Dental Public Health Warrior Project: Attempt to Increase Awareness of Preschool Children's Dental Health

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Dental Public Health Warrior Project: Attempt to Increase Awareness of Preschool Children's Dental Health

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Abstract

The Dental Public Health Warrior (DPHW) project is a social activity which provides a creative, fun, and interactive dental health education throughout kindergarten and elementary schools in Keputih-Surabaya, Indonesia. The aim of this study was to determine the effectivity of those projects in increasing the awarness of preschool children's dental health.

This is a pre experimental study, the ethical approval for this study has been obtained. Subjects are 462 children age 4–5 years in Keputih from 2015 to 2017. All subjects were educated by the DPHW team, pretest and post test were performed and and def-t score was collected by a calibrated dentist at the same time. Def-t data were analyzed by Kruskal-Wallis and Mann-Whitney tests. The percentage of children with free caries decrease in 2016, (from 3.3% to 3,2%) and increase in 2017 (8,3%).

There's significant difference among def-t variable (p= 0,101). There is signficant difference from pre-test to post-test in 2015 (p= 0,006), 2016 (p=0,001) and 2017 (p=0,002). The DPHW can be effectively used to increase the awareness of preschool children's dental health in Keputih-Surabaya, in Indonesia.

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Introduction

The most common dental disease suffered by children worldwide is dental caries, and Indonesia is not exempted. Indonesia is a developing country, but the prevalence of dental caries is still very high. That is, 50-70% of the Indonesian population have experienced in dental caries, such as those living in Surabaya City.[1]

Preschool children mostly suffered from dental caries. Factors that caused children's caries include level of education.[2] The Indonesian law about health center (Puskesmas) stated that public health education is one of the health center's medical team responsibilities.[3] In fact, the medical teams in most health centers in Indonesia are very limited; thus, public health educations were very difficult to perform optimally.[4]

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Keputih area is the largest area in Sukolilo-Surabaya. Keputih Health Center is responsible for 16.980 citizens's oral and dental health.[5] It has only 3 dentists and one of the dentist is the head of the health center itself who spends most of her job in management area rather than being a functional dentist.[6] Based on survey, oral and dental health education in Keputih Health Centre only can be performed once a year because of limited human resources. To realize their programs usually health center were helped by local people or local institution such as university.

Considering such that problems, as part of dental public health community, we made a social project named Dental Public Health Warrior (DPHW). DPHW is a social project which provides creative, fun, and interactive dental health education throughout kindergarten and elementary schools in Keputih-Surabaya in Indonesia every 6 months. In this project, creativity means that our team made education media using our own hands based on our creativity, and we made them as attractive as we can, such as huge dental model, puppet show, and stage act with costume. Fun and interactive

means children are allowed to join our activities, such as dancing and singing, brushing teeth, and palying games with prizes. The aim of this project is to help the government in increasing the awarness of children's dental health in the Keputih area. Therefore, the aim of this study was to determine if such project is effective in increasing the awareness of preschool children's dental health in Keputih based on the def-t index and pre-test post-test score.

Figure 1. Dental public health warrior educated Children with creative, fun and interactive activities.

Methods

This is a pre experimental study (one group pretest posttest only design) and the ethical approval for this study has been obtained. The subjects are children age 4–5 years from eight kindergardens in Keputih from 2015 to 2017. There were a total of 462 children, that is, 151 children in 2015, 154 children in 2016, and 157 children in 2017. Different children were studied in each year but still have same inculsion criteria. The inclusion criteria are: children age 4-5 years old, children with deciduous teeth only (permanent not eruption yet) and children who have never been given dental health education by health education team from any health services before. The knowledge level and def-t score were variables in this experiment. We obtained permission from the principal of each school and arranged the schedule of the health education activity and the experiment. Informed consent and explanation of research sheet were distributed to all parents. On the day of the activity, all subjects had to answer the pre-test before educated by the DPHW team. After being educated all the subjects had to answer the post-test. The same questions were being used in pre test and post-test. There are 10 questions about general dental health and the maximum score of the test is 20. def-t score of each subject was collected by a calibrated dentist at the same time. All dentists were calibrated using Cohen's Kappa.

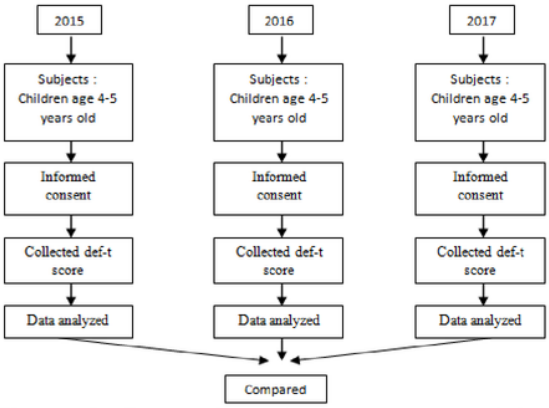

Figure 2. Research method to compare def-t index

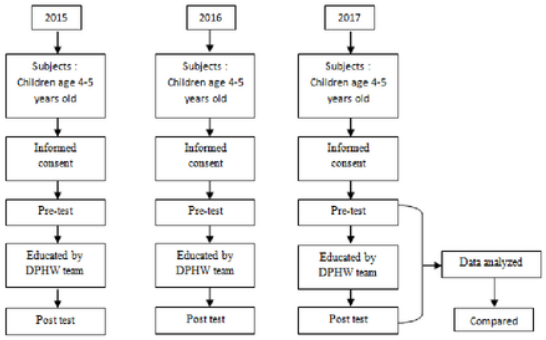

Figure 3. Research Method to Compare Pre-test and Post-test

All data in def-t variable were analyzed by Kruskal-Wallis and Mann-Whitney tests to found differences between them. All pretest and posttest data were analyzed by paired t-test.

Results

The percentage of children with caries is shown in **Table 1**. In 2015, only 3.3% of children were free from caries. In 2016, the proportion children free from caries decreased from 3.3% to 3.2%. In 2017, the proportion of children free from caries increased from 3.2% to 8.3%. **Table 2** shows the mean of def-t score from 2015 to 2017. The trends showed the decrease in def-t score from 2015 to 2017. The Kruskal Wallis analysis (**Table 3**) showed there are no significant difference in def-t variable (p=0.101).

To find the differences in each year, Mann-Whitney analysis was performed and theresultshowed in **Table 4**. There is significant difference in def-t variable between 2015 and 2017 (p=0,042), but there are no significant differences between 2015 and 2016 (p=0.581) and 2016 and 2017 (p=0.120).

To check the effectivity of the dental health education, pre-test and post-test was performed. The trends in **Table 5** showed increased from pre-test to post-test in each year. The differences in each year showed in **Table 6** as the result of paired t-test. There is signficant difference from pre-test to post-test in 2015 (p= 0,006), 2016 (p=0,001) and 2017 (p=0,002).

Year	Caries		Caries Free		Total
	n	Percent	N	Percent	
2015	146	96.7 %	5	3.3 %	151
2016	149	96.8 %	5	3.2 %	154
2017	144	91.7 %	13	8.3 %	157
Total	439	95 %	23	5 %	462

Table 1. Proportion of children with caries from 2015 to 2017

Year	n	$\overline{X}$ ± SD
2015	151	4.89 ± 2.86
2016	154	4.71 ± 2.73
2017	157	4.33 ± 2.61
TOTAL	462	

Table 2. Mean of def-t in 2015–2017

	N	Sig
Def	462	0.101

Table 3. Kruskal-Wallis analysis

Year	Sig		
	2015	**2016**	**2017**
2015	-	0.581	0.042
2016	0.581	-	0.120
2017	0.042	0.120	-

Table 4. Mann-Whitney analysis (def)

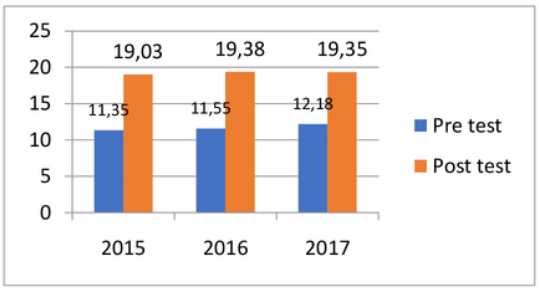

Table 5. Trends of Pre-test and post-test score

Year	N	Sig
2015	151	0,006
2016	154	0,001
2017	157	0,002

Table 6. Paired t-test analysis of pre-test and post-test score

Discussion

The results from this study showed that more than 90% of children in Keputih-Surabaya aged 4–5 years had experience caries. The proportion of children free from caries in Keputih-Surabaya far from oral health goals that had been formulated by WHO and FDI in 2000, which stated that 50% of children age 4-6 years had should be free of dental caries.[7] The fact, that high prevalence caries in children are not followed by health programs such as early education in preschool aged children. Proven in this study, it wasn't difficult to find the subjects who have never been given any dental health education because it very rarely done in this area. DPHW is the first dental health educator who educated pre school age children in this area. This is one of the shortcomings in this study, because the subjects cannot compared DPHW project with another project or method. The increase of caries-free numbers in 2017 cannot be ascertained whether it is a direct effect of the DPHW program but it is probable that the more frequent we educate children, information can spread more widely whether to their younger siblings, their parents, the children of the teachers, etc.

There are many ways to give ducation to children.[8] The education's level of successis influenced by the right methods and attractive packaging in the delivery of the message.[9] De Porter says from quotes derived from Dr. Vernon A Magnesen, that 10% we learn from what we read, 20% we learn from what we hear, 30% we

learn from what we see, 50% we learn from what we see and hear, 70% we learn from what we say, and 90% we learn from what we say and we do.[10] The lecture method is considered effective to use for listeners who are not more than ten people but often arise boredom if the story that we convey is less attractive.[11] What was done by our team was to provide education with puppet stage, role playing, singing and dancing together interactively which was interspersed with a tooth brushing demo. Children not only see and hear but also say and do. Table 5 and 6 showed the increased score from pre-test to post-test which means this method was effectively used. Further, increasing knowledge was not enough, it must be followed by changes in behaviour.

Conclusion

The goal of this project was achieved, increase the awareness of preschool children's dental health by increase their knowledge. Further reasearch is expected to see the changes in children behaviour so that the education method can keep develops.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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