

*The 5<sup>th</sup> International Conference on Dental and Oral Health (ICODOH)*

**Elementary School Student's Knowledge About Caries Using Dental Story Sticker Media**

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**ABSTRACT**

**Background:** Dental and oral health problems remain an important issue in Indonesia. These problems are not only experienced by adults but also by children, especially elementary school students. One of the most common issues is dental caries, which is caused by a lack of knowledge among children about tooth decay. A total of 79% of students experience dental caries, while 21% are caries-free. This result is lower compared to data from the 2023 Indonesia Health Survey (SKI), which showed that the proportion of caries-free children aged 10–14 years was 35.5%. **Object:** This study aims to describe the level of knowledge about dental caries among fourth-grade students at SDN Ploso I Surabaya before and after receiving education using the dental story sticker media. **Method:** The study employed a descriptive design with a pretest and posttest approach. The research sample consisted of all fourth-grade students (classes 4A and 4B) at SDN Ploso I Surabaya, totaling 42 students, selected using a total sampling technique. Data were collected using a questionnaire, and the responses were analyzed by calculating averages and converting them into percentages. **Results:** The results indicated that students' knowledge before the intervention was at a moderate level, but after the health education using the dental story sticker media, it improved to a good level. **Conclusion :** This media effectively helped students understand the importance of maintaining oral health and preventing dental caries through an engaging and enjoyable learning approach.

**Keywords:** Knowledge, Dental Caries, Elementary School Student, Dental Story Sticker, Dental Health Education

**BACKGROUND**

Dental and oral health problems that affect nearly the entire population of Indonesia are primarily caused by dental caries. Dental caries are especially common among children due to their limited knowledge and poor attitudes towards maintaining oral hygiene. Oral health knowledge is closely related to the incidence of dental caries. Among school-aged children with poor oral health knowledge, (59.4%) were found to have dental caries in their oral cavities (Alifunisa et al., 2023).

According to the 2018 Basic Health Research (Riskesdas) conducted by the

Ministry of Health of the Republic of Indonesia, (55.6%) of children aged 10–14 years were reported to have dental and oral health problems, yet only around (9.4%) had received treatment from healthcare professionals. According to the (Puspitasari et al., 2024) reported a dental caries prevalence of (73.4%) and a root caries prevalence of (48.1%) among school-aged children between 10–14 years.

Dental caries is defined as a localized destruction of the hard tissues of the teeth, occurring in specific areas on the tooth surface. This condition results from the loss of enamel and dentin structure due to

acid deposit produced by plaque form bacteria accumulated on the tooth surface (Manik et al., 2024). Several factors contribute to the development of dental caries, including oral health knowledge, attitude toward oral hygiene, oral health behavior, and the frequency of consuming cariogenic food (Arum et al., 2023). According to the (Marlindayanti et al., 2022) emphasize that the presence of certain causes or consequences of caries is recognized as a risk factor for its occurrence. These risk factors can be categorized into internal and external elements.

Dental caries can cause pain and discomfort in the oral cavity, leading to difficulties in eating and sleeping, impaired concentration during learning activities, and even school absenteeism among children. These consequences have a significant negative impact on children's overall quality of life (Alifunisa et al., 2023). Student characteristic refer to individual trait or quality, including interest, attitude, learning motivation, learning style, cognitive ability, and prior knowledge. Character, on the other hand, is defined as personal attributes or distinctive qualities shaped by environmental influences (Widiyani et al., 2024). In general, the learning characteristics of elementary school students are divided into two categories: lower-grade students (grades 1 to 3) and upper-grade students (grades 4 to 6) (Hidayatulloh et al., 2023).

SDN Ploso 1 Surabaya is one of the elementary school under the supervision of the Rangkah Public Health Center in Surabaya. According to school official, dental health activities conducted by the health center are carried out every six months. These activities include dental health screening and referrals to the health center for students who are found to have dental problems, such as caries or cavities (Widiyani et al., 2024).

In a targeted group of 14 fourth-grade students at SDN Ploso 1 Surabaya, 79% were found to have dental caries,

while only 21% were caries free. In comparison, according to the 2023 National Dental Health Survey (SKI), the proportion of caries-free children aged 10–14 years was 35.5%. These findings indicate that the prevalence of dental caries among fourth-grade students at SDN Ploso 1 Surabaya is considerably high. Health personnel have previously provided dental health education and conducted dental examinations for these students.

The high prevalence of dental caries is often attributed to a lack of knowledge regarding oral and dental health. Adequate knowledge can influence positive health behaviors, especially those related to oral hygiene. Conversely, poor knowledge about the importance of oral and dental health is often due to infrequent health education efforts, resulting in a negligent attitude towards oral hygiene (Nuraini Utami Harahap et al., 2022). Knowledge is defined as the result of sensory perception following exposure to a specific object. This perception process occurs through the human senses, namely vision, hearing, smell, taste, and touch. Most human knowledge is acquired through vision and hearing. Knowledge represents a crucial domain that significantly contributes to shaping one's actions (Tameon et al., 2021).

Based on the background described above, the central problem identified in this study is the low percentage of caries-free students at SDN Ploso 1 Surabaya in 2024. One of the roles of Dental and Oral Therapists, as stated in the Indonesian Ministry of Health Regulation No. 20 of 2016, is to implement promotive, preventive, and simple curative efforts to improve optimal oral health at individual, group, and community levels. A theoretical foundation relevant to the use of educational media in learning is Edgar Dale's Cone of Experience.

Media play a critical role in the learning process at school, one of which is to attract student's attention and reduce boredom. The use of instructional media

helps student's receive, comprehend, and master the material delivered, thus enhancing the success of educational interaction. According to Edgar Dale's Cone of Experience, media that clearly conveys learning material in the form of fiction, image, sound, and video is considered essential in the learning process. The use of educational media is aimed at improving the effectiveness and efficiency of teaching and learning processes, there by enhancing student's memory retention and learning outcomes (Ambarwati, 2023).

There are various types of media that can be utilized in the learning process; one such medium that can be used in health education is the "sticker board" or dental story sticker. This oral health educational medium involves the use of reusable stickers combined with storytelling techniques as part of the health promotion method. Health promotion using visual aids, such as the dental story sticker, has been shown to improve children's knowledge, particularly regarding dental caries. This medium also supports the dissemination of health information in an engaging and easily understandable manner. The advantages of using sticker-based media in health promotion include: being easy to understand, attention-grabbing, interactive, flexible or portable, and independent of technological reliance (Putri et al., 2021).

## RESEARCH METHODE

This study aims to describe the level of knowledge regarding dental caries among fourth-grade students at SDN Ploso I Surabaya before and after receiving education using the dental story sticker media. The study employed a descriptive design with a pretest–posttest approach. The research sample included all fourth-grade students (classes 4A and 4B) at SDN Ploso I Surabaya, totaling 42 students, selected through a total sampling technique. Data were collected using a structured questionnaire, and the responses were analyzed by calculating the mean scores

and converting them into percentages. The study was conducted at SDN Ploso I Surabaya, located at Jl. Ploso VI No. 9, Ploso, Tambaksari District, Surabaya. The research took place over a period spanning from September 2024 to March 2025. This study was carried out in accordance with research ethics guidelines and was approved by the Ethics Committee of Poltekkes Kemenkes Surabaya under registration number No. EA/3769/KEPK-Poltekkes\_Sby/V/2025, with informed consent obtained from all respondents.

**The Dental Story Sticker technique was implemented by dividing respondents into four groups.** Each group was provided with one Dental Story Sticker board. Subsequently, each respondent was instructed to attach a sticker representing their answer in response to the questions displayed on the board.

## RESULT AND DISCUSSION

**Table 1.**

Distribution Based on Age and Gender of Fourth-Grade Students at SDN Ploso I Surabaya in 2025

No.	Category	Total	Percentage
<b>Gender</b>			
1.	Male	22	52%
	Female	20	48%
<b>Age</b>			
2.	10 years old	29	69%
	11 years old	13	31%
<b>Total</b>		<b>42</b>	<b>100%</b>

Based on Table 1, the majority of respondents in this study were male, accounting for 52%, while females comprised 48%. The most common age among the respondents was 10 years old, representing 69% of the total participants.

**Table 2.**

Recapitulation of Knowledge Levels on Dental Caries Before Health Education Using Dental Story Sticker Media Among Fourth-Grade Students at SDN Ploso I Surabaya, 2025

No.	Knowledge	Respondent's Correct Answer
1.	Knowledge of the Definition of Dental Caries	82%
2.	Knowledge of the Causes of Dental Caries	62%
3.	Knowledge of the Consequences of Dental Caries	84%
4.	Knowledge of the Prevention of Dental Caries	59%
5.	Knowledge of the Treatment of Dental Caries	70%
<b>Total</b>		<b>357%</b>
<b>Average</b>		<b>71%</b>
<b>Category</b>		<b>Fair</b>

According to Nursalam (2020), the level of knowledge is classified into three categories: good (76–100%), fair (56–75%), and poor (<56%). The results presented in Table 4.4 show that the percentage of knowledge among fourth-grade students at SDN Ploso I Surabaya prior to the educational intervention using the dental story sticker media in 2025 was (71%), which falls into the **fair** category.

**Table 3.**

Recapitulation of Knowledge Category Results on Dental Caries Before Health Education Using Dental Story Sticker Media Among Fourth-Grade Students at SDN Ploso I Surabaya in 2025

No.	Category	Number of Student's	%
1.	Good	13	31%
2.	Fair	22	52%
3.	Poor	7	17%
<b>Total</b>		<b>42</b>	<b>100%</b>

Based on Table 3, it was found that prior to the educational intervention using dental story sticker media, the majority of fourth-grade students at SDN Ploso I Surabaya were in the **fair** knowledge category, totaling 22 student's (52%).

**Table 4.**

Recapitulation of Knowledge Results on Dental Caries After Health Education Using Dental Story Sticker Media Among Fourth-Grade Students at SDN Ploso I Surabaya in 2025

No.	Knowledge	Respondent's Correct Answer
1.	Knowledge of the Definition of Dental Caries	96%
2.	Knowledge of the Causes of Dental Caries	88%
3.	Knowledge of the Consequences of Dental Caries	92%
4.	Knowledge of the Prevention of Dental Caries	88%
5.	Knowledge of the Treatment of Dental Caries	94%

<b>Total</b>	<b>458%</b>
<b>Average</b>	<b>92%</b>
<b>Category</b>	<b>Baik</b>

According to Nursalam (2020), knowledge levels are classified into three categories: good (76–100%), fair (56–75%), and poor (<56%). The results presented in Table 4 indicate that the percentage of knowledge among fourth-grade students at SDN Ploso I Surabaya after the educational intervention using dental story sticker media in 2025 reached (92%), which falls within the **good** category.

**Table 5.**

Category Recapitulation of Knowledge Results on Dental Caries After Health Education Using Dental Story Sticker Media Among Fourth-Grade Students at SDN Ploso I Surabaya in 2025

No.	Category	Number of Student's	%
1	Good	29	69%
2	Fair	9	21%
3	Poor	4	10%
<b>Total</b>		<b>42</b>	<b>100%</b>

Based on Table 5 it was found that after the educational intervention using dental story sticker media, the majority of fourth-grade students at SDN Ploso I Surabaya fell into the **good** knowledge category, with a total of 29 students (69%).

### Discussion

The Stimulus-Organism-Response (SOR) model describes a communication process that triggers action-reaction or behavior-reaction responses. Therefore, the cause of behavioral change depends on the quality of the stimulus transmitted through communication with the organism (communicant). In this communication model, the process begins when the

communicant (receiver) pays attention to the message received, indicating that communication is underway. If the communicant can comprehend the stimulus or message, subsequently accept it, and respond accordingly, they are willing to change their attitude.

The S-O-R behavioral change theory is crucial in educational settings because the objective of S-O-R communication is to achieve a specific effect on the communicant (Budiman et al., 2024). In relation to this study, the stimulus refers to the dental story sticker media, the organism comprises all fourth-grade students at SDN Ploso I Surabaya, and the response or effect is the increased interest in the material delivered through the dental story sticker media, resulting in students gaining a better understanding of dental caries.

This study aimed to assess the level of knowledge regarding dental caries among fourth-grade students at SDN Ploso I Surabaya. Based on the data analysis conducted on 42 respondents using the dental story sticker media, the results indicated a **good** level of knowledge. This conclusion is supported by the following findings:

Based on the results of data analysis, it was found that the level of knowledge among fourth-grade students at SDN Ploso I Surabaya regarding dental caries, prior to the health education intervention using dental story sticker media, was categorized as fair. This was evident from the fact that the majority of students had not yet understood the definition, causes, consequences, prevention, and treatment of dental caries, which resulted in their inability to correctly answer related questions. These findings are consistent with the study by (Budiman et al., 2024) which reported that prior to the educational intervention using dental story sticker media, most students at SDN 2 Mulyasari Garut also demonstrated a fair level of knowledge, with only a small

proportion possessing good knowledge regarding caries prevention.

Dental caries is a common chronic infection that progressively demineralizes the tooth structure over time. It is a disease of the dental tissues characterized by tissue destruction, beginning on the surface of the tooth (such as pits, fissures, and interproximal areas) and extending toward the pulp. Dental caries can affect individuals of all ages and may occur on one or more tooth surfaces, potentially progressing deeper into the tooth, from the enamel to the dentin or even reaching the pulp (Maharani, 2023). Elementary school children are particularly vulnerable to dental diseases due to poor oral health habits, such as frequent consumption of sugary foods and failure to brush their teeth before bedtime. Food debris left on tooth surfaces can promote bacterial growth and lead to tooth decay if not properly cleaned (Hidayati et al., 2021).

This study is consistent with the findings of Sitanaya et al., (2024), which reported that the pretest results of students at SDN 39 Mattirowalie regarding oral and dental health knowledge fell into the poor category. This was attributed to the students' lack of prior knowledge concerning the maintenance of oral and dental health.

Based on the results of data analysis, it was found that the knowledge level of fourth-grade students at SDN Ploso I Surabaya regarding dental caries improved from the fair category to the good category. After receiving oral health education, student's knowledge increased, as reflected in the posttest results indicating that most student's had achieved a good level of understanding. Reference (Sitanaya et al., 2024) states that many children tend to neglect their oral and dental health due to a lack of knowledge. Therefore, the use of engaging and easy-to-understand educational media is considered an effective method to enhance student's interest in the learning process. Attractive media are expected to positively influence

student's attitudes and habits in maintaining their personal health.

Dental caries problems can be addressed by increasing knowledge about oral and dental health, which is expected to lead to positive changes in attitudes and behaviors toward maintaining oral hygiene. Knowledge improvement can be achieved through various means, one of which is health education. Oral health education aims to enhance public knowledge in order to achieve a higher level of dental health (Majid & Apriani, 2020).

Oral health education is a planned and targeted effort to encourage individuals or groups within the community to shift from behaviors that are harmful to oral health to more beneficial and healthy practices. Delivering health information becomes more effective when conducted in an enjoyable learning environment. Approaches that incorporate games can reduce students' anxiety, thereby facilitating easier acceptance of the information provided. This method is intended to make the learning process more efficient and to maintain students' interest, particularly when presenting material that may be considered difficult or complex (Rifky et al., 2024).

Dental story sticker is an educational medium that involves interactive storytelling combined with image placement activities, where children are encouraged to attach removable and reusable stickers while engaging with narratives related to oral hygiene. This method not only fosters enthusiasm among children in receiving the information presented but also enhances their knowledge through an enjoyable learning experience. The dental story sticker functions as a dental health education tool that incorporates storytelling as a core instructional strategy. During the session, educators narrate topics related to oral and dental health while students participate actively by placing corresponding stickers (Putri et al., 2021). This aligns with the findings of (Keumala et al., 2024), which

reported a positive effect of the Dental Story Sticker on improving oral health knowledge among first-grade students at SDN 22 Banda Aceh

Based on the results above, the researchers concluded that the student's knowledge regarding dental caries was categorized as good, as demonstrated by their ability to answer the questionnaire accurately. This success was supported by the use of effective educational media during the learning process, which contributed to student's improved comprehension of the material.

### CONCLUSION

Based on the data collection and analysis of the questionnaire responses from fourth-grade students at SDN Ploso I Surabaya, the following conclusions can be drawn: The level of knowledge regarding dental caries among fourth-grade students before the intervention using the dental story sticker media was categorized as moderate. Furthermore, there was a significant improvement in student's knowledge about dental caries after the educational intervention with the Dental Story Sticker media, with the knowledge level increasing to a good category.

### CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in this manuscript.

### REFERENCES

- Alifunisa, Hasna, D., Ana, K., Riolina, S., & Nendika, S. A. M. (2023). Peningkatan Pengetahuan Kesehatan Gigi Dan Mulut Anak Sekolah Dasar Dengan Penyuluhan Menggunakan Media Dento Board Game. *Jurnal Pengabdian Masyarakat Medika*, 11–15.  
<https://doi.org/10.23917/jpmmmedika.v3i1.1124>
- Ambarwati, S. (2023). *Implementasi Teori Cone of Experince Edgar Dale Dalam Pembelajaran Pendidikan Agama Islam Di SMP Negeri 1 Baturraden Kabupaten Banyumas*. 1–129.
- Arum, Y. P., Maritasari, D. Y., & Antoro, B. (2023). Faktor-Faktor Yang Berhubungan Dengan Kejadian Karies Gigi Pada Remaja di Klinik Gigi Cheese Bandar Lampung Tahun 2022. *Jurnal Kesehatan Gigi (Dental Health Journal)*, 10(1), 1–10.
- Budiman, A. S. S., Robbihi, H. I., & Primawati, R. S. (2024). Health Promotion Using Dental Story Sticker Media on Prevention Knowledge Caries in Primary School. *Journal Center of Excellent : Health Assistive Technology*, 2(2), 86–90.  
<https://doi.org/10.36082/jchat.v2i2.1687>
- Hidayati, S., Kunafah, S., & Mahirawatie, I. (2021). Pengetahuan Tentang Karies Gigi Pada Siswa Kelas V Sdn Pakal 1 Surabaya Tahun 2020. *Indonesian Journal of Health and Medical*, 1(3), 2774–5244.
- Hidayatulloh, I., Kurniati, & Maimunah. (2023). Karakteristik Pembelajaran Siswa Tingkat Sekolah Dasar. *Seminar Nasional Teknologi Pendidikan*, 3(1), 123–127.
- Keumala, C. R., Mardelita, S., & Safriani, F. (2024). Pengaruh Penyuluhan Media Dental Story Sticker Terhadap Tingkat Pengetahuan Kesehatan Gigi Dan Mulut Pada Siswa Sdn 22 Banda Aceh. *Jurnal Kesehatan Gigi Dan Mulut (JKGM)*, 6(1), 53–59.  
<https://doi.org/10.36086/jkkm.v6i1.2111>
- Maharani, S. (2023). Makanan Manis Sebagai Faktor Risiko Karies Gigi Pada Anak Di Sd Negeri Buni Bakti 04. *Jurnal Kesehatan Tambusai*, 4(3), 1852–1859.
- Majid, Y. A., & Apriani, S. (2020). UPAYA PENCEGAHAN KARIES GIGI PADA ANAK SEKOLAH DASAR DENGAN MEDIA KOMIK EDUKASI DAN VIDEO ANIMASI. 2, 109–118.
- Manik, N. M., Ulfah, S. F., & Sugito, B. H. (2024). *Surabaya Dental Therapist Journal*. 2(1), 93–101.

- Marlindayanti, Hanum, drg. nu. adiba, Ismalayani, & Herianto, Y. (2022). *Manajemen Pencegahan Karies - Marlindayanti, S.* 8–19.  
<https://doi.org/10.31964/jsk.v12i1.277>
- Nuraini Utami Harahap, S., Chairanna Mahirawatie, I., Hidayati, S., Kesehatan Gigi, J., Kemenkes Surabaya, P., Kunci, K., Siswa, P., & Gigi, K. (2022). Pengetahuan Tentang Karies Gigi Pada Siswa Kelas Iii Sdn Asemrowo I Surabaya. *E-Indonesian Journal of Health and Medical*, 2(4), 377–386.
- Puspitasari, D. K., Edi, I. S., Kesehatan, J., Poltekkes, G., & Surabaya, K. (2024). *Surabaya Dental Therapist Journal*. 2(1), 93–101.
- Putri, Y. L., Mujiyati, M., & Syahniati, T. (2021). Pengaruh Promosi Kesehatan Menggunakan Media Menempel Gambar (Dental Story Sticker) Terhadap Pengetahuan Anak Dalam Menjaga Kebersihan Gigi Dan Mulut. *Jurnal Kesehatan Gigi Dan Mulut (JKGM)*, 3(1), 31–34.  
<https://doi.org/10.36086/jkgm.v3i1.760>
- Rifky, M. F., Puspita, S. R., & Ruslan, M. R. (2024). Penyuluhan Kesehatan Gigi dan Mulut Bagi Siswa SD di Kecamatan Manggar, Belitung Timur. *ABDI MOESTOPO: Jurnal Pengabdian Pada Masyarakat*, 7(1), 50–56.  
<https://doi.org/10.32509/abdimoestopo.v7i1.3559>
- Sitanaya, R., Lesmana, H., Irayani Yunus, S., & Andini, N. (2024). Busy Book Sebagai Media Peningkatan Motivasi dan Pengetahuan Kesehatan Gigi Mulut Bagi Anak Usia 6-7 Tahun. *Media Kesehatan Gigi: Politeknik Kesehatan Makassar*, 23(1), 39–44.  
<https://doi.org/10.32382/mkg.v23i1.602>
- Tameon, J. E. M., Larasati, R., & Hadi, S. (2021). Hubungan Pengetahuan Anak Dengan karies Gigi Anak Kelas VA SDI Raden Paku Surabaya Tahun 2020. *Jurnal Skala Kesehatan*, 12(1),