Independence of Brushing Teeth to Free-Plaque Score in Preschool Children: A Cross Sectional Study

Ngatemi[1], Tedi Purnama[1], Ni Nyoman Kasihani[1]

[1]Lecturer, Departement of Dental Health Ministry of Health Polytechnic Jakarta I, Indonesia

Abstract

Preschool children do not yet have independence in maintaining oral hygiene, especially brushing teeth. Bad oral hygiene causes plaque accumulation, where brushing teeth is a simple act of removing plaque and food debris with a toothbrush and toothpaste, because plaque and food debris are the main causes of dental caries. Purpose: This study was to determine the relationship between independence of brushing teeth to free plaque score in preschool children. Method: This type of analytic observational study with cross sectional design. The research was conducted on the students of Bintang Kindergarten in Pondok Labu Village, Cilandak District, South Jakarta. Data collection using the observation sheet brushing teeth and index free plaqu score. Data analysis using Chi-Square. Result: Less of independence in brushing teeth as many as 28 respondents (87.5%) and as many as 4 respondents (12.5%) independently brushed their teeth while the free plaque score with good criteria was 3 respondents (9.4%) and 29 respondents (90.6%) with bad criteria. Independence of brushing teeth on the free plaque score showed that the p-value was 0.001 ($p < 0.05$). Conclusion: There is a significant relationship between independence of brushing teeth on free plaque score in preschool children.

Keywords: *Independent brushing teeth, free-plaque score, preschool*

Introduction

Dental caries is a dental disease that is often experienced by preschool children. Dental caries in preschool children is commonly known as early childhood caries, because the enamel layer of primary teeth is thinner than permanent teeth, making it more susceptible to dental caries. Dental caries in Western Australian Aboriginal children especially preschool aged 1- 4 years is the number 5 disease that must be hospitalized.In Indonesia, caries children aged 5-6 yearshas a high prevalence ieamounting to 93% with a national def-t figure of 8.43. So it can be interpreted that the average preschool children has a history of dental caries as much as 8 to 9 teeth per child.[1–4]

Corresponding Author:
Tedi Purnama
Departemen of Dental Health, Health Polytechnic of Jakarta I, Wijaya Kusuma Raya Street, No. 47, Jakarta, Indonesia Email: tedypurnama23@yahoo.com

The condition of damaged teeth due to dental caries will result in many problems that will arise, namely missing teeth as a result of damaged teeth or untreated trauma, will interfere with the function and activity of the oral cavity, so that it will affect nutritional status and will have an impact on quality of life. During childhood, these conditions will have an impact on their growth and development and have an impact on their future lives.[5–7]

The high rate of oral and dental disease in preschool children is strongly influenced by several factors. The main factors causing caries are the host (teeth and saliva), microorganisms, substrate and added time factor.Another factor knowledge, attitudes and behavior of parents in maintaining the health of their children's teeth and mouth.Bad oral and dental hygiene causes the accumulation of plaque which contains various kinds of bacteria, including streptococcus mutans as the main cause of caries.[8–10]

Brushing teeth is a simple act of removing plaque and food debris with a toothbrush and toothpaste,

because plaque and food debris are the main causes of dental caries. In Indonesia, it shows that the behavior of brushing teeth of people aged ≥ 3 years is 2.8% who are brushing their teeth properly.[4,11]

Brushing teeth in children must be done in everyday life without feeling forced. The ability to brush your teeth properly and correctly is an important factor for oral health care. Research by Purnama et al. proves that preschool children do not yet have independence in brushing their teeth at school; Ngatemi also proved that in brushing the teeth of world-aged children they do not have independence at home.[7,12,13]

Preschool children are those aged 4-6 years. Preschool children are also called the phase of individual development. In this phase, the child begins to have an awareness of himself as a man or woman, can regulate himself in brushing his teeth, defecating and recognizing some things considered dangerous or injuring him. One of the children's independence can be seen through daily activities, namely instilling independence in early childhood through cleanliness. The independence of preschool children can be done like brushing their own teeth.[13–15]

Several studies have shown that Razi et al showed the mean value of self-brushing teeth at a kindergarten in Jambi City of 4.34, which means that early childhood does not have the independence to brush their teeth. Research by Zulfikri show that the plaque index score of children with moderate criteria is 31 people (51.7%), with bad criteria of 29 people (48.3%), and very good criteria (0%) and good criteria. (0%) because there are no students who have very good criteria and good criteria. So it can be interpreted that early childhood who are not independent in brushing their teeth have a worse dental hygiene status than those who are independent.[16,17]

Method

This study is an observational study with a cross-sectional design. The research was conducted on the students of Bintang Kindergarten in Pondok Labu Village, Cilandak District, South Jakarta in February 2020. The research sample was taken using a total sampling technique, as many as 32 people. The independent variable in this study was the independence of brushing teeth and the dependent variable was the dental hygiene status of preschool children (free-plaque score).

Data collection on independence of brushing teeth was measured by checking teeth brushing, validity and reliability tests had been carried out by the same previous researcher who examined tooth brushing independence Dental hygiene status was measured by standard dental hygiene checks, namely the free plaque index.[13,18]

The stages of the activity include: before examining the child, the guardian / parent fills in the inform concern sheet first as an agreement that he is willing to be a research respondent. Then perform plaque index checks on all children in turn and observe tooth brushing.

Data analysis was performed using the SPSS statistical program for univariate analysis and presented in the form of a frequency distribution. After that was donebivariate analysis with chi-square to measure the relationship of tooth brushing independence to the free plaque score of preschool children.

Result

Table 1. Frequency distribution of respondent characteristics

No.	Variable	N	Percentage (%)
1	Age		
	4 years	1	3.1
	5 years	9	28.1
	6 years	22	68.8
	total	32	100
2	Gender		
	Man	15	46.9
	Women	17	53.1
	total	32	100

Table 1 shows that most respondents in the study were from the age of 6 years (68.1%) with female gender, namely 17 respondents (53.1%).

Table 2. Frequency distribution of independent brushing teeth

No.	Independent brushing teeth	N	Percentage (%)
1	Less Independent	28	87.5
2	Independent	4	12.5
Total		32	100

Table 2 shows that respondents who less independence were 28 respondents (87.5%) and those who had the independence to brush their teeth were 4 respondents (12.5%).

Table 3. Frequency distribution of free-plaque score

No.	Free plaque score	N	Percentage (%)
1	Good	3	9.4
2	Bad	29	90.6
	Total	32	100

Table 3 shows that respondents with good free plaque score criteria were 3 respondents (9.4%) and as many as 29 respondents (90.6%) with bad free plaque score criteria.

Table 4. Results of the chi-square analysis of tooth brushing independence on the free plaque score

Independence	Free plaque score				Total		OR (95% CI)	p-value
	Good		Bad					
	N	%	N	%	N	%		
Less Independent	0	0	28	100	28	100	0.773- 21.83	0.001
Independent	3	75	1	24	4	100		
Total	3	9.4	29	90.6	32	100		

Table 4 the results of the chi-square analysis of independence of brushing teeth on the free plaque score, shows that the p-value is 0.001 ($p < 0.05$), meaning that there is a significant relationship between the independence of brushing teeth on the free plaque score.

Discussion

The results obtained showed that the majority of respondents who lacked independence were 28 respondents (87.5%). This is because the majority of respondents did not pass the observation sheet brushing skills numbers 5, 8 and 9. Checklist no 5, namely the front surface of the teeth with a movement following the direction of tooth growth, if the upper teeth move up and down and the lower teeth move from the bottom up. Checklist number 8 is brushing your teeth with a gouging motion on the inside of the teeth and checklist number 9 is cleaning the surface of the tongue, meaning that the children at Kindergarten Bintang in Pondok Labu Village can only brush their teeth with back and forth and circular motions

It is reinforced by Arianto et al. that the lack of knowledge from children about tooth brushing techniques can affect children's independence. There are several factors that can cause a person's lack of knowledge, including limited information and low awareness of the importance of oral and dental hygiene. The results of the study are also in line with the results of research conducted by Nuraini showing that respondents have category independence good, namely as many as 15 people (65.2%) lack of independence, namely 1 person (4.3%). Another study, Razi et al Having the independence of brushing your teeth, it can be interpreted that both the research conducted by the researcher and the relevant research show that both of them do not have the independence of brushing their teeth.[12,16,19,20]

The results of the free plaque score study showed that the majority of respondents were 29 respondents (90.6%) with bad criteria free plaque score. This is not much different from the results of Zulfikriresearch which shows that most of the dental and oral hygiene status of children with moderate criteria is 31 people (51.7%). Brushing teeth is the most important effort to prevent or reduce the formation of plaque on the tooth surface. Brushing your teeth is a mechanical way to remove plaque. Brushing teeth aims to clean soft deposits on the surface of the teeth and gums and is a preventive measure towards the success and optimal health of the oral cavity.[17,18]

The results of the chi-square analysis of independence of brushing teeth on the free plaque score showed that the p-value was 0.001 ($p < 0.05$), meaning that there was a significant relationship between the independence of brushing teeth on the free plaque score. This is due to the absence of a routine tooth brushing program every day at school so that children do not have the habit of brushing their teeth.

According to the Ministry of Health it is necessaryimplementing self-care practices in schools with the implementation of brushing teeth every day at school.In addition, every school does not have tooth brushing equipment (toothbrush, toothpaste and mouthwash) stored in school. Brushes, toothpaste and mouthwash glasses as well as a personal storage place can make it easier for children to take and store toothbrushes without the help of others. Strengthened by Purnama et al. states that facility support is one of the successes of the dental health program in schools.Sari et al. research proves that brushing skills can also affect oral and dental hygiene.[6,21,22]

Reinforced by Arianto et al. that proper and correct brushing skills are quite important factors for oral and dental hygiene. Another opinion of Putri et al. also states that brushing teeth is a mechanical way to clean plaque. Brushing the teeth aims to clean the soft deposits on the surface of the teeth and gums and is a preventive measure towards the success and optimal health of the oral cavity.[12,18]

Conclusion

Based on the research results, it can be concluded that:

1. Independence in brushing teeth, most preschool children do not have independence

2. Free plaque score, most preschoolers have bad free plaque score criteria

3. There was a significant relationship ($p < 0.001$) between the independence of brushing teeth and the free plaque score.

Acknowledgement: This study was done by self-funding from the authors.The authors thank to all

partisipants and research assistans

Conflict of Interest: The authors declare that they have no conflictinterests.

Ethical Clearance: All participants were signed the informed consent prior to the data collection.

References

1. Purnama T, Fadjeri I, Widiyastuti R. Model Mentoring Teachers and Parents as an Efforts for Brushing Teeth Behavior in Preschool Children. Indian J Forensic Med Toxicol. 2020;14(4):3511–6.
2. Purnama T, Rasipin R, Ngatemi N. Tedi's Behavior Change Model To Improving Brushing Teeth Behavior Parents. J Appl Heal Management Technology. 2020;2(1):1–12.
3. Dogar F, Kruger E, Dyson K, Tennant M. Oral health of pre-school children in rural and remote Western Australia. Rural Remote Health. 2011;11(4):124.
4. Kemenkes RI. Hasil Utama Riset Kesehatan Dasar Tahun 2018. Kementrian Kesehatan Republik Indonesia. 2018;1–100.
5. Sari DN, Laela DS, Restuning S. Tingkat Pengetahuan Orang Tua Dengan Kejadian Nursing Bottle Caries. JDHT J Dental Hygiene Therapy. 2020;1(2):40–4.
6. Purnama T, Rasipin R, Santoso B. Pengaruh Pelatihan Tedi's Behavior Change Model pada Guru dan Orang Tua terhadap Keterampilan Menggosok Gigi Anak Prasekolah. Quality J Kesehatan. 2019;13(2):75–81.
7. Ngatemi, Purnama T. Dental Health Handbook as Parents Monitoring in the Formation of Independence for Brushing Teeth in Early Childhood. Exec Ed. 2020;11(01):766.
8. Van Loveren C, Broukal Z, Oganessian E. Functional foods/ingredients and dental caries. Europan Journal Nutrition. 2012;51(2):15–25.
9. Naidu R, Nunn J, Irwin JD. The effect of motivational interviewing on oral healthcare knowledge, attitudes and behaviour of parents and caregivers of preschool children: an exploratory cluster randomised controlled study. BMC Oral Health. 2015;15(1):1–15.
10. Kawashita Y, Kitamura M, Saito T. Early childhood caries. Int J Dent. 2011;2011.
11. Purnama T, Rasipin N. Tedi's Behavior Change Model to Improving Brushing Teeth Behavior Parents. J Appl Heal Manag Technol. 2020;2(1):1–12.
12. Arianto A, Shaluhiyah Z, Nugraha P. Perilaku Menggosok Gigi pada Siswa Sekolah Dasar Kelas V dan VI di Kecamatan Sumberejo. J Promosi Kesehat Indones. 2014;9(2):127–35.
13. Purnama T, Ngatemi N, Sofian R, Kasihani NN, Pudentiana, Nurbayani S. Model 5 days gosgi sebagai upaya pembentukan kemandirian menggosok gigi anak usia dini di sekolah. Quality J Kesehatan. 2020;14(1):19–24.
14. Doi Y, Ishihara K, Uchiyama M. Reliability of the strengths and difficulties questionnaire in Japanese preschool children aged 4–6 years. J Epidemiology. 2014;24(6):514–8.
15. Garaigordobil M, Berrueco L. Effects of a play program on creative thinking of preschool children. Span J Psychol. 2011;14(2):608–18.
16. Razi P, Marlia L. Pengembangan Model Pelayanan Asuhan Keperawatan Gigi dengan Pola Asah, Asih dan Asuh pada Anak Usia Dini. J Bahana Kesehat Masy (Bahana J Public Health. 2017;1(2):140–9.
17. Zulfikri Z, Huda ZI. Hubungan Indeks Kebersihan Gigi dan Mulut dengan Indeks Karies Gigi Pada Murid Sdn 03 Pakan Kurai Kecamatan Guguk Panjang Kota Bukittinggi. J Kesehatan Gigi. 2017;4(1):55–62.
18. Hiranya MP, Eliza H, Neneng N. Ilmu pencegahan penyakit jaringan keras dan jaringan pendukung gigi. Jakarta EGC. 2011;104.
19. Hardianti H. Pengaruh Penyuluhan Melalui Metode Simulasi dan Audiovisual Terhadap Tingkat Keterampilan Menggosok Gigi pada Murid SD Inpres Cambaya IV. Universitas Islam Negeri Alauddin Makassar; 2017.
20. Nuraini N, Khusnal E. Pengaruh Penyuluhan Kesehatan Melalui Audio Visual terhadap Kemandirian Gosok Gigi pada Anak Prasekolah di TK ABA Tegalsari Yogyakarta. STIKES'Aisyiyah Yogyakarta; 2015.
21. Kemenkes RI. Pedoman Usaha Kesehatan Gigi Sekolah (UKGS). Jakarta Kementeri Kesehatan RI. 2012;

22. Sari SAN, Efendi F, Rachmawati PD. Pengaruh Pendidikan Kesehatan Metode Simulasi Menggosok Gigi Teknik Modifikasi Bass dengan Ketrampilan dan Kebersihan Gigi Mulut pada Anak Mi At-Taufiq Kelas V. Indones J Community Heal Nurs. 2012;1(1).