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# Education Using Dental Health Book Media to Increase Dental Health Knowledge in Preschool Children

**Rika Alipah[1], Syifa Yulia Lestari[2]**

[1,2] Department of Dental Health, Polytechnic Health of Jakarta I, Indonesia

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**ABSTRACT**

Background: Early childhood to elementary school–aged children are considered a vulnerable group for dental caries due to their limited understanding of the importance of oral and dental health. One effective effort to prevent and manage this problem is the provision of oral and dental health education. The use of attractive and interactive media is an effective approach for delivering information to children. A dental health book is one educational medium that can be utilized in promotive activities to improve children's knowledge of oral and dental health. Objective: To describe students' knowledge of oral and dental health before and after educational intervention using a dental health book among kindergarten students at Miftahul Huda, Tangerang, in 2025. Method: This study employed a pre-eksperimental design. The sampling technique used in this study resulted in a total sample of 37 kindergarten students at Miftahul Huda in 2025. Results: The results showed an improvement in students' knowledge. Before the educational intervention, 17 students (45.9%) were categorized as having poor knowledge. After the intervention, all 37 students (100%) demonstrated good knowledge. Conclusion: There was an increase in students' knowledge of oral and dental health after education using a dental health book. Prior to the intervention, most students were classified as having poor knowledge, whereas after the intervention, all students achieved a good knowledge category.

## INTRODUCTION

Oral and dental health refers to a condition in which the mouth, teeth, and related structures are in a healthy state, enabling individuals to perform vital functions such as eating, breathing, and speaking optimally (Purnama & Sofian, 2023). In addition, oral and dental health encompasses psychosocial aspects, including self-confidence, well-being, and the ability to interact socially and work without experiencing pain or discomfort (Andrews & Sharma, 2018). Data from the 2023 Indonesian Health Survey indicate that approximately 57% of the population aged ≥3 years reported experiencing oral and dental problems within the past year. Nationally, the prevalence of oral and dental problems decreased by 0.5% compared to the 2018 Basic Health Research. The 2023 SKI also shows a decline in the DMF-T index across all age groups compared to 2018. The lowest DMF-T index was observed in the 12-year-old age group; however, the index increased with advancing age and reached its highest level among individuals aged 65 years and older. Furthermore, the dmft index for primary teeth in children aged 3–5 years showed an increase and was categorized as high (≥6.6). Therefore, despite the observed decline in DMF-T indices since 2018, oral and dental health in Indonesia still requires greater attention, as the DMF-T index remains high to very high among children aged 3–5 years and adults aged over 35 years (Kemenkes, 2023; Riskesdas, 2018).

Health is a fundamental aspect of human life, as optimal growth and development can only be achieved with a healthy body. Oral and dental health is an integral part of overall health that requires special attention (Fadjeri et al., 2023). Problems affecting the teeth and oral cavity may have a negative impact on general health. The condition of oral and dental health is influenced by local factors within the oral cavity. Inadequate maintenance of oral and dental hygiene can lead to various disorders or diseases affecting this area (Pontoluli et al., 2021).

Oral and dental care in children, including primary teeth, plays an important role in the development of permanent teeth. In early childhood, good oral hygiene habits should be established as early as possible (Puteri & Emini, 2023). However, many children still experience various dental problems, such as dental caries, plaque accumulation, and periodontal diseases. These conditions can interfere with daily

*Corresponding author
E-mail addresses: rikaalipah839@gmail.com

activities, affect appearance, and have an impact on overall health (Kasihani et al., 2022). Unhealthy dietary patterns, such as a preference for sugary foods, low-fiber diets, and foods that easily adhere to the teeth, contribute to these problems. Therefore, the high prevalence of dental caries is closely associated with excessive sugar consumption. In addition, inadequate oral hygiene practices or poor oral hygiene behavior can further increase the risk of dental damage (Nurilawaty et al., 2021).

The social determinants of health are non-medical factors that influence health outcomes. The conditions in which individuals are born, grow, live, work, and age have a significant impact on health and well-being. Dental caries is influenced by multiple factors arising from the interaction between environmental, behavioral, and genetic factors (Sutjipto, 2014). Individual actions in maintaining oral and dental health play a crucial role in determining overall oral health status. These behaviors include toothbrushing habits, dietary patterns, and the frequency of dental visits. When such maintenance behaviors are suboptimal, the risk of developing dental caries increases (Purnama et al., 2020).

Another influencing factor is accessibility, which includes distance to health facilities, lack of transportation, limited awareness, and the cost of dental care, all of which affect the utilization of oral and dental health services. In addition, financial constraints may lead to poor nutritional status and unhealthy eating habits, thereby contributing to oral and dental health problems. Children from families with higher socioeconomic status generally have better oral and dental health and are more likely to attend regular dental check-ups compared to children from families with lower socioeconomic status. Studies have shown that the presence of dental caries is a strong indicator of socioeconomic inequality in both children and adults (Kemenkes, 2023).

Therefore, the high prevalence of dental caries requires appropriate management, particularly through preventive efforts in children. Early childhood to elementary school–aged children constitute the most vulnerable group to dental caries due to their limited understanding of oral and dental health. One effective strategy to prevent and address oral and dental health problems is through oral and dental health education (Andreastiti & Widodo, 2023).

The success of oral health education among school-aged children is strongly influenced by the educational methods employed and the role of media in supporting the learning process. Educational media facilitate students' understanding of the delivered material, enabling health messages to be conveyed in a more engaging and easily comprehensible manner (Husna & Prasko, 2019).

Interactive and enjoyable media can serve as effective tools for delivering information to children in a more easily understood manner. One educational medium that can be utilized for this purpose is an illustrated book or dental health book. Such books are designed to attract children's interest through engaging illustrations, entertaining stories, and information presented in a simple and clear format. Consequently, children are able to learn about the importance of maintaining oral and dental health in a more enjoyable way.

Based on data from the 2018 Basic Health Research, the prevalence of damaged, decayed, or painful teeth in Tangerang City reached 48.62%. Among children aged 3–4 years, 39.62% experienced dental problems; however, only 6.00% received counseling related to oral and dental hygiene and health care. Therefore, Tangerang City was selected as the study location, specifically at Miftahul Huda Kindergarten, located at Jl. Ki Hajar Dewantara, RT 001/RW 002, Gondrong, Cipondoh District, Tangerang City, Banten. The school had a total of 45 Grade B students in 2025 (Riskesdas, 2018). Oral and dental health is a complex problem that requires comprehensive management. Preventive efforts, health education, and improved access to high-quality oral and dental health services are essential to enhance the oral health status of the Indonesian population.

## METHOD

This study employed a pre-eksperimen design. The data analyzed focused on students' knowledge of oral and dental health before and after educational intervention using a dental health book as a learning medium. Knowledge levels were assessed through pre-test and post-test data collected from kindergarten students at Miftahul Huda.

The population refers to the entire group of research subjects. Values calculated and obtained from a population are referred to as parameters. According to Djarwanto, a population is the total number of units or individuals whose characteristics are to be examined (Saputro & Pradana, 2022). The study population consisted of 37 kindergarten students at Miftahul Huda, Tangerang.

A sample is a subset of the population that serves as the source of data for a study, representing part of the population's characteristics (Sugiyono, 2017). The sampling technique used in this study was purposive sampling. Purposive sampling is a method of sample selection based on specific considerations, whereby subjects are chosen according to particular characteristics that are considered relevant to the objectives and characteristics of the population under study.

According to (Adam & Ratuela, 2022), a larger sample size relative to the population is preferable; however, there is a minimum sample size that must be met by researchers, which is 37 subjects. It has been stated that for studies employing statistical data analysis, the minimum required sample size is 37. Therefore, this study included a minimum sample of 37 participants. The sample inclusion criteria in this study were as follows:

1. Students enrolled in Class B of Miftahul Huda Kindergarten, Tangerang, in 2025;
2. Students who were present during the data collection period;
3. Students who were willing to participate as study subjects; and
4. Students who obtained consent from their parents or guardians.

This study was conducted from January to April 2025. The instrument used for data collection was a pre-test and post-test questionnaire designed to measure students' knowledge of oral and dental health before and after the educational intervention using a dental health book as a learning medium. The questionnaire was adapted from several previous educational research studies.

Data collection in this study was conducted to measure students' levels of knowledge before and after the educational intervention using a dental health book as a learning medium. The kindergarten students at Miftahul Huda, Tangerang, completed pre-test and post-test questionnaires for this purpose.

The data collection process was carried out through the following stages:

1. Obtaining permission and approval from the school to conduct the research.
2. Determining the research respondents, namely students of Miftahul Huda Kindergarten.
3. Providing informed consent to the parents or guardians of the kindergarten students.
4. Introducing the researcher and explaining how to use the dental health book to the students.
5. Prior to the use of the dental health book, distributing the pre-test questionnaire to the students.
6. Conducting the oral and dental health education session using the dental health book as an educational medium. The researcher also explained how to complete and use the book properly. This activity lasted approximately 15–20 minutes.
7. On the first day, administering the pre-test and conducting oral and dental health education.
8. On the second day, guiding students to complete the dental health book and administering the post-test.

There were several stages in the use of this learning medium to support students' reading, writing, and numeracy skills with the theme of oral and dental health, as follows::

1. The dental health book was used individually by each student; however, the activities were conducted simultaneously in the classroom to allow guidance from the teacher, with a duration of approximately 20 minutes.
2. In the first stage, students were asked to observe the images in the book while spelling the words printed below each image. This activity aimed to help students recognize and understand vocabulary related to oral and dental health.
3. In the second stage, students read the informational content presented on each page. The teacher provided guidance and explanations to facilitate students' understanding of the material.
4. In the final stage, students completed the exercises provided on several pages as a form of practice and reinforcement of the learned material. These activities included tracing letters, counting, and matching images with the appropriate words.

The collected data subsequently underwent an editing process. During this stage, the researcher reviewed and checked the completeness of the data. If the collected data were incomplete or insufficient, additional data were obtained at the research site. Data obtained from questionnaires or observations were edited prior to further processing. The next step was coding, which involved assigning codes or labels to facilitate data entry. The data were then tabulated to simplify data analysis, followed by rechecking to identify any potential errors or inconsistencies.Research data analysis was conducted using univariate analysis, or analysis used to describe collected data and focus on a single variable. Primary data was collected, recorded, and presented in tabular form, then analyzed descriptively to obtain an accurate picture and variables.

## RESULT

**Table 1.** Frequency distribution of participants by gender

| Gender | Frequency | Percentage (%) |
|---|---|---|
| Male | 16 | 43.24 |
| Female | 21 | 56.76 |
| **Total** | **37** | **100** |

Table 1 shows that a total of 37 Class B kindergarten students at Miftahul Huda, Tangerang, participated as respondents. Of these, 16 students (43.24%) were male, while 21 students (56.76%) were female.

**Table 2.** Frequency Distribution of Knowledge Levels Before Education Using a Dental Health Book Among Kindergarten Students at Miftahul Huda

| Knowledge | Frequency | Percentage (%) |
|---|---|---|
| Good | 9 | 24.3 |
| Moderate | 11 | 29.7 |
| Poor | 17 | 45.9 |
| **Total** | **32** | **100** |

Table 2 shows that prior to the educational intervention, the majority of Class B kindergarten students at Miftahul Huda, Tangerang—17 students (45.9%)—had poor knowledge of oral and dental health. Meanwhile, 11 students (29.7%) had moderate knowledge, and 9 students (24.3%) demonstrated good knowledge.

**Table 3.** Frequency Distribution of Knowledge Levels After Education Using a Dental Health Book Among Kindergarten Students at Miftahul Huda

| Knowledge | Frequency | Percentage (%) |
|---|---|---|
| Good | 37 | 100 |
| Moderate | 0 | 0 |
| Poor | 0 | 0 |
| **Total** | **32** | **100** |

Table 3 The results indicate that after the educational intervention using a dental health book among Class B kindergarten students at Miftahul Huda, Tangerang, all 37 students (100%) demonstrated good knowledge of oral and dental health. No students were classified as having moderate or poor knowledge after the intervention.

**Table 4.** Comparison of Knowledge Scores Before and After Education Using a Dental Health Book

| Statistic | Before education | After education |
|---|---|---|
| Total score | 2,220 | 3,650 |
| Mean | 60 | 98.64 |
| Maximum | 30 | 90 |
| Minimum | 80 | 100 |

Table 4 shows that prior to the educational intervention using a dental health book, the total number of correct answers was 2,220, with a minimum score of 30 and a maximum score of 80. After the educational intervention, an improvement was observed, with the total number of correct answers increasing to 3,650. The minimum score increased to 90, while the maximum score reached 100. Furthermore, the mean knowledge score of respondents before the educational intervention using a dental health book was 60.00, which increased to 98.64 after the intervention.

## DISCUSSION

Based on the pre-test results obtained before the educational intervention using a dental health book, 17 children (45.9%) were classified as having poor knowledge. This finding indicates that many children had limited understanding of the questionnaire content, including insufficient knowledge of oral

and dental health, proper toothbrushing techniques and timing, as well as low awareness of the importance of maintaining personal hygiene. This finding is consistent with the opinion of (Abral et al., 2020), who stated that the stage of fluent reading represents the final phase of learning to read; however, children achieve this stage at different rates depending on their individual development. At this stage, teachers facilitate the learning process by providing books containing simple words and sentences. Therefore, the selection of appropriate learning materials, such as dental health books with simple language, can help children better comprehend the reading content while simultaneously improving their knowledge of oral and dental hygiene.

Maintaining oral and dental hygiene is an important measure to improve overall health, as it can prevent the development of various diseases within the oral cavity. Habits related to oral and dental health should be established from an early age, as the school period represents an ideal time to instill values that can foster positive oral health behaviors (Fitri et al., 2023). Therefore, the researchers implemented an effort to improve oral and dental health through the use of a dental health book containing information on foods that are beneficial and harmful to dental health, knowledge about dental caries, other dental diseases, and proper oral and dental care practices. The post-test results obtained after the educational intervention using the dental health book showed a significant improvement, with all Class B kindergarten students (37 children; 100%) achieving a good knowledge category.

This increase in knowledge can be attributed to the use of interactive and enjoyable educational media, which serve as effective tools for delivering oral health information to children in a more easily understood manner. During the activities involving the completion of the dental health book, students demonstrated active participation in joint reading, counting, and writing activities, as well as responding to questions related to the book to assess their understanding of oral and dental health. The process of completing the book up to the final page was carried out with careful attention and enthusiasm, while maintaining a pleasant learning atmosphere. Consequently, information regarding oral and dental health was conveyed effectively.

The results of this study indicate a comparison of mean knowledge scores before and after education using a dental health book as a learning medium. The mean score prior to the educational intervention was 60.0, which increased to 98.6 after the intervention, resulting in a difference of 38.6 points. This finding is consistent with the study by Mawardah et al. (2021) which reported a mean pre-test score of 880 and a mean post-test score of 1,980, resulting in an N-Gain value of 0.83, categorized as high. These results indicate that illustrated storybook media are effective for the learning process. Based on the findings of the present study, there was an improvement in children's knowledge of oral and dental health, which shifted from the poor category before the intervention to the good category after participating in the educational activity.

During the research process, all participants demonstrated high levels of enthusiasm and interest in the learning activities. The children were actively engaged in completing the tasks provided in the dental health book, which were carried out simultaneously in the classroom while each child worked independently on their own book, with an average completion time of approximately 20 minutes. Although the results indicated an improvement in knowledge and positive responses from the participants, this study also highlights the need for further development of the learning media used. One recommendation for future improvement is to include a greater variety of question types in the dental health book to prevent monotony and to maintain children's interest throughout the learning process.

The dental health book used in this study was an educational medium adapted from several previous studies that utilized dental health books as learning media in different educational contexts. Thus, it can be concluded that illustrated storybook media are effective for the learning process. Illustrated storybooks served as the primary reference in developing learning media for children, particularly in enhancing reading, writing, and numeracy skills, which were subsequently modified into an educational medium with an oral and dental health theme. Although the mode of presentation differed, the primary objective remained the same—to deliver learning material in an informative manner. These adaptations were made to ensure that the delivery of oral and dental health information to early childhood learners remained engaging, enjoyable, and free from monotony throughout the learning process.

Learning media are essential elements that influence the achievement of educational objectives, as they play a significant role in supporting the effectiveness of the learning process. One effective form of learning media is illustrated children's storybooks, in which the images presented are tailored to the topic and narrative characteristics, enabling them to represent the implicit meanings within the story. The process of learning to read becomes more effective when implemented systematically, allowing students to engage in reading activities without feeling compelled. In addition, reading enriches students' vocabulary, and experiences gained through interaction with various words help children understand the world in a

concrete manner. This understanding subsequently serves as a foundation for comprehending more abstract concepts, thereby supporting the development of their knowledge (Nugraheni et al., 2019).

## CONCLUSION

These results indicate that interactive educational media, such as a dental health book, can significantly enhance young children's understanding of oral hygiene.

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