ORIGINAL ARTICLE

Improving Teacher Knowledge at Sdn Pandanwangi 1 After Training Using the Flowchart Method of Caries Early Detection

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ABSTRACT

Introduction: Dental caries is the most common dental and oral health problem in children. Cooperation between the children themselves, parents, and teachers at school is required as the solution to overcome dental caries. Teachers who know of the early detection of dental caries and dental growth can help increase students' awareness to maintain and improve dental and oral health. The flowchart method can help teachers to remember the sequence and interactions in the caries process. The research objective is to determine the increase in dental and oral health knowledge of SDN Pandanwangi 1 teachers after being trained with an early caries detection flowchart. **Methods:** The activity was carried out in December 2021, involving 17 teachers at SDN Pandanwangi 1. The research type is descriptive research. The types of data obtained are primary data in the form of pre-test, post-test results regarding early detection of caries and proper dental health preservation. **Results:** There was an overall increasing score from pre-test to post-test for teachers ($p=0.024$) which was statistically significant ($p<0.05$). **Conclusion:** The training method using flowcharts is beneficial and can provide a clearer understanding of the topics presented.

Keywords: Dental Health Education; Flowcharts; Elementary School Teacher

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INTRODUCTION

Dental caries is one of the most common dental and oral health problems in children. According to the 2018 RISKESDAS data, the DMF-T in children aged 5-6 years is 8.43 indicating that Indonesian children are categorized as severe early childhood caries (S-ECC). (1) Meanwhile, according to research by Gayatri in 2018, it was stated that the DMF-T index for elementary school students in Malang City was 5.75. This score is also categorized as high according to WHO because it is in the range of 4.5-6.5. (2,3) This illustrates that some people do not pay special attention to dental and oral health.

An activity to increase health awareness in society can be carried out through elementary educational institutions. Teachers have the role of educators, mentors, lesson planners, motivators, and evaluators. Teachers can also have an important role in maintaining the dental and oral health of elementary school-aged students. Teachers who know the early examination of caries and dental growth can help increase students' awareness to maintain and improve dental and oral health. Teachers are able to improve the health status in schools by creating a healthy school environment and through maintenance and services in schools. (7,8)

Knowledge about early caries examination can be conveyed to teachers using the flowchart method. This method can help simplify the delivery of material for the caries occurrence process. In addition, it can also help explain simple dental diagnoses and what actions are suggested to teachers and parents. Flowcharts and flow diagrams generally use short text and images to make the material become more catchy and easier to understand. (9) This research was carried out to know the increase in knowledge of SDN Pandanwangi 1 teachers after being trained with flowcharts on early caries detection.

MATERIALS AND METHODS

The activity was held in December 2021 at SDN Pandanwangi 1, Malang City. This type of research is descriptive research. The data type obtained is primary data in the form of pre-test results, post-test results, and documentation of early detection of caries examination. The instruments in this study were pre-test and post-test questions, and oral health education media. The implementation stages start from the preparation stage. Starting from making a research code of ethics, licensing, and administration with SDN Pandanwangi 1, determining and making oral health education media, and preparing pre-test and post-test questions for teachers and students in grades 3 and 4. The flowchart method is used to explain a simple dental diagnosis and the treatment that should be carried out as shown in Figure 1.

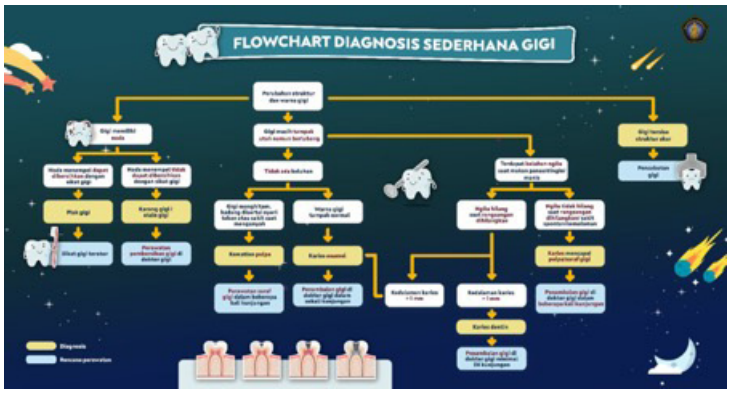

Figure 1 : Flowchart of Simple Dental Diagnosis.

After the preparation stage, there is the actualization stage. Starting from conducting pre-test, and training how to detect early caries, tooth growth and development, and how to maintain dental and oral health for teachers and students in grades 3 and 4. The fundamental reason for executing this activity is because a person's lack of knowledge about dental and oral health will influence health behavior carried out in everyday life. Thus, providing training like this is expected to improve the health behavior of teachers as role models for students, and improve student health behavior, as role models for other students. (10) Next, a post-test was conducted. After the activity was completed, then, the teacher conducted an early detection of caries on students independently and submitted evidence in the form of photos through an online form. The evaluation of the activities obtained from the first, the post-test results were then analyzed for the data related to the pre-test and post-test results. Second, photos of the early detection of caries were then evaluated by the researchers.

Ethical Clearance

This study was approved by Health Research Ethics Committee, State Polytechnic of Health Malang Reg.No. 260/KEPK-POLKESMA/2021.

RESULTS

The results of this study are pre-test and post-test data from 17 teachers and 37 students at SDN Pandanwangi I. The results of differences scores by the t-test showed in table below.

The pre-test and post-test total score differences table of teachers (17 samples) can be seen in Table II below.

In grade 3 and 4 students at SDN Pandanwangi 1, the lowest pre-test score was 20 out of 100 and the highest was 100 out of 100. While the lowest post-test score was 40 out of 100 and the highest was 90 out of 100. The average pre-test and post-test scores -test can be reviewed in Table III below:

Furthermore, the table of differences in pre-test and post-test total scores for grade 3 and 4 students at SDN Pandanwangi 1 (37 samples) can be reviewed in table IV below.

DISCUSSION

The results of the different answer scores for each item in table I show that the item "The decrease in pH/acidity level in the mouth to 5.5 causes minerals to dissolve. What is this condition called?" and "What are the characteristics of caries that has reached the pulp chamber?" there was a significantly difference in knowledge, that showed in before and after treatment ($p=0.015$; $p=0.004$). The results of the effectiveness of providing training/ education sessions on early caries detection, dental growth, and knowledge of maintaining dental and oral health to 17 teachers on increasing knowledge of 17 teachers in this research showed by p-value $p=0.024$ ($p<0.05$) in table II. It shows that there is an increasing in the score of pre-test and post-test for teachers which is statistically significant. Which means that this training on early caries detection, tooth growth, and knowledge of maintaining oral and dental health is effective in increasing teacher knowledge.

Based on study of Ngatemi (2020) that the Dental Health Guide Book effectively increases the knowledge and behavior of parents in improving the dental and oral health of their children. Health education is an important activity for delivering information to communities, groups, or individuals. When training is given, respondents will learn and

Table I : Table of Differences Scores Answer Test per Item of Pre-test and Post-test on 17 Teachers at SDN Pandanwangi 1

Questions	Sample (n=17)		p
	Pre	Post	
	Mean ± S.D.	Mean ± S.D.	
How was the early occurence of tooth cavities?	2.29 ± 0.77	2.53 ± 0.72	0.332
What kind of condition can be used as a reference in the beginning of the occurrence of tooth cavities?	1.88 ± 0.99	2.41 ± 0.87	0.132
The Decreasing of the pH / acidity level in the mouth to 5.5 causes minerals to dissolve. What is this condition called?	2.47 ± 0.80	3.00 ± 0.00	0.015*
Which statement is true about enamel caries?	2.59 ± 0.51	2.41 ± 0.71	0.188
Which statement is true about dental caries?	2.23 ± 0.75	2.47 ± 0.80	0.260
What are the characteristics of caries that has reached the pulp chamber?	2.65 ± 0.61	2.06 ± 0.66	0.004*
What are the characteristics of a necrose tooth?	2.76 ± 0.56	2.88 ± 0.33	0.496
What are the causes of cavities in tooth??	2.53 ± 0.51	2.71 ± 0.47	0.188
When do permanent teeth start to grow normally?	1.88 ± 0.99	2.53 ± 0.87	0.069
What is the treatment for teeth that have stains, but can not be cleaned with a toothbrush?	2.94 ± 0.24	3.00 ± 0.00	0.332
What is the treatment for teeth that change its color into blackish, accompanied by tenderness and pain when chewing?	1.71 ± 0.92	2.12 ± 0.99	0.248
What is the treatment for tootth with caries depth > 1mm and pain that persistent when the stimulus is removed?	2.24 ± 0.75	2.41 ± 0.62	0.382
In your opinion, what is the correct time to brush your teeth?	3.00 ± 0.00	3.00 ± 0.00	-
In your opinion, when is the right time to brush your teeth?	2.88 ± 0.33	2.88 ± 0.33	1.000
In your opinion, what is the correct way to brush the teeth of elementary school students?	2.41 ± 0.80	2.64 ± 0.61	0.260
In your opinion, what should children or students do after eating sweet foods during school breaks?	2.94 ± 0.24	2.94 ± 0.24	1.000
How do you eat to keep your teeth healthy?	3.00 ± 0.00	3.00 ± 0.00	-
In your opinion, what is the right size of toothbrush for children?	3.00 ± 0.00	3.00 ± 0.00	-
In your opinion, what is the ideal amount of toothpaste for 1-time toothbrush?	2.4 ± 0.62	2.65 ± 0.50	0.104
When is the right time to go to the dentist?	3.00 ± 0.00	3.00 ± 0.00	-

* $p<0.05$

Table II : Table of Differences in Pre-test and Post-test Total Scores of Teachers at SDN Pandanwangi 1

	Pre (n=17)	Post (n=17)	p
	Mean ± S.D.	Mean ± S.D.	
Knowledge	50.82 ± 4.54	53.65 ± 2.80	0.024*

* p<0.05

Table III : Descriptive statistics on average pre-test and post-test scores of grade 3 and 4 students (37 samples)

	(n=37)	(n=37)	Mean ± S.D.
	Minimum	Maximum	
Student Pre-test	20,00	100,00	55,95 ± 16,74
Student Post-test	40,00	90,00	70,81 ± 15,70

Table IV : The table of differences in pre-test and post-test total scores for grade 3 and 4 students at SDN Pandanwangi 1

	Pre (n=37)	Post (n=37)	p
	Mean ± S.D.	Mean ± S.D.	
Knowledge	55.95 ± 16.74	70.81 ± 15.70	0.000*

* p<0.05

the results can be seen from changes that previously did not know, then became known and those who previously did not understand became understood. (11)

Through tables III and IV, the total difference scores of pre-test and post-test in grades 3 and 4 of SDN Pandanwangi, it is seen that increasing in scores from pre-test to post-test is statistically significant ($p < 0.05$). It suggested that the training and education activities can improve the knowledge of dental and oral health of grade 3 and 4 students. The statistical results, showed that there were increasing in both of teachers and students knowledge after training and education. This result is in line with the community service research conducted by Arini (2018) which states that there is an increase in knowledge of several coordinators of Integrated Health Care Center/Posyandu resulting in 62.9% of them having very good knowledge. In this study, there was increasing in scores of pre-test and post-test and also increasing in skills in how to brush teeth properly. (12)

There was a significant increasing in scores from pre-test to post-test of teachers and students known from the results of data analysis, supported by training and education sessions that had been carried out using dental health education presentation media. Flowcharts and diagrams help remember sequences of events and remember interactions in complex processes. It also facilitates the learning process to understand the relationship between objects or steps. Some people can remember details from images with text for a longer time than details from text alone. Flowcharts and flowcharts typically use short text and graphic elements to provide an overview of a multi-step process, theory, or comparison. (9)

Research by Nugraheni, 2018 explains that teachers have an important role in influencing their students to perform a behavior, such as health behavior. Teacher knowledge and good attitudes related to dental and oral health in schools affect student attitudes and affect health promotion activities in the school. (8)

CONCLUSION

After the training was carried out, this activity received a good response from SDN Pandanwangi 1. There was an increase in scores from pre-test to post-test for teachers and grade 3 and 4 students at SDN Pandanwangi 1. The enthusiasm of the teacher during the question and answer session also contributed to the success of this training. Meanwhile, for students, there are several Little Doctors who are enthusiastic and livens up the

atmosphere in the class. In general, this activity did not face significant obstacles, so the activity was carried out optimally and smoothly. SDN Pandanwangi 1 has benefited from this training in the form of increasing knowledge about tooth growth and development, early detection of caries examination, and ways to maintain dental and oral health which hopefully can be implemented in daily activities both at home and in the school environment for students. The dental health education media provided were deemed to provide benefits and a clearer picture of the topics presented. Furthermore, it is hoped that further training can be carried out with broader targets and more complex materials.

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