

# Increasing Oral Hygiene Level with Android-Based Healthy Food E-book

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## ABSTRACT

Many methods are used to get the maximum oral health, through promotion, such as toothbrush education and demonstration for elementary school children. One way to improve children's behavior in maintaining oral and dental hygiene is to provide dental health education about how to brush teeth properly and correctly by using tools or media that are popular with children nowadays. According to current trends, the Android-based Healthy Food e-book is one of the right methods to change children's behavior. This study aims to determine the effect of an Android-based healthy food E-book on improving knowledge, parents' role, and the Debris Index. This is quasi-experiment research. Samples of 150, 5th-grade elementary students, are divided into control and intervention groups. The intervention group was given dental health education with a brushing demonstration using a jaw model and accompanied by an Android-based healthy food E-book and the control group was given dental health education only. The data of the Debris Index were gathered by 4- time-weekly examinations. Knowledge and Parents' role were gathered by questionnaire before and after the intervention. The data were analyzed with t-test ( $p=0.05$ ). The results showed that there were significant differences ( $p<0.05$ ) in the Debris Index, knowledge, and parents' role in improving oral and dental hygiene between the intervention and control groups. This study concludes that counseling with an Android-based healthy food e-book, as a breakthrough innovation, accompanied by brushing teeth demonstrations, can reduce the debris index, following increasing knowledge and parents' role to improve dental and mouth hygiene.



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## 1. INTRODUCTION

The percentage of people with dental and mouth problems according to National Basic Health Research in 2007 and 2013 increased from 23.2% to 25.9%. The population who have dental and oral health problems, the percentage of people receiving dental care increased from 29.7% in 2007 to 31.1% in 2013. Similarly, the Effective Medical Demand (EMD), is defined as the percentage of people who have problems with teeth

and mouth in the last 12 months multiplied by the percentage of people receiving dental care or treatment from dental medical personnel, increased from 6.9% in 2007 to 8.1% in 2013. Most of the population aged  $\geq 10$  years (93.8%) brush my teeth every day. Most of the population also brushed their teeth during the afternoon bathing, which was 79.7%. Most residents brush their teeth every day in the morning shower or afternoon bath. The true habit of brushing teeth is only 2.3% of Indonesia's population [1]. The proportion of people who brush their teeth every day after breakfast is only 12.6% and before going to bed at night is only 28.7%. This might be due to the lack of public knowledge and awareness of dental-mouth hygiene, as well as the presence of areas where information is still difficult to reach due to varied geographical conditions. The three provinces that had the highest percentage in terms of brushing their teeth were DKI Jakarta (98.5%), West Java (95.8%), and East Kalimantan (95.5%), while the lowest in NTT Province (74.7%) and Papua (58.4%) [1]. Economic and income level factors, as well as knowledge, indicate that low socioeconomic conditions have little awareness and knowledge of the importance of maintaining dental health compared to people who have higher socioeconomic lives. Other factors are attitudes and behaviors towards maintaining dental health such as, among others, oral hygiene related to the frequency and habit of brushing teeth, the amount and frequency of eating cariogenic foods that cause caries [2]. The use of technologies such as appliances on hand phone in promoting health is widely abundant nowadays since everybody has hand phone. Development of methods and tools to analyze the processes and outcomes of oral health promotion interventions as part of national health programs is also one of the development of programs for oral health promotion. The choice of method for promoting oral health is based on the theory that dental health care by brushing teeth using the jaw model, as well as mentoring by using an Android-based healthy food E-book have better results. The role of the companion is needed in assisting, educating, encouraging and supervising. The attitude of the School dental health program's teacher, besides parents, plays an important role in maintaining children's dental health in underlying the formation of positive behavior that supports children's dental health [3] The objective of this research was to determine the effect of Android-based healthy food E-book in improving knowledge, parents' role and the Debris Index in 5th grade elementary school students.

## **2. METHODS**

This research has got an Ethical clearance from the Ethics Committee of Health Polytechnic, Ministry of Health in Jakarta No.152 / KEPK / VIII / 2019. Prior to this research there was a preliminary study conducted at the Elementary School in Bali in 2016 for developing the android-based healthy food e-book. The subjects of this follow up research, conducted in Bali in 2019, are 5th grade Elementary School students with a total of 150 students. This is quasi-experiment research. The sample size was calculated with sample size formula considering  $Z\alpha$  and  $Z\beta$ . The chosen method is based on the theory that dental health care by brushing teeth using the jaw model, as well as mentoring by using an Android-based healthy food E-book have better results. The first group of students was the intervention group who was given dental health education with a demonstration of brushing using a jaw model and accompanied by an Android-based healthy food e-book. The control group, as many as 75 other students, were given dental health education only by demonstrating tooth brushing using a jaw model without an Android-based healthy food E-book.

### **2.1 Study determination**

This research was carried out in several steps: 1) Educating to all subjects for using the Android-based healthy Food E-book, 2) Monitoring tooth brushing with the existence of an Android-based healthy Food E-book, 3) Assessing data through field research, 4) Concluding and making recommendations. The variables for this research were Debris Index (by examining students' oral condition), Knowledge of Students, and Parents' Role (by questionnaire). The data was analyzed using t-test to show statistically significant

difference in variables ( $p < 0.05$ ).

### 3. FINDINGS

The students' debris index, for both intervention and control groups, was examined weekly in 4 consecutive weeks. The result of the 1st and 4th examination can be seen in Table 1. The result showed a decrease significantly in the Debris Index from 1.2752 to 0.7955 ( $p$  value  $< 0.05$ ).

**Table 1.** Debris Index (DI) at First and Fourth Assessment in the Intervention Group

Debris Index (DI)	Average	SD	SE	p value	N
1 <sup>st</sup> Assessment	1.2752	0.23822	0.04279	0.001	75
4 <sup>th</sup> Assessment	0.7955	0.48834	0.08771		75

**Table 2.** Knowledge and Parents 'Role in Intervention and Control Group

	Average	SD	p value	N
<b>Knowledge</b>				
Intervention	19.52	1.71	0.001	75
Control	17.18	1.07		75
<b>Parents' Role</b>				
Intervention	6.90	0.523	0.001	75
Control	6.10	0.758		75

The analysis in Table 2, showed that there was a significant difference,  $p = 0.001$  ( $p < 0.05$ ), in knowledge between respondents who were given the intervention of the Android-based Healthy Food E-book and control, where the average knowledge of respondents who were given an E-book Healthy food based on Android 19.52+1.71 and control group 17.18 + 1.07. Thus the Android-based healthy food E-book will increase the knowledge of students about oral health. The same thing happened to Parent's role with the score higher in intervention group compared to control group and the result was statistically significant ( $p < 0.05$ ).

### 4. DISCUSSION

Providing an Android-based healthy food e-book will help in the implementation of monitoring the habit of brushing teeth of the child by both teachers and parents of students. Children's dental and oral health is also influenced by children's compliance and parents' assistance in maintaining oral health [4]. The Android-based healthy food E-book will have a positive impact in the form of improved dental and oral hygiene of children as seen from the decrease in the Debris Index on the targets given the Android-based healthy food E-book. (Table 1.) The use of an Android-based healthy food e-book is an innovative method to improve the oral health of elementary school students in Bali. Knowledge of children and parents about oral health is very important in shaping behavior that supports oral and dental hygiene of children with low knowledge of oral and dental health is a predisposing factor of behavior that does not support children's oral and dental health [4], [5]. This can happen because parents are the main social force that affects the child's development, including dental and oral health care for children [3], [6], [7]. Knowledge is influenced by

education, especially the promotion and demonstration of dental and oral hygiene care. Health education is the simplest and most cost-effective approach [8,9]. Counseling in the form of education and demonstration that is equipped with an Android- based healthy food E-book will make it easier for children and parents, especially mothers to monitor the child's oral health care and health education in an effort to increase awareness of the importance of oral and dental health [10]. Therefore, an Android-based healthy food e-book will help children and mothers to take care of children's oral health. The attention of parents, especially mothers, on dental and oral health of children begins early to obtain a healthy behavior habits. The role of parents has an influence on children's dental and oral hygiene. The family, that is, the attitude of parents towards the importance of oral hygiene, plays a major role in maintaining the healthy teeth of children. The family creates an environment with a healthy lifestyle, increases self-confidence, and helps form habits [11]. This can happen because of health behaviors and practices; parents have a very big influence on children's dental health [12]. The Role of Parents' 5th Grade Elementary School students as a model, has a great influence because parents become an idol model when children learn from what they see, hear, and from experiences. Children learn through their observations of an activity carried out by the mother or father or teacher. Children learn from what they hear from parents and people around them and their environment. Children remodeling mother-father activities so that they gain experience about an experience [13]. Parents' participation is really needed in caring, educating, encouraging and supervising. Mother / parents play an important role in maintaining children's dental health in underlying the formation of positive behavior that increases the degree of children's dental health. The attitude and behavior of parents in maintaining dental health significantly influence the behavior of children [3]. The more active the parents' role towards their children, the better the child's behavior will be. In this case, parents not only play a role but also take action in shaping healthy behavior.

Dental health status is influenced by health behavioral factors which include factors such as knowledge, attitudes and actions (practice). Therefore, the role of parents is very important in guiding, providing knowledge, controlling and giving the best models so that children are able to grow well, parents' responsibilities and loving attention are equipped with facilities for children so that children can maintain oral health properly. Parents can be represented by the teacher, especially the teacher is the figure closest to the child at school, besides that the child's behavior will also play a role in maintaining and improving oral health [14]. Giving E-book Android-based healthy food can increase efforts to improve oral and dental habits and children will brush their teeth better. Children's oral health is greatly influenced by children's compliance and parental assistance in caring for their teeth and mouth [4]. With the ability and commitment of parents to start treatment for children's teeth from an early age will improve the child's oral health and be better [12].

## **5. Conclusion**

This study concludes that counseling with an Android-based healthy food e-book, as a breakthrough innovation, accompanied by brushing teeth demonstrations, can reduce the debris index, following increasing knowledge and parents' role to improve dental and mouth hygiene. of 5th-grade elementary school students in Bali. This research suggests that educators or instructors, both dental health workers and dental health promoter, can innovate with the Android-based healthy food e-book to be able to achieve optimal goals in an effort to improve the degree of dental and oral hygiene of elementary students in Bali.

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