

Effect of Self-Efficacy on Teethbrushing Action among Elementary School Students

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Abstract: *Self efficacy can influence a person's choice of action. Likewise, individual students of primary school age are able to brush their teeth with the correct procedure. This study aims to examine the effect of self-efficacy on students' actions to brush their teeth properly (with the right tool, on time and in the right way).*

The research method was a quasi-experimental research design with a randomized control group pretest-posttest design. In this research design, the subjects were divided into two groups, namely the treatment group and the control group, all of which would be carried out pretest and posttest. The population of this study were all Grade 5 Elementary School students in the working area of Puskesmas Pegandan Kota Semarang. The intervention carried out was assisting in teeth brushing use a control card when brushing teeth at home for 10 days, after being given education using booklets to both groups.

Data analysis was performed using the Wilcoxon Signed Ranks Test to determine differences in self-efficacy and student actions before and after the intervention in the intervention group and t test in the control group. Meanwhile, the correlation test between self-efficacy and action used the nonparametric correlation test.

The results showed that there were differences in self-efficacy and respondent actions between before and after the intervention ($p < 0.0001$). There is a relationship between self-efficacy and respondent's actions in the intervention group ($p < 0.005$). In the control group, there was no relationship between self-efficacy and respondent actions ($p = 0.089$).

Keywords: *Self Efficacy, Tooth Brushing, Students.*

1. BACKGROUND

Oral health in Indonesia is still an important thing to get special attention from health workers, both dentists and dental nurses. Dental caries in children remains a significant clinical problem.⁽¹⁾ In Indonesia, dental caries in children ranks first as a chronic disease most experienced by school-age children.⁽²⁾ Tooth caries that are not properly treated can cause pain, tooth loss, and even death.⁽³⁾ According to Riskesdas 2018 the prevalence of cavities in early childhood is very high, namely 93%, meaning that only 7% of Indonesian children are free from dental caries.⁽⁴⁾ In fact, the World Health Organization (WHO) said that Indonesia has the highest Early Childhood Caries (ECC) prevalence rate in children aged three to five years.⁽⁵⁾ Dental health problems are closely related to the behavior of brushing teeth properly. Meanwhile, from Riskesdas 2018, it was found that Indonesian residents aged three years and over who brushed their teeth properly had a very small proportion of 2.8%.⁽⁴⁾ Brushing teeth is one of the important things in the process of dental caries. Good quality brushing (brushing your teeth the right way and the way it should be done) will increase the efficacy of the brushing

procedure. Brushing your teeth with toothpaste that contains fluoride is an addition in the prevention of dental caries.⁽⁶⁾

Children are one component of society. Children at school age are prone to various health problems, such as dental caries, intestinal worms, visual acuity disorders, nutrition, and others. Therefore, starting school is an important step in developing children's habits to always maintain their health from an early age through health education programs. Dental and oral health education is an effort to influence someone to behave well and motivate to maintain oral health, as well as to increase public awareness of the importance of oral health and provide understanding of ways to maintain oral health.^(7,8) Efficacy self is a specific individual's belief in his ability to display behavior in specific situations. Self-efficacy can affect a person's choice of action, how much effort is required and how long they can face difficulties.⁽⁹⁻¹¹⁾ Likewise, individual primary school age students believe in being able to brush their teeth with the correct procedure.

Children spend most of their time in school, so the development of a healthy environment and the adoption of health-promoting behaviors are appropriate in school. Intervention of school students was carried out with the aim that learning about dental hygiene and health could be carried out as early as possible to increase students' knowledge about the importance of maintaining health, especially oral health and body health and the environment in general.⁽¹²⁻¹⁴⁾

2. PURPOSE

This study was to examine the effect of self-efficacy on students' actions to brush their teeth properly (with the right tool, on time and in the right way).

3. METHOD

The research method used was a quasi-experimental research design with a randomized control group pretest-posttest design. In this research design, the subjects were divided into two groups, namely the treatment group and the control group, all of which would be carried out pretest and posttest.

The population was all 5th Grade Elementary School students in the working area of Puskesmas Pegandan Kota Semarang, totaling 623 students, due to considerations that they could be invited to communicate and cooperate in receiving educational materials. The number of samples is 62 students. The number of samples was divided into 2 groups which were one intervention group totaling 31 students, namely grade 5 SD Negeri Petompon II and one control group with a total of 31 students in grade 5 SD Al Huda. The instrument used to collect data was a questionnaire. The questionnaire consisted of statements about self-efficacy and the act of brushing your teeth using the recall method.

Students are first given education to equalize knowledge about brushing teeth. Educational material contains about the selection of toothbrushes and toothpaste as well as how and when to brush teeth correctly. The educational material was provided with booklet media accompanied by a tooth brushing control card. The booklet "Brushing Teeth Sehat" has been validated and has obtained an IPR certificate (Letter of Registration of Creation from the Ministry of Law and Human Rights No. EC00202022540).

Students who will be sampled are measured for self-efficacy and the action of brushing their teeth properly using a questionnaire (pre test) as data before giving the intervention. Then the teacher and enumerators motivated and assisted the students to brush their teeth properly while at home using the tooth brushing control card for 10 days. Each student who brushed his teeth was marked on the brushing control card. The respondent's self-

efficacy and actions of brushing their teeth were re-measured using the same questionnaire (post test) to see the effect of the changes.

Data analysis in the intervention group was carried out using the Wilcoxon Signed Ranks Test, to determine whether there were differences in student self-efficacy between pre and post tests. Meanwhile, to determine whether there is a relationship used parametric correlation test. Data analysis in the control group was carried out using the T-Test, to determine whether there were differences in student self-efficacy between pre and post tests. Meanwhile, to determine whether there is a relationship used parametric correlation test.

4. RESULT

1. Self-Efficacy and Correct Teeth Brushing Actions in Intervention Group Respondents

Table 1 Self-Efficacy and Correct Teeth Brushing Actions in Intervention Group Respondents

No	Intervention	Intervention Group					
		Self Efficacy (%)				Action (%)	
		high	moderate	low	good	enough	Not good
1	Pre tes	0,06	0,9	0,04	0,06	0,94	0,00
2	Post tes	0,23	0,77	0,00	0,42	0,58	0,00

In table 1, it can be seen that students in the intervention group, both at the pre-test (90%) and post-test (77%), mostly self-efficacy for brushing their teeth correctly in the moderate category. While the correct action of brushing teeth in the intervention group respondents, both during the pre-test (94%) and post-test (58%), was mostly in the sufficient category.

2. Self-Efficacy and Correct Teeth Brushing Actions in Control Group Respondents

Table 2 Self-Efficacy and Correct Teeth Brushing Actions in Control Group Respondents

No	Intervention	Control Group					
		Self Efficacy (%)				Action (%)	
		high	moderate	low	good	enough	Not good
1	Pre tes	0,06	0,94	0,00	0,06	0,94	0,00
2	Post tes	0,06	0,94	0,00	0,06	0,94	0,00

In table 2, it can be seen that students in the control group, both at the pre-test and post-test (94%), mostly had their efficacy for brushing their teeth correctly in the moderate category. Meanwhile, the correct action of brushing teeth in the control group respondents, both during the pre-test and post-test (94%), was mostly in the sufficient category.

3. Differences in self-efficacy and students' actions in brushing their teeth properly before and after the intervention

Table 3 Differences in self-efficacy and students' actions in brushing their teeth properly before and after the intervention

	Mean ± SD		(post<pre)	(post=pre)	(post>pre)	Z	pValue	Result
	Pre	Post	f	f	f			
Self Efficacy Intervention Group	12,16 ± 4,51	18,71 ± 4,17	0	0	31	-4,893	< 0,0001	difference
Action Intervention Group	15,06 ± 3,60	21,65 ± 2,77	0	0	31	-4,877	< 0,0001	difference

In table 3, it turns out that there is a difference in the self-efficacy of students in brushing their teeth properly between pre and post test with p value <0.0001, as well as in the correct brushing action, it turns out that there is a difference between pre and post test in students in the intervention group. . with p Value <0.0001.

4. The relationship between self-efficacy and students' actions in brushing their teeth properly in the intervention group

Table 4 The relationship between self-efficacy and students' actions in brushing their teeth properly before the intervention

Correlations				
	selfefficacy_pre	selfefficacy_post	action_pre	action_post
selfefficacy_pre	Pearson Correlation	1	.899**	.637**
	Sig. (2-tailed)		.000	.000
	N	31	31	31
selfefficacy_post	Pearson Correlation	.899**	1	.611**
	Sig. (2-tailed)	.000		.000
	N	31	31	31
action_pre	Pearson Correlation	.637**	.611**	1
	Sig. (2-tailed)	.000	.000	
	N	31	31	31
action_post	Pearson Correlation	.580**	.566**	.845**
	Sig. (2-tailed)	.001	.001	.000
	N	31	31	31

In table 4, it turns out that there is a relationship between self-efficacy and students' actions in brushing their teeth properly during the pre-test with p value <0.005, while at the post-test there is no relationship between self-efficacy and correct brushing in the intervention group with p Value <0.114.

5. Differences in self-efficacy and students' actions in brushing their teeth properly pre and post test in control group

Table 5 Differences in self-efficacy and students' actions in brushing their teeth properly pre and post test in control group

	Mean ± SD		(post<pre)	(post=pre)	(post>pre)	Z	pValue	Result
	Pre	Post	f	f	F			
Self Efficacy Control Group	12,35 ± 3,66	13,52 ± 3,36	0	9	22	-4,216	<0,0001	difference
Action Control Group	13,90 ± 2,68	14,87 ± 3,12	0	18	13	-3,204	0,001	difference

In table 5, it turns out that in the control group, there is a difference in the self-efficacy of students in brushing their teeth properly between pre and post test with p value <0.0001, as well as in the correct brushing action, it turns out that there is a difference between pre and post test in students. in the control group. with p Value = 0.001.

6. The relationship between self-efficacy and students' actions in brushing their teeth properly in the control group

Table 6 The relationship between self-efficacy and students' actions in brushing their teeth properly in the control group

		Correlations			
		selfefficacy_pre	selfefficacy_post	action_pre	action_post
Spearman's rho	Correlation Coefficient	1.000	.896**	.209	.277**
	selfefficacy_pre Sig. (2-tailed)	.	.000	.259	.131
	N	31	31	31	31
	Correlation Coefficient	.896**	1.000	.233**	.315
	selfefficacy_post Sig. (2-tailed)	.000	.	.207	.085
	N	31	31	31	31
	Correlation Coefficient	.209	.233	1.000	.850
	action_pre Sig. (2-tailed)	.259	.207	.	.000
	N	31	31	31	31
	Correlation Coefficient	.277	.315		
	action_post Sig. (2-tailed)	.131	.085		
	N	31	31	31	31

In table 6, it turns out that there is no relationship between self-efficacy and students' actions in brushing their teeth correctly during the pre-test with p Value = 0.259, while during the post-test there is no relationship between students' self-efficacy in brushing their teeth correctly during the pre-test with p Value = 0.085.

5. DISCUSS

Based on Riskesdas 2018 data, students who brushed their teeth every day were 94.8%, but those who brushed their teeth twice at the right time, namely 5.0% in the morning after eating and 14.3% at night before bed.⁽⁴⁾ Meanwhile, the results of this study state that in the intervention group, most of the respondents (94%) had a moderate self-efficacy, and there was a high self-efficacy increase from 6% to 42% from pre-test to post-test. This is in accordance with the theory which states that self-efficacy is the belief that a person has that he is able to do something to achieve a goal and overcome obstacles.^(11,15,16) Including doing the correct tooth brushing action. Many factors can influence the occurrence of dental caries problems. In this study, the description of tooth brushing behavior studied included routine, use of toothbrushes, use of toothpaste, frequency of brushing teeth, duration of brushing teeth, the correct type of toothbrush, and the correct time and method of brushing teeth.⁽¹⁷⁻¹⁹⁾ Sources of self-efficacy or self-habit beliefs can be obtained, changed, enhanced, or passed down through one or a combination of four sources, namely the experience of mastering an achievement (performance accomplishment), vicarious experience, social persuasion (social persuasion) and emotional generation (emotional physiological states).^(11,19,20)

Performance experience is an achievement that has been achieved in the past. Past performance is the most powerful self-efficacy modifier. Past good performances will raise efficacy expectations.^(11,19,20) Students who brushed their teeth twice a day had already exceeded 50% but judging from the time when they brushed their teeth, only 3.7% had done it correctly the morning after breakfast and at night before going to bed. When viewed separately, students who brushed their teeth properly in the morning or at night were still below 15%. This indicates that there is still little discipline towards time or a lack of knowledge of students and parents. According to a study, it was found that brushing teeth after breakfast and before bedtime there is a tendency for fewer people to have caries.^(2,21,22) How to brush your teeth is another factor that plays an important role in determining the incidence of dental caries as seen from the absence of students who behave how to brush your teeth properly. However, seen separately, some students brushed their teeth in the correct way on the front teeth (incisors and fangs) on the outer surface with an up and down motion and the back teeth (molars) on the upper surface in a back and forth motion. The front teeth (incisors and canines) of the inner surface with a tilt motion, the back teeth (molars) of the outer surface in a circular motion, the back teeth (molars) of the inner surface with a tipping motion were still incorrectly done by more than 70% of grade 5 elementary students in the intervention group. In theory, brushing teeth with the correct movement causes plaque to be removed more effectively and prevents caries from occurring on the teeth.^(22,23) Although the frequency and method of brushing teeth is good, if the duration of brushing is not suitable, this will cause permanent dental caries. occurs because the duration is important to make sure the teeth are really clean. In theory, the correct duration of brushing your teeth is 2-3 minutes.^(12,24,25)

Students who do not use the correct toothbrush say that it is their parents' authority to determine the type of toothbrush used.^(26,27) The correct type of toothbrush will cause plaque to be cleaned up to the crevices of the teeth and reduce the incidence of caries. The recommended toothbrush is a soft toothbrush because hard toothbrushes can damage

enamel coating and injure teeth. This can invite caries or make existing caries worse. In order to reach the areas of the teeth at the back, the ideal brush head size is 35-40 mm.⁽²⁸⁻³⁰⁾ Achieving success will have different efficacy effects, depending on the process of achieving it. The more difficult the action, but successfully carried out, the higher the self-efficacy. Self-work, increases the efficacy more than group work, or assisted by others.⁽⁹⁻¹¹⁾ Therefore, students who do self-brushing at home, with a control card monitor “brushing healthy teeth” will increase their self-efficacy, and furthermore will step up in action. The vicar experience is obtained through social models. Efficacy will increase when observing the success of others, on the other hand, efficacy will decrease if observing people whose abilities are roughly the same as themselves fail.⁽⁹⁻¹¹⁾ If the observed figure is different from the observer, the vicar's influence is not great. Conversely, when observing a figure who is equal to himself, people may not want to do what the observed figure has failed to do for a long time.⁽⁹⁻¹¹⁾ Likewise with proper tooth brushing. Elementary school students who know that their friends are not brushing their teeth properly, resulting in cavities, and understanding how great the suffering caused by cavities will encourage them to take the correct tooth brushing action (the right tool, the right time and the right way).

Self-efficacy can also be obtained, strengthened or weakened through social persuasion.^(15,16,31) The impact of this source is limited, but under the right conditions persuasion from others can affect self-efficacy. This condition is a sense of trust in the giver of persuasion, and the realistic nature of what is satisfied.^(32,33) In the case of proper tooth brushing, the giver of persuasion is the parent at home. Because brushing your teeth is normally done at home. However, if there is education along with the movement to brush your teeth together at school, the most obeyed giver of persuasion is the school teacher.⁽³⁴⁻³⁶⁾

The emotional state that follows an activity will affect the efficacy in that field of activity. Strong emotions, fear, anxiety, stress, can reduce self-efficacy. Success increases efficacy confidence, while failure decreases efficacy. The success of other people (school friends, close relatives, playmates) who are successful in overcoming the suffering of cavities with the correct brushing will increase the student's confidence to participate in the correct brushing action.⁽³⁷⁻³⁹⁾

6. CONCLUSION

1. There are differences in the self-efficacy of students in brushing their teeth properly before and after the intervention
2. There were differences in the students' actions in brushing their teeth properly before and after the intervention
3. There is a relationship between self-efficacy and students' actions in brushing their teeth right before the intervention
4. There is a relationship between self-efficacy and students' actions in brushing their teeth correct after the intervention
5. There is no relationship between self-efficacy and student actions in brushing their teeth correct in the control group

7. RECOMMENDATION

1. Because it has been proven that there are differences in student self-efficacy and actions brushing teeth properly, before and after treatment, intervention in the form of education with a booklet accompanied by assistance with a control card "brushing healthy teeth" is recommended to become an educational medium for healthy brushing, through efforts to increase self-efficacy which encourages increased brushing action good healthy teeth.
2. The educational program using the "Healthy Teeth Brushing" booklet accompanied by assistance using the "Healthy Tooth Brushing" control card is implemented through the School Dental Health Program (UKGS) in health education activities and brushing teeth together at schools.

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