

# Revitalizing School Dental Health Effort through “Model 222” as a Strategy to Achieve Caries-Free Indonesia 2030

Bedjo Santoso<sup>1</sup>, Edi Susanto<sup>2</sup>, Melyana Nurul Widyawati<sup>3</sup>, Rasipin<sup>4</sup>, Waljuni Astu Rahman<sup>5</sup>, Ismi Rajiani<sup>6</sup>

<sup>1,2,3,4</sup>Poltekkes Kementerian Kesehatan Semarang, Indonesia

<sup>5</sup>Poltekkes Kementerian Kesehatan Banjarmasin, Indonesia

<sup>6</sup>Universitas Muhammadiyah Gresik, Indonesia

Article History:

Submitted: 15.12.2019

Revised: 12.02.2020

Accepted: 06.03.2020

## ABSTRACT

The tooth brushing program together is a self-preservation effort for elementary school children. The tooth brushing program that has been implemented in schools has not been able to change the tooth brushing behaviour of elementary school students, indicated by the value of OHI-S = 1.3; DMF-T = 1.09, def-t = 1.78, indicating the condition is below the national target 2010. Improvements in the behavioural aspects need to be done to improve the dental health status of elementary school students. One of the changes in behaviour influenced by information. Information will be stored as much as 20% if delivered through visuals, 50% if delivered through audio-visual media and 70% if implemented in real practice. to generate alternative changes in tooth brushing behaviour through brushing teeth audio-visual model in elementary school students and analyse their effectiveness. Research and Development (R&D) with stages: information gathering, model design, expert validation and revision as well as model testing (using the Quasi-Experimental Control Group Pre-test and Post-test Design method). The model test sample was divided into two, the model 222 (intervention), and brushing teeth 21 days (control) group. The results of expert validity showed that the model 222 was feasible as an effort to form the teeth brushing behaviour of elementary school children (p = 0.020). Model 222 was more effective in increasing teacher knowledge,

attitudes and skills than brushing teeth 21 days (control) p = (0,002). The model 222 was more effective in increasing the knowledge, attitudes and skills of *dokter kecil* (elementary school student child doctor) than brushing teeth 21 days (control) p-value <0.05, while the debris score was no difference between the two groups p-value > 0.05 but the mean value in the intervention group was bigger. The model 222 was more effective in increasing knowledge, attitudes, skills, and reducing debris scores in elementary school students compared to the 21 days program (control) p = 0.000. from the results of the research, it can be concluded that the "model 222" effectively shaped the teeth brushing behaviour of teachers, elementary school student child doctor and the skills of brushing teeth and dental hygiene of students at school.

**Keywords:** Model 222, School Dental Health Effort Programme

### Correspondance:

Bedjo Santoso

Poltekkes Kementerian Kesehatan Semarang  
Indonesia

E-mail: [bedjosantoso27@gmail.com](mailto:bedjosantoso27@gmail.com)

DOI: [10.5530/srp.2020.2.94](https://doi.org/10.5530/srp.2020.2.94)

©Advanced Scientific Research. All rights reserved

## INTRODUCTION

Various prevention programs have been carried out to halt the rate of development, reduce the prevalence and incidence of dental and oral diseases. In Indonesia, efforts are made through the School Dental Health Effort or *Usaha Kesehatan Gigi Sekolah* (UKGS). Internationally, efforts have been made through WHO resolution in the 60th World Health Assembly (WHA) in 2007, which is developing and implementing the promotion and prevention of dental and oral diseases as part of health promotion activities in schools. In 2010, WHO launched the Global Oral Health Programme (GOHP) 2020, by advising countries in the world to develop policies on prevention of dental and oral diseases and the promotion of dental health specifically for school children and teenagers (Kemenkes, 2010).

The UKGS programme and the oral health service programme which were launched by the Indonesian and international governments have not produced results, it is evident that no country is free from dental caries (Kwan et al., 2005). South Kalimantan Province, has a few dental and oral health problems above the national average of 59,6%, and the number of people receiving care and treatment from medical personnel (dental nurses, dentists or specialist dentists) is relatively low at only 12,3 %. The city of Semarang, which has 37 public health centres in 16 subdistricts, has 706 elementary schools (SD)/Madarasah Ibtidaiyah (MI), which received UKGS programme's promotive service coverage are only 27% and 37% preventive, which is quite low compared to national promotive service targets as 100% and preventive services 80%. The results of a preliminary study at SD Padangsari 1 Banyumanik Semarang obtained data that 95% of students have the habit of brushing while bathing, 90% of students

are not skilled in brushing their teeth, the average score of OHI-S = 1,3; DMF-T = 1,09, def-t = 1,78.<sup>1</sup>

Dental health problems above, far from expectations to achieve the Ministry of Health's long-term target at 2020: the rate of dental caries (mixed teeth) age 6 years 50%, the caries-free teeth rate of 6<sup>th</sup> grader by 70%, DMF-T age 12 years ≤ 1, PTI is 50% and 6<sup>th</sup> gradeer dentally fit is 85%. The target for 2030 is that Indonesia is caries-free

Strategic measurements need to be taken to address dental health problems, but beforehand, the cause of the problem needs to be identified. Based on the data above, it can be concluded that dental health problems are caused by poor dental health maintenance behaviour. Dental health maintenance programs implemented in schools through the UKGS have not been able to change students' tooth brushing behaviour for the better and correct, because it is only carried out once a year. Habits in maintaining dental and oral health can be initiated through the behaviour shaping from the early age. Elementary school age is the ideal age for practicing a child's motoric skills, including brushing teeth. Shaping tooth brushing behaviour early, will lead children to brush their tooth in the future. According to the theory of behaviour change, to change a person's habits requires a period of 21 days that is constantly conditioned to change his habits<sup>2</sup>.

Based on the background of the problem, it can be concluded that to shape behaviour, innovative model is needed to foster children's habits in maintaining oral and dental hygiene. The model is designed by instilling children's habits in choosing oral and dental hygiene at school, through the program: 2 minutes tooth brushing at school, not eating for 2 hours after tooth brushing at school, tooth brushing at least 2 times a day. The implementation of this programme begins with the training of teachers and

elementary school student child doctor before it is carried out by students.

Model 222 is a revitalization of the school dental health effort (UKGS) as a strategy to achieve the target of the Indonesian Ministry of Health free of caries in 2030.

## METHOD

The method used in this research is Research and Development (R&D) with stages: information gathering,

model design, expert validation and revision as well as model testing (using the Quasi-Experimental Control Group Pre-test and Post-tests Design method). The model test sample was divided into two, the model 222 (intervention), and tooth brushing 21 days (control) group. There were 400 research respondents consisting of 100 people in intervention group and 100 in control group in the city of Semarang; 100 people in intervention group and 100 people in control group in Banjarmasin.

## RESULT

Table 1: Normality test table of teacher data in the intervention and control groups in Semarang and Banjarmasin

Normality Test*		
Variable	p-value	
	Semarang (n=6)	Banjarmasin (n=6)
Intervention's knowledge	0.101	0.004
Control's knowledge	0.000	0.004
Intervention's attitude	0.212	0.000
Control's attitude	0.000	0.000
Intervention's skill	0.033	0.000
Control's skill	0.000	0.001

\*Shapiro-Wilk

Table 1 shows that the normality test results obtained p-value <0,05, so it can be concluded that the data are not normally distributed

Table 2: Effectiveness test table on the knowledge, attitudes, skills and debris scores of elementary school student child doctor in the intervention and control group in Semarang and Banjarmasin

City		Knowledge*				Attitude*				Skill*			Debris*		
		n	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value	
Semarang	Intervention	6	3.83	0.753	0.006	3.17	0.753	0.003	3.50	0.548	0.000	0.533	0.1862	0.056	
	Control	6	2.50	0.548		1.83	0.408		1.83	0.408		0.317	0.1602		
Banjarmasin	Intervention	6	4.17	0.408	0.000	3.67	1.211	0.008	4.00	1.095	0.003	0.533	0.2066	0.763	
	Control	6	1.50	0.548		1.67	0.516		2.17	0.408		0.483	0.3371		

The results of the effectiveness test of the attitudes, knowledge, skills, and debris scores on unpaired data indicate that the p-value was <0,05, meaning that the model 222 was more effective in increasing the knowledge, attitudes and skills of elementary school student child

doctor than tooth brushing 21 days. While the debris score variable did not have a difference between the two groups, however the mean value in the intervention group was greater than the control group, both in Semarang and Banjarmasin cities.

Table 3: Effectiveness test table of knowledge, attitudes, skills and debris scores of elementary school students in the intervention and control groups in Semarang and Banjarmasin

City		Knowledge*			Attitude*		Skill*		Debris*	
		n	Mean Rank	p-value	Mean Rank	p-value	Mean Rank	p-value	Mean Rank	p-value
Semarang	Intervention	100	140.39	0.000	1.33.04	0.000	148.73	0.000	132.81	0.000
	Control	100	60.61		67.96		52.27		68.20	

Banjarm asin	Intervention	100	149.84		143.90		150.50		78.38	
	Control	100	51.16	0.000	57.11	0.000	57.11	0.000	122.6 3	0.000

The results of the unpaired effectiveness test showed that the intervention group's p-value was 0,000 ( $p < 0,05$ ), meaning that model 222 was more effective in increasing knowledge, attitudes, skills, and reducing debris scores in elementary school students compared to the 21-day program in both Semarang and Kota banjarmasin.

## DISCUSSION

Model 222 is a method of instilling the habit of tooth brushing behaviour in elementary school students conducted at school and at home by applying the principle of tooth brushing for 2 minutes, tooth brushing 2 times a day after breakfast and before going to bed at night, no eating for 2 hours after tooth brushing. These efforts are carried out continuously while at school under the supervision of teachers and elementary school student child doctor and at home under the supervision of parents. Actions taken continuously will lead to habits, it is according to research conducted by Santoso (2015) which proves that actions taken continuously will form habits which eventually become permanent behaviour.

Model 222 is implemented independently by students and elementary school student child doctor under the supervision of teachers in schools. elementary school student child doctors are chosen students who have intelligence in academics, behave healthily in school, have clean performance and can communicate effectively with schoolmates. elementary school student child doctor in school will be an example for his friends in healthy life behaviour. Health education needs to be instilled early on in children, one of them through elementary school student child doctor training<sup>3</sup>.

Teachers as role models in schools, therefore the role of teachers is needed. The role of the teacher is needed in educating and fostering children to maintain their dental health.<sup>4</sup> Teachers have a role in the formation of dental health care behaviour in schools, including in the process of students learning to brush their teeth, so that a school-based dental health program involving teachers is effective in maintaining dental health.<sup>5</sup>

Teachers and elementary school student child doctor in the transfer of knowledge and skills about tooth brushing to students, provided training on maintenance of dental health including tooth brushing. Therefore, model 222 training is effective in increasing the knowledge, attitudes and skills of teachers and elementary school student child doctor in brushing their teeth.

The results of the paired data effectiveness test showed that the p-value of the intervention group and the control group was 0.000 ( $p < 0,05$ ), meaning that the model 222 and toothbrushing 21 days were effective in increasing knowledge, attitudes, and skills, and reducing the debris scores of elementary school students. This is because teachers have the same educational background and abilities in accordance with their respective fields and expertise. Before the implementation process is carried out, teachers in

the intervention and control groups are given the same oral health education, but in the intervention group, given additional material in the form of the application of "model 222" in accordance with the module. So that both groups experienced an increase in attitude and skill knowledge.

Increased knowledge occurs after people make a sensation of a certain object. Knowledge is one of the domains of behaviour. Children's knowledge is very important in underlying the shaping of behaviours that support oral and dental hygiene.<sup>6,7</sup> Maintaining dental and oral hygiene at school age is one way to improve health at an early age.<sup>8</sup> In the opinion of Fatmasari (2019), the high number of dental and mouth diseases is influenced by the main factors, lack of knowledge about oral hygiene and poor eating patterns.<sup>9</sup>

Attitude enhancement occurs when someone responds after being given information then considers that they will act in accordance with the information provided. According to Siwiendrayanti (2017), attitudes can be formed if someone gets information, responds and will act after being given that information.<sup>10</sup> Increased skills occur because of training activities during the tooth brushing practice

These results prove that the model 222 can improve students' tooth brushing and dental hygiene skills, this is because the model 222 contains a series of interrelated learning efforts in the form of training, simulations between friends, practice and evaluation.

Model 222 training has a standardized learning and time curriculum, where the practice weight is greater than theory. Because repeated practice will lead to experience for the target. Model 222 accustoms students to brush their teeth every day beginning with (1) the little doctor prepares the student line in front of the class, (2) the elementary school student child doctor checks the completeness (glass, brush, and toothpaste), (3) the elementary school student child doctor drops the disclosing solution into each student, (4) the elementary school student child doctor directs students to take gargle, (4) the elementary school student child doctor directs and arranges students to line up in the field, (5) the elementary school student child doctor demonstrates how to brush their teeth in the field, (6) the elementary school student child doctor directs students to apply toothpaste to toothbrush, (7) the elementary school student child doctor monitors and guides students to brush their teeth, (8) the elementary school student child doctor rearranges student lines in front of the class, (9) the elementary school student child doctor check the dental hygiene of students one by one, (10) the elementary school student child doctor directs students to return tooth brushing equipment in place.

The teacher monitors the performance of the elementary school student child doctor in the implementation of 222 in schools by using a check list. Sharpening the model is done through monitoring the of children's tooth brushing at home by parents using the check list instrument.

Model 222 is effective in increasing knowledge, attitudes, and skills in elementary school students. Behaviour is a

habit that will be more formed if done at an early age, supported by the theory of behaviour change to brush teeth every day (21 days) routinely, will have an impact on changing habits. Research by Sabatul Habibah S and Danan D (2019) concluded that the influence of brushing teeth for 21 days with plaque scores before intervention was the lowest plaque score 0.66, highest plaque score 4.16, average plaque score 2.86. Plaque score after intervention plaque lowest score 0.00, plaque highest score 2.16, plaque average score 0.82, P value 0.000 <from Alpha 0.05.<sup>11</sup>

Behaviour change theory reveals that for 21 days to change a person's habits, it requires a period of constant conditioning for that person to change his habits according to Foster's theory in Maher et al (2014). In 21 days, it was divided into three stages to form memory and which governed the mind and body to do new habits namely; The first 7 days are introductions, the second 7 days are repetitions/exercise, enter the training stage. The more often children do these activities, the more easily the children memorize and enjoy; and last, the third 7 days is more towards strengthening where it leads to stabilization. It is hoped that "behaviour" is permanently formed into a habit. " Consistency is needed to achieve this change if it is absent for a day and then it will be recalculated starting from the start<sup>2</sup>.

Statistical test results in the unpaired group showed that the model 222 was more effective in increasing the knowledge, attitudes, skills of teachers, elementary school student child doctor and elementary students. This is because in addition to the larger portion of practice in training, the role of small doctors, teachers and parents is a crucial role for the media. In the school environment intervention group, put up a 3-dimensional poster about the 222 program and the technique of toothbrushing and listening to the song tooth brushing. It is hoped that posters in schools are exposed to information about tooth brushing, while listening again to tooth brushing will lead students to brush their teeth correctly.

By posting posters about programme 222 in schools and playing songs when brushing teeth, there is an automatic interaction directly through the various senses involved, namely the senses of sight and hearing. The more the five senses that are used will facilitate the absorption/understanding of material, someone who understands a concept then that person will easily do the practice<sup>12</sup> According to Edgar Dale described through the Dale Experience Cone, <sup>13</sup> the educational process by involving more senses will be more easily accepted and remembered by educational targets.<sup>14</sup>

The provision of health education will be more effective and the results will be optimal when using health education methods and media that are appropriate and involve more senses.<sup>15</sup> The "model222 " research contained a 2D poster containing tooth brushing twice a day after breakfast and at night before going to bed, tooth brushing for 2 minutes, not eating for 2 hours after brushing teeth.

Poster is one of the visual education media that can help change behaviour by increasing knowledge, facilitating abilities, and interest in behaviour. Children aged 6-12 years who are in a period of growth and development will respond to new things by developing their behaviour and skills. The

results of this study showed a significant difference ( $p < 0,05$ ) between the average plaque score before poster placement (plaque score day 0) with the average plaque score after poster placement (day 7, day 14, and day 21). Based on the results of the study it can be concluded that the poster for how to brush teeth has the effect of decreasing dental plaque scores in children aged 6-12 years.<sup>16</sup>

The results of research by Kumboyo (2011) that health education using audio visual media is better than health education using printed medium/flipchart as seen from the average value of audio visual media which is higher than 23,8 compared to printed medium which is 22,0 with a value of  $p$  (significance)  $t$  independent test results 0,009 ( $p < 0,05$ ).<sup>17</sup>

## CONCLUSION

Based on the results of the research, it can be concluded that the "Model 222" is effective in shaping the tooth brushing behaviour of teachers, elementary school student child doctor as well as the tooth brushing and dental hygiene skills of students at school. This is proven by:

- Model 222 is more effective at increasing teacher's tooth brushing knowledge than the 21-day tooth brushing group.
- Model 222 was more effective in increasing teacher's tooth brushing attitude than the 21-day tooth brushing group.
- Model 222 was more effective in improving teacher's tooth brushing skills than the 21-day tooth brushing group.
- Model 222 is more effective in increasing the knowledge of brushing teeth of small doctors than in the 21-day tooth brushing group.
- Model 222 was more effective in improving the attitude of brushing teeth of small doctors than in the group brushing program for 21 days.
- Model 222 is more effective in increasing the ability to brush the teeth of a small doctor than the 21-day tooth brushing group.
- Model 222 is more effective in improving the teeth brushing skills of elementary school students than the 21-day brushing program group.
- Model 222 was more effective in improving dental and oral hygiene of elementary school students than the 21-day tooth brushing group.

## REFERENCES

- Purnomowati RRD. Efektivitas Sikat Gigi Orthodontik Dan Sikat Gigi Konvensional Terhadap Nilai Ohi-S Pada Pasien Fixed Orthodontic Appliance. *Jurnal Keperawatan* 2018; 13: 53-57.
- Maher CA, Lewis LK, Ferrar K, et al. Are health behavior change interventions that use online social networks effective? A systematic review. *Journal of medical Internet research* 2014; 16.
- Wahyuni IS. Pendidikan Kesehatan Mulut Melalui Pendekatan Metode Ceramah Dan Praktek (Studi Kasus Pelatihan Dokter Kecil Di Sekolah Dasar Alam). *Jurnal Pengabdian Kepada Masyarakat* 2017; 1

4. ER W. Hubungan Perilaku Membersihkan Gigi terhadap Tingkat Kebersihan Mulut Siswa Sekolah Dasar Negeri Wilayah Kerja Puskesmas Gladak Pakem Kabupaten Jember. 2003; 10: 10-13.
5. Pullishery F, Panchmal GS and Shenoy R. Parental attitudes and tooth brushing habits in preschool children in Mangalore, Karnataka: A cross-sectional study. *International journal of clinical pediatric dentistry* 2013; 6: 156.
6. Ignatia PS TW, Ranny R. Perbedaan tingkat pengetahuan kesehatan gigi dan mulut pada siswa sekolah dasar di kota dan di desa. 2013.
7. Sariningrum E I. Hubungan tingkat pendidikan, sikap, dan pengetahuan orang tua tentang kebersihan gigi dan mulut pada anak balita 3-5 tahun dengan tingkat kejadian karies di Paud Jatipurno. 2009; 3: 2.
8. Herijulianti E IT, Artini S. *Pendidikan Kesehatan Gigi*. Jakarta: Buku Kedokteran EGC, 2001, p.p. 98.
9. Fatmasari D, Purba A and Salikun S. MEDIA PERMAINAN TEBAK GAMBAR EFEKTIF DALAM PENINGKATAN PENGETAHUAN DAN TINDAKAN MENYIKAT GIGI DIBANDINGKAN MEDIA BOOKLET. *Jurnal Kesehatan Gigi* 2019; 6: 76-79.
10. al. SAe. Enhancing Sport, Physical Activity, and Health Promotion International Conference on Physical Education, Sport and Health (Ismina) 2017.
11. sabatul Habibah S and Danan D. Pengaruh Sikat Gigi Setiap Hari (21hari) Dengan Pasta Gigi Yang Mengandung Fluor Menggunakan teknik Roll Terhadap Plakskor Di Sdn Keramat 3 Desa Sungai Tabuk Keramat. *Jurnal Skala Kesehatan* 2019; 10: 35-40.
12. al. Me. Dental health education media in the form of android-based monopoly game. *International Journal of Allied Medical Sciences and Clinical Research*. 2018: 6.
13. Kadarwati K, Soemanto R and Murti B. The Influence of Family Support, Social Capital, Self Efficacy, Education, Employment, Income, and Residential Status on the Quality of Life Among the Elderly in Salatiga, Central Java. *Journal of Epidemiology and Public Health*; 2: 58-69.
14. Suiraoaka IP SIN. *Media Pendidikan Kesehatan*. Yogyakarta: Graha Ilmu, 2012.
15. Kantohe ZR, Wowor VN and Gunawan PNJe-G. Perbandingan efektivitas pendidikan kesehatan gigi menggunakan media video dan flip chart terhadap peningkatan pengetahuan kesehatan gigi dan mulut anak. 2016; 4.
16. SUKMA MR. *PENGARUH POSTER CARA MENYIKAT GIGI TERHADAP SKOR PLAK GIGI PADA ANAK USIA 6-12 TAHUN (Kajian di Panti Asuhan Brayat Pinuji dan Panti Asuhan Sancta Maria Kalibawang-Kulonprogo)*. Universitas Gadjah Mada, 2013.
17. Kumboyo. Perbedaan efek penyuluhan kesehatan menggunakan media cetak dengan media audio visual terhadap peningkatan pengetahuan pasien tuberkulosis. 2011.