The Influence of Information Technology-Based Toddler Dental Health Care Model (AGITA) on Mothers towards Teeth Brushing Skills of Children

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ABSTRACT

Toddlers are vulnerable group to dental and oral health since they still need help from other in doing daily activities. Strategies to prevent dental caries in children can be done through behavior changes by involving the role of parents, especially mothers. A new method relate with the mitigation of pandemic Covid 19 need to be developed which this method can reach the goal to increase tooth brushing skill of toddlers. This study used Research and Development (R&D) and model trials using one group pre-experimental pretest and posttest design. There are 5 stages of research namely 1) information collection, 2) model design, 3) expert validation and revision, 4) product/model trials, 5) product results. The mother and child study subjects was 82 samples, given interventions by applying AGITA for 10 days. The data was tested using intra class correlation and Wilcoxon tests. AGITA model validation test obtained an average value of 95.1 is categorized very decent (p=0.016) and increased child's teeth brushing skills (p=0.001) after the mother applied AGITA in guiding the child in brushing teeth. When mother's knowledge about tooth brushing is increase it will influence their children's skill. The application of information technology-based AGITA model in mothers is effective to increase the child's teeth brushing skills. Recommendation for this software named AGITA can be socialized and applied to more mother and their children in Indonesia.

Keywords: AGITA, Asuhan Gigi Balita, tooth brushing skills

INTRODUCTION

Dental caries is one of the most common chronic diseases of children that can interfere the masticatory system and the quality of life of children so that the growth and the development of the children can be disrupted.[1] The results of Riskesdas 2013 proved that the prevalence of dental caries in children aged 1-4 years is 10.4% and the results of Riskesdas 2018 showed that the prevalence of dental caries in children aged 3-4 years is 36.4%. The data from Riskesdas from 2013 to 2018 experienced an increase in the prevalence of dental caries in children by 26%.[2,3]

One of the cause of the increasing prevalence of dental caries in children is due to the behavior in maintaining dental and oral hygiene that is not optimal, it is evidenced by the behavior of brushing teeth with the correct category in Indonesian population is only reaching 2.8% and in Central Java Province by 2.0%.[2] Strategies to prevent dental caries in children can be done through maintaining the dental hygiene by brushing their teeth after having a breakfast and before going to bed at night.[4]

The activity of brushing teeth for toddlers needs to emphasize the role of the mother because the children have not been able to independently maintain their dental and oral hygiene.[5] The care of dental and oral hygiene in children from an early age will reduce the risk of dental and oral diseases.[4] The age of toddlers is an age that is vulnerable to the behavior formation to maintain dental and oral hygiene in the form of bad habits such as consuming sweet foods and drinks, using bottles at bedtime, and not brushing teeth after using bottles at night.[6]

Such bad habits of children is a risk factor for dental caries. The prevention that can be done is the active role of mothers in assisting the children in brushing their teeth. In maintaining dental and oral hygiene, the role of the mother is very necessary, because the mother can provide motivation, provide facilities, and guide the children. Behavior changes of brushing teeth of children depend on the stimulus provided and adapted to the development of children.[7] Stimuli given to children can be in the form of promotive and preventive efforts with the active role of mothers which can be found in the implementation of dental and oral health care for individuals and communities, but there are no special rules for children under five as it is regulated in Permenkes No. 284 of 2016.[8]

Researchers create a model of information technology-based dental health care for toddlers which includes comprehensive continuous activities and evaluations covering the promotive and preventive fields by using effective and targeted communication, information, and education media. The implementation of the model was carried out for 10 days with the active role of mothers using the tedi behavior change theory, before the implementation began, all mothers were given training aimed to form the same perception of mothers by providing stimulus in the form of counseling, simulation, and practice of brushing teeth using power points and videos.

The model stages: the first day is the assessment stage, which aimed to determine the risk factors for the occurrence of dental caries in children, at this stage the mothers input data in the form of children's behaviors that can possibly affect the occurrence of dental caries, the second day is the diagnostic stage, which aimed for mothers to be able to do early detection of dental caries in children by looking directly at the condition of the children's oral cavity and inputting data into the system, the third day is the planning stage, carried out by the dental and oral therapist to determine the material that will be carried out by the mother in the next stage, the fourth – ninth day is the implementation stage which aimed to change the behavior of children's brushing teeth which is carried out for 6 days with the active role of the mother in the form of promotive efforts by providing material to children and preventive efforts by accompanying children to brush their teeth after having a breakfast and before going to bed at night, then the last day, which is the tenth day of the evaluation, aimed for mothers to identify the progress of their children's tooth brushing ability from day to day through the system. The model of dental health care for children under five with a 10-day intervention was named "AGITA". The objective is to improve children's tooth brushing skills.

METHODS

The research design used was Research and Development (R & D) with a pre-experimental one-group pretest-posttest design. This study aimed to develop a promotive and preventive model for toddlers. The research and development have five stages namely: 1) information collection, 2) model design, 3) expert validation and revision, 4) product/model trials, 5) product results.

The sample used in this study amounted to 90 people with details: Sample I for the information collection stage was taken by purposive sampling totaling 5 people. Sample II for the expert validation stage was taken by purposive sampling totaling 3 people. Sample III for the model trials on mothers and children was taken by purposive sampling totaling 41 mothers and 41 children in one group. The data for measuring children's teeth brushing skills was carried out by applying statistical tests. The research data used an interval scale. Statistical test was used to test paired variable data in the intervention group using the Wilcoxon test because the data were not normally distributed.

RESULTS

A. Information Collection

From the results of information collection, it was concluded that to form children's independence in brushing their teeth, it is necessary to have the appropriate educational method and also supported by the active role of the mother as a correct exemplar for children.

B. Model Design

The data obtained from the results of information collection is used to make the model design. The results of information collection revealed that in improving children's tooth brushing skills, an active role of mothers who supported them in promotive and preventive efforts was needed, so the researchers made an AGITA information technology-based model as an effort to improve the children's tooth brushing skills.

C. Expert Validation

Table 1. Expert validation statistic test

Expert Validation					
	N	F (%)	Total	Category	*p-value**
Relevant	3	100	95,1	Very good	0,016
Not Relevant	0	0			

**interclass correlation coefficient*
The results of expert validation showed that the p-value = 0.016 which means that the AGITA information technology-based model is proper to be applied in the implementation of dental health care for toddlers.

D. Product/Model Trials

Table 2. Respondent characteristic data

No.	Characteristics of Children	n	%
1	Gender		
	Male	18	43,9
	Female	23	56,1
2.	Age		
	3 years	15	36,6
	4 years	26	63,4

Table 2 shows that the distribution of the frequency of children based on gender is 56.1% with the highest percentage of 23 female children.

Table 3. Table 3. The average value of children's tooth brushing skills before and after given the AGITA model

Variable	Statistic				
	Mean	Delta	SD	Min	Max
Children's tooth brushing skills pre-test	16,12	6,1	2,900	11	25
Children's tooth brushing skills post-test	22,22		3,054	18	29

Table 3 shows that the average value of the children's tooth brushing skill variable pre and post given the information system increased from 16.12 to 22.22. Before proceeding with the next test, the researcher has tested the normality of the data and the result is that the data is not normally distributed, so for the next test will be using non-parametric analysis.

Table 4. The results of the paired data test of children's tooth brushing skills before and after the application of the AGITA model

Variable		Statistic		
		Before	After	*p-value**
Children's tooth brushing skills				
a.	Mean ±SD	16,12±2,900	22,22±3,054	0,001
b.	Min-Max	11-25	18-29	

**Wilcoxon*

Table 4 shows that there is a significant difference in children's tooth brushing skills between before and after the application of the AGITA model as evidenced by a significance value of <0.05. The average result shows that the value after the application of the AGITA model is greater than before the application, so it can be concluded that the application of the AGITA model is effective in improving children's tooth brushing skills.

E. Product Result

The product results are in the form of an information system that can be accessed at http://AGITA.online/ and a guidebook of information technology-based dental health care for toddlers (AGITA) that contains procedures for using the information systems. The implementation of the AGITA model emphasizes the active role of mothers

in assisting their children to brush their teeth through an information system where mothers play a major role in implementing promotive and preventive efforts in children such as 1) mothers have a role as a mediator to distribute the dental health materials to children, 2) mothers input the data on the system in the form of reports of children's activity of tooth brushing in the morning after having a breakfast and before going to bed at night, and 3) mothers put the schedules of brushing teeth on the system.

Figure 1. Guide book for toddler dental health care model (AGITA)

DISCUSSION

From the results of information data collection, it was concluded that in order to increase children's skill in brushing their teeth, the effort of providing educational methods that were right on target and supported by the active role of the mother as an example for children was necessarily needed. It is in accordance with the results of the previous studies that the educational method of children's tooth brushing activity with the stimulus and the right response for children's growth and development can affect changes in children's behavior and it must emphasize promotive and preventive efforts and also involve the role of the mother.[9,10] The appropriate model for brushing teeth education to achieve those objectives is the toddler dental health care model (AGITA). The results of expert validity show that the p-value = 0.016, which means that the AGITA model is proper to use in the implementation of dental health care for toddlers. The expert validation process is important in developing the model so that it can produce a model that is useful in improving the quality of education, in accordance with the results of previous studies that media able to convey information clearly, concisely, briefly, and on target will support the process of forming children's tooth brushing behavior.[11,12]

Toddlers have certain characteristics, they have not been able to independently maintain dental and oral hygiene so that they are categorized in the age group susceptible to dental caries, so children really need special attention from mothers on maintaining their dental and oral hygiene.[13] Mothers play a fundamental role as parents who are fully responsible for children's dental health and have an important role in children's learning processes such as teaching and assisting children to brush their teeth, which will have an effective impact on children's tooth brushing skills..[14]

The mothers are given a training in the form of dental health counseling, so that mothers have knowledge about dental and oral health and can deliver the knowledge gained to their children through brushing their teeth activity, it is in accordance with the result of the previous research that the more effective the training provided to respondents, the more respondents have information about their oral health.[15]

The AGITA model was implemented on both mothers and children for 10 days using the behavior change theory *of tedi behavior change* as an effort to build children's teeth brushing skills. The stages of implementing the AGITA model are as follows: the first day of the assessment, the second day of diagnosis, the third day of planning, the fourth to the ninth day of implementation, and the tenth day of evaluation.

The results of the effectiveness test of paired variable data showed a p-value of 0.001, it means that the AGITA information technology-based model was effective in improving children's tooth brushing skills. Children's tooth brushing skills are improved after being given interventions in the form of dental health counseling and animated videos demonstrated by mothers to their children, this is in accordance with previous research that animated video media makes children concentrate more on counseling activities because both the senses of hearing and vision are used simultaneously and in building teeth brushing skills, it is necessary to involve interaction between children and their mothers.[16,17]

CONCLUSION

Based on the results of the study, it can be concluded that the toddler dental health care model (AGITA) for mothers is feasible and its application is effective as an effort to improve children's tooth brushing skills. A recommendation is given to the Health Authority to support the software for UKGS program in Community Health Service especially in the pandemic of Covid 19 which need a program with software.

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