ISSN No:-2456-2165

Android-Based Dental and Oral Health Education (E-Kgm) Model as an Effort to Improve the Behavior of Brushing Teeth in Pregnant Women

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Abstract:-

Background.

Pregnancy is a physiological process that causes changes in the female physiologically such as weight gain and swelling of the gums caused by an increase in the hormones extrogen and progesterone. These changes can improve vascularity and changes in the walls of gingiva blood vessels so that they become more permeable and can improve inflammatory processes and are exacerbated by poor dental and oral hygiene maintenance behavior. Dental and oral diseases that often occur in pregnant women are gingivitis and periodontitis, such diseases can affect pregnancy such as: BBLR, premature and pre-eclampsia. Stategi overcome this problem through dental health education with media rocks used one of them technology-based media.

Purpose of Study.

To Produced a model of dental and oral health education (E-KGM) based on android as an effort to change the behavior of brushing teeth in pregnant women.

Methods.

Research and Development (R&D) which is a mix-method (qualitative and quantitative). Test model using quasy-experimental Non Randomized Control Group Pretest and Posttest method. Respondents numbered 29 people per group.

Result.

The feasibility test of E-KGM model application obtained an average value of 91.3 (very feasible). in both groups after effective treatment improved knowledge, attitude and skills of brushing teeth in pregnant women ($p < 0.05$). The average difference (∆) of the intervention group (knowledge 2.69) (attitude 4.96) (skills 1.93) of the control group (knowledge 1.24) (attitude 4.89) (skill 0.90) can be concluded that the average value of the difference in the intervention group is greater than in the control group.

Conclusion.

Android-based E-KGM application is effective in im p roving the behavior of brushing teeth in pre r gnant women. The use of education using E-KKGM is more effective than video.

Keywords:- *Pregnant Women, Dental and Oral Health Education Model (E-KGM), Knowledge, Attitude, and Skills.*

I. INTRODUCTION

Dental and oral health is the healthy state of the soft and hard tissues of the teeth as well as elements associated with the state of the oral cavity that allow individuals to eat, talk and interact socially without dysfunction, thus being able to live a socioeconomically productive life.[1] Dental and oral health is not a priority for some people, even though the impact of dental and oral health can affect other general health.[2] Based on RISKESDAS data in 2018 people in Indonesia have dental and oral health problems reaching 57.6%. This is evidenced by the high prevalence of dental caries by 88.8% and periodontal tissue disease by 74.1%.[3]

Groups vulnerable to dental and oral diseases are preschoolers, adolescents, the elderly, children with disabilities and one of them is pregnant women.[4] Pregnancy is a physiological process that causes changes in

a woman's body both psychic and physiological such as weight gain, swelling of the legs and gums / gingiva caused by the increase in female sex hormones, namely extrogen hormones and progesterone. Increased hormone production during pregnancy leads to increased vascularization and changes in the walls of the gingival blood vessels, thus becoming more permeable and can improve the inflammatory process.[5]

Dental and oral diseases that are widely found by pregnant women are gingivitis and periodontitis.[6] Dental and mouth problems in pregnant women tend to be ignored, either by the mother or doctor or midwife. In fact, if dental and mouth problems are ignored and not treated immediately can cause the occurrence of babies born prematurely and low body babies (BBLR) by 8.75 times compared to mothers who do not experience dental and mouth problems after pre-eclampsia.[7]

The Indonesian government's efforts in addressing dental and oral health problems in pregnant women are through health promotion.[8] Dental health promotion can be done with several approaches including through direct counseling and electronic media.[9] The rapid development of electronic media becomes a penomena that is always interesting to be in demand, especially in the field of android and the internet.[10]

Based on the background above, researchers need to develop health promotion specifically using current application media towards the era of the industrial revolution 4.0 through "Android-based dental and oral health education model (E-KGM) in an effort to improve brushing behavior, so that promotive and preventive measures in pregnant women can be implemented.

II. METHODS

The research method used is Research and Development (R&D) with reference to Borg &Gall (1983) by Sugiyono (2013) which consists of gathering information from sources, designing model buildings using rappid aplication development (RAD) methods then in expert validation tests by media experts, dental health education experts and IT experts, the next step is product trials using quasy-experimental non randomized control group pretest and posttest design methods.

The research was conducted in the village of ngadirejo temanggung regency in January 2021. Respondents numbered 29 pregnant women for each group for improved brushing behavior (knowledge, attitude and leadership) of pregnant women. Model test results data tested using paired tests and unpaired tests.

III. RESULT

Based on the results of information collection conducted by interview method and systematic review can be concluded as follows: The promotion of dental and oral health in pregnant women has been well integrated in one of the programs, namely an integrated ANC as for the constraints in its implementation, namely the lack of implementing resources, limited implementation time with integration tasks and lack of maternal awareness in checking dental and oral health during pregnancy.

Expert validation of three people, namely dental health education experts, media experts and information technology experts. Validation test results are as follows:

Table 1. Expert Validation Results

No	Ahli	Skor	*p-value*
1	Health education expert	87,00	0,021
2	Media Expert	96,00	
3	Information Technology Expert	91,00	

**interclass correlation coefficient*

Expert validation results known p-value value 0.021 shows that the E-KGM model is relevant and worthy of use as a medium of dental and oral health education in pregnant women.

Table 2. Frequency Distribution of Respondent Characteristics

Characteristic	Control		Intervention	
	F	%	F	%
Age				
≤20th	1	3,4	0	0.0
21-30th	16	55,2	15	51,7
31-40th	11	37,9	13	44,8
≥ 41 th	1	3,4	1	3,4
Total	29	100,0	29	100,0
Education				
Primary School	4	13,8	2	6,9
Junior high school	14	48,3	7	24,1
High school	7	24,1	11	37,9
bachelor	4	13,8	9	31,0
Total	29	100,0	29	100,0
Gestational age				
Trimester 1	7	24,1	6	20,7
Trimester 2	13	44,8	15	51,7
Trimester 3	9	31,0	8	27,6
Total	29	100,0	29	100,0
Complaints				
Epulis	1	3,4	3	10,3
Kalkulus	11	37,9	8	27,6
Periodontitis	1	3,4	1	3,4
Pregnancy gingivitis	16	55,2	17	58,6
Total	29	100,0	29	100,0

ISSN No:-2456-2165

The number of respondents based on age is generally 21-30 years, based on the level of education in the majority control group is the level of Junior high school In the intervention group, the level High school/ Equivalent Furthermore, respondents based on gestational age in general are the age of pregnancy of the 2nd trimester with complaints experienced, namely pregnancy gingivitis.

Table 3. Test of normality

Variable	*p-Value**
Pretest Control knowledge	0,089
Knowledge of intervention pretest	0,065
Pretest Attitude of Control	0,066
Intervention pretest attitude	0,099
Control pretest skills	0,053
Intervention pretest skills	0,083
Posttest Control knowledge	0,136
Posttest knowledge of interventions	0,052
Posttest Attitude Control	0,345
Intervention posttest attitude	0,057
Control posttest skills	0,053
Intervention posttest skills	0,076

**Shapiro Wilk*

Based on the results of the normality test showed all variables in the control group and normal distribution interventions where the significant value > 0.05..

Table 4. Average Values of Knowledge, Attitudes and Brushing Skills in Intervention Groups and Control Groups

Variable	Control		Intervention		*P value*
	M	SD	M	SD	
Pretest					
Knowledge	11,97	2,13	11,41	2,15	0,330
Attitude	44,45	3,99	42,38	4,22	0,060
Skills	30,34	3,38	30,79	2,54	0,571
Total score	86,76	5,73	84,58	5,10	0,173
Posttest					
Knowledge	13,21	1,74	14,10	1,37	0,034
Attitude	49,34	2,04	47,34	2,91	0,004
Skills	31,24	2,77	32,72	2,31	0,031
Total score	93,79	4,07	94,16	2,96	0,000
Delta					
Knowledge	1,24	1,64	2,69	1,79	0,002
Attitude	4,89	3,89	4,96	3,30	0,042
Skills	0,90	1,84	1,93	0,59	0,006
Total score	7,03	4,76	9,58	3,52	0,032

Descriptive results in the table above showed that the average difference in knowledge increase of control group by 1.24 while in the intervention group 2.69. The average difference in attitude improvement in the control group was 4.89 while the intervention group was 4.96. The average difference in skill improvement in the control group was 0.90 while in the intervention group it was 1.93. The total score difference increased in the control group 7.03 while in the intervention group was 9.58.

Table 5. Paired and Unpaired Knowledge Tests in Intervention Groups and Control Groups

Desc	Paired test							
	Intervention				Control			
	Pre	Post	Δ	*P* value	Pre	Post	Δ	*P value*
Mean	11,4	14,1	2,69	0,001 *	11,9	13,2	1,24	0,001 *
SD	2,15	1,37			2,13	1,37		
Independent T Test								
(Δ)	2,69				1,24			0,002 **

*** Paired T Test ** Independent T Test*

In both groups it was effective to increase the knowledge of brushing teeth in pregnant women with a p-value of 0.001 ($p < 0.05$) but the average value of the difference in intervention groups (2.69) was greater than in the control group (1.24) meaning education through E-KGM was more effective than video**.**

Table 6. Paired and Unpaired Attitudes Tests in Intervention Groups and Control Groups

Desc	Paired test							
	Intervention				Control			
	Pre	Post	Δ	*P* value	Pre	Post	Δ	*P value*
Mean	42,3	47,3	4,96	0,001 *	44,4	49,3	4,89	0,001 *
SD	2,13	3,99			3,99	2,40		
Independent T Test								
(Δ)	4,96				4,89			0,042 **

*** Paired T Test ** Independent T Test*

In both columns effectively improved the attitude of brushing teeth in pregnant women with a p-value of 0.001 ($p < 0.05$) but the average value difference (Δ) of the intervention group (4.96) was greater than in the control group (4.89) meaning education through E-KGM was more effective than in video.

Table 7. Paired and Unpaired Skills Tests in Intervention Groups and Control Groups

Desc	Paired test							
	Intervention				Control			
	Pre	Post	Δ	*P* value	Pre	Post	Δ	*P value*
Mean	30,7	32,7	1,93	0,001*	30,3	31,2	0,90	0,014 **
SD	2,54	2,31			3,99	2,40		
Independent T Test								
(Δ)	1,93				0,90			0,006 **

*** Paired T Test ** Independent T Test*

In both groups it was effective in improving the brushing skills in pregnant women ($p < 0.05$), but the average value difference (Δ) of the intervention group (1.93)

was greater than in the control group (0.90) meaning education through E-KGM was more effective than video. In both groups it was effective in improving the brushing skills in pregnant women ($p < 0.05$), but the average value difference (Δ) of the intervention group (1.93) was greater than in the control group (0.90) meaning education through E-KGM was more effective than video.

Product/Model.

The resulting product is one of the innovations to overcome the problems faced by pregnant women in maintaining healthy teeth and mouth during pregnancy.

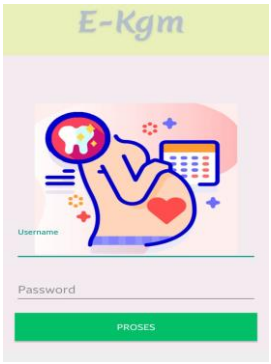

Figure 1. Login page on the E-KGM App

Figure 2. Menu on the E-KGM app

IV. CONCLUSION AND RECOMMENDATIONS

Based on the results of the study showed that the E-KGM education model is effective in improving the behavior of brushing teeth in pregnant women. There was a difference in effectiveness in the implementation of android-based dental and oral health education (E-KGM) models with videos in improving brushing behavior proved to be higher in the delta value of the intervention group than in the control group.

The advice that the author can convey is that further research is needed using different research designs and variables to add to the idea and development of the research.

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