



# Education Using Pop-Up Book Pull-Tabs Media to Increase Knowledge of Dental and Oral Health

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**Abstract :** Dental and oral health problems in Indonesia are still a serious concern, primarily among elementary school children. Riskesdas 2018 data shows that 45.3% of the population experiences dental damage, with the prevalence in North Sulawesi reaching 55.5%, and the 9-10 year old age group at 11.3%, although nationally the proportion of caries incidence decreased to 43.6% according to the 2023 Indonesian Health Survey results. The incidence of dental caries in North Sulawesi is still in the high criteria (52.0%), occurring in children aged 9-10 years (37.2%). The decrease in dental caries incidence can be achieved by providing dental and oral health education to improve dental and oral health. Education can be delivered through an approach adapted to children's development to effectively increase their knowledge, for example, through pop-up book pull-tabs media. This study aims to determine the effect of education using pop-up book pull-tabs media on the increase in knowledge about dental and oral health among first and second-grade students of SDN 105 Manado. The research design used was a quasi-experimental one-group pretest-posttest approach. The sample consisted of 51 students. The measurement of this knowledge increase was carried out before and after providing education using pop-up book pull-tabs media and analyzed using the Wilcoxon test. The results of this study showed that before the treatment, 70.6% of students were in the poor knowledge category, but after the treatment, a significant increase in knowledge was observed (100%). The analysis using the Wilcoxon test yielded a p-value of 0.000 ( $0.000 < 0.05$ ), which means there was a significant effect before and after providing education using pop-up book media on the increase in dental and oral health knowledge.

**Keywords-** *Education, Pop-up book pull-tabs media*

## I. INTRODUCTION

Oral and dental health are inseparable from physical health because they mutually influence the overall condition of the body. Well-maintained teeth and mouth support various important activities such as speaking and eating.[1, 2] In elementary school-aged children, health problems that often arise are generally related to poor personal and environmental hygiene, such as improper tooth brushing techniques, not having a habit of washing hands with soap, and low awareness of maintaining personal hygiene. Therefore, common illnesses experienced by children in this age group include toothache, diarrhea, and worm infections.[3, 4]

Based on the results of the 2018 Basic Health Research, it was recorded that 45.3% of the Indonesian population experienced tooth decay, cavities, or pain. In North Sulawesi Province, the figure was even higher, reaching 55.5%, with a prevalence of 11.3% in the 9–10 age group.[5] Meanwhile, the results of the 2023 Indonesian Health Survey (SKI) showed that 43.6% of the Indonesian population still experienced similar problems, with the figure in North Sulawesi reaching 52.0% and among children aged 9–10 increasing to 37.2%. These data illustrate that dental and oral health problems in Indonesia, especially among elementary school-aged children, remain quite high. Therefore, efforts are needed to increase public awareness of the importance of maintaining dental health from an early age.[6]

Lack of knowledge, attitudes, and individual practices regarding dental hygiene contribute to high rates of dental and oral disease. Therefore, health workers need to provide education on dental and oral health to increase public understanding and develop healthy habits related to dental hygiene.[7] Teachers and health workers can instill healthy behaviors, such as tooth brushing, in elementary school students through persuasive approaches such as invitations, appeals, information, and counseling using engaging media such as pop-up books.[8, 9]

Health workers can use pop-up books as a means of educating about dental and oral health. These media display three-dimensional images that move or appear when the pages are opened and scrolled, thereby capturing the attention of elementary school children. Through interactive and surprising visual illustrations on each page, pop-up books create a fun learning experience and foster children's curiosity. Because elementary school-aged children tend to learn through visual observation, using pop-up books can help them grasp information more easily. In this way, pop-up books play an active role in increasing children's knowledge and awareness of the importance of maintaining dental and oral health.[10] Educators use media as a tool to convey and channel messages in the learning process. Media is considered educational media when educators use it to help students understand the subject matter. In learning activities, educators play a crucial role in selecting and using media to make learning more effective. Due to its flexible nature, educators can use media at various levels of education and in various learning activities. Through the use of learning media, educators can also encourage students to be more independent, take responsibility for their learning process, and foster a long-term perspective on their educational goals.

Audio-visual media is a type of media that combines auditory and visual elements simultaneously. Examples of this media include television and picture books or interactive books that display movement, such as pop-up books.[11] Educational media also plays a role in overcoming the limitations of the senses, space, and time. In other words, learning media can be designed in such a way that it helps students learn more easily whenever and wherever they are.[12] To improve dental health knowledge, pop-up books are designed to contain core and engaging stories. Digital pop-up books can also help improve students' understanding of the material being studied.[13, 14]

## **II. METHODS**

This type of research uses a quasi-experimental method with a pre-test and post-test design, this is to see the effect of education using pop-up book pull-tabs media on increasing knowledge of dental and oral health. The sample used in this study, namely students of SDN 105 Manado, totaling 51 people. In the data collection technique, the researcher collected data to measure students' initial knowledge about how to maintain dental and oral health, then provided education, and then re-measured students' knowledge to obtain final data. The collected data were analyzed using the Wilcoxon statistical test. This research has received ethical approval from the Health Research Ethics Commission of the Manado Ministry of Health Polytechnic, with No: DP.04.03/FXXX.28/164/2025

## **III. RESULT AND DISCUSSION**

Table 1. Frequency distribution of knowledge levels before and after education

Knowledge Level	Before		After	
	F	%	F	%

Good	15	29.4	51	100
Less	36	70.6	0	0
<b>Total</b>	<b>51</b>	<b>100%</b>	<b>51</b>	<b>100%</b>

The results in Table 1 show that before education, 70.6% of respondents were included in the less good criteria, and only 29.4% of respondents were included in the good criteria, whereas after education, 100% of respondents were included in the good criteria, and there were no respondents in the less good criteria.

Table 2. Results of the Knowledge Effectiveness Test Before and After the Intervention

		N	Mean Rank	Sum of Rank	<i>p</i>
<b>Before Intervention</b>	Negative Ranks	0	00	00	0.000
<b>After Intervention</b>	Positive Ranks	51	26.00	1326.00	
	Ties	0			
	Total	51			

Based on Table 2, respondents experienced an increase in scores from the pretest to the posttest, as indicated by a Positive Rank of 51 with a Mean Rank of 26.00. No respondents experienced a decrease in scores (Negative Ranks = 0) or a score that remained the same (Ties = 0). The test results showed a *p*-value of 0.000 ( $p < 0.05$ ), indicating a significant difference between the pretest and posttest scores.

Pull-tab media is designed using thick paper to prevent damage. Certain parts of the media can be moved, shifted, or pushed to display new images, creating dynamic visual effects. In pop-up book pull-tab media, the arrangement is also designed in several parts or scenes that can be moved to show changes in appearance. This media can attract children's interest in learning through picture books that display movement when opened, making learning activities more fun and interactive.[15, 16]

Increasing knowledge requires a learning process. A person acquires knowledge through the process of understanding and recognizing a particular object, resulting in a comprehensive understanding of that object.[17] One way to increase students' knowledge is through counseling. This knowledge can be provided to elementary school children in the form of proper dental and oral health care.[18, 19] By providing knowledge about dental and oral health care, tooth decay can be reduced, as dental caries can affect everyone.[20]

Oral hygiene plays a crucial role in determining a person's oral health. Children generally have lower levels of oral hygiene than adults because they frequently consume foods and drinks that can trigger tooth decay.[21, 22] The primary effort to prevent oral disease is to maintain optimal oral hygiene and health. Avoid foods that are too hard, hot, or cold, as these habits can damage dental health.

The results of the study stated that education using pop-up book media, the pull-tabs type, was effective in improving dental and oral health knowledge in students of SDN 105 Manado, where the *p* value = 0.000 ( $0.000 < 0.05$ ). This result is in line with research which stated that there was an increase in tooth brushing skills through pop-up picture book media.[23] Likewise, research conducted which stated that pop-up book learning media was proven to have a significant influence on improving student learning outcomes and can be used as an alternative learning media for teachers to help improve student learning achievement.[24] The use of

pop-up book pull-tabs media in learning can provide a unique learning experience through interesting visualizations, accompanied by images and moving elements, so that children show higher enthusiasm in participating in learning.[25]

#### IV. CONCLUSION

The results of research conducted on students of SDN 105 Manado, it can be concluded that education using pop-up book pull-tabs media has a significant effect on increasing knowledge about dental and oral health among students of SDN 105 Manado. This is proven by the results of the Wilcoxon test which shows a p-value of 0.000 (<0.05).

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