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Model of Early Childhood Dental Health Care as an Effort to Improve the Dental Health Status of Early Childhood in Dental Clinics

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Original Article
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ABSTRACT

Background: The main problem of dental and oral health in early childhood is caries, it is proven that the prevalence of dental health in children aged 5-6 years is 92.6% with a def-t index of 8.43. Prevention efforts with promotive and preventive efforts through dental health care. The model of early childhood dental health care is a modification of general dental health care. This model is oriented towards promotive and preventive efforts with a behavioral approach, so that in addition to fulfilling clinical dental health problems, early childhood is trained to be independent in maintaining dental health, especially brushing their teeth.
Material and Methods: This study used a quasi-experimental pretest and posttest with control group design. The research subjects for early childhood were divided into 2 groups: 1. The intervention model of early childhood dental health care 2. The model of care according to Kepmenkes No. 284 as control. The data were tested using paired sample t-test/ Wilcoxon analysis, namely the pre-post design, while to compare the mean of the treatment and control groups, the independent t-test/Mann Whitney was used.
Results: The results of the difference in knowledge test showed that the p-values between the intervention group and the control group were knowledge $p = 0.000$ ($p < 0.05$), independence in brushing teeth $p = 0.000$ ($p < 0.05$) and dental hygiene status $p = 0.000$ ($p < 0.05$).
Conclusion: The application of the model of early childhood dental health care is more effective as an effort to improve the dental health status of early childhood in the dental clinic.

Keywords: Dental Health Care, Dental Health Status, Early Childhood, Model.

Introduction

Dental caries is a disease of the hard tissues of the teeth characterized by the destruction of enamel and dentin caused by the metabolic activity of bacteria in plaque that causes demineralization. Dental caries in children is commonly known as early childhood caries. The enamel layer of primary teeth is thinner than that of permanent teeth so they are more susceptible to dental caries.[1–3]

It is proven that the prevalence of dental health continues to increase, in 2013 children aged 5-9 years was 28.9% while the prevalence of dental health for children aged 5-6 years was 93% with a def-t index of 8.43 in 2018. These data show health problems Children's teeth in Indonesia are included in the high category when compared to the WHO target, which is 50% of children aged 5-6 years free from caries.[4–6]

Prevention of dental caries in early childhood requires special strategies, both in the community and individually in dental healthcare facilities. Prevention in dental healthcare facilities has not been implemented by dental therapists, because they do not have a special dental healthcare model for early childhood. Minister of Health Regulation Number 20 of 2016 explains that the main task of dental therapists is to carry out dental and oral healthcare services for individuals in healthcare facilities. Dental and oral health care is a process using a systematic approach in the fields of promotive, preventive, and simple curative. Aspects of the implementation of dental and oral health care include assessment, dental nursing diagnosis, planning, implementation, and evaluation.[7–10]

The research development of dental health care has been carried out by researchers in 2021, producing a product in the form of a model of early childhood dental health care and has been tested in the first phase in the educational clinic of the Department of Dental Health, Health Polytechnic of Jakarta I. This model is oriented towards a behavioral approach, so that in addition to fulfilling health problems Clinically, early childhood is trained to be independent in maintaining dental health, especially brushing their teeth. With the creation of independence in brushing teeth in early childhood, it can prevent the occurrence of dental caries. The independence of brushing teeth can improve the dental and oral hygiene status of early childhood.[11,12]

Based on previous research, most of the early childhood children in dental health care clinics had less knowledge (54.1), less brushing skills (54.4), moderate dental hygiene status (64.9), and high dental caries status (75.7). This means that the dental health status of early childhood patients in dental health care clinics is in the moderate category.[13]

Materials and Methods

This study used a quasi-experimental control group pretest and posttest design. This research was carried out by the Dental Clinic of the Department of Dental Health, Health Polytechnic of Jakarta I and the Dental Clinic of the Dental Health Academy of the Puskesad Jakarta.

The sampling technique used was purposive sampling. In this study, the sample amounted to 144 consisting of 48 early childhood children, 48 parents, and 48 students. The estimated sample size in this study using a minimum sample size calculation can use the formula for testing the hypothesis sample size on the average of two independent populations.

The data collection instruments used in this study were questionnaires and examination cards for early childhood dental health care that the researchers compiled and tested for validation and reliability. Analysis of the data used, namely univariate analysis was carried out to analyze each variable from the results of the study. In categorical data, the data summary only uses a frequency distribution with a percentage or proportion size. In numerical data, the description is based on the mean and standard deviation. Then bivariate analysis was conducted to examine the relationship between the two variables, namely each independent variable and the dependent variable. The purpose of the analysis is to analyze the differences, before conducting the analysis, the normality test is carried out first. If the data is normally distributed, then the bivariate analysis in the intervention and control groups is used, respectively, using paired sample test or

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Wilcoxon analysis, namely the pre-post design. Then to compare the mean of the treatment and control groups, a t-test was used if the data were normally distributed and Mann Whitney if the data were not normally distributed. The study was conducted after obtaining approval from the Ethics Committee of the Health Polytechnic of Jakarta I No. 027/KEPK/VI/2022.

Result

The results showed that the age of children in the intervention and control groups had the same proportion, most of them were 5 years old. Gender in the intervention and control groups had the same proportion, in the intervention and control groups mostly women. The age of parents in the intervention and control groups had the same proportion, mostly with the proportion > 30 years old. The work of mothers in the intervention and control groups had the same proportion of work as housewives. Mothers' education in the intervention and control groups had the same proportion of high school education. The age of students in the intervention and control groups had the same proportion, mostly with the proportion aged < 20 years. Gender in the intervention and control groups had the same proportion, in the intervention and control groups mostly women. (**Table-1**)

Variable		Intervention		Control	
		Frequency	Percentage	Frequency	Percentage
Age	5 years	13	54.2	12	50.0
	6 years	11	45.8	12	50.0
Gender	Male	9	62.5	8	33.3
	Female	15	37.5	16	66.7
Age parents	≤ 30years	6	25.0	4	16.7
	>30 years	18	75.0	20	83.3
Gender	Male	1	4.2	2	8.3
	Female	23	95.8	22	91.7
Work parents	Housewives	20	83.3	19	79.2
	Private	3	12.5	4	16.7
	Entrepreneur	1	4.2	1	4.2
Educational parents	Junior High School	1	4.2	1	4.2
	Senior High School	15	62.5	18	75.2
	College	8	33.3	5	20.8
Age student	≤ 20years	20	83.3	18	75.0
	> 20 years	4	9,7	6	25.0
Gender	Male	2	8.3	1	4.2
	Female	22	91.7	23	95.8

Table 1: Frequency distribution of respondent characteristics

The mean value of children's tooth brushing knowledge increased, in the intervention group it increased from 69.17 to 96.67 while the control group remained at the same at 58.75. The mean value of children's teeth brushing independence increased, in the intervention group increased from 50.42 to 87.92, and in the control group increased from 50.83 to 51.67. The mean value of children's dental hygiene status decreased, in the intervention group it decreased from 31.83 to 20.17 while the control group increased from 20.17 to 30.54. (**Table-2**)

International Journal of Drug Research and Dental Science
Volume 4 Issue 4 (Page: 1-8), 2022 ISSN: 2582-0826

Variable	Intervention		Control	
	Pre-test	Post-test	Pre-test	Post-test
Knowledge				
Mean	69.17	96.67	58.75	58.75
SD	9.743	4.815	11.53	11.91
Independence Brushing Teeth				
Mean	50.42	87.92	50.83	51.67
SD	12.67	13.50	16.39	15.51
Dental Hygiene Status				
Mean	31.83	20.17	20.17	30.54
SD	9.743	8.741	8.741	4.354

Table 2: The average value of knowledge, independence in brushing teeth and dental hygiene status of early childhood in the intervention and control groups.

The results of the normality test for knowledge of early childhood in the intervention and control groups with a p-value <0.05 which was not normally distributed, then continued with non-parametric tests, independence of brushing teeth, and dental hygiene status of early childhood in the intervention and control groups were normally distributed, because the values p-value > 0.05 then proceed with the parametric test.(**Table-3**)

Variable	Groups	
	Intervention	Control
Knowledge		
Pre-test	0.001	0.023
Post-test	0.000	0.058
Independence Brushing Teeth		
Pre-test	0.113	0.132
Post-test	0.001	0.166
Dental Hygiene Status		
Pre-test	0.062	0.063
Post-test	0.179	0.033

Table 3: Data normality test

The results of the effectiveness test of the data before and after being given the early childhood dental health care model showed the knowledge of the p-value of the intervention group was 0.000, the p-value of the independence of brushing teeth was 0.000, and the p-value of dental hygiene status was 0.000 (p <0.05 This means that the application of the early childhood dental health care model is effective in increasing knowledge, independence in brushing teeth and dental hygiene status in early childhood. The p-value of the control group on knowledge is 1,000, the p-value of brushing teeth independence is 0.162 and the p-value of dental hygiene status is 0.166, meaning that the care model according to Kepmenkes No.284 is not effective in influencing the score of knowledge, brushing independence and status dental hygiene in early childhood.(**Table-4**)

International Journal of Drug Research and Dental Science
Volume 4 Issue 4 (Page: 1-8), 2022 ISSN: 2582-0826

Groups		Knowledge		Independence Brushing Teeth		Dental Hygiene Status	
		Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value
Intervention	Pre-test	69.17±9.743	0.000	50.42±12.67	0.000	31.83±9.743	0.000
	Post-test	93.71±8.075		87.92±13.50		20.17±8.741	
Control	Pre-test	58.75±11.53	1.000	50.83±16.39	0.162	30.83±4.260	0.166
	Post-test	58.75±11.91		51.67±15.51		30.54±4.354	

Table 4: Test the effectiveness of knowledge and independence of brushing teeth and dental hygiene status before and after the intervention.

The results of the knowledge difference test showed that the p-value between the intervention group and the control group was 0.000 (p <0.05), meaning that the early childhood dental health care model was more effective in increasing knowledge, brushing teeth independence, and dental hygiene status than the control group. (**Table-5**)

Groups	Knowledge		Independence brushing teeth		Dental hygiene status	
	Mean	p-value	Mean	p-value	Mean	p-value
Intervention	93.71	0.000	50.42	0.000	20.17	0.000
Control	58,75		51.67		30.54	

Table 5: Different test of knowledge, independence in brushing teeth and dental hygiene status of early childhood in the intervention and control groups.

Discussion

One of the important aspects of child dental health services is behavior management techniques. Without good cooperation between dentists, children, and parents or caregivers, treatment will be difficult. There are several types of child behavior, namely cooperative, less cooperative, uncontrolled behavior, stubborn child, shy child, tense behavior and whiny child. The approach strategy used in children with non-pharmacological measures, namely behavioral countermeasures, for example by Tell Show Do, speech recognition, and reinforcement, is an ideal approach in child dental care.[14–16]

The model of dental and oral health care services for early childhood is the development of dental and oral health care services carried out for early childhood through approaches and behavior change management methods. This is in accordance with the competence of dental and oral therapists, namely as providers of dental health care services. The development of a model of child dental health care can improve the dental and oral health status of early childhood in previous studies in 2021.

Five processes of dental and oral health care (assessment, diagnosis, planning, implementation, and evaluation) that are oriented towards behavioral management in the form of forming or changing dental

health behavior for early childhood involving parents in every stage of the dental health care activities provided, building mutual relationships believe in every stage and use multiple media and methods in the stage of providing dental health education.

The role of dental and oral therapists is in carrying out dental and oral healthcare services for individuals, groups, and communities in healthcare facilities, including in higher education institutions. Dental Health involving lecturers and students. The success factor of dental and oral health care services for early childhood is influenced by dental health workers in implementing the early childhood dental health care model, as well as parents in accompanying their children so that children become cooperative during the care service process.[17,18]

The implementation stage of the model begins with student training on early childhood dental health care. Students are given training aimed at increasing knowledge, attitudes, and skills toward model implementation so that they are expected to be able to transfer knowledge of skills to parents and children. Dental health promotion training should emphasize promotive and preventive by involving community participation in this case parents in its implementation.[19] Then students implement the model of early childhood dental health care in accordance with the stages of implementing early childhood dental health care.

The application of the model of dental health care for early childhood begins with the process of building a trusting relationship between the operator and the child and parents. This activity aims to make children more cooperative. Activities carried out by playing methods with dental health media that have been provided. Then continued the assessment of dental health care subjectively and objectively, including the behavior of brushing teeth.

The assessment of children's tooth brushing behavior is carried out with the aim of measuring the independence of brushing children's teeth so that the promotive implementation process in the form of dental health education that can be carried out can be appropriate for both children and parents. It is hoped that parents can implement monitoring of brushing their teeth at home. The role of parents is very necessary for guiding, providing understanding, reminding, and providing facilities to children so that children can maintain dental and oral hygiene. In addition, parents also have a significant role in preventing plaque accumulation and caries in children. The role of parents as caregivers is carried out by paying attention to children in maintaining oral and dental hygiene. Parents act as caregivers to observe children's behavior in maintaining dental health.[20–23]

The results of the effectiveness test of the data before and after being given the early childhood dental health care model showed that knowledge and independence of brushing was 0.001 ($p < 0.05$) meaning that the application of the model of dental health care for young children was effective in increasing the knowledge and independence of brushing children's teeth.

Knowledge and independence of brushing teeth in early childhood have increased because, during the first and second visits to the pediatric dental clinic, students are trained to be able to brush their teeth independently. Supported for 5 days, the child is given intervention in the form of assistance in brushing their teeth by parents, where every day the parents guide and monitor brushing their teeth after breakfast and at night before going to bed. The role of parents as a motivator is to motivate children in maintaining oral and

dental hygiene. Parents will motivate children in maintaining and caring for dental health. The parental monitoring model is effective in improving children's tooth-brushing behavior.[24,25]

The success of the dental health care model is also seen in the improvement of the dental hygiene status of preschool children. The results of the data effectiveness test before and after being given the early childhood dental health care model showed the dental hygiene status was 0.001 ($p < 0.05$) meaning that the application of the early childhood dental health care model was effective in improving the dental hygiene status of early childhood, this is because early childhood has understood the correct practice of brushing teeth. The practice of brushing your teeth properly will be able to remove plaque. Brushing teeth with the correct technique will improve the dental and oral hygiene of preschool children.[26,27]

Conclusion

Based on the results of the study, it can be concluded that the application of the model of early childhood dental health care is more effective as an effort to improve the dental health status of early childhood in the dental clinic.

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