



The Discipline of Tooth Brushing on Caries Prevalence in Children

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ARTICLE INFORMATION	ABSTRACT
<p><i>Article History:</i> Received: November 24, 2023 Revised: December 24, 2023 Published: May 31, 2024</p>	<p>Indonesian people's brushing habits are still very concerning, as seen from the 2018 Basic Health Research data where only 2.3% of the population aged ≥ 10 years brushed their teeth after eating breakfast and before going to bed at night. This study aimed to determine the effect of tooth brushing discipline on the prevalence of caries in children of SD Negeri 2 Baumata Timur, Kupang Regency. This study is an experiment with a one-shot case study design, without a control group conducted on all 130 SDN 2 Baumata Timur students. All respondents were given an initial examination to determine dental caries (def-t/DMF-T) and were educated on brushing their teeth properly. Respondents were given control cards and stickers to be attached to the column after brushing their teeth in the morning after eating and the column brushing their teeth before going to bed at night for 120 effective days. Respondents will be evaluated for dental caries by re-examining dental caries (def-t/DMF-T) after brushing their teeth for 120 days, this aims to determine whether there are new caries after routine brushing activities carried out by the response. The results showed that the behavior of brushing teeth that was carried out consistently or the discipline of children brushing their teeth for 120 days by students at home was in the morning after eating and at night before going to bed. The results of the evaluation of dental caries after the intervention on regular brushing habits using oral health control cards showed that there was no risk of caries or new caries during 120 days of regular and consistent brushing. The results of the Wilcoxon Signed Ranks Test statistical test showed a significant value of $p > 0.05$, so there was no difference before and after treatment using a dental health control card, but in substance there was an effect on caries prevention. The conclusion is that the discipline or consistency of children in brushing their teeth in the morning after eating and at night before bed can prevent dental caries in children.</p>
<p>Keywords: Discipline Tooth Brushing Control Card Caries Prevention</p>	

INTRODUCTION

Oral health problems in Indonesia are still a serious concern, especially related to the high prevalence of dental caries. Based on Basic Health Research (Riskesmas) data in 2013, the prevalence of dental caries in Indonesia reached 73% of the total population. This indicates that most Indonesians have dental health problems requiring special attention. One of the main factors supporting this high prevalence is the habit of brushing teeth that does not follow recommendations. Of the 835,256 respondents aged ≥ 10 years, only 2.3% brushed their teeth after eating breakfast and before going to bed at night. This error in tooth brushing timing may also reflect suboptimal brushing quality (Kementerian Kesehatan Republik Indonesia, 2013; Fifiana, Hidayati, & Larasati, 2023; Chairunnisa et al., 2023; Variiani et al., 2022).

Riskesmas 2013 also reported that the tooth decay index (Decayed, Missing, Filled Teeth or DMFT) of Indonesians reached 4.6. This means that for every 100 people, there are 460 decayed teeth, or on average, each individual has 4-5 carious teeth (Kementerian Kesehatan Republik Indonesia, 2013). This figure is much higher than the World Health Organization (WHO) recommendation, which states that the ideal DMFT index for 12-year-old children should be no more than 1 tooth (World Health Organization, 2013). This high rate indicates that the level of public knowledge regarding the importance of maintaining dental health is still very low.

Dental caries is one of the most common dental health problems suffered by the Indonesian people (Anggow, Mintjelungan, C& Anindita, 2017; Cahyaningrum, 2017; Purnama, et al., 2020; Hardika, 2018; Alhamda, 2011). Efforts to prevent dental caries can be made through the habituation of good and correct tooth-brushing behavior. School age is the ideal phase to in still this behavior because at this stage children tend to be easier to form habits. One of the media that can be used to support the formation of this behavior is a dental health control card. This card serves to monitor children's activities in brushing their teeth regularly, namely in the morning after breakfast and at night before bed.

In the new normal era after the COVID-19 pandemic, disease prevention efforts, including dental caries, are becoming increasingly important. Through the implementation of dental health control cards at State Elementary School 2 Baumata Timur, Taebenu District, Kupang Regency, it is expected that the level of student compliance in maintaining dental health will increase. This study aimed to determine the effect of tooth brushing discipline on the prevalence of caries in children of SD Negeri 2 Baumata Timur, Kupang Regency.

METHOD

This study employed an experimental research design with a *one-shot case study* approach, conducted without a control group. The study involved all 130 students of SDN 2 Baumata Timur as respondents. The research was carried out at SDN 2 Baumata Timur from May 20, 2023, to September 20, 2023.

The research began with an initial dental caries examination of the 130 respondents. The findings revealed an average caries rate of 2.50 for deciduous teeth and a DMF-T (Decayed, Missing, Filled Teeth) score of 0.50 for permanent teeth. Following this baseline assessment, respondents received education on the importance of maintaining oral health from an early age. They were also provided with guidance on using a dental hygiene monitoring card.

Each respondent was given a dental hygiene monitoring card, toothpaste, and a toothbrush. They were instructed to brush their teeth regularly twice daily: in the morning after breakfast and at night before bedtime. Respondents were required to document their brushing habits on the monitoring card by placing stickers in the designated sections for morning and evening brushing over 120 calendar days.

After the 120-day intervention period, a follow-up dental caries examination was conducted. This post-intervention examination aimed to determine whether any new caries had developed during the period of regular brushing facilitated by the intervention.

RESULTS AND DISCUSSION

State Elementary School (SDN) 2 Baumata Timur is one of the elementary schools located in the Taebenu Subdistrict of Kupang Regency. Administratively, it falls under the jurisdiction of the Baumata Community Health Center (Puskesmas). Research on the impact of dental and oral health monitoring cards as an effort to prevent dental caries in children during the new normal era was conducted at SDN 2 Baumata Timur from May 20, 2023, to September 20, 2023, with the following results:

Table 1. Children's tooth brushing behavior

Tooth brushing behavior	Number of children who brush their teeth (n)	Percentage (%)
Morning after breakfast	130	100%
Night before sleep	125	86%

Table 1 shows that 130 children (100%) brushed their teeth after eating breakfast and 125 children (86%) brushed their teeth before going to bed at night.

Table 2. Incidence rate of dental caries

Incidence rate of dental caries	Mean
def-t	2,5
DMF-T	0,5

Table 2 shows that the incidence of dental caries in deciduous teeth (def-t) was an average of 2.5 and that in permanent teeth (DMF-T) was an average of 0.5.

Table 3. Crosstabulation of Gender and Dental Caries Categories Before and After Intervention

Variable	Caries Status						Total	
	Very Low (VL)		Low (L)		Medium (M)		n	%
	n	%	n	%	n	%		
Pre								
Male	66	50.8	2	1.5	0	0.0	68	52.3
Female	55	42.3	3	2.3	4	3.1	62	47.7
Post								
Male	66	50.8	2	1.5	0	0.0	68	52.3
Female	55	42.3	3	2.3	4	3.1	62	47.7

Table 4. The Results of the Wilcoxon Signed Ranks Test

Test Statistic	DMF-T Pre and Post	DEF-T Pre and Post
Z	.000 ^b	.000 ^b
Asymp. Sig. (2-tailed)	1.000	1.000

Table 4 shows the results of the Wilcoxon Signed Ranks Test with a significance value of $p\text{-value } 1.000 > 0.05$, so there is no difference in caries between before and after treatment. This means that teeth brushing behavior carried out consistently for 120 days by students at home, namely in the morning after eating and at night before bed using a dental and oral health control card, can suppress the occurrence of new caries or can prevent the risk of dental caries in children.

DISCUSSION

The study findings indicate that consistent toothbrushing behavior over 120 days, conducted at home by students in the morning after breakfast and at night before bed using a dental hygiene monitoring card, effectively reduces the risk of new dental caries in children. This success is attributed to the consistent tracking system, where students placed stickers on the card to record their morning and evening toothbrushing activities. Prevention of dental

caries can be more effective when students develop a habit of brushing their teeth correctly and consistently.

Post-intervention evaluations showed no new caries risk or occurrences among students during the 120-day period of regular and disciplined toothbrushing. The Wilcoxon Signed Ranks Test yielded a significant result ($p = 1.000 > 0.05$), indicating a strong and meaningful relationship between toothbrushing behavior and dental caries incidence. Although there was no statistical difference between pre-and post-intervention conditions, the results highlighted a substantive relationship: increased regular toothbrushing leads to a reduction in caries incidence, whereas decreased brushing behavior results in higher caries rates.

The findings suggest a significant inverse relationship between toothbrushing habits and dental caries in students at SDN 2 Baumata Timur. Better and more disciplined brushing practices correlate with lower caries prevalence. Nainggolan (2019) supports this conclusion, noting that consuming cariogenic foods combined with poor toothbrushing habits significantly contributes to dental caries development. Proper toothbrushing aims to maintain oral cleanliness, which is crucial in preventing caries. Oral hygiene includes keeping teeth and the oral cavity clean and free from plaque, food debris, tartar, and unpleasant odours.

Toothbrushing behavior encompasses the technique, frequency, and timing of brushing. Effective brushing methods directly relate to caries prevention, as supported by Haryanti et al. (2014), who reported that proper brushing techniques effectively remove plaque. Similarly, research by Santi and Khamimah, (2019) revealed that brushing habits and timing significantly influence caries incidence. Students who brushed after meals exhibited fewer caries symptoms than those who did not, while regular morning and evening brushing also reduced caries prevalence.

Widi, (2003) emphasized that clean and healthy oral conditions are influenced by dental care behaviors, particularly toothbrushing. Poor brushing habits often lead to dental problems, including caries. Despite the absence of statistical differences before and after using the dental hygiene monitoring card, the intervention substantively reduced new caries cases and positively influenced children's toothbrushing habits, particularly brushing after breakfast and before bed.

Factarun, (2018) also identified a significant relationship between toothbrushing behavior and caries in school-aged children. Among 33 respondents with good brushing habits, 87.9% did not experience caries, while 12.1% did, likely due to other factors such as tooth morphology or plaque-prone areas. Similarly, Maulidta, & Hastuti, (2017), emphasized that improper brushing habits and incorrect brushing times contribute to caries. Brushing at least twice daily—after breakfast and before bed—is essential. Morning brushing removes food debris, while evening brushing inhibits bacterial growth (Imamah, Ningsih, & Abral, 2022).

These findings underscore the importance of consistent and properly timed toothbrushing behaviors in reducing dental caries, highlighting the effectiveness of tools like dental hygiene monitoring cards in fostering good oral health habits among children.

CONCLUSION

The use of dental hygiene monitoring cards for children effectively reduces the occurrence of new caries and positively influences their toothbrushing habits, particularly brushing after breakfast and before bedtime. Consistent toothbrushing behavior can significantly lower caries prevalence and prevent the development of dental caries in children.

Children's discipline and adherence to proper toothbrushing routines play a critical role in mitigating the risk of caries. A clear relationship exists between toothbrushing behavior and dental caries in school-aged children. One of the primary contributing factors to caries is improper toothbrushing habits.

The recommended toothbrushing frequency is at least twice daily—after breakfast and before going to bed at night. Although most children already brush their teeth twice a day, many do so at incorrect times, such as during morning and evening baths, rather than the optimal times. Addressing these behavioral inconsistencies can further enhance the prevention of dental caries in children.

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