align with contemporary evidence suggesting that participatory and media-assisted educational interventions yield superior outcomes compared with conventional lecture-based methods. Previous systematic reviews have demonstrated improvements in oral health knowledge and behaviors following school-based interventions; however, most studies have focused on cognitive outcomes rather than practical diagnostic abilities. The present study

contributes to the literature by introducing a child-centered self-screening approach that integrates educational content with immediate application, thereby bridging the gap between knowledge acquisition and skill development. In contrast, the absence of significant improvement in the control group highlights the limitations of traditional education methods that rely solely on one-way information delivery. Such approaches may be insufficient to develop applied competencies, particularly in younger populations that require multisensory engagement for effective learning. (American Academy of Pediatric Dentistry, 2020; Deutsch & Strack, 2020; Wu et al., 2017) This finding supports the growing consensus that educational strategies in pediatric populations should incorporate interactive and task-based components to optimize learning outcomes.

The effectiveness of *Kartu Gigiku* may be explained from both educational psychology and behavioral science perspectives. From an educational psychology standpoint, the intervention applies principles of visual learning by combining illustrations, symbols, and simple instructions that reduce cognitive load and facilitate children's understanding of oral health concepts. The use of visual representations enables students to recognize normal and abnormal oral conditions more effectively, enhances memory retention through dual coding of visual and verbal information, and supports pattern recognition during self-examination. These learning processes are particularly important for elementary school children, whose cognitive development relies heavily on concrete visual experiences.

From a behavioral science perspective, the intervention is consistent with the Health Promotion Model, which emphasizes the importance of self-efficacy, active participation, and behavioral reinforcement in promoting health-related behaviors. Rather than functioning as passive recipients of health education, students were actively engaged in examining their own oral cavity using *Kartu Gigiku*. Repeated practice, immediate feedback through comparison with the dentist's examination, and successful identification of dental caries likely strengthened students' confidence in performing self-examinations independently. Increased self-efficacy may have facilitated sustained engagement in oral self-monitoring and encouraged the adoption of preventive oral health behaviors beyond the intervention period. These educational and behavioral mechanisms may explain why the intervention produced a significant improvement in students' ability to detect dental caries compared with conventional oral health education, which generally emphasizes knowledge acquisition without providing structured opportunities for active self-examination and skill development.

Despite its strengths, this study has several limitations that should be considered when interpreting the findings. First, the relatively short duration of the intervention limits the ability

to assess long-term retention of detection skills and their translation into sustained oral health behaviors. Second, the use of an observation checklist, although validated, may be subject to observer bias and may not fully capture nuanced improvements in diagnostic accuracy. Third, the study was conducted in a single school with relatively homogeneous characteristics, which may limit the generalizability of the results to broader populations with different socioeconomic or cultural contexts. Additionally, the potential for a Hawthorne effect cannot be excluded, as participants may have modified their behavior due to awareness of being observed.

The implications of this study are both practical and theoretical. From a public health perspective, integrating simple, low-cost tools such as *Kartu Gigiku* into existing school oral health programs may enhance early detection capacity while reducing reliance on limited oral health personnel. This approach is particularly relevant in resource-constrained settings where routine professional screening is not feasible. From a theoretical standpoint, the findings support the application of empowerment-based and experiential learning models in oral health promotion, emphasizing the role of self-efficacy and active participation in shaping health behaviors.

This study has several limitations. First, the study was conducted in a single elementary school, which may limit the generalizability of the findings to other educational settings and populations. Second, although participants were randomly allocated to the intervention and control groups, the study employed a quasi-experimental design, which may be more susceptible to selection bias and confounding than a fully randomized controlled trial. Third, the outcome assessment focused primarily on students' ability to detect visible dental caries and did not evaluate their ability to identify other common oral conditions.

Finally, the study assessed the immediate effect of the intervention after implementation, and therefore the long-term retention of knowledge, self-examination skills, and behavioral changes could not be determined. Future research should aim to evaluate the long-term effectiveness of this intervention, including its impact on behavioral outcomes and clinical indicators such as caries incidence. Expanding the study to multiple schools and diverse populations would improve external validity, while the incorporation of digital or technology-enhanced versions of the tool may further increase engagement and scalability. Additionally, the use of more advanced analytical approaches, such as multivariable modeling, could provide deeper insights into factors influencing the effectiveness of self-detection interventions.

CONCLUSION

The findings indicate that using *Kartu Gigiku* as an educational medium effectively improves elementary school students' ability to independently detect oral diseases. The intervention group demonstrated a statistically significant improvement from pretest to posttest, whereas the control group, which received conventional education, showed no significant change. Additionally, posttest comparisons revealed a higher proportion of students correctly detecting oral diseases in the *Kartu Gigiku* group. These findings suggest that visual, simple, and interactive educational media enhance students' understanding and practical skills in recognizing signs of oral diseases. Learning tools aligned with children's cognitive developmental stages facilitate a more effective learning process than one-way educational methods. Therefore, *Kartu Gigiku* may serve as an innovative alternative to support school-based oral health education programs, particularly in improving early detection of oral diseases among elementary school children.

Integration of *Kartu Gigiku* into the School Dental Health Program (*Usaha Kesehatan Gigi Sekolah*, UKGS) is recommended as an educational and early-detection tool for independent student use. Oral health professionals and school personnel may employ this medium as part of promotive and preventive strategies to enhance oral health literacy from an early age. Future studies should include larger sample sizes and longer follow-up periods to evaluate the sustainability of the intervention's effects on oral health behaviors and the clinical incidence of dental caries. Additionally, further development of educational media incorporating visual, audio, or digital elements is encouraged to address the diverse needs and characteristics of learners across various age groups and contexts.

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