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THE USE OF THE WORD SQUARE METHOD IN HEALTH PROMOTION ON KNOWLEDGE AND ATTITUDES TOWARD TOOTH BRUSHING AMONG STUDENTS AT SD ISLAM AL ISHLAH BUKITTINGGI

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Abstract

Oral and dental health remain a significant issue in Indonesia, particularly among elementary school children. Data indicate that approximately 39.06% of students in Bukittinggi experience dental problems, primarily caries, which can disrupt their activities and quality of life. The low level of knowledge and positive attitudes toward dental care are the main causes of this high prevalence. This study aims to examine the effect of the Word Square Method in Health Promotion on students' knowledge and attitudes regarding tooth brushing.The research employed a quantitative pre-experimental design using a one-group pre-test and post-test approach. The sample consisted of 66 students selected from a population of 214 through stratified random sampling. The study was conducted on August 5, 2025. Data were collected using questionnaires and analyzed with the Wilcoxon test.Univariate results showed that the mean knowledge score before the Word Square intervention was 11.53, which increased to 13.06 after the intervention. The mean attitude score before the intervention was 59.14 and increased to 64.00 afterward. The Wilcoxon test yielded a p-value of 0.000 for both knowledge and attitude scores, indicating a statistically significant effect ($p \leq 0.005$).It is concluded that the Word Square Method positively influences knowledge and attitudes toward tooth brushing among students at SD Islam Al Ishlah Bukittinggi in 2025. It is recommended that schools implement the Word Square Method as a reference to enhance students' knowledge and attitudes.

Keywords: Word Square, Tooth Brushing, Knowledge, Attitude

1. INTRODUCTION

Dental and oral health problems in Indonesia remain very high, with approximately 57.6% of the population experiencing such conditions. Data from the Basic Health Research (Riskesdas) indicate that many Indonesians suffer from dental caries, with a prevalence reaching 45.3%. Among children aged 5–9 years, around 54%, or approximately 92,746 children, also experience dental caries. In West Sumatra, the prevalence of dental and oral health problems reaches 42.83%, highlighting the importance of increasing awareness and prevention efforts in the community to maintain oral health. Specifically, in Bukittinggi, dental and oral health cases are recorded at 39.06%. (1). The 2023 Indonesian Health Survey reported that 37.2% of children aged 10–14 years experience tooth decay and cavities, which can cause severe pain, disrupt learning activities, make chewing difficult, and reduce quality of life. The main contributing factors to this high prevalence include poor oral hygiene, unhealthy dietary patterns high in sugar, limited access to dental health services, and a lack of education regarding the importance of maintaining oral health. Therefore, preventive efforts are urgently needed to improve children's health and academic performance. (2) Attitude refers to an individual's perspective, opinion, or feeling toward an object or event, typically reflected in likes or dislikes, including approval or rejection. Meanwhile, knowledge is the result of remembering and understanding something through experience and sensory perception, particularly through the senses of

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sight and hearing. Knowledge is closely related to health education; students with good knowledge tend to maintain better oral hygiene. However, many still experience dental problems, indicating that education on proper tooth brushing techniques is highly necessary. (3) In the educational process, knowledge is acquired through various media, each of which has a different influence on individuals. The sense of sight plays the most significant role in knowledge acquisition, with approximately 75%–85% of information obtained through visual perception, while hearing contributes about 13%, and the remainder is acquired through other senses. (5) Effective health education should involve engaging and interactive learning methods (6). One of the methods used in this study is the word square method, a learning technique that combines elements of games with educational activities. In this context, printed media and games have a significant impact on improving understanding and changing attitudes. Printed media serve as tools for delivering health messages, such as booklets, leaflets, rubik media, posters, and word square. The development of health promotion media has also undergone many innovations, including various forms such as leaflets and games like snakes and ladders, puzzles, and word square. In addition, art-based media such as songs, jathilan, hanging puppets, besutan, and sermons are also utilized. (7) Elementary school children require special attention as they are vulnerable to dental and oral health problems. Their knowledge about the proper timing of tooth brushing is still limited, and they often have not yet developed consistent habits for maintaining oral hygiene. (9) One effective effort to prevent dental caries is maintaining oral hygiene through proper tooth brushing techniques. The elementary school period is an ideal time to develop children's motor skills, including the habit of brushing teeth. (10) Students in Bukittinggi, as in other cities in Indonesia, also face challenges in maintaining oral health. Based on data obtained from the Mandiangin Public Health Center, 1,126 elementary school students in its service area have dental and oral health problems, particularly dental caries. At SD Islam Al Ishlah, 430 students have oral health issues. This study focuses on students within the working area of the Mandiangin Public Health Center to explore how the word square method can be used as a tool to improve their knowledge and attitudes toward dental health. Considering the importance of maintaining oral health from an early age, the authors consider it necessary to examine the effect of the word square media in health promotion, particularly in improving knowledge and attitudes toward tooth brushing among students. By using engaging and interactive media, it is expected that students will better understand the importance of oral hygiene and develop good tooth brushing habits, thereby preventing the negative impacts caused by poor oral hygiene practices.

2. METHODOLOGY

This study is a quantitative study employing a pre-experimental method with a one-group pre-test and post-test design. In this design, an initial measurement (pre-test) is conducted before the treatment is administered, followed by a subsequent measurement (post-test). This study was conducted among fourth- and fifth-grade students at SD Islam Al Ishlah Bukittinggi in 2025. Primary data were collected using a questionnaire as the research instrument. The study was carried out from August 5 to August 12, 2025, with a sample of 66 students from a total population of 214 students. Data collected through the questionnaire were analyzed using the Wilcoxon test. The results showed that the mean knowledge score before the word square intervention was 11.53, and after the intervention, it increased to 13.06. The significance value was $p = 0.000$ ($p \leq 0.005$).

3.RESULTS

Univariate Analysis

A. Knowledge

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1. Normality Test

Table 1. Results of the normality test of research variables before and after the intervention using the Kolmogorov–Smirnov test.

Variabel	Statistic	df	Sig.(p-value)
Pre-test Knowledge	0.167	66	0.000
Post-test Knowledge	0.197	66	0.000
Pre-test Attitude	0.091	66	0.200
Post-test Attitude	0.111	66	0.041

The results of the normality test showed significance values below 0.05, indicating that the data were not normally distributed. Therefore, a paired analysis was conducted using the Wilcoxon test.

a. Frequency Distribution of the Mean of Students' Knowledge

Table 2. Frequency distribution of respondents based on the level of tooth brushing knowledge among fourth- and fifth-grade students at SD Islam Al Ishlah Bukittinggi

Variable	n	Maen	Min	Max	Std.dev.
Knowledge (Pre -test)	66	11.53	3	15	2.463

Based on the results of the study presented in Table 2, data were obtained regarding the average knowledge of students before the implementation of the word square intervention. The data showed that the mean score was 11.53.

b. Frequency Distribution of the Mean of Respondents' Knowledge After the Intervention

Table 3. Frequency Distribution of Post-Test Tooth Brushing Knowledge Among Students After the Intervention

Variable	n	Maen	Min	Mx	Std.Dev.
Knowledge (Post -test)	66	13.06	5	15	1.984

Based on the results of the study presented in Table 3, data were obtained regarding the average knowledge of students after the implementation of the word square intervention. The mean score was 13.06.

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Based on the results of the data analysis, it was found that the level of knowledge showed an improvement in students' understanding of tooth brushing after the intervention using the word square method. Before the intervention, the mean knowledge score of students was 11.53, while after the intervention it increased to 13.06.

Regarding the most frequently incorrect response, it was related to the appropriate amount of toothpaste (pea-sized). Before the intervention, 34 students (51.5%) answered this question incorrectly. After the implementation of the word square method, the number of students who answered incorrectly decreased from 34 (51.5%) to 13 students (19.7%).

B. Attitude

a. Respondents' Attitudes Before the Intervention

Table 4. Frequency Distribution of Respondents' Pre-Test Attitudes Toward Tooth Brushing Among Fourth- and Fifth-Grade Students at SD Islam Al Ishlah Bukittinggi

Variabel	n	Maen	Min	Max	Std.Dev
Attitude (Pre- test)	66	59.14	40	75	6.877

Based on Table 4, it can be seen that the mean attitude toward tooth brushing among fourth- and fifth-grade students at SD Islam Al Ishlah Bukittinggi before the word square intervention was 59.14.

b. Respondents' Attitudes After the Intervention

Table 5. Frequency Distribution of Post-Test Attitudes Toward Tooth Brushing Among Students After the Intervention

Variabel	n	Mean	Min	Max	Std.Dev
Attitude (Post-test)	66	64.00	45	75	6.020

Based on Table 5, it can be seen that the mean attitude toward tooth brushing among fourth- and fifth-grade students at SD Islam Al Ishlah Bukittinggi after the word square intervention was 64.00.

Based on the results of the data analysis, the distribution and frequency of students' attitudes before and after the word square intervention indicate an improvement in students' positive attitudes toward tooth brushing following the intervention.

From the frequency analysis, it was found that the item with the highest number of less agreeable or neutral responses was related to forgetting to brush the inner surfaces of the teeth due to being in a hurry. Before the intervention, 23 students (34.5%) responded with less agreement. After the intervention, the number of students giving less agreeable responses decreased to 17 students (25.8%).

Before the intervention, the mean attitude score of students was 59.14. After the intervention, the mean score increased to 64.00. These findings indicate a significant positive improvement in students' attitudes toward tooth brushing after the implementation of the word square method as a learning medium.

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Bivariate Analysis

A.Knowledge

1. The Effect of the Word Square Method on Knowledge

Table 6. Wilcoxon Test on the Effect of the Word Square Method on Tooth Brushing Knowledge Among Fourth- and Fifth-Grade Students at SD Islam Al Ishlah Bukittinggi

Variabel	Negatif Ranks	Positive Ranks	Ties	Sig.(2-tailed)
Knowledge	7	41	18	0.000

Based on Table 6, it can be seen that there are 7 negative ranks in knowledge, indicating a decrease in scores in the post-test. There are 41 positive ranks, indicating an increase in post-test scores. There are 18 ties, meaning there was no change between the pre-test and post-test scores.

The p-value for knowledge is 0.000 ($p \leq 0.05$), which indicates a statistically significant effect. Therefore, it can be concluded that the use of the word square method has a significant effect on the knowledge of fourth- and fifth-grade students at SD Islam Al Ishlah Bukittinggi. Thus, $H0_1$ is rejected and Ha_1 is accepted.

Based on the results of the statistical analysis, it can be concluded that the word square method has a significant effect on students' knowledge of tooth brushing among fourth- and fifth-grade students at SD Islam Al Ishlah Bukittinggi. This is evidenced by the significance value (Sig. 2-tailed) of 0.000 for knowledge, which is lower than the significance threshold of 0.05. Therefore, the null hypothesis ($H0_1$) is rejected and the alternative hypothesis (Ha_1) is accepted, indicating that the word square method significantly improves students' knowledge of tooth brushing.

B. Attitude

2. The Effect of the Word Square Method on Attitude

Table 7. Wilcoxon Test on the Effect of the Word Square Method on Tooth Brushing Attitudes Among Fourth- and Fifth-Grade Students at SD Islam Al Ishlah Bukittinggi

Variable	Nagative Ranks	Positive Ranks	Ties	Sig. (2-tailed)
Attitude	12	50	4	0.0000

Based on Table 7, it can be seen that there are 12 negative ranks in attitude, indicating a decrease in post-test scores. There are 50 positive ranks, indicating an increase in post-test scores. There are 4 ties, meaning there was no change between the pre-test and post-test scores.

The p-value for attitude is 0.000 ($p \leq 0.05$), indicating a statistically significant effect of the word square method on students' attitudes among fourth- and fifth-grade students at SD Islam Al Ishlah Bukittinggi. Therefore, $H0_2$ is rejected and Ha_2 is accepted.

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Based on the statistical test results, it can be concluded that the word square method has a significant effect on students' attitudes toward tooth brushing. This is supported by the significance value (Sig. 2-tailed) of 0.000 for attitude, which is lower than the significance threshold of 0.05. Thus, the null hypothesis ($H0_2$) is rejected and the alternative hypothesis (Ha_2) is accepted, indicating that the word square method significantly influences students' attitudes toward tooth brushing.

DISCUSSION

The results of this study indicate that the Word Square method significantly improves students' knowledge and attitudes toward tooth brushing. The mean knowledge score increased from 11.53 before the intervention to 13.06 after the intervention, while the mean attitude score rose from 59.14 to 64.00. The results of the Wilcoxon test showed a significance value below 0.05, indicating a statistically significant effect of the Word Square method on students' knowledge and attitudes.

Knowledge is the result of a sensory process involving the five senses and can be obtained through various sources, including formal and non-formal education, as well as information media (Notoatmodjo, 2012). The Word Square method, which is interactive and engaging, facilitates students to be more focused and motivated in learning, thereby improving their understanding of the basic concepts of tooth brushing. These findings are consistent with the study by Tiara Wahyu Nigrum, which reported an increase in students' knowledge scores after the use of Word Square-based health promotion media. (11)

Furthermore, the improvement in students' positive attitudes indicates that learning methods that combine elements of games and interaction can enhance students' emotional engagement with the material, thereby significantly influencing their perspectives and feelings. This is in line with the findings of Rezkyhariani and Aqilah Eka Rahmadhani, who stated that the Word Square method is effective in improving students' attitudes toward health-related behaviors.

However, this intervention was conducted only once, and the observed changes are still at an initial stage. Therefore, repetition and continuous reinforcement of the material are necessary to ensure that improvements in knowledge and attitudes are sustained and can influence students' daily behavior. (14)

In this study conducted at SD Islam Al Ishlah Bukittinggi, the Word Square method, which is interactive, engaging, and enjoyable, was able to produce significant positive changes in students' attitudes toward tooth brushing behavior in a short period of time. By actively involving students in finding relevant words, this method increases attention, interest, and emotional engagement with health promotion material, thereby shifting initial attitudes in a more positive direction. The attitude changes observed in a single session reflect an initial positive response to both the material delivered and the learning method used.

Nevertheless, attitude changes resulting from a single session are still preliminary and may be influenced by environmental factors or previous habits. To maintain and strengthen these positive changes, further interventions, repeated exposure to the material, and consistent habit formation are required so that the new attitudes become more stable and integrated into students' daily behavior.
The Word Square method is an effective learning medium as an initial step in attitude modification; however, it needs to be supported by continuous health education approaches. One limitation of using the Word Square method in a single session is that the long-term effect on attitude change cannot yet be ensured without follow-up. The measured attitude changes based on immediate responses may not fully reflect consistent behavioral change.

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Overall, this study indicates that the Word Square method is an effective learning medium as an initial step in improving students' knowledge and attitudes toward maintaining oral health, with the consideration that follow-up efforts are necessary to sustain and deepen the impact of this intervention.

CONCLUSION

1. The results showed that the knowledge of fourth- and fifth-grade students at SD Islam Al Ishlah Bukittinggi in 2025 regarding tooth brushing before the intervention using the Word Square method indicated that 59.1% of respondents were in the good category. The mean knowledge score was 11.53 in the pre-test, with a minimum score of 3.
2. After the intervention using the Word Square method, 84.8% of respondents were in the good category. The mean knowledge score increased to 13.06 in the post-test, with a minimum score of 5.
3. The results also showed that students' attitudes toward tooth brushing before the intervention indicated that 62.1% of respondents were in the good category. The mean attitude score was 59.14 in the pre-test, with a minimum score of 40.
4. After the intervention, 90.9% of respondents were in the good category. The mean attitude score increased to 64.00 in the post-test, with a minimum score of 45.
5. The p-value for knowledge was 0.000 ($p \leq 0.05$), indicating a significant effect of the Word Square method on students' knowledge. Therefore, $H0_1$ was rejected and Ha_1 was accepted. Similarly, for attitude, the p-value was 0.000 ($p \leq 0.05$), indicating a significant effect of the Word Square method on students' attitudes. Thus, $H0_2$ was rejected and Ha_2 was accepted. It can be concluded that there is a significant effect of the Word Square method on both knowledge and attitudes toward tooth brushing among fourth- and fifth-grade students at SD Islam Al Ishlah Bukittinggi in 2025.

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