



The Effectiveness of a School-Based Education Program on Oral Health in Bandung Resident: A Pilot Study

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ABSTRACT

The lack of an organized school dental health policy in Indonesia requires an affordable, easily accessible, and sustainable strategy. Provision of dental and oral health knowledge delivered by a little doctor at the school level can help the implementation of the program that school-age is the time of peer groups. The school-age is in which children begin to learn basic oral hygiene practices and are most vulnerable to dental caries. This study was conducted to assess the effect of little doctor training on the knowledge, attitudes and skills of little doctors, as well as on the skills and patterns of brushing teeth in Bandung Regency, Indonesia. This research used a quasi-experimental design with pretest and posttest. A total of 12 little doctors and 291 school children in grades 4-6 elementary school from four government schools were included in this study. The instrument consisted of a knowledge and attitude questionnaire, an observation sheet, and a checklist sheet. Evaluation of tooth brushing patterns at school was done every month for 3 months. Data analysis using paired t-test. Data before and after training were compared and it was found that there was a significant improvement in the knowledge, attitudes, practices of the little doctors and students ($p = 0.005$). Skills and practice patterns of brushing teeth of school children increased significantly after the program ($p = 0.005$). The results of this study indicate that school-based oral health education methods that involve little doctors are effective for improving oral hygiene in elementary school children.

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Keefektifan Program Pendidikan Berbasis Sekolah tentang Kesehatan Mulut di Kabupaten Bandung: Sebuah Pilot Studi

ABSTRAK

Kurangnya kebijakan kesehatan gigi sekolah yang terorganisir di Indonesia membutuhkan strategi yang terjangkau, mudah diakses, dan berkelanjutan. Pembekalan pengetahuan kesehatan gigi dan mulut yang disampaikan oleh dokter kecil di tingkat sekolah dapat membantu pelaksanaan program bahwa usia sekolah adalah masa peer group. Usia sekolah adalah masa dimana anak-anak mulai mempelajari praktik dasar kebersihan mulut dan paling rentan terhadap karies gigi. Penelitian ini dilakukan untuk menilai pengaruh pelatihan dokter cilik terhadap pengetahuan, sikap dan keterampilan dokter cilik, serta terhadap keterampilan dan pola menggosok gigi di Kabupaten Bandung, Indonesia. Penelitian ini menggunakan desain eksperimen semu dengan pretest dan posttest. Sebanyak 12 dokter kecil dan 291 anak sekolah kelas 4-6 sekolah dasar dari empat sekolah negeri diikutsertakan dalam penelitian ini. Instrumen terdiri dari angket pengetahuan dan sikap, lembar observasi, dan lembar checklist. Evaluasi pola menggosok gigi di sekolah dilakukan setiap bulan selama 3 bulan. Analisis data menggunakan uji-t berpasangan. Data sebelum dan sesudah pelatihan dibandingkan dan ditemukan adanya peningkatan yang signifikan

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pada pengetahuan, sikap, praktik dokter kecil dan siswa ($p= 0,005$). Keterampilan dan pola praktik menggosok gigi anak sekolah meningkat secara signifikan setelah program ($p= 0,005$). Hasil penelitian ini menunjukkan bahwa metode pendidikan kesehatan gigi dan mulut berbasis sekolah yang melibatkan dokter kecil efektif untuk meningkatkan kebersihan gigi dan mulut pada anak sekolah dasar.



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INTRODUCTION

Oral disease is a major health problem, especially in children where the prevalence and incidence is high in almost all regions of the world (Kwan, Petersen, Pine, & Borutta, 2005; Lundstrom, Hamp, & Nyman, 1980; Taani, 2002). Therefore, it is necessary to maintain health. Oral and dental health is important in human health and well-being (Haque et al., 2016), especially for children who are growing up, one of them by brushing their teeth. Besides avoiding toothache, it can also increase nutrient intake indirectly. Poor oral health can have a negative impact on children's quality of life, their performance at school, and their success rate in the future (Kwan et al., 2005). With a healthy mouth will allow a person to do activities, such as: eating, talking, and socializing without experiencing pain, discomfort, or shame (Offices, 2000; World Health Organization, 2003). A good attitude towards dental and oral health care will create good behavior as well, where the behavior of caring for the mouth and teeth, one of which is the correct pattern of brushing teeth will be applied by children in their daily lives. Unfortunately, there are still many who ignore the importance of oral and dental care, especially school children who often neglect health, this causes the incidence of dental caries in children to increase. Dental caries is a disease that can be prevented but in fact it remains a major chronic disease in 25% of children aged 6-11 years and 59% of adolescents aged 12-19 years (Centers of Control Diseases Prevention, 2013). Likewise, in Indonesia, the prevalence of dental caries is still quite high reaching 72.1% (Kemenkes, 2013). Research shows that there are more than 50 million school hours lost globally due to poor oral health problems, which can affect student performance later in life (Sheiham, 2006; World Health Organization, 2003). Other studies have found that school-age children who suffer from poor oral health are 12 times more likely to limit their daily activities compared to those who have good oral health (Offices, 2000; Shah et al., 2010). Therefore, it is necessary to educate and promote health about dental and oral care to children who are sustainable. Lack of implementation of health education and inadequate preventive measures causes high prevalence of morbidity and poor health status for students (Gift, Reisine, & Larach, 1992).

Oral and dental health education interventions have proven successful in many developing countries (Buischi, Axelsson, Oliveira, Mayer, & Gjermeo, 1994; Hartono, Lambri, & Helderman, 2002; P. E. Petersen & Esheng, 1998; Poul Erik Petersen & Razanamihaja, 1999) and developed countries (Burt & Eklund, 2005; Yang, Sue, Warnakulasuriya, & Dasanayake, 2009). One of them is a health education campaign conducted among school students in China 'Love Teeth Day' proven effective in improving oral health where there is a decrease in caries in children (Peterson & Esheng, 1998).

Oral health education and promotion can be delivered in various forums (Haque et al., 2016), one of them at school.

Schools are the best place to promote oral and dental health because it is at school that many children spend their time. There are around one billion children around the world spending most of their daytime lives there (World Health Organization, 2003). One effort to overcome these problems is to increase awareness and behavior of children through the school base education program by empowering little doctor to improve their knowledge, attitudes, skills and brushing behavior in schools. Schools are an ideal place to provide education about oral health in combination with prevention services to achieve oral health promotion involving the School Dental Health Efforts (UKGS [Usha Kesehatan Gigi Sekolah]). Children at school age have a very sensitive character to instill understanding and healthy living habits (Solehati, Susilawati, Lukman, & Kosasih, 2015). School-based oral health education through traditional lectures has proven to be only successful in increasing oral health knowledge (De Farias, de Araujo Souza, & Ferreira, 2009; Kay & Locker, 1996), but has no effectiveness in overall oral health (Anaise & Zilkah, 1976; Angelopoulou, Kavvadia, Taoufik, & Oulis, 2015; Choo, Delac, & Messer, 2001; De Farias et al., 2009). There needs to be a school-based educational approach based on the school community by involving small doctors. School-based approaches have been proven to be more efficient in prevention and curative efforts than community-based approaches (Larsen, Larsen, Handwerker, Kim, & Rosenthal, 2009). Solehati's research reported that health education with school children was a very effective method for changing behavior and lifestyle (Solehati, Kosasih, Susilawati, Lukman, & Paryati, 2017). School-based educational research in elementary and junior high school students in Papua New Guinea has succeeded in improving their attitudes (Chen, Hsieh, Chen, Kao, & Chen, 2018). School-based education for elementary school students in Taipei, Taiwan has succeeded in improving their dental knowledge, oral hygiene habits, plaque accumulation, periodontal status, and caries experience (Silveira Schuch & Giang Do, 2017).

In Indonesia, especially in Bandung, there is a dearth of published literature on the effectiveness of school-based oral and dental health programs. Government programs on oral and dental health are already in place, but implementation has been hampered, not involving little doctor in their implementation, the success of the program is not assessed, and the implementation of the program in schools is not running. With this in mind, this study was conducted to determine the impact of oral and school-based health programs in improving knowledge, attitudes, and practices regarding oral hygiene in little doctor, as well as students' daily tooth brushing practices in schools in Bandung, West Java, Indonesia. It is hoped that with oral hygiene and patterns of brushing teeth at regular school, the children behavior will be brought to their homes, and spread the behavior to their families.

METHODS

This research used quasi experimental design with pre-test and post-test. The study was conducted in 2016. A total of 12 little doctors (3 little doctor each from each school) and 291 school children in grades 4-6 elementary schools from four government schools were included in this study (SDN Bojong Asih 1, SDN Leuwi Bandung, SDN Pasawahan, SDN Cangkuang Dayeuhkolot, sub-district Dayeuhkolot regency Bandung). The research approach method uses the Integrated School Dental Health (UKGS) method which is a combination of the Model Fit For School (FFS) with selected UKGS consisting of 6 stages namely; problem assessment and outreach, teacher training by the research team (using interactive question and answer lectures, oral and dental care demonstrations and demonstrations, as well as video and mouth and dental mannequins), small doctor training by teachers (using interactive question and answer lectures, simulations and oral and dental care demonstrations, as well

as video and mouth and tooth mannequins), providing health education including good and correct simulation of tooth brushing to students by a small doctor accompanied by the teacher (using interactive question and answer lectures, oral care demonstrations and demonstrations and teeth, as well as video and oral and dental mannequins), and daily evaluations by teachers and little doctor for three months. This FFS model has been tested on school children in the Philippines and Cambodia, which has succeeded in reducing the incidence of improving children's nutritional status because their teeth are maintained (Duijster et al., 2017; Monse, Naliponguit, Belizario, Benzian, & Helderma, 2010). The instrument consisted of a knowledge (validity test = 0.74) And attitude questionnaire (validity test = 0.72.), an observation sheet, and a checklist sheet. Evaluation of tooth brushing patterns at school was done every month for 3 months. Data analysis using paired t-test and univariate. Data before and after training were compared.

RESULTS AND DISCUSSION

1. Little doctor

Step activities that have been carried out in the form of a pre-test to a small doctor and then provide education related to dental and oral care including how to brush teeth

properly, then end with a post-test. The results obtained from the evaluation before and after the intervention can be seen in the table 1.

Table 1
 Frequency distribution the level of knowledge, attitudes, and skills of little doctor before and after intervention (n= 12).

Variable	Before Intervention		After Intervention	
	<i>f</i>	%	<i>f</i>	%
Level of knowledge				
Good	10	83,30	12	100
Poor	2	16,70	0	0
Attitudes				
Favorable	8	66,70	12	100
Unfavorable	4	33,30	0	0
Skill				
Poor	12	100	0	0
Good	0	0	12	100

From table 1 above it was known that there were 2 (16.70%) respondents who have poor knowledge about dental and mouth care, there were 4 respondents (33.30%) being unsupportive, and there were 12 respondents (100%) having oral care skills and bad teeth before intervention. After the intervention, there were no respondents with poor knowledge (0%), there were no respondents who were not

unfavorable (0%), and there were no respondents who had poor skills. To determine the effect of education on the knowledge and attitudes of little doctors, it was necessary to know the difference in the average level of knowledge before and after the intervention period. The following will be explained about these differences, namely:

Table 2
 Differences in average levels of knowledge, attitudes, and skills of little doctors before and after intervention (n: 12).

Variable	Mean	SD	p
Level of knowledge			
Before intervention	1,16	0,38	0.003
After intervention	1,00	0,00	
Attitudes			
Before intervention	1,33	0,49	0.004
After intervention	1,00	0,00	
Skill			
Before intervention	7,08	1,5	0.001
After intervention	13	0,00	

Table 2 shows that there were differences in the average level of knowledge ($p = 0.003$), attitudes ($p = 0.004$), and

skills before and after the intervention in little doctor ($p = 0.001$).

2. Students' brushing skills

Table 3
 Distribution of skills about brushing teeth before and after intervention (n = 291).

Category	Before Intervention		After Intervention	
	f	%	f	%
Good	5	1,7	215	73,9
poor	286	98,3	76	26,1

From table 3 above it can be seen that from 291 students, before the intervention it turned out that only 5 people (1.7%) students had good skills about brushing their teeth while 286 people (98.3%) students had poor skills. After the

intervention, there was an increase in skills where most of the respondents had good knowledge about brushing their teeth in the amount of 215 people (73.9%).

Table 4
 Differences in average students' brushing skills before and after intervention (n = 291).

	Mean	SD	p
Before Intervention	6,72	2,22	
After Intervention	12,05	1,70	0.001

Table 4. Showed that there were differences in the average skills in brushing teeth before and after intervention in students ($p = 0.001$). From table 5 can be seen that before the intervention was carried out all 291 students (100%) did

not have a supporting pattern in brushing their teeth in school and after the intervention became all students 291 (100%) had a supporting pattern in brushing their teeth in school.

3. Tooth brushing patterns on students

Table 5
 Frequency distribution of tooth brushing patterns before and after intervention (n = 291)

Variable Behavior	Before Intervention				After Intervention			
	Supportive		Unsupportive		Supportive		Unsupportive	
	f	%	f	%	f	%	f	%
Brushing teeth at school	0	0	100	100	100	100	0	0

To find out the effect of interventions on tooth brushing patterns in schools, table 6 Shows that there are differences

in the average pattern of brushing teeth before and after intervention in students ($p = 0.001$).

Table 6.
 Differences in the average patterns of brushing the teeth before and after intervention in 2016 (n = 291)

Level of knowledge	Mean	SD	p
Oral dental care	Before intervention	8,16	2,54
	After intervention	24,0	0,00

DISCUSSION

Implanting health behavior from an early age was very important, especially in oral and dental care. Oral health is an integral part of general health (Dunning, 1986). Poor oral health can affect their performance in school because they will be more absent from school because of illness (Prabhu & John, 2015). At the elementary school age was the period in which children begin to learn basic hygiene practices in the mouth and teeth which were the most vulnerable to dental caries (Jain et al., 2016). School age was the most influential period in a child's life to develop the skills, beliefs and

attitudes that they practice throughout their lives (Sekhar et al., 2014; Stephen, 1984). Schools were the right place to improve oral and dental health through a skillful and powerful approach to reach children around the world (Brown, 1994; Prabhu & John, 2015).

This research was targeted at school children, namely elementary school, this was done because of the ease of accessibility, where the school has a supportive environment and has many individuals with the same age and strata (Bhardwaj et al., 2013). Health Education emphasizes the right method of brushing teeth, the importance of oral hygiene and regular dental examinations because based on

the results of previous studies obtained data that students have inadequate oral hygiene habits. The results of school-based Health Education interventions in this study were successful in improving oral and dental care skills in little doctor and elementary school students ($p < 0.05$). This happens because school-based education was the most common method that is easily managed, has a very low cost, can benefit many children, and is easy to implement (Gill, Chestnutt, & Channing, 2009; Kwan et al., 2005; Offices, 2000; Pine, 2007). In addition, because the educational method used was not using traditional education methods but experiential learning. School-based health education using experiential learning was more effective in increasing the level of knowledge, attitudes and behavior of children in performing oral health care (Angelopoulou et al., 2015) The teachers were trained in their knowledge, attitudes, and skills about dental and oral care at school by the researchers. Then the teachers train their little doctors about what they have gotten in the training. This is done because the teacher is someone close to their students in school, making it easier and more useful. Provision of oral health knowledge by their teachers at the school level has proven to be more beneficial (Jain et al., 2016). This is evidenced by the significantly increased level of knowledge (0.003), attitudes (0,004), and skill (0,001) little doctor about oral and dental care.

School-based oral health education according to several studies has proven to be effective in improving oral and dental hygiene, knowledge levels, and behavior in maintaining oral and dental health (Biesbrock, Walters, & Bartizek, 2004; Chapman, Copestake, & Duncan, 2006; De Farias et al., 2009; Ekstrand, Kuzmina, Kuzmina, & Christiansen, 2000; Reinhardt, Löpker, Noack, Klein, & Rosen, 2009; Tai, Du, Peng, Fan, & Bian, 2001; Worthington, Hill, Mooney, Hamilton, & Blinkhorn, 2001). Empowering little doctor to become leaders in schools in promoting and inviting school friends to do patterns of daily dental and oral care at school. Health promotion messages can strengthen the development of attitudes and skills that are sustainable throughout the child's life (Kwan et al., 2005) Empowerment of little doctor is also an action appropriate to their age because at the age of these school children they are in the peer group where peers can influence the behavior of other children (Tomé, de Matos, Simões, Camacho, & AlvesDiniz, 2012). Children perform desirable behaviors when they receive significant positive feedback from others, one of them from peers (Jain et al., 2016). They will better follow what is done and ordered by their peers. Education at this time is right because they are in the stage of forming their own health habits (Laurie & Leonard, 2008). Significant other people function as models for children, they will have strong self-efficacy if they observe and imitate successful models that are similar to themselves (Bandura, 2014; Yekaninejad et al., 2012).

The little doctors are school health cadres who can be trusted because they are selected students with special requirements, one of which is to have good behavior and excel in their class. These little doctors are usually students who are respected by their friends at school because they have good performance and behavior in their schools. So that the person owned by the little doctor will influence the attitudes and behavior of students. Peer facilitators play an important role in determining the success of something (Delisle et al., 2016). Little doctors who have been equipped with adequate dental and oral care knowledge and skills will be able to promote their knowledge and skills to their friends. Little doctors were expected to help equalize health education by becoming a health cadre for peers (Indonesia,

2011). They will evaluate the behavior of their friends in caring for their teeth and mouth, especially the behavior of brushing their teeth at the school so that it becomes a pattern of daily life in supportive schools. These little doctors will always invite and remind their friends at school to do the right brushing, because they feel responsible for being given the trust by their teachers. So thus, the task of school to improve the health of their students in school can be helped by the role of the little doctor. In addition, the cost of energy to improve health can be prevented by the existence of these little doctor, because they are voluntary health assistance workers who do not need to be paid.

The continuation to maintain good health behavior patterns will be sustainable, where teachers can educate new doctors as health assistance if older doctors move to school for continuing to junior high school. So that the resources will be little doctor in schools will never be lacking. By empowering schools that involve little doctor, the pattern of health behaviors that have been fostered can be maintained and evaluated on an ongoing basis. This has been proven in this study where a three-month evaluation of tooth brushing patterns in schools takes place every day with the supervision of a small doctor and their teacher. So that the health behaviors of students in oral and dental care can be maintained, diseases caused by poor oral care can be prevented, so that it can indirectly reduce children's morbidity due to toothache or tartar. Brushing your teeth regularly can reduce the incidence. gum disease and therefore can keep teeth longer (Nyandindi, Milen, Palin-palokas, & Robison, 1996; Sekhar et al., 2014). With a healthy mouth makes children free to talk, eat and communicate without any dynamic disease, discomfort or inferiority complex (Kwan et al., 2005).

Empowering the school community by involving little doctor is very helpful in the implementation of health in daily life at school. School-based oral and dental health education methods were effective for improving oral hygiene in elementary school children (Jain et al., 2016). So that this can be an example for other schools to conduct education with the empowerment of little doctor in schools. In addition, coordinating efforts need to be increased between school personnel, parents of professional education, and health professionals to ensure the long-term benefits of the program. (Bhardwaj et al., 2013), so that the program can be guaranteed its sustainability.

CONCLUSION AND RECOMMENDATION

Based on the results of the study it can be concluded that the school-based education program is effective in improving oral health both for little doctor and for other students.

Coaching, collaboration, and ongoing evaluation are needed for the continuation of the teeth brushing program in schools, both from the Puskesmas and the UPTD education supported by the Bandung Regency Government.

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Conflict of interest

There is no conflict of interest in this research.

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