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DENTAL HEALTH EDUCATION INFLUENCE ON KNOWLEDGE AND DENTAL ORAL HEALTH STATUS IN ELEMENTARY GRADERS

Reca[1)], Rosmawati[2)], Ni Ketut Nuratni[3)]
[1)]Department of Dental Health, Poltekkes Kemenkes Aceh, Aceh
[2)]Department of Dental Health, Poltekkes Kemenkes Jambi, Jambi
[3)]Department of Dental Health, Poltekkes Kemenkes Denpasar, Denpasar

ABSTRACT
Background*: Children at age 10 – 12 is in a period of attention for their dental health. The simplest possible technique for the model to teach tooth brushing is indispensable.* ***Purpose:*** *This study's purpose is to analyse Dental Health Education influence on the knowledge and Oral Health Index Simplified (OHIS) status of children in elementary school.* ***Method:*** *This study utilized quasi-experimental research. The purposive sampling was used to determine students as much as 60 became the subject of this research and divided every 30 students into an intervention group from SDN 33 and a control group (SDN 3) in the Banda Aceh city. Paired sample and independent t-test were used to analyse the quantitative data results.* ***Results:*** *The result of the mean value of knowledge and dental and oral hygiene status (OHIS status) of students in the pre-test in the intervention group and the control group shows p more than 0. 05. But there is a change in the mean value of knowledge and OHIS status after dental health education (DHE) was carried out in the intervention group (SDN 33) which is statistically significant (p<0.05). Meanwhile, in the control group, the p-value for OHIS status is p>0.05. There are also differences in knowledge and OHIS status of the intervention group compared to the control group, shown by a p-value of less than 0.05.* ***Conclusion:*** *Better change in knowledge and OHIS status prevailed after performing DHE for the elementary grades.*

Keywords: *Dental Health Education (DHE), Elementary, Knowledge, OHIS*

Correspondence: Reca, Department of Dental Health, Poltekkes Kemenkes Aceh, Jl. Soekarno – Hatta, Lagang, Kec. Darul Imarah ; Kab. Aceh Besar, Aceh 23231, Indonesia; Email: reca.zulkarnain@yahoo.com

INTRODUCTION

The tooth is the important asset as it relates to other body health. It plays an important role in the process of food consumption, especially for chewing.[1-4] The key to a good dental health status is to start taking care of it. The period of shaping a behaviour begins at the age of children. Because this period is the most time for children to get various things from the environment, including bad influences. This causes the dental health status of children, especially to caries, to be quite vulnerable.[5,6]

The ability to remember, capture material and children's learning interest at the age of 10-12 years is at a high level.[7] Age 10-12 is the age with critical thinking in processing information and getting to know lifestyle. This age also experiences an increase in energy need due to an increase in the body's metabolic processes. This increase makes changes in children's behaviour, especially in food consumption, including snacks with more irregular patterns than other children's ages.[8] Therefore, the behaviour of tooth brushing is expected to be a step to prevent from dental diseases caused by the increasing frequency of eating and changing eating patterns.

The age of elementary school with the improved motor skills is the right time to teach how to brush teeth properly [9,10] The skill of tooth brushing determines the dental and oral health status of a person.[11] The act of tooth brushing less than twice a day and difficulty of doing so in the first years preschool are significant determinants of caries prevalence at the age of 5 years.[12] Several factors can influence efforts to maintain dental and oral health, such as the use of toothbrushes, how to brush teeth, and the frequency as well as time of brushing teeth.[13] Thus, educational program interventions need to be carried out for children.[14,15]

Several previous studies have been conducted in terms of dental health education. Correlation studies related to knowledge and caries incidence have been carried out and obtained the results that the correlation

coefficient is 0.599 (medium correlation strength), which means that the worse the level of knowledge, the higher the caries incidence.[16] An effort to overcome such problem is by conducting behavioural analysis on children aged 5-6 years. The provision of dental health education at that age was mentioned in a research article can change the behaviour of maintaining children's dental health.[17] However, children aged 5-6 years still have limited ability to take care of their teeth because it is related to parents' self-efficacy.[18] Interventions in the form of education have also been conducted to analyse its effect on children aged 8-10 years in Myanmar, as well as age 9 years in Turkey.[19,20] The results show that plaque accumulation can be controlled through educational programs. Previous studies have only focused on its effect on knowledge and behaviour, but few have discussed the dental health status after dental health education practices, especially for ages 10 -12 years.

This study conducted a preliminary survey of 10 fifth grade students at SDN 3 and SDN 33 Banda Aceh, which yielded information that 80% of children had poor Oral Hygiene Index Simplified (OHIS) criteria, ranging from 3.1 to 6.0. These two schools have not yet received a dental health program.

The aim of this study was to analyse the effect of Dental Health Education (DHE) on changes in the level of knowledge and dental health status of fifth grade students at SD N 3 and SD N 33 Banda Aceh by measuring OHIS value.

METHOD

Ethical approval was obtained before the research was conducted from the Health Research Ethics Committee (KEPK) Poltekkes Kemenkes Aceh No. LB.02.03/3193/2021. This research was performed with a Quasi Experimental Design with a control group. The research design was used pretest and posttest. All 60 students of Class V SDN 3 and SDN 33 Banda Aceh City aged 10 to 12 years were the subjects of the study. Students were grouped into an intervention group with 30 children who were given DHE and a control group of 30 children without DHE intervention.

The intervention variable in this study was dental health education (DHE) on how to brush teeth and clean tartar. The independent variable is the knowledge and dental health status OHIS (Oral Hygiene Index Simplified) of students before intervention, while the dependent variable is the knowledge and status of the student's OHIS after intervention.

The instruments used are questionnaires and diagnostic tools as well as status cards. The questionnaire used is a questionnaire to measure the level of knowledge of respondents, containing 20 questions related to dental function and daily dental care such as how to brush teeth. The determination of the good, fair and poor categories is based on the results of the questions correctly answered multiplied by five. Poor category if the result is 0 – 33, fair if the result is 34 – 67 and good if the result is 68 – 100.

OHIS measurement was resulted from the sum of the Debris Index (DI) with the Calculus Index (CI). This measurement was carried out with the OHIS examination card. The OHIS value follows the criteria of 0 – 1.2 good, 1.3 – 3.0 fair and 3.1 – 6.0 poor.[21] Quantitative data were analysed first using a paired t-test. Paired t-test tested the difference in knowledge scores and OHIS status before and after the intervention (DHE). Second, the independent T-test was performed to understand the differences in knowledge and OHIS status. SPSS software was used to analyze the data by testing the hypothesis based on the significance level of $p < 0.05$.

RESULTS

The results are grouped into six tables related to the difference in knowledge and OHIS in the intervention group and the control group. Next is the analysis of differences between groups using independent t-test on knowledge and OHIS status.

Table 1. Differences and Standard Deviation of Knowledge Levels in the Intervention Group

Data	Average ± SD	t	p
Pretest – posttest I	-38.5 ±15.37	-13.713	<0.001 *
Posttest I - posttest II	6.16 ±8.87	3.806	0.001*
Pretest – posttest II	-32.3 ±19.33	9.161	<0.001 *

Table 1 provides information regarding the significant difference in knowledge levels, statistically indicated by a p-value less than 0.05 ($p<0.05$) in the intervention group.

Table 2. Difference and Standard Deviation of Knowledge Level in Control Group

Data	Average ± SD	t	p
Pretest – posttest I	0.67 ±7.39	0.494	0.625
Posttest I - posttest II	1.83 ±5.65	1.779	0.065
Pretest – posttest II	2.50 ±10.73	1.276	0.212

Table 2 shows that there is no statistically significant difference in knowledge in the control group ($p>0.05$).

Table 3. Differences in OHIS in the Intervention Group

Data	Average ± SD	t	p
Pretest –posttest I	2.67 ±1.38	10.627	<0.001*
Posttest I -posttest II	-1.14 ±1.65	-3.786	0.001
Pretest – posttest II	1.52 ±0.49	16.854	<0.001

Table 3 shows the conclusion that there is a significant difference in the mean OHIS status ($p<0.05$) in the intervention group.

Table 4. OHIS Difference and Standard Deviation in Control Group

Data	Average± SD	t	p
Pretest – posttest I	0.50 ±1.05	2.599	0.150
Posttest I - posttest II	0.00 ±0.61	0.030	0.976
Pretest – posttest II	0.50 ±1.22	2.259	0.320

Table 4 informs that there is no significant difference in the mean OHIS status in the control group with a p value of more than 0.05. Table 5 and table 6 show the analysis of differences between the intervention and control groups using independent t-test.

Table 5. Mean and Standard Deviation of Knowledge Intervention and Control Group

Test	Group	Average ±SD	t	p	Conclusion
Pre test	Intervensi	40.5 ±16.3	1.336	0.187	Not significant
	Kontrol	34.8 ±16.5			
Post-test I	Intervensi	79 ±10.12	12.894	<0.001*	Significant
	Kontrol	34.1 ±13.5			
Post-test II	Intervensi	72.8 ±11.1	13.175	<0.001*	Significant
	Kontrol	32.3 ±12.6			

Table 5 shows that there is no significant difference in the level of knowledge of the control and intervention group students. This is shown statistically with p> 0.05. However, there is a significant difference in the level of knowledge of students in the post-test, and there is a significant difference in the level of knowledge of students in one month after the intervention (post-test II).

Table 6. OHIS Mean and Standard Deviation Between Intervention and Control Group

Test	Group	Average ±SD	t	p	Conclusion
Pre test	Intervensi	3.97 ±1.09	0.376	0.708	Not significant
	Kontrol	3.87 ±0.958			
Post-test I	Intervensi	1.30 ±0.67	-11.39	<0.001*	Significant
	Kontrol	3.37 ±0.73			
Post-test II	Intervensi	1.53 ±0.50	11.403	<0.001*	Significant
	Kontrol	3,37±0.72			

Table 6 shows that there is no significant difference in OHIS status between the intervention and control groups before the intervention (pre-test). In addition, there are also significant differences in OHIS status between the intervention and control groups after intervention (post-test I) and OHIS status 1 (one) month after intervention (post-test II).

DISCUSSION

The independent t-test analysis, in the control group (SDN 3), shows that the pre-test students' knowledge scores were 34.8; post-test 34.8; post-test I 34.1 and post-test II 32.3 (table 5). This shows that in the control group the value of knowledge about dental and oral hygiene did not increase. Meanwhile, in the intervention group (SDN 33) the students' pre-test knowledge value is 40.5. After education (DHE) there is an increase in the value of students' knowledge with a post-test score I of 79 and post-test II of 72.8 (table 5).

Based on the results of the paired sample t-test, the knowledge scores of students in the control group (SDN 3) did not show a statistically significant difference in the mean score of students' knowledge (p>0.05). Meanwhile, the knowledge value of students in the intervention group (SDN 33) showed a statistically significant difference in the mean value of knowledge (p <0.05). In general, with the dental health education (DHE) students can get good dental health education materials so that students get a better understanding of dental and oral care. Evaluation with feedback provides a form of attention to two-way communication for students to express their opinions.[22]

Previously, students did not understand the importance of maintaining dental and oral health, where the diet of many elementary school students was more likely to consume predominantly sweet foods such as candy and chocolate. However, after dental health education (DHE) was conducted, students became aware of positive dental care habits.

An important behaviorual domain, to begin with, is knowledge.[23] Behavior with knowledge can lead to good results.[24,25] The acquisition of knowledge is not only based on experience, but also from formal education or learning in schools or informally such as in the family. As stated in the study that parents have a relationship with the incidence of child caries. If the role of parents is good, then the incidence of caries in children will also decrease. The role of parents is included in children's

compliance with brushing their teeth.[26,27] Through the results of this study, it is known that this dental health education (DHE) method can be an important step to increase a person's level of knowledge, especially children to start learning, get used to it and finally gain experience. In maintaining dental and oral health as a high-value asset.

The results of the analysis between groups (independent t-test), the control group (SDN 3) obtained a pre-test score of 3.87; post-test I 3.37 and post-test II 3.37 (table 6). This shows that in the control group, dental and oral hygiene status (OHIS status) did not show better results. While in the intervention group (SDN 33) the pre-test (OHIS status) was 3.97, after dental health education (DHE) showed better results on dental and oral hygiene status (OHIS status) with post-test I a value of 1 .30 and post-test II 1.53 compared with pre-test with a result of 3.97 (table 6). So based on the results of the post-test I and post-test II, the OHIS score is categorized as sufficient.

The OHIS status of the control group did not show a significant change. Meanwhile, the OHIS status of students in the intervention group (SDN 33) showed a statistically significant difference in the mean value of knowledge ($p<0.05$). This is because knowledge is an important factor in efforts to maintain dental and oral health. Dental Health Education (DHE) is an extension that provides direction to students in inculcating healthy behaviour in maintaining teeth and mouth at an early age which has a big influence in the following ages. Dental health education (DHE) can improve dental and oral health status so that students begin to know new information and learn to understand new objects, namely how to maintain dental and oral hygiene. As expected, our study showed that dental health education did influence students' knowledge and oral health status.

This study concludes that the encouragement of dental health education or Dental Health Education (DHE) can increase knowledge and improve the OHIS status of fifth grade elementary school students at SDN 33 Banda Aceh City, when compared to the control group who did not receive DHE intervention.

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