EFFECTIVENESS OF D-SALMA'S CATALOG SMART AS ACONTROL OF DENTAL CARIES PREVENTION BEHAVIOOR IN PREGNANT WOMEN

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ABSTRACT

Background: Pregnant women are one of the groups vulnerable to dental caries with a prevalence of 84.7%.During pregnancy, hormonal changes occur which are characterized by nausea, vomiting and feeling lazy about brushing teeth, the acidic nature and changes in saliva pH cause dental caries. This condition can result in low birth weight (LBW) babies, miscarriage and pre-eclampsia. One effort to improve the dental and oral health maintenance behavior of pregnant women is to carry out promotive and preventive measures using educational media. **Objective:**Producing appropriate educational models and analyzing their effectiveness in improving the behavior of pregnant women in preventing dental caries. **Method**: R&D research type, quasy experiment method Pre-Posttest group design (nonequevalent control group design). In applying the model, a sample of 60 pregnant women was used, divided into 2 intervention groups with the development of the D-Salma's Catalog Smart model and a control group with a booklet. The variables measured are knowledge, attitudes and OHIS of pregnant women. Data analysis used univariate analysis, bivariate analysis and multivariate analysis. **Results**:The development of the D-Salma's Catalog Smart model is validated and suitable for application as a dental health education medium. The results of the effectiveness test increased knowledge from 3.40 to 8.00 (p=0.000), attitudes from 24.17 to 38.00 (p=0.000), actions from 12.77 to 28.00 (p=0.000), and reduced the OHIS score from 3.90 to 1.00 (p=0.000). **Conclusion**:The application of the development of the D-Salma's catalog smart model is feasible and effective in changing the behavior of pregnant women in preventing dental caries.

Keywords: Behavior; OHIS; Pregnant Women; Caries.

Introduction

According to The Global Burden of Disease Study 2016, dental and oral health problems, especially dental caries, are a disease experienced by almost half of the world's population (3.58 billion people).[1] The results of Basic Health Research (Riskesdas) in 2018 stated thatThe prevalence of caries in Indonesia is 88.8% with the prevalence of root caries being 56.6%.[2] Riskesda South Sulawesi in 2018 for the prevalence of dental caries was ranked 7th.[2]in Bantaeng Regency, 50.27% experienced dental caries, 19.80% swollen gums or abscesses, 23.67% bleeding gums and 8.13% canker sores.[3]

Pregnant women are a group vulnerable to dental caries with a prevalence of 84.7%, while those who are caries-free are only 15.3%. The average DMF-T value for pregnant women is stated as follows: D = 3.03, M = 1.08 and F = 0.05. The average DMF-T index in pregnant women is 4.34. Pregnant women in the first trimester have a DMF-T value of 2.33, while in the second trimester they have a DMF-T value of 4.69. Third trimester pregnant women have a DMF-T value of 4.57.[4]

Dental caries is a disease caused by bacteria that destroys hard tooth tissue. Dental caries is chronic and develops over a long time, so most sufferers experience it throughout their life. If left untreated, this disease can result in pain, tooth loss and infection. During pregnancy, pain due to dental caries makes pregnant women not want to eat. Malnutrition can cause babies to be born with low birth weight (LBW). The pain caused by dental caries can also cause an increase in pregnant women's blood pressure, putting them at risk of pre-eclampsia. Dental caries also stimulates the release of the hormone prostaglandin. This hormone causes contractions in the uterus. If the uterus continues to contract, it will threaten premature birth and even miscarriage. In addition, dental caries can reduce the health status of pregnant women.[5]

Poor dental and oral health status of pregnant women has an impact on the development of early childhood caries which can have many consequences for the child's health in the future. Preventing dental infections during pregnancy requires pregnant women to receive oral health education as well as self-care behavior education. A study of pregnant women's knowledge and awareness about dental and oral health found that they had a low level of knowledge and awareness. In addition, another study found that the majority of pregnant women did not receive dental or oral health care at service facilities while they were pregnant.[6]

Personal hygiene behavior in dental and oral health by brushing teeth properly and correctly according to program recommendations, namely after breakfast and before going to bed at night, is only 2.8%, even though the percentage of people who brush their teeth every day is quite high, namely 94.7%. The fact that this condition continues to persist indicates that people's self-care practices in the field of dental health have failed to improve the situation. Behavior is one of the determinants of health, can influence the incidence of disease as a measure of health outcomes (such as quality of life, life skills, or health expectations.[7]Behavior control can be done with the Theory of planned behavior (TPB), a theory developed by Ajzen which is a refinement of the Theory of reasoned action (TRA) proposed by Fishbein and Ajzen. According to this theory, a person's intention to behave is the most important factor in his behavior. The results of measuring attitudes, subjective norms, and perceived behavioral control determine the intention to display a behavior.[8]

Together with appropriate systematic health education, health services such as

comprehensive oral health examinations and care during antenatal visits can play an important role in improving oral health during and after pregnancy.[9] Apart from that, the success of health promotion is influenced by the media used to convey health information. The tool or media that is most widely used in counseling is print media because it makes it easier to use the media and store it.[10]

Based on a preliminary study conducted at the Pakis Aji Public Health Center, Jepara Regency, Central Java Province in November-December 2022, pregnant women who received education using WhatsApp-based caries catalog media effectively changed the behavior of pregnant women, namely by increasing knowledge, attitudes, actions and decreasing OHIS scores. However, in this study, the WhatsApp-based caries catalog could not be continued due to different sample characteristics, where the sample at the Pa'bentengang health center did not all have Android cellphones and there were still pregnant women who could not read, so the author developed the D-Salma's Catalog Smart Model in preventing caries. teeth in pregnant women. The development of the D-Salma's Catalog Smart model is the result of a modification of the COC (Caries On Catalog) media as a health promotion media. The advantage of D-Salma's Catalog Smart is that it is equipped with a smart pen as audio counseling which contains the definition of caries, signs and symptoms of caries, causes, treatment and prevention, aimed at changing the behavior of pregnant women in increasing knowledge, attitudes and skills to reduce OHIS scores during pregnancy.

Methods

Type of R&D research, quasy experiment method Pre-Posttest group design (nonequevalent control group design). In applying the model, a sample of 60 pregnant women was used, divided into 2 intervention groups with the development of the D-Salma's Catalog Smart model and a control group with a booklet. The variables measured are knowledge, attitudes and OHIS of pregnant women. Data analysis used univariate analysis, bivariate analysis (Paired Sample T-test and Independent Sample T-test) and multivariate analysis (linear regression). In this research, we have received a certificate of ethical suitability from the Ethics Committee of the Health Polytechnic of the Ministry of Health, Semarang No.0741/EA/KEPK/2023

Results

This research involved 60 people as respondents. The sample was divided into 2 groups, namely intervention and control with the following research results:

Table 1. Frequency distribution of Respondent characteristics

Characteristics	Intervention		Control		p-value
	F	%	F	%	
Education					
elementary school	10	33.3	3	10	
Junior High School	10	33.3	5	16.7	
Senior High School	10	33.3	18	60	0.798
S1	0	0	4	13.3	
Total	30	100	30	100	
Gestational Age					
Trimester 1	4	13.3	12	40	
Trimester 2	9	30	11	36.7	0.661
Trimester 3	17	56.7	7	23.3	
Total	30	100	30	100	

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Table 1 shows that the level of education and gestational age in the 2 groups are homogeneous.

Table 2. Test of the Effectiveness of Pregnant Women's Knowledge

Variable	Group	Intervention Mean±SD	Control Mean±SD	p-value
Knowledge	*Pre-test*	3.40 ± 1.610	5.00±1.259	0,000**
	Post test	8.00±1,399	5.50±1.614	0,000**
	Difference	4.60±1.958	0.50±1.796	0,000**
	p-value	0,000*	0.138*	

*Paired Samples T-Test **Independent Samples T-Test

The results of the difference test for paired data on the knowledge variable showed changes in knowledge between before and after treatment with the mean value of the intervention group before treatment being 3.40 and after treatment being 8.0 and the control group before treatment being 5.0 and after treatment being 5.50. The results of the effectiveness test were unpaired data where in the intervention group the difference value was 4.60 while the control group was 0.50, meaning that the development of the D-Salma's catalog smart model was more effective in increasing knowledge compared to booklets.

Table 3. Test of the Effectiveness of Pregnant Women's Attitudes

Variable	Group	Intervention Mean±SD	Control Mean±SD	p-value
Attitude	*Pre-test*	24.17±2.520	26.47±2.837	0.002**
	Post test	38.00±1.259	27.63 ± 2.684	0,000**
	Difference	13.83 ± 2.679	1.17 ± 1.085	0,000**
	p-value	0,000*	0,000*	

The results of the difference test for paired data on attitude variables showed changes in attitudes between before and after treatment with the mean value of the intervention group before treatment being 24.17 and after treatment being 38.0 and the control group before treatment being 26.47 and after treatment being 27.63. The results of the effectiveness test were unpaired data, where in the intervention group the difference value was 13.83 while the control group was 1.17, meaning that the development of the D-Salma's Catalog Smart model was more effective in improving attitudes compared to the booklet.

Table 4. Test the Effectiveness of Actions for Pregnant Women

Variable	Group	Intervention Mean±SD	Control Mean±SD	p-value
Action	*Pre-test*	12.77 ± 2.012	18.50±2.36	0,000**
	Post test	28.00±1,399	18.57 ± 2.329	0,000**
	Difference	15.23 ± 2.359	0.07±1.893	0,000**
	p-value	0,000*	0.848*	

The results of the difference test for paired data on action variables showed changes in actions between before and after treatment with the mean value of the intervention group before treatment being 12.77 and after treatment being 28.0, while the control group before treatment was 18.50 and after treatment was 18.57. The results of the effectiveness test were unpaired data where in the intervention group the difference value was 15.23 while the control group was 0.07, meaning that the development of the D-salma's catalog smart model was more effective in increasing action compared to booklets because the difference was very low.

Table 5. OHIS Effectiveness Test for Pregnant Women

Variable	Group	Intervention Mean±SD	Control Mean±SD	p-value
OHIS	*Pre-test*	3.90 ± 0.74	3.05±0.98	0,000**
	Post test	1.0 ±0.27	2.65 ± 0.92	0,000**
	Difference	2.9 ± 0.81	0.39 ±0.62	0,000**
	p-value	0,000*	0.002*	

The results of the difference test for paired data on the OHIS variable showed a significant decrease in OHIS between before and after treatment with the mean value of the intervention group before treatment being 3.90, which is a bad criterion and after treatment it decreased to 1.0, having a good criterion, while the control group before treatment was 3.05 and after treatment. 2.65. The results of the effectiveness test were unpaired data where in the intervention group the difference value was 2.9 while the control group was 0.39, meaning that the development of the D-Salma's Catalog Smart model was more effective in reducing the OHIS score compared to the booklet.

To determine the effect of the Counfoding variable on the dental and oral hygiene of pregnant women. The Counfoding variable used in the Multivariate test is behavioral control. The test used is a multiple linear regression test obtained from the delta pre-test and post-test. The test results can be seen from the following table:

Table 6. Behavioral counfounding variables regarding changes in OHIS status of pregnant women

Variable	B	p-Value	R	R Square	Adjusted R Square	C	p-value Anova
Knowledge	0.040	0.422	0.0871	0.759	0.746	0.275	0,000
Attitude	0.097	0.012					
Action	0.071	0.027					

*Multiple Linear Regression Analysis

Based on table 6, it can be seen that the constant value is 0.275 with a knowledge coefficient of 0.040, meaning that an increase in the knowledge value of pregnant women by 1% will increase dental and oral hygiene by 0.040. The attitude coefficient value is 0.097, meaning that an increase in the attitude of pregnant women by 1% will increase the oral hygiene of pregnant women by 0.097 and the action coefficient value is 0.071, meaning that

an increase in the action value of pregnant women by 1% will increase the action of brushing pregnant women's teeth by 0.071.

The results of the analysis show R=0.087, meaning that there is a fairly strong correlation and a very significant influence between the knowledge, attitudes and actions of pregnant women and the formation of dental and oral hygiene behavior, while the R2 (R Square) result is 0.759 or (75.9%) meaning knowledge of attitudes. and the actions of pregnant women have a 75.9% influence on the formation of dental and oral hygiene behavior. The results of the analysis also show a p value = 0.000, meaning that there is an influence of knowledge, attitudes and actions of pregnant women on the formation of dental and oral hygiene behavior. Test results for each knowledge of pregnant women (p=0.422), attitudes of pregnant women (p=0.012), and actions of pregnant women (p=0.027)

Discussion

Maintaining oral health depends on the behavior of the pregnant mother, because the level of knowledge, attitudes and actions are important components of behavior. [11] One of the variables that contributes to dental and oral health is information that can increase knowledge and this can be obtained through educational media.[12]

Behavior is an individual's response or reaction to stimuli or the environment. According to the theory of planned behavior (Theory of Planned Behavior), behavioral intentions are determined by three factors: attitudes towards behavior, subjective norms about behavior, and perceived behavioral control. In the current formulation of the theory, favorable attitudes and supportive subjective norms provide the motivation to engage in the behavior but concrete intentions to do so are only formed when the perceived control over the behavior is strong enough. Behavioral intentions can predict a person's tendency to carry out or not carry out

certain behaviors. The harder someone intends to behave, the greater the tendency to actually carry out that behavior.[13]

According to Annisa and Peter's 2015 research, dental and oral health maintenance behavior can be done independently at home (brushing teeth, gargling with warm water or mouthwash, flossing, etc.) or by having regular dental check-ups during pregnancy. By maintaining dental and oral health, the dental and oral health conditions of pregnant women will be optimal, this greatly influences the food intake that enters the fetus.[14]

One of the causes of the high rate of dental caries in Indonesia is that dental and oral hygiene education programs in society are currently not running well. Providing education that should be continuous has been interrupted, resulting in low knowledge of dental and oral health. According to Brein et al, the OHB index is influenced by knowledge, attitudes and perceptions. Socio-psychological factors also play a role in oral health care. Providing ongoing education is very important for teenagers, because there are differences in maintaining oral hygiene between children and teenagers, such as how to brush teeth, changes in diet patterns, awareness of seeking care and low priority for dental and oral hygiene. Based on these changes, motivation and encouragement is needed by providing routine education and correct and appropriate practices regarding the time, pressure, duration and method of brushing teeth and cleaning the tongue.[15]

Conclusion

Based on the research results, it can be concluded that:
1. The development of the D-Salma's Catalog Smart model has been created and is feasible and effective in its application to change behavior to improve the dental and oral hygiene status of pregnant women, proven by expert tests, namely 90% in the very feasible category.
2. The development of the D-Salma's Catalog Smart model is effective and can be applied in controlling behavior before and after treatment of:
   a. Increased knowledge of pregnant women in preventing dental caries from 3.40 to 8.00 with p value 0.000
   b. Changes in attitudes of pregnant women in preventing dental caries from 24.17 to 38.00 with p value 0.000
   c. Increase in actions of pregnant women in preventing dental caries from 12.77 to 28.00 with p value 0.000
   d. Decrease in dental and oral hygiene scores of pregnant women from 3.90 to 1.00 with a p value of 0.000

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