

## THE EFFECTIVENESS OF THE "I CAN BRUSH MY TEETH" MOVEMENT AND SONG PROGRAM IN IMPROVING TOOTH BRUSHING KNOWLEDGE IN CHILDREN AGED 4-6

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### ABSTRACT

*Children with good dental health can experience optimal physical, mental and social development, but in reality 9 out of 10 Indonesian children experience dental caries (cavities). This study aims to determine the effectiveness of the "I Can Brush My Teeth" singing and dancing program to increase 4 – 6 years old children's toothbrushing knowledge. This research uses quantitative research method with a within-subjects quasi experimental pre-post design to measure the effectiveness of intervention using movement and song methods delivered through music video clips as a medium for learning children's knowledge regarding the frequency, duration, schedule and benefits of good toothbrushing, as well as providing children with an understanding of the importance of parental involvement. Post test results showed a significant increase in the average children's knowledge score using the non-parametric Wilcoxon Signed Rank Test comparison technique with a P value of 0.002 with a significance limit of <0.05. One week after post-test1 another post-test was done (post-test 2), and the increase of toothbrushing knowledge persists significantly with a P value of 1.000 with a significance limit of <0.05. Based on the results of the data analysis above, it can be concluded that "I Can Brush My Teeth" singing and dancing program is considered effective in increasing the knowledge of children aged 4 - 6 years about good tooth brushing. Further research evaluating the effect of parental involvement using singing and dancing programs on the level of knowledge about good toothbrushing behavior in children aged 4 - 6 years is considered necessary.*

**KEYWORDS** Intervention Program, Movement and Song, Toothbrushing Knowledge



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**How to cite:**

**E-ISSN:**

**Published by:**

Nila Alya Maulidina, Farida Kurniawati (2024). The Effectiveness of the "I Can Brush My Teeth" Movement and Song Program in Improving Tooth Brushing Knowledge in Children Aged 4-6. *Journal Eduvest*. 4 (4): 2236-2246

2775-3727

<https://greenpublisher.id/>

## INTRODUCTION

Children can experience optimal physical, mental, and social well-being with good dental health conditions (Glick et al., 2016). However, the reality is that 9 out of 10 Indonesian children experience tooth decay (cavities) (RiskesDas RI, 2019). Early Childhood Caries (ECC) is tooth decay in young children that can be prevented by healthy lifestyle behaviors of children, families, and caregivers (WHO, 2019).

Good and proper tooth brushing behavior is influenced by various factors; knowledge of oral health concepts, tooth brushing skills, and motivation (Fagbule et al., 2023). Education about healthy behaviors should be introduced from an early age. Behaviors and habits formed in early childhood will influence their behaviors and habits later in life (Melo et al., 2018). In addition to fine motor skills, the frequency and duration of tooth brushing are the most important variables determining the effectiveness of tooth brushing activities, clinically measured by plaque formation on the tooth surface (Riyanti et al., 2021; Suryanti et al., 2019).

The recommended brushing activity based on the Indonesian Ministry of Health is to brush teeth regularly twice a day using fluoride toothpaste for two minutes (120 seconds), in the morning after meals and at night before bedtime, which can prevent Early Childhood Caries (Kemenkes, 2019; WHO, 2019). In reality, according to the Indonesian Health Survey (2023), only 6% brush their teeth according to the recommended time.

Based on a preliminary survey of 54 parents, the majority of parents let their children brush their teeth by themselves because they want to train their independence, even though this contradicts the opinion that young children do not have sufficient fine motor skills and mental maturity to brush their teeth independently (Dini, 2022). Considering this, the author assesses that children's knowledge of good and proper tooth brushing behavior is very important (Respati et al., 2018).

A program that emphasizes daily repetition and reinforcement, involving schools and parents, is considered most effective in providing long-lasting results compared to one intensive program (Rahardjo et al., 2015). The use of digital technology development is one of the pillars of health transformation initiated by the Indonesian Ministry of Health towards achieving a healthy, productive, independent, and equitable society (DPR RI, 2023). Songs packaged in animated videos are expected to convey messages to listeners, helping to retain information about dental hygiene in a fun way (Ibiyemi et al., 2022).

The results of this study can be an alternative strategy for schools or early childhood education teachers to increase children's knowledge, especially about tooth brushing behavior and general oral health, so that children can become agents of change for their families and surrounding environment. The use of intervention programs involving movement and the song "I Can Brush My Teeth" is expected to be integrated with existing school curricula, thus becoming one of the learning and teaching activities to achieve competency in having a healthy lifestyle and artistic activities for children aged 4-6 years. This research aims to determine the effectiveness of the intervention program involving movement and the song "I Can Brush My Teeth" in improving tooth brushing knowledge.

## RESEARCH METHOD

This research uses a quantitative research method with a within-subjects quasi-experimental pre-post design. A pre-post design research is a study that conducts a series of observations on a single group of participants at different times (Gravetter & Forzano, 2003). Generally, the pre-post method has various threats to internal validity related to pre- and post-treatment timing, such as history, instrumentation, testing effects, maturation, or regression. If there are attempts to control these threats to internal validity, then the within-group pre-post design is categorized as quasi-experimental (Gravetter & Wallnau, 2017).

This research was conducted from February 20, 2024, to March 1, 2024. The data collection method for pre-treatment children's knowledge in this study was done through one-on-one questioning between the researcher and the child using 8 question items covering the child's knowledge of the frequency, duration, schedule, benefits of good tooth brushing, and the child's knowledge of the importance of parental involvement.

In this study, the participants were 4-6 year-old students registered at the Smart Brilliant Kindergarten, Ciawi, West Java, not Special Needs Children, allowed and willing to participate in the research activities, and willing to participate, namely 15 sample children. The respondent recruitment method in this study was the accidental sampling or convenience sampling method, where the researcher recruited participants based on the ease of obtaining samples. Respondents were selected based on availability and willingness to participate in the research (Gravetter & Forzano, 2016).

This study measures the effectiveness of intervention using movement and song methods conveyed through music video clips as a learning medium for children's knowledge about the frequency, duration, schedule, and benefits of good tooth brushing, as well as providing children with an understanding of the importance of parental involvement. The measurement of this study is achieved with knowledge related to the frequency, schedule, duration, technique, function, and role of parents in brushing teeth properly and can be memorized by children simply by singing the song "I Can Brush My Teeth," making it easier to enter and remain in the child's memory. This 60-second song, when played or hummed during tooth brushing, can serve as a natural timer according to the recommendation of 120 seconds, so that children do not brush their teeth hastily, as found to be one of the problems in tooth brushing implementation in Indonesia.

The research process consists of preparation and implementation stages. The research preparation stage consists of permission, determining intervention goals, and determining research variables, namely knowledge about good and proper tooth brushing behavior. The intervention was created by paying attention to lyrics, melody, arrangement, duration, illustration characters, and animated video as well as video modeling of tooth brushing movements.

The tool-making stage was carried out considering the ability of participants aged 4-6 years to answer. The items in the measuring instrument were made in closed questions using words that are easily understood by children. The answers to the items in the measuring instrument are answered by children through pictures which are then stamped by the child when selected, there are 3 (three) picture

options, agree (smiling picture), disagree (frowning picture), and confused (confused picture).

This research measuring instrument was prepared through input from two experts (expert judgment), one from the advisor and the other from an experienced kindergarten teacher. A pilot study was conducted on 11 kindergarten students. Pre-test and post-test were conducted on the eleven children, then observations were made on comments and reactions to the questions. Inputs from the expert judgment and pilot study processes were used as the basis for correcting the measuring instrument.

In the implementation stage of the research, this study consists of pre-test, intervention, post-test1, and post-test2 stages. The results of data collection before and after treatment are compared using the non-parametric Wilcoxon Signed Rank Test technique. In addition to conducting comparative analysis, the researcher will also perform descriptive analysis on the obtained research data.

## RESULT AND DISCUSSION

In the recruitment process, students who became respondents went through several consent stages. The first Informed Consent was obtained from all parents or caregivers of students at Smart Brilliant Kindergarten, Ciawi, West Java, aged 4-6 years without special conditions. All students who obtained permission from their parents were then recorded by the researcher and teacher and simultaneously given explanations. The researcher explained the role of the students in this study, after which the researcher asked if the students were willing to assist the researcher in the study by performing their roles. Children who seemed unwilling or uncomfortable were offered to participate in the activities accompanied by a teacher or not participate at all. In this study, the sample consisted of students aged 4-6 years registered at Smart Brilliant Kindergarten, Ciawi, West Java, not Special Needs Children, allowed and willing to participate in the research activities, and willing to participate, namely 15 sample children.

**Table 1. Overview of Research Subject**

Gender	Age			Total
	4 year	5 year	6 year	
Male	1	4	4	9
Female	1	2	3	6

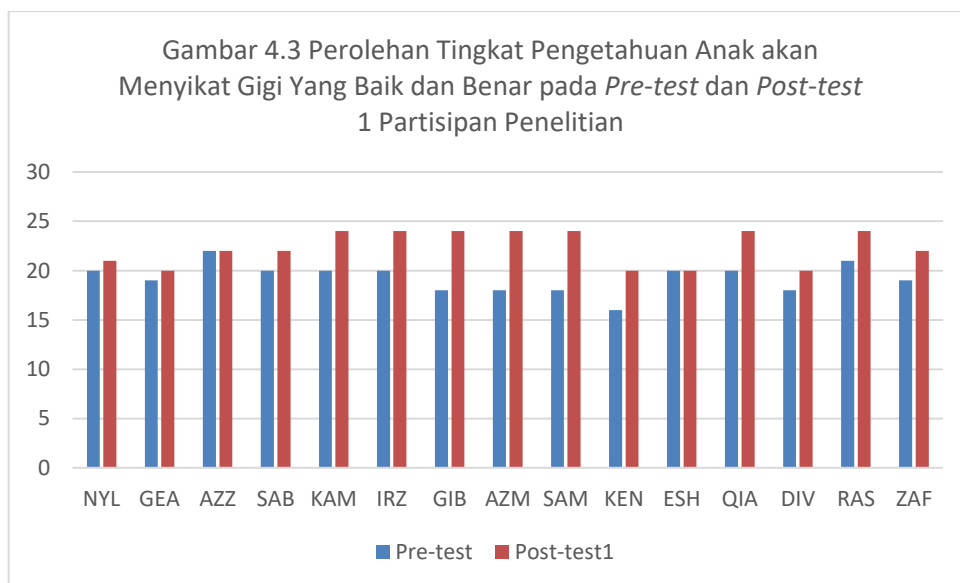
Based on calculations using G\*Power, the statistical test of the average Wilcoxon-rank test (one sample case) with effect size  $d = 0.8$ ,  $\alpha$  err prob 0.05, and Power ( $1-\beta$  err prob) 0.80 requires a total sample size of 12.

The non-parametric data analysis technique Wilcoxon Signed Rank Test was used to prove the hypothesis statistically, where the data came from the same two populations measured at different times. The statistical t-test analysis technique cannot be used because the data in this study are non-parametric, considering the small sample size ( $n < 30$ ). The results of descriptive analysis of the research data can be seen in Table 2 below:

**Table 2. Results of Descriptive Analysis of Research Data**

<b>Scale of Children's Knowledge of Good and Proper Tooth Brushing</b>			
	<i>PreTest</i>	<i>PostTest 1</i>	<i>PostTest 2</i>
N	15	15	15
Median	<b>20</b>	<b>22</b>	<b>22</b>
Standard Deviation	1.49	1.76	1.49
Minimum Value	16	20	20
Maximum Value	24	24	24
Data Range	8	4	4
Shapiro-Wilk Normality Test	<b>0.258</b>	0.002	0.006

The acquisition of scores for the level of children's knowledge of good and proper tooth brushing in the Pre-test and Post-test 1 can be seen in the figure below:



The statistical analysis conducted on the pre-test and post-test 1 scores of the Scale of Children's Knowledge of Good and Proper Tooth Brushing can be seen in the following Table 3:

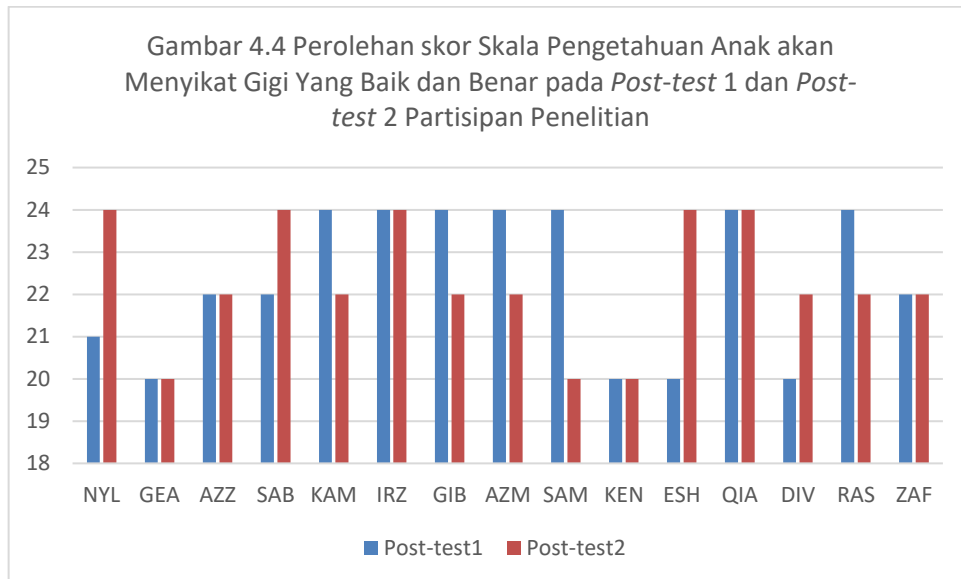
**Table 3. Results of Statistical Analysis of Pre-test and Post-test 1 Scale of Children's Knowledge of Good and Proper Tooth Brushing**

	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Z Value</b>	<b>Significance</b>
<i>Pre-test</i>	15	19.3	1.49	16	21	-0.61	<b>0.002*</b> ( <b>p&lt;0.05</b> )

<b>Post-test 1</b>	15	22.3	1.76	20	24
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Based on Table 3 above, the comparison of scores between pre-test and post-test 1 of the Scale of Children's Knowledge of Good and Proper Tooth Brushing shows a significant difference  $p = 0.002$  ( $p > 0.05$ ). Based on this, it can be concluded that the null hypothesis ( $H_0$ ) in this study is rejected, there is a significant difference in children's knowledge of good and proper tooth brushing in early childhood before and after being given the intervention of movement and the song "I Can Brush My Teeth" (HA1).

The acquisition of scores for the level of children's knowledge of good and proper tooth brushing in Post-test 1 and Post-test 2 can be seen in the figure below:



The statistical analysis conducted on the scores of Post-test 1 and Post-test 2 of the Scale of Children's Knowledge of Good and Proper Tooth Brushing can be seen in Table 4 below:

Table 5. Results of Statistical Analysis of Post-test 1 and Post-test 2 Scale of Children's Knowledge of Good and Proper Tooth Brushing

	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum Value</b>	<b>Maximum Value</b>	<b>Z Value</b>	<b>Significance</b>
<b>Post-test 1</b>	15	22.3	1.76	20	24	0	1.000
<b>Post-test 2</b>	15	22.3	1.76	20	24		( $p > 0.05$ )

Based on Table 5 above, the comparison of scores between post-test 1 and post-test 2 of the Scale of Children's Knowledge of Good and Proper Tooth Brushing shows no significant difference  $p = 1.000$  ( $p > 0.05$ ). Based on this, it can be concluded that there is no significant difference in the level of children's knowledge of Good and Proper Tooth Brushing after a one-week interval since the

last intervention with the movement and song "I Can Brush My Teeth". This indicates that the movement and song activities can be remembered by students even though one week has passed between the last intervention and Post-test 2.

### **Discussion**

The research findings indicate that the movement and song intervention "I Can Brush My Teeth" are effective in enhancing the knowledge of 4-6 year-old children about proper tooth brushing and can last for up to 1 week. Movement and song-based learning typically create meaningful impressions on children, making it easier for them to remember the learning material provided by the teacher. The meaningfulness of movement and song-based learning has a positive impact, namely, developing intelligence in children (Respati et al., 2018). Movement and song activities are inseparable in children's learning. This learning is both a game activity and learning within the game. These activities are expected to be enjoyable and stimulate language development, rhythm sensitivity, confidence, and willingness to take risks. Listening to music experiences can enhance children's ability to express what is on their minds and feelings through rhythm, through their own voices, and through body movements.

This research used animated videos for children to play a song containing information about the frequency, duration, schedule, function, and involvement of parents in proper child tooth brushing activities. Participants were not asked to raise any sensitive issues that could evoke emotional reactions. However, as a precaution, socialization about the question and answer activities and watching videos was conducted one week before the activity through parents and teachers, so that children could start participating in the study in a prepared state by their closest people. To ensure that children can undergo the research process in a calm and positive mood, activities were scheduled at a time when children enjoy their school day, right before snack time, which is usually filled with art activities. Researchers will also conduct debriefing on what the children have watched, explain the purpose of the research to the children, and inquire about the children's feelings after watching. Through parents, it is also explained that the children's participation is voluntary and they can withdraw at any time. The question and answer activities are designed in such a way that they are easily understood by children and do not pose any risks to the participants.

After watching the animated video with the song "I Can Brush My Teeth", children will be invited to discuss in simple language what they have watched, explain the benefits of the research for the children, systematically explore what the children have gained from the animated video so that children can easily remember it, inquire about how the children feel after watching, and inquire about the children's willingness to continue their involvement in the research using simple words. For 4-6 year-old kindergarten students, the song "I Can Brush My Teeth" can be an information medium that makes children happy, easy to remember and repeat, and reinforces children's knowledge and positive attitudes towards proper tooth brushing activities. Information about the frequency, schedule, duration, technique, function, and role of parents in proper tooth brushing can be repeated by children just by singing the song "I Can Brush My Teeth", making it easier to enter and stay in

the children's memory. This 60-second song, when played or hummed during tooth brushing, can serve as a natural timer according to the recommendation of 120 seconds, so that children do not brush their teeth hurriedly, as found to be one of the problems in tooth brushing implementation in Indonesia. The hope is that better knowledge of proper tooth brushing in children can prevent dental caries in children and provide children with the opportunity for optimal growth.

In the family environment, parents can use songs in interventions to accompany and encourage children's tooth brushing activities, so that tooth brushing activities can be done happily. Theoretically, this research is expected to add to the wealth of knowledge in psychology about the benefits of animation-based intervention programs in improving tooth brushing behavior knowledge. Additionally, the results of this research are expected to serve as a reference for further research so that the results obtained can be more optimal.

Practically, the results of this research can be an alternative strategy for schools or early childhood education teachers to improve children's knowledge, especially about tooth brushing behavior and oral health in general, so that children can become agents of change for their families and surroundings. The use of intervention programs such as movement and song "I Can Brush My Teeth" to improve children's knowledge is expected to be integrated with existing school curricula to become one of the learning and teaching activities aimed at achieving the competence of having a healthy lifestyle and artistic activities for 4-6 year-old children.

This research supports the efforts of the Indonesian Ministry of Health to achieve a cavity-free Indonesia by 2030 through preventive and promotive efforts related to dental and oral health, which have a significant ability to prevent dental caries. The use of animated video media for preventive and promotive efforts is in line with the transformation of the health sector according to Law No. 17 of 2023, which emphasizes the use of digital developments to achieve a healthy, productive, independent, and just society.



**Figure 1. Story Board Motion Intervention Animation Video and Song "I Can Brushing My Teeth"**

The limited number of participants in the study may affect the validity of the results; with a larger sample size, the generalization of the research results would



be stronger. The research is solely focused on children aged 4-6 years, so the results may not be applicable to older or younger age groups. There is a possibility of other factors outside the intervention that could influence the research results, such as previous tooth brushing habits, parents' educational level, or access to dental health services.

Movement and song activities can enhance children's knowledge. Moreover, they can also help improve children's intelligence holistically, such as language skills, self-confidence, and motor skills. The animated video used as a learning medium introduces tooth brushing information in an enjoyable way. It then encourages children to discuss, thereby strengthening the understanding and material obtained from the video they watched.

The song "I Can Brush My Teeth" not only provides information about tooth brushing techniques but also covers frequency, duration, schedule, and the role of parents. This short song also serves as a natural timer to ensure that children brush their teeth for the recommended time. Besides direct benefits for children, this research also has broad practical and theoretical implications. Practically, these findings can be used as an alternative strategy in early childhood education and serve as a reference for further research.

The intervention using movement and song "I Can Brush My Teeth" has been proven successful in improving the understanding of proper tooth brushing practices among children aged 4-6 years. This approach combines elements of movement and song in the learning process, creating an engaging and interactive learning experience for children. Thus, by incorporating body movements, children are actively engaged in learning, while the song delivers important messages about dental hygiene in an enjoyable and memorable way. Therefore, with this combination, children not only acquire knowledge about the importance of proper tooth brushing but also feel motivated to do it regularly. This intervention allows children to better understand complex concepts through direct experience and their active involvement in the learning process. Therefore, the intervention using movement and song "I Can Brush My Teeth" is effective in transforming children's knowledge about good tooth brushing practices into real actions integrated into their daily lives.

## CONCLUSION

The intervention using movement and song "I Can Brush My Teeth" has been proven effective in improving the knowledge of children aged 4-6 years about good tooth brushing practices. This statement is supported by the post-test results showing a significant increase in the average knowledge scores of children after the intervention, as evidenced by the non-parametric Wilcoxon Signed Rank Test comparison technique with a value of  $p = 0.002$ , which is below the significance threshold of  $<0.05$ . Thus, with this approach, children not only acquire knowledge but also actively engage in learning by using body movements and songs as enjoyable learning media. Body movements help create a fun and interactive learning experience, while songs help reinforce the messages conveyed and enhance children's memory. The combination of movement and song in this intervention creates a holistic learning experience that enables children to better understand the concepts taught about proper tooth brushing. Therefore, this

intervention not only provides theoretical knowledge but also transforms knowledge into real behaviors integrated into children's daily lives. This indicates that enjoyable and interactive approaches like this are effective in improving children's knowledge about good tooth brushing practices at an early age.

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