DIFFERENCES IN TOOTHBRUSHING KNOWLEDGE WITH COUNSELING USING DEMONSTRATION AND SIMULATION METHODS STUDENTS AT SDN 06 TALUAK IV SUKU, BANUHAMPU DISTRICT, AGAM REGENCY

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Abstract

Dental and oral health issues remain a significant public health concern in Indonesia, particularly in regional areas such as Agam Regency. A primary risk factor contributing to the high prevalence of dental diseases among school-aged children is a profound lack of knowledge regarding proper toothbrushing techniques and oral hygiene maintenance. This study aimed to evaluate and compare the effectiveness of two different educational interventions the demonstration method and the simulation method in improving toothbrushing knowledge among fourth, fifth, and sixth-grade students at SDN 06 Taluak IV Suku, Banuhampu District, Agam Regency.
Utilizing a quasi-experimental design with a pretest-posttest approach, a total of 60 students were selected through a total sampling technique. The respondents were divided into two intervention groups: one receiving counseling via the demonstration method and the other through the simulation method. Data were meticulously collected using structured knowledge questionnaires and direct observations, which were subsequently analyzed using the non-parametric Mann-Whitney U statistical test. The results demonstrated a notable increase in knowledge scores across both groups; however, the simulation group exhibited a more substantial improvement, rising from a baseline of 69% to 84%, compared to the demonstration group which increased from 70% to 82%. Statistical analysis confirmed a significant difference between the two interventions ($p = 0.000$), indicating that the simulation method, which emphasizes active participation and hands-on practice, is more effective than passive demonstration. These findings suggest that incorporating interactive simulation into school dental health programs (UKGS) is essential for fostering better oral health literacy and long-term behavioral changes in children.

Keywords: Dental Health Education, Toothbrushing Knowledge, Demonstration Method, Simulation Method, Elementary School Students.

1. INTRODUCTION

The World Health Organization (WHO) states that health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity [1]. Health, as defined in Law (UU) Number 17 of 2023, is a state of physical, mental, and social well-being that allows individuals to lead a productive life, not merely being free from disease [2]. Dental and oral health encompasses the condition of the mouth, teeth, and all elements within the oral cavity being in a healthy state, enabling individuals to perform essential functions such as eating, breathing, speaking, and social interaction [3].

Data on Dental and Oral Health Status from the World Health Organization (WHO) estimates that approximately 3.5 billion individuals worldwide experience dental and oral health problems [1]. The 2018 Basic Health Research (Riskesdas) data states that 57.6% of the population in Indonesia has dental and oral health issues [4]. In West Sumatra Province, 58.5% of the population experiences dental and oral health problems. Furthermore, the 2023 Indonesia Health Survey (SKI) data indicates that

56.9% of the Indonesian population still faces dental and oral health issues, and in West Sumatra Province, the figure is higher at 61.1% [5].

Riskesdas 2018 data shows that the habit of brushing teeth at the correct time—after breakfast and before bed—in Indonesia reaches 2.8%. In West Sumatra Province, the percentage of those brushing at the correct time is even lower at 1.2%, and in Agam Regency, the population brushing at the correct time reaches only 0.9%. The 2023 SKI data states that the habit of brushing teeth twice a day in Indonesia reaches 72.5%, while in West Sumatra Province, it shows a higher figure of 78.6%. However, the 2023 SKI data also indicates that the habit of brushing at the correct time (after breakfast and before bed) in Indonesia only reaches 6.2%, and in West Sumatra Province, it is 1.2% [6].

From the data above, it is evident that there are significant issues regarding dental and oral health; such good habits must be supported by adequate knowledge.Knowledge emerges as a result of understanding after observing something or is gained from experience [7]. The higher a person's level of knowledge or education, the easier it is for them to absorb new information regarding dental health compared to those with lower knowledge levels [8]. Efforts to maintain oral hygiene can be carried out through toothbrushing [9].

Toothbrushing is a method used to clean food debris adhering to the tooth surfaces and gums and serves as a preventive measure to achieve optimal oral hygiene and health [10]. One way to increase knowledge about toothbrushing is through counseling. Counseling is a promotional activity within the School Dental Health Program (UKGS) in schools. It is a method frequently used in dental health education; for elementary school children, counseling can be conducted using demonstration and simulation methods The demonstration method is a way of delivering information by showing objects directly or explaining a procedure. Demonstration activities generally involve the use of visual aids and include Q&A sessions to support the process. The simulation method is a counseling technique performed through teaching and learning activities that focus on the internalizing of skills and practice within a situation that mimics the actual conditions [11].

2. METHODOLOGY

The research design employed was a quasi-experimental approach using a pretest-posttest design, where measurements were taken before (pretest) and after (posttest) the counseling intervention. The study was conducted on May 24, 2025, involving fourth, fifth, and sixth-grade students at SDN 06 Taluak IV Suku, Agam Regency. The population for this study consisted of 65 students. The sampling technique utilized was total sampling, resulting in 60 respondents who met the inclusion criteria, which required students to be present during the study and willing to participate as respondents.

The participants were divided into two groups: 30 respondents for the counseling group using the demonstration method and 30 respondents for the counseling group using the simulation method. Data collection involved observations and the distribution of questionnaires regarding toothbrushing knowledge, consisting of both primary and secondary data. Data analysis included univariate analysis to determine frequency distributions and bivariate analysis using the non-parametric Mann-Whitney U test with a significance level of alpha < 0.05.

In the initial stage, the researcher introduced themselves and explained the study's objectives. Subsequently, the researcher distributed the knowledge questionnaires prior to the counseling sessions. Once completed, the questionnaires were collected by the researcher and the designated enumerators.

3. RESULTS AND DISCUSSION

The study was conducted on May 24, 2025, aimed at evaluating the differences in toothbrushing knowledge among fourth, fifth, and sixth-grade students through counseling using demonstration and simulation methods at SDN 06 Taluak IV Suku, Agam Regency. A total of 60 respondents participated, divided into two groups: 30 respondents in the demonstration counseling group and 30 respondents in the simulation counseling group. The data obtained are as follows:

3.1 RESULTS

3.1.1 Univariate Analysis

***Table 1**. Frequency Distribution of Toothbrushing Knowledge Before and After Counseling Using the Demonstration Method*

Criteria	Before (Pre-test)	After (Post-test)
	F	**%**
Good	9	30
Moderate	17	56.7
Low	4	13.3
Total	**30**	**100**

***Table 2.** Frequency Distribution of Toothbrushing Knowledge Before and After Counseling Using the Simulation Method*

Criteria	Before (Pre-test)	After (Post-test)
	F	%
Good	8	26.7
Moderate	18	60
Low	4	13.3
Total	30	100

3.1.2 Bivariate Analysis

***Table 3**. Differences in Toothbrushing Knowledge With Demonstration and Simulation Methods*

Method	N	Knowledge (Before)	Knowledge (After)	Difference
Demonstration	30	70%	82%	12%
Simulation	30	69%	84%	15%

***Table 4**. Mann-Whitney U Test Results: Differences in Toothbrushing Knowledge Between Demonstration and Simulation Methods*

Method	N	Mean Rank	Asymp. Sig. (2-tailed)
Demonstration	30	38.75	0.000
Simulation	30	40.80	

Based on Table 4, the Mann-Whitney U test results indicate that the mean rank for toothbrushing knowledge among students who received simulation counseling was higher (40.80) compared to those who received demonstration counseling (38.75). The statistical test yielded an Asymp. Sig. value of 0.000 ($p < 0.05$), leading to the acceptance of Ha. This confirms a significant difference between demonstration-based counseling and simulation-based counseling in improving toothbrushing knowledge among fourth, fifth, and sixth-grade students at SDN 06 Taluak IV Suku, Banuhampu District, Agam Regency.

3.2 DISCUSSION

The results showed that prior to the demonstration counseling, 13.3% of students in grades IV, V, and VI had "low" knowledge criteria. After the intervention, there was a significant improvement, with 73.3% reaching the "good" criteria. This indicates an overall increase in toothbrushing knowledge at SDN 06 Taluak IV Suku, with a 60% gain in the "good" category. However, 26.7% of respondents still remained in the "moderate" category post-intervention.

The researcher assumes that the demonstration method effectively enhances knowledge because the use of visual aids, such as dental models and toothbrushes, captures students' attention. This method allows them to visualize and understand procedures quickly. Before the counseling, students were provided with comprehensive teaching materials covering the definition and objectives of toothbrushing, the optimal timing and frequency, common errors, and guidelines for selecting and maintaining a toothbrush. The improvement in knowledge is evidenced by the respondents' ability to correctly answer questionnaire items after observing the researcher demonstrate the procedures using the dental model. Dental and oral health education for school-aged children requires special attention as they are in a critical growth phase. To improve knowledge, counseling must utilize engaging media or aids to maintain children's interest [12] [13}[14] [15] [16]

The results indicated that students with "low" knowledge (13%) prior to simulation counseling improved significantly, with 80% reaching "good" criteria after the intervention. This represents a 67% increase in the "good" category. The researcher suggests that the simulation method is highly effective because it fosters enthusiasm; students are more engaged when instructed to reenact the toothbrushing process. Before the simulation began, students received the same theoretical foundation as the demonstration group. However, the simulation method added a layer of active participation. By using dental models and sikat gigi (toothbrushes) directly, students practiced everything they had learned—from the choice of brush to the correct sequence of cleaning each tooth surface. This method focuses on internalizing skills through practice in situations that mimic reality [17][18][19].

Statistical analysis using the Mann-Whitney U test yielded an *Asymp. Sig.* value of 0.000, leading to the acceptance of . While both methods increased knowledge, the simulation group achieved a higher mean rank (40.80) compared to the demonstration group (38.75). This indicates that simulation is more effective for delivering toothbrushing material. The researcher assumes that this difference arises because the demonstration method only provides theoretical and visual understanding (students only observe), whereas the simulation method allows for immediate hands-on practice. Students in the simulation group showed better accuracy in answering questions regarding the choice of toothbrush, the proper frequency of twice a day, and specific maintenance techniques. By involving direct practice with the dental model, students do not only receive theory but also internalize the motor skills required. Knowledge is a critical factor in forming a person's attitude and behavior. Counseling provides a significant impact on an individual's knowledge and motivation to change. To ensure long-term dental health, toothbrushing should be established as a daily routine, supported by proper tools and correct techniques [20] [21].

4. CONCLUSIONS AND SUGGESTIONS

Based on the research findings regarding the differences in toothbrushing knowledge among fourth, fifth, and sixth-grade students at SDN 06 Taluak IV Suku, Agam Regency, it can be concluded that there is a statistically significant difference between counseling using the demonstration method and the simulation method. This is evidenced by the statistical analysis leading an Asymp. Sig. value of 0.000 ($p < 0.05$).

The study highlights that while both methods contribute to knowledge enhancement the simulation method is significantly more effective in improving students' toothbrushing knowledge compared to the demonstration method. This effectiveness is attributed to the active participation and hands-on experience provided during the simulation, which allows students to internalize the procedures more deeply than through observation alone

Based on the findings of this study, it is highly recommended that students consistently integrate the knowledge gained into their daily routines by maintaining optimal oral hygiene, specifically by brushing their teeth using correct techniques at least twice a day after breakfast and before bed. Educational institutions, particularly through the School Dental Health Program (UKGS), should consider adopting simulation-based counseling as a primary educational tool, as integrating direct practice with teaching aids proves more impactful in establishing long-term healthy habits in children. Furthermore, acknowledging the limitations of this study specifically its relatively short observation period and focused geographic scope future researchers are encouraged to conduct longitudinal studies to explore long-term knowledge retention. Subsequent research should also move beyond theoretical assessment to evaluate the actual impact of these methods on students' psychomotor skills and objective oral health indicators, such as the plaque index, to provide a more comprehensive evaluation of behavioral change.

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