

# The Effect of E-Monitoring Tools on Changes in Family's Degree of Dental and Mouth Health In The Community Of Meunasah Manyet Village, Aceh Besar

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## ABSTRACT

Adolescent dental health is an important thing that is often neglected in the family. Family dental nursing care can help resolve family health problems in adolescents. This study aims to determine the effect of e-monitoring tools on changes in the degree of dental and oral health of families in the community in Meunasah Manyet village, Aceh Besar. This research method is quasi-experimental I. The subjects in this study were 60 teenagers, then divided into two groups, the intervention group (monitoring with e-monitoring tools and providing home visit services) consisted of 30 people, and the control group consisted of 30 people who were not given intervention (only sheet monitoring manual and dental health education). Analysis of the data results (quantitative) in this study used paired sample t-test and independent t-test. The results showed that there was an effect of e-monitoring tools on changes in the degree of family dental and oral health (Knowledge, Attitudes, and Actions) in the community in Meunasah Manyet Aceh Besar village ( $p < 0.05$ ). The use of e-monitoring tools as a tool/media to change adolescent behavior in a positive direction, of course, still prioritizes persuasive parenting patterns to children.

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## 1. Introduction

The World Health Organization (WHO) (2016) suggests that oral health is a crucial indicator of overall health, well-being, and quality of life [1]. It can affect people's lives and cause pain, discomfort, disability, and even death [2]. The Global Burden of Disease Study 2017 estimated that oral disease affects 3.5 billion people worldwide, with untreated dental caries being one of the most common non-communicable diseases [3]. Oral health (OH) is an essential component of overall human health and closely relates to physical, social, and mental health and quality of life [4]. According to the World Health Organization (WHO), poor OH can negatively impact children's school performance and their future academic success. Oral health problems also reduce a person's ability to smile, eat, and talk and negatively affect their social and mental health [5]. Oral health is essential for preventing pain, ensuring adequate nutrition, and promoting optimal general and psychosocial well-being [6]. Dental and oral health promotion programs targeting the community, especially adolescents, have improved the clinical outcomes of dental and oral health in the short and long term [7]. Oral health promotion and strategies to screen for oral health problems and expand dental access should be considered part of a public health program [8][9]. Many studies have shown strong evidence linking oral health status with health promotion and literacy [10],[11]. Various parties have used the development of information technology media for health promotion. One example of today's society tends to use smartphones to access health services. Smartphone use is widespread among the public and parents, from teenagers to children [12],[13]. Technology development has provided various benefits in monitoring dental health, one of which is using e-monitoring tools. Through e-monitoring tools make it easy for health workers and families to

monitor. Therefore, the use of this e-monitoring tool as an Android-based media to monitor dental and oral health needs special attention to the extent of its effectiveness. For this reason, this study aims to implement e-monitoring tools for changes in the degree of dental and oral health of the family in the village community of Meunasah Manyet Darul Imarah Aceh Besar.

## 2. Methods

The research design used was the pretest and posttest control group design. The research location is in the village of Meunasah Manyet, District of Ingin jaya, Aceh Besar. This research was conducted from 28 September to 2 November. The population in this study were all people included in the inclusion criteria as respondents. The calculation of the sample size in this study uses the sample size formula to test the two-sided hypothesis of the average population, which is 60 people, as the intervention group, 30 people and 30 teenagers as the control group, who live in Kandang village. The sample criteria in this study are Inclusion criteria: Adolescents aged between 15 -17 years; Have a complete family, father, and mother; Willing to participate in research; Not currently using orthodontic appliances; Have problems with dental and oral health; Have an android phone—exclusion criteria Adolescents who do not have dental and oral health problems—system design by developing electronic monitoring tools that adopt BARs (Brief Adherence Rating Scale).

The research process is divided into three stages. The first stage is conducting an initial meeting/pretest, measuring knowledge, attitudes, and actions to determine the extent of the respondent's understanding of dental and oral health maintenance (pretest) using online questionnaires and explaining the use of e-monitoring tools, and teaching how the use of the application. Phase II (after one week) is carried out by Dental Health Education (DHE) on ways to maintain oral health. Stage 3 For three weeks, the researchers monitored the behavior of respondents using e-monitoring tools. Data collection in this study was done by interview and observation. The data is processed by editing, coding, tabulating, and cleaning techniques. Meanwhile, data analysis was carried out in univariate and bivariate ways with paired t-tests and independent t-tests.

## 3. Results

The test results using *the Kolmogorov-Smirnov Z test*, and *Levene's Test for Equality of Variances*, were all significant at the 5% significance level ( $p > 0.05$ ), which means that the data in this study are typically distributed and homogeneous.

TABLE 1  
DISTRIBUTION OF RESPONDENTS BY AGE, GENDER IN THE INTERVENTION GROUP (I) AND THE CONTROL GROUP (II)

Characteristics of Respondents	Group I		Group II	
	N	%	N	%
Age				
13	9	30	10	33
14	11	36.7	7	23
15	6	20	7	23
16	4	13.3	6	20
Total	30	100	30	100
<b>Gender</b>				
Male	12	40	7	23,3
Female	18	60	23	76,7
Total	30	100	30	100

Based on the table above, the most dominant age of respondents was at 14 years, in the intervention group, 36.7 %, and in the control group, aged 13 years, as much as 33 %. The female sex was dominant, both in the intervention group and the control group.

TABLE 2  
DISTRIBUTION OF RESPONDENTS BASED ON KNOWLEDGE, ATTITUDES AND ACTIONS IN GROUPS I AND II BEFORE

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Pre test	TREATMENT			
	Group I		Group II	
	N	%	N	%
Knowledge				
Tall	11	36.7	16	53.3
Low	19	63.3	14	46.7
Total	30	100	30	100
Attitude				
Positive	13	43.3	12	40
Negative	17	56.7	18	60
Total	30	100	30	100
Action				
Well	16	53.3	13	43.3
Not good	14	46.7	17	56.7
Total	30	100	30	100

Based on table 2, the knowledge results in the intervention group, 63.3 %, are in a low category, while the control group is 53.3 % in the high category. Attitudes in the harmful category and actions in the intervention group are in a suitable category at 53.3%, and the control group in the less good category, 56.7%

TABLE 3  
DISTRIBUTION OF RESPONDENTS BASED ON KNOWLEDGE, ATTITUDES AND ACTIONS IN GROUPS I AND II AFTER TREATMENT

Post test	TREATMENT			
	Group I		Group II	
	N	%	N	%
Knowledge				
Tall	17	56.6	10	33.3
Low	13	43.4	20	66.7
Total	30	100	30	100
Attitude				
Positive	18	60	15	50
Negative	12	40	15	50
Total	30	100	30	100
Action				
Well	16	53.3	13	43.4
Not good	14	46.7	17	56.6
Total	30	100	30	100

Based on table 3, the results of knowledge after treatment in the intervention group 5 6.6 % were in the high category, while the control group was 66.7 % in the low category. The attitude of the intervention group, 60%, had a positive attitude, while in the control group, 50% had a positive attitude. While the excellent action in the intervention group was 53.3% in the excellent category, and the control group had an action in the less good category at 56.6%.

TABLE 4  
AVERAGE KNOWLEDGE, ATTITUDES, AND ACTIONS OF RESPONDENTS FROM *PRE-TEST* TO *POST-TEST* IN THE TREATMENT GROUP AND CONTROL GROUP

Knowledge	Group I			Group II		
	mean±SD	CI	P	mean±SD	CI	P
pretest	55 ± 13.3			47.3 ± 12, 5		
posttest	73 ± 14.9	50.2 - 59.9	0.001 *	40.0 ± 11.4	2.53 - 12.1	0.01 *
<b>Attitude</b>						
pretest	49 ± 15, 6			75 ± 13.3		
posttest	75 ± 13.3	43.1-54.8	0.001 *	34.6 ± 11.9	33.7 - 46.7	0.04*
<b>Action</b>						
pretest	37.6 ± 14.0			73.3 ± 13.5		
posttest	75.3 ± 13.5	32, 4 - 42, 9	0.001 *	39, 3 ± 16.1	0.06-0.47	0.06

Table 4 shows that in the intervention group, there are differences in the mean knowledge, attitudes, and actions from *posttest* to *posttest* ( $P < 0.05$ ). Likewise with the control group, except

for measures that were not significant ( $P > 0.05$ ).

TABLE 5  
INDEPENDENT TEST RESULTS BEFORE AND AFTER INTERVENTION WITH *E-MONITORING TOOLS* AT MEUNASAH MANYET  
K SUB-DISTRICT OF INGIN JAYA, ACEH BESAR

	mean±SD	CI	P
e-monitoring tools -knowledge	73.3 ± 14.9 40.0 ± 11.4	26.4 - 40.2	0.001*
e - monitoring tools - Attitude	75.0 ± 13.3	28.2-43.7 28.2-43.7	0.001*
e-monitoring tools- Action	34.6 ± 11.9 75.3 ± 13.5 39.3 ± 16.1	28.2-43.7	0.001*

Table 5 shows that there are differences in the level of knowledge, attitudes, and actions after the application of e-monitoring tools to adolescents. ( $P < 0.05$ ).

Today I brushed my teeth in the morning after breakfast  
346 responses

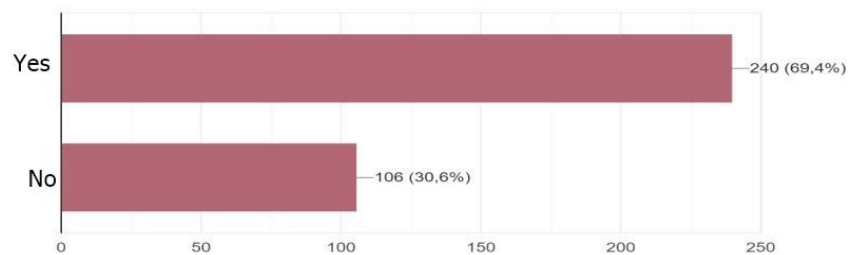


Figure 1. Data on respondents who brush their teeth in the morning after breakfast after applying e-monitoring tools to adolescents

Based on graph 1, it can be seen that 69.9% of respondents brush their teeth after breakfast, and 30.6% do not brush their teeth after breakfast.

Today I have brushed my teeth in the morning before going to bed at night  
346 responses

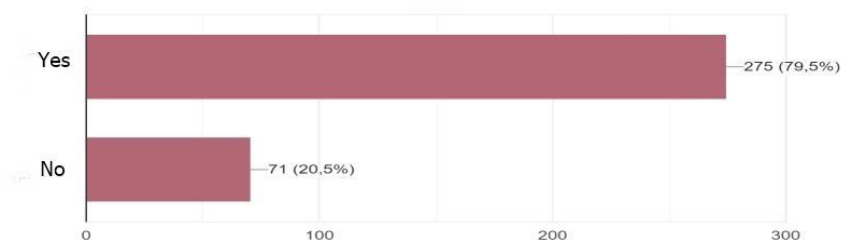


Figure 2. Data on respondents who brush their teeth at night before going to bed at night after applying e-monitoring tools to adolescents

Based on graph 2, it can be seen that 79.5 % of respondents brush their teeth before going to bed at night, and 20.5% of respondents do not do this behavior.

## How to brush teeth

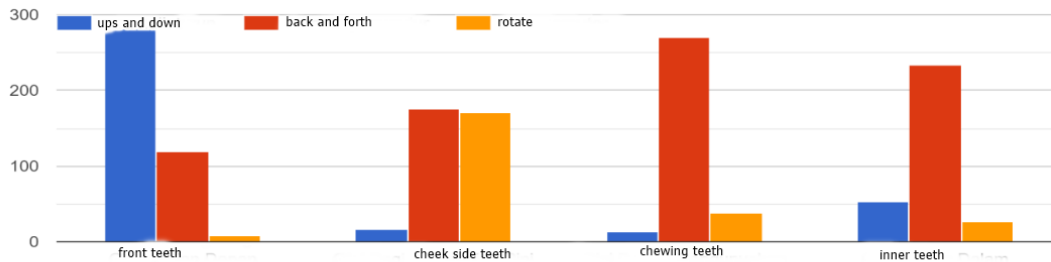


Figure 3. Data on respondents who practice brushing their teeth after applying e-monitoring tools to adolescents

Graph three provides information about brushing techniques that are done every day.

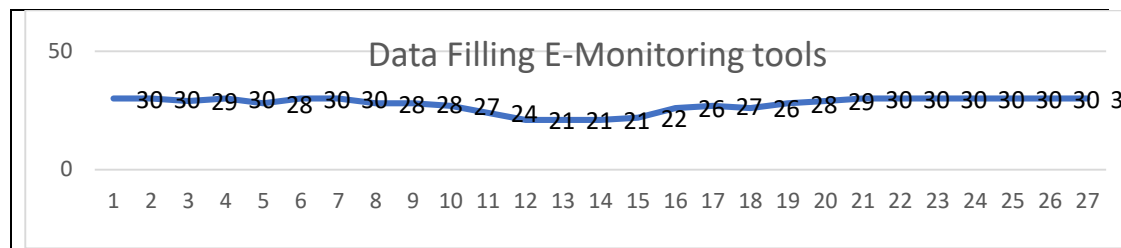


Figure 4. Data of respondents who filled out e-monitoring tools when brushing their teeth after breakfast and before going to bed at night in adolescents

Based on graph 4, it can be seen that the number of respondents who filled in the data decreased in the middle of the time but increased again until the end of the observation period.

TABLE 7  
OVERVIEW OF THE RESULTS OF IMPLEMENTING E-MONITORING TOOLS ON ADOLESCENTS

Finding	Advantages	Deficiency
The functionality of e-monitoring tools	It has features that are easy to use, equipped with attractive images and reminder messages, and the purpose of the expected behavior. Intuitive and easy to use, as it is internet based.	Not equipped with a reminder, but relying on the cell phone alarm set at the beginning of the time so it can be canceled.
Usage time	Free from ads and guaranteed respondent privacy Assisted by a team of enumerators whose job is to remind and help if there are problems in filling out Respondents are provided with internet package vouchers	Sometimes respondents forget to fill in e-monitoring tools Low bat cellphone battery, the respondent forgot to charge it again. Unlimited use of internet packages.
Use of positive motivation strategies	Only reinforce good behavior with information and correct tooth brushing techniques through videos that play in 2 minutes.	Do not give awards or points to respondents when they have done good results.
Design used	Attractive according to age and equipped with a video that can be played at any time, if the respondent needs information Easy way to fill up	It depends on the internet quota to access the youtube video.
User accuracy	Data filling by respondents can be appropriately recorded, so it can be known whether the filling time follows the guidelines.	It does not explain in detail how to fill in the e-monitoring. Respondents can fill in the free e-monitoring without being limited

	Respondents cannot edit the results that have been filled in	in time.
Appearance	The researcher account owner can only see the data Can read all activities carried out by respondents	Respondents cannot see the graph of behavior change
Informative	Provide a graphical description of the development of activities using e-monitoring Provide clear information about the purpose of brushing the teeth after breakfast and before going to bed. Explain the video on how to brush the teeth correctly and adequately	It does not involve the respondent in discovering the development of the behavior changes that have been carried out. The respondent cannot provide a complete picture of dental health after adopting a new behavior.

Based on the results of inter-group analysis ( *independent t-test* ) on adolescents from the village of Meunasah Manyet Darul Imarah Aceh in Aceh in both groups (the treatment group and the control group), it was found that there was a difference in the level of knowledge after the application of e-monitoring tools to adolescents, the p-value <0,05. This shows that education on family dental nursing care through *e-monitoring tools* has a substantial positive impact on maintaining dental and oral health.

### Discussion

Based on the results of inter-group analysis ( *independent t-test* ) on adolescents from Meunasah Manyet Darul Imarah Aceh village in both groups (treatment group and control group), it was found that there were differences in attitudes after the application of e-monitoring tools to adolescents obtained p-value <0.05. the application of e-monitoring tools in the maintenance of dental and oral health with the use of hand trees has the potential to influence the attitudes and behavior of adolescents to form habits in maintaining dental and oral health. Based on the analysis results between groups (*independent t-test*) in adolescents. This shows that the application of e-monitoring tools in dental and oral health maintenance makes teenagers prefer or enjoy communicating at close and far distances because the attractive appearance and easy use comfort them. The interview results revealed that teenagers feel more comfortable and free to communicate via cellphones than face to face. In addition, teenagers have been involved with cell phones in almost every activity to form new habits, and teenagers also think their cell phones are already part of their lives because they have what they need. Adolescent behavior in maintaining oral and dental health is influenced by the frequency with which they use mobile phones because e-monitoring tools will always remind them of the importance of maintaining dental health. teeth [14].

The growing sophistication of digital technology has generated widespread interest in the public health practice sector for monitoring health-promoting service delivery and policies. Governments and non-governmental organizations have invested in digital technology in the form of digital monitoring systems to track and monitor the quality and delivery of health promotion services—especially evidence-based policies and programs [15,[ 16]. Digital monitoring systems can collect, record, analyze, and communicate real-time data about programs and policy implementation for various stakeholders located at great distances [17]. Based on the results of the analysis by analyzing the difference between the difference (*paired sample t-test*) in the village youth of Meunasah Manyet Darul Imarah Aceh in the two groups, namely the treatment group and the control group, from pretest to posttest, there was a statistically significant difference in the mean value of adolescent attitudes. (p<0.05) in both groups. These results indicate that the application of e-monitoring tools in the maintenance of dental and oral health will play an important role in shaping or indoctrinating adolescents' conceptions of the social reality surrounding them. Monitoring of dental and oral health maintenance that is carried out continuously will provide an overview and influence adolescents.

Inculcating the habit of maintaining dental and oral health will affect the attitudes and behavior of adolescents. The application of e-monitoring tools in the maintenance of dental and oral health makes teenagers prefer to communicate because it has an attractive appearance, is quite

easy to use, and provides comfort. Teenagers feel more comfortable and free to communicate via cell phones than face to face. In addition, teenagers have been involved in cell phones in almost every activity to form new habits, and teenagers also think that their cell phones are already part of their lives because they have what they need. The frequency of cellphone use influences adolescent behavior in maintaining oral and dental health because e-monitoring tools will always remind them of the importance of maintaining dental health. The analysis results by analyzing the difference between the differences (paired sample t-test) in the village youth of Meunasah Manyet Darul Imarah Aceh in the control group showed the value of adolescent actions from pretest to posttest.  $p > 0.05$ ).

In the control group, only manual monitoring was carried out. In the actions of adolescents in the treatment group from pretest to posttest, there was a statistically significant difference in the mean value of adolescent actions ( $p < 0.05$ ). These results indicate the importance of implementing e-monitoring tools in maintaining oral health. This study also has shortcomings, where there is still dependence of respondents with enumerators tasked with reminding, it can be concluded that at the beginning of the monitoring, the treatment graph was still good, but in the middle of the time, the progress graph showed a decline. (Graph 4). At the time of delivering the use of e-monitoring tools at the beginning of the activity, each respondent's android device has been made a reminder alarm every 8 am and 10 pm. However, from a brief interview, the respondent stated that the cellphone was in a low battery state or off because it forgot to charge it. An obvious advantage of e-monitoring systems is that they have the potential to offer increased visibility of health promotion at high levels of the bureaucracy, in a health sector currently dominated by clinical services. The e-monitoring system can give more authority to health promotion [18],[ 19]. Its use can signal a move out of the margins and into the mainstream. Moreover, the system provides new information to high-level decision-makers that have the potential to highlight health promotion.

#### 4. Conclusion

There is an effect of the application of e-monitoring tools on changes in the degree of family dental and oral health, namely knowledge, attitudes, and actions in the village community of Meunasah Manyet Darul Imarah Aceh Besar ( $p < 0.05$ ).

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