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Counseling with crossword puzzle games on knowledge about dental health maintenance in elementary school children

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ABSTRACT

Background: Oral health is an essential component of overall health. Primary school-aged children are particularly vulnerable to dental problems due to limited knowledge and inadequate oral hygiene practices. Educational interventions using engaging methods, such as crossword puzzles, have been shown to be effective in enhancing children's understanding of oral health. Objective: To the knowledge of oral health maintenance before and after an educational intervention using crossword puzzles among students of Class B, Grade V, at SDN Pondok Labu 14 Pagi, South Jakarta. Method: This study employed a pre-experimental design with a one-group pre-test and post-test approach. The sample consisted of 30 Grade VB students at SDN Pondok Labu 14 Pagi, South Jakarta, selected using total sampling. The data collection instrument was a questionnaire assessing knowledge of oral health maintenance, while the educational intervention was delivered using a crossword puzzle as the learning medium. Results: Knowledge of oral health maintenance before and after the educational intervention using crossword puzzles showed notable improvements. The proportion of students in the "good" category increased from 6.7% to 76.6%, while those in the "moderate" category decreased from 40% to 23%. Students in the "poor" category, initially 53.3%, were no longer observed after the intervention (0%). The mean knowledge score after the intervention was 86%, representing an increase of 33% compared to the pre-test. Conclusion: There was an increase in knowledge about dental health maintenance after counseling using crossword puzzles in elementary school children.

INTRODUCTION

Health is a fundamental aspect of human life, including oral and dental health (Purnama et al., 2024). Oral health is an integral component of overall health, and it is evident that the factors contributing to and the risks associated with oral diseases often overlap with those involved in general health conditions (Ramadhan & Sukmana, 2016). Oral and dental health is an integral part of overall health and cannot be separated from general well-being. Problems in oral health can serve as indicators or even contributing factors for the development of other health issues (Marimbun et al., 2016).

According to the World Health Organization, approximately 3.5 billion people worldwide experience oral health problems, which encompass all aspects of good oral health, including teeth, gums, and supporting tissues. Good oral health is characterized by the absence of chronic tooth pain, gum disease, tooth loss, and other conditions that can impair oral function and overall quality of life (WHO, 2022).

According to the 2023 Indonesian Health Survey, the prevalence of oral health problems among 10–14-year-olds in Jakarta was 48.8%, with 82.7% of affected children receiving medical treatment. The oral health issues reported included damaged teeth, dental caries, and toothache (Kemenkes, 2023). Oral health maintenance, particularly among primary school children, requires proper education on dental and oral care to prevent tooth decay. The primary cause of oral health problems in children is often related to habits or mindsets that do not prioritize oral hygiene (Pratiwi et al., 2019).

Dental caries is a common oral health disorder caused by food residues adhering to the teeth, ultimately leading to tooth decay. The effects of dental caries include tooth weakening, cavities, and even fractures. In children, dental caries can result in reduced chewing ability and impaired digestion, which may negatively affect optimal growth (Widayanti, 2015).

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Good oral hygiene can be achieved through proper understanding and consistent habits in maintaining dental and oral health. Knowledge plays a crucial role in shaping an individual's behavior, as insufficient knowledge may lead to poor attitudes and practices (Septiani et al., 2023). Oral health education using learning media for primary school children aged 6–12 years is essential because this age represents a critical period of development during which children's skills and ability to absorb information are optimal. At this stage, children can retain information more easily, making educational interventions particularly effective. Consequently, oral health education can effectively improve knowledge, attitudes, and healthy behaviors, especially regarding dental and oral care (Husna, 2019).

Educational interventions using game-based media, such as crossword puzzles, are an effective way to teach oral health education to primary school children. This learning method encourages active participation and discussion while creating an enjoyable learning environment. In addition, it supports comprehension of the material, aids in information retention, and develops problem-solving skills (Santoso et al., 2022). Crossword puzzle-based education is an alternative method for health promotion. This medium, as a printed tool, can be effectively used for oral and dental health education (Herlina et al., 2019).

A crossword puzzle is a word-based game consisting of empty boxes that must be filled with letters to form words based on given clues. The answers are typically entered horizontally or vertically, allowing words to intersect with one another, with each word numbered according to its corresponding clue (Agustin & Hamdu, 2021). Crossword puzzles can serve as a tool to capture children's attention, making the learning process more engaging and interactive. This method is considered an attractive learning strategy because it combines elements of play and entertainment, can be conducted in a relaxed manner, and allows for various types of activities (Mi & Hidayah, 2024). Primary school children prefer learning through interactive and dynamic methods, making the application of "learning through play" highly relevant in the context of oral health education. One example of an educational model that can be utilized is the crossword puzzle, which is designed to enhance students' interest and motivation in learning about oral health topics (Mahmudah, 2019).

Previous studies demonstrated that crossword puzzle interventions significantly improve oral health knowledge. A study conducted by Kokanda & Asyurati (2020) demonstrated a significant increase in knowledge levels, with the mean score rising from 12.03% before the intervention to 15.94% one week after oral health education using crossword puzzles. Similarly, research by Sutomo et al. (2020) showed that the mean knowledge level of children improved, with 7 children (39%) in the moderate category during the pre-test, increasing to 9 children (50%) in the good category in the post-test.

METHOD

This study employed a pre-experimental, one-group pre-test and post-test design to evaluate the effect of crossword puzzle-based learning on oral health knowledge among students of Class B, Grade V, at SDN Pondok Labu 14 Pagi, South Jakarta. The population and sample included all 32 students in the class, selected through purposive sampling. Inclusion criteria were enrollment in Class B, willingness to participate, and presence during data collection and the intervention. The study was conducted on April 9–10, 2025, using primary data collected via a questionnaire assessing oral health knowledge. Data collection occurred over two visits: the first for obtaining permission and explaining the study, and the second for obtaining consent, confirming participants, distributing pre-test questionnaires, and supervising completion after the intervention. Data processing involved editing for clarity and completeness, coding responses (0 = incorrect, 1 = correct), entering data into a structured database, and cleaning for accuracy. Univariate analysis was performed using computer software, and results were presented in tables and percentages.

RESULT

Table 1. Respondent Characteristics by Age

Age (years)	Frequency (n)	Percentage (%)
10	12	37.5
11	15	46.9
12	5	15.6
Total	**32**	**100**

Table 1 the age distribution of students in Class B, Grade V. The majority of respondents were 11 years old (73.3%), followed by 12 years old (23.3%), and 13 years old (3.3%).

Table 2. Frequency Distribution of Knowledge Before Counseling with Crossword Puzzle

Knowledge	Frequency (n)	Percentage (%)
Good	2	6.7
Moderate	12	40
Poor	16	53.3
Total	**30**	**100**

Table 2 shows shows that prior to the crossword puzzle-based oral health intervention, among students of Class B, Grade V, at SDN Pondok Labu 14 Pagi, 2 students (6.7%) had good knowledge, 12 students (40%) had moderate knowledge, and 16 students (53%) had poor knowledge of oral health maintenance.

Table 3. Frequency Distribution of Knowledge After Counseling with Crossword Puzzle

Knowledge	Frequency (n)	Percentage (%)
Good	23	76.7
Moderate	7	23.3
Poor	0	0
Total	**30**	**100**

Table 3 shows shows that after the crossword puzzle-based oral health intervention, among students of Class B, Grade V, at SDN Pondok Labu 14 Pagi, 23 students (76.7%) demonstrated good knowledge, 7 students (23.3%) had moderate knowledge, and no students (0%) had poor knowledge of oral health maintenance.

DISCUSSION

This study that before the intervention, 2 students (6.7%) demonstrated good knowledge, 16 students (53.3%) had moderate knowledge, and 12 students (40%) had poor knowledge. The majority of students exhibited poor knowledge, which may be attributed to limited awareness about oral health maintenance (Putriyanti & Retnani, 2022). Knowledge acquisition is strongly influenced by the teaching method employed, as effective methods can significantly enhance students' motivation and learning outcomes. Moreover, the use of crossword puzzles as a learning tool has been proven effective in improving students' knowledge (Wasgito & Setiadarma, 2019).

After the educational intervention using crossword puzzles, students' knowledge of oral health maintenance improved significantly. Post-intervention results showed that 23 students (76.6%) achieved good knowledge, 7 students (23.3%) had moderate knowledge, and no students (0%) demonstrated poor knowledge. The proportion of students with good knowledge increased from 6.7% before the intervention to 76.6% afterward, indicating that the crossword puzzle-based intervention was effective in enhancing students' understanding of oral health.

This study aligns with the findings of Kokanda & Asyurati (2020) on the which reported a significant increase in students' knowledge, with mean scores rising from 12.03% pre-intervention to 15.94% one week post-intervention. Another study by Santoso & Sutomo (2024), titled "Improving Knowledge and Attitudes on Oral Health Maintenance in Elementary School Children Through Android-Based Crossword Puzzles," reported that most students initially had moderate knowledge (39%), which increased to good knowledge (50%) after the post-test. These findings align with the present study, supporting the conclusion that crossword puzzles effectively enhance children's oral health knowledge.

This study is further supported by Halimah et al. (2019) who compared oral health education using crossword puzzles versus traditional lectures in their study, their findings demonstrated that crossword puzzle-based education led to a greater increase in knowledge (22.1%) compared to lectures (20.1%). The enhanced effectiveness of crossword puzzles is attributed to their engaging, playful format, which motivates students, facilitates easier recall of vocabulary, and provides a memorable learning experience.

Compared to previous studies using crossword puzzles as an educational tool, this study produced similar results, demonstrating a significant improvement in students' knowledge. Crossword puzzles are an effective medium for health education because they combine learning with enjoyment. By presenting assessments as a game, crossword puzzles encourage active participation without causing stress. Their simple format—filling in answers according to the number of available boxes—facilitates engagement.

Additionally, crossword puzzles help develop writing skills and reinforce vocabulary comprehension, making them an effective tool for assessing participants' understanding of the material (Nafiah et al., 2021).

CONCLUSION

The implementation of a crossword puzzle-based educational intervention significantly improved oral health knowledge.

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REFERENCES`

Abral, A., Kristianto, J., Maryani, Y., Setiawaty, N., & Sofian, R. (2020). Smart Dental Box Sebagai Media Penyuluhan Untuk Peningkatan Pengetahuan Dan Perilaku Kesehatan Gigi Mulut. *Quality: Jurnal Kesehatan*, *14*(1), 38–45.

Adam, J. D. Z., & Ratuela, J. E. (2022). Tingkat pengetahuan tentang kebersihan gigi dan mulut siswa sekolah dasar. *Indonesian Journal of Public Health and Community Medicine*, *3*(1), 1–7. https://doi.org/10.35801/ijphcm.v3i1.42516

Amalia, M. (2023). *Kemampuan Berpikir Kritis Pada Mata Pelajaran Ipa Siswa Kelas IV SDN 249 Mattirobulu*.

Erdiyani, T., Purnama, T., Emini, E., & Nurilawaty, V. (2023). Videoscribe as an innovative media for dental health education. *Journal Center of Excellent: Health Assistive Technology*, *1*(1), 12–16. https://doi.org/10.36082/jchat.v1i1.1016

Fitri, E., Sittatunnikmah, A., Wulandari, A., & Indriyani, T. (2023). The Use of BUKPIN Media on Maintaning Behavior of Dental and Oral Health among Primary School Students. *Media Karya Kesehatan*, *6*(2). https://doi.org/10.24198/mkk.v6i2.44811

Haq, Z. (2015). Pengetahuan Dan Kepercayaan Siswa Kelas V Sdn Martopuro 01 Kecamatan Purwosari Kabupaten Pasuruan Tahun 2015. *Jurnal Promkes*, 124–133.

Kantohe, Z. R., Wowor, V. N. S., & Gunawan, P. N. (2016). Perbandingan efektivitas pendidikan kesehatan gigi menggunakan media video dan flip chart terhadap peningkatan pengetahuan kesehatan gigi dan mulut anak. *E-GIGI*, *4*(2), 7–12. https://doi.org/10.35790/eg.4.2.2016.13490

Kanza, M., Darmawati, D., & Hermawati, D. (2021). Penggunaan Media Smart-Book Terhadap Pengetahuan Kadar Hemoglobin Pada Ibu Hamil. *Jurnal Ilmiah Mahasiswa Fakultas Keperawatan*, *5*(4).

Kemenkes. (2023). Survei Kesehatan Indonesia 2023 (SKI). *Kemenkes*, 235.

Mahirawatie, I. C., & Ramadhani, F. (2021). Faktor Yang Mempengaruhi Pengetahuan Orang Tua Pada Karies Gigi Anak Usia Sekolah 6-12 Tahun. *Indonesian Journal of Health and Medical*, *1*(3), 487–492.

Ngatemi, N., Purnama, T., & Suwarsono, S. (2022). Development of educational model of the pillow book kesgi as learning to brushing teeth for preschool children. *Journal of Drug Delivery and Therapeutics*, *12*(6), 89–93.

Purnama T, Rasipin, N. (2020). Tedi's Behavior Change Model to Improving Brushing Teeth Behavior Parents. *Journal of Applied Health Management and Technology*, *2*(1), 1–12.

Purnama, T., Ngatemi, N., & Suwarsono, S. (2024). Dental Health Pillow Book Model as an Effort to Improve the Dental Health Status of Preschool Children. *Journal of International Dental and Medical Research*, *17*(2), 685–691.

Ratih, I. A. D. K., & Yudita, W. H. (2019). Hubungan Tingkat Pengetahuan Tentang Cara Memelihara Kesehatan Gigi Dan Mulut Dengan Ketersediaan Alat Menyikat Gigi Pada Narapidana Kelas IIB Rutan Gianyar Tahun 2018. *Dental Health Journal*, *6*(2), 1–4.

Tsakila, S. Q., & Purnama, T. (2025). *Uno Dental Card Game as an Effort to Improve Dental Health Knowledge in Elementary School Students*. *3*(1), 14–18. https://doi.org/10.36082/jchat.v3i1.2204

Widiyastuti, R., Purnama, T., & Laut, D. M. (2022). The effectiveness of the application of the mentoring module on brushing teeth by parents on the behavior of brushing teeth in early childhood. *Journal of Drug Delivery and Therapeutics*, *12*(2), 83–86.

World Health Organization. (2022). Global oral health status report. In *Dental Abstracts* (Vol. 57, Issue 2).