The differences of caries prevalence and caries index of children in primary school with UKGS and without UKGS in Kota Batam

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ABSTRACT

The purposes of this research were to describe the caries prevalence and caries index of children in primary school with UKGS (SD Kartini I) and without UKGS (SD 009 Bulang) in Kota Batam. Total samples of this research was 193 persons, it is consist of 107 persons from SD Kartini I and 86 persons from SD 009 Bulang. The Chi Square Test and U Mann-Whitney Test were conducted in this research. The statistical analysis was significant for caries prevalence between children in primary school with UKGS and without UKGS with χ^2_{table} = 2,71 and $\chi^2_{calculate}$ = 3,73, whereas def-t index between children in primary school with UKGS and without UKGS was significant with - Z_{table} = -1,96 and $Z_{calculate}$ = -2,91 with α = 0,05. The DMF-T index between children in primary school with UKGS and without UKGS was significant with Z_{table} = 1,96 and $Z_{calculate}$ = 6,32 with α = 0,05. The conclusions of this study indicate that there were differences of caries prevalence and caries index between children in primary school with UKGS and without UKGS.

Key words: caries prevalence, caries index, UKGS

INTRODUCTION

It is important to understand that the presence of cavity in teeth is a sign of bacterial infection. Dental caries is the form of bacterial infection that occurs in teeth. Dental caries is defined as an infectious microbiologic disease of the teeth which results in localized dissolution and destruction of the calcified tissues.[1]

According to The Health Profile of Teeth and Mouth in Indonesia of Pelita V, caries prevalence in Indonesia is still high. It is reported that caries prevalence is 90,90% and mean of DMFT is 6,44, which means every people may have 6 to 7 teeth which are decayed, missing, or filled due to caries.[2] In Indonesia, children age 4 to 5 years old in urban area are 90,5% affected by caries with def-t 7,92, whereas in rural area are 95,9% affected by caries with def-t 7,98.[3] It shows that children living in urban area still highly affected by caries.

According to Direktorat Kesehatan Gigi[4], UKGS (Usaha Kesehatan Gigi Sekolah) is part of UKS (Usaha Kesehatan Sekolah). UKGS program improves health of teeth and mouth for primary school children. UKGS program includes prevention program (promotion and prevention) and curative program (rehabilitative).[5] UKGS program in primary school is aimed to decrease the caries prevalence of primary school children.

There is uneven distribution of health services in Kecamatan Bulang. The location is far from the city and it is difficult to access due to limited transportation which can access this kecamatan. People who live in Kecamatan Bulang

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only use sampan as transportation. Majority of people who live in Kecamatan Bulang are classified as low socioeconomic class. Most of them work as fishermen. Sekolah Dasar (SD) 009 Bulang is the only primary school located in Kecamatan Bulang, Kota Batam. The school is based on national curriculum. SD 009 Bulang does not have a special program for dental health care which is known as UKGS (Usaha Kesehatan Gigi Sekolah). The location of school is also far from the nearest puskesmas and it is never visited by dental professionals, the level of dental care awareness of students in SD 009 Bulang is not monitored well. Children in SD 009 Bulang never have a dental filling, only extraction is performed. Amount of dental extractions performed on permanent tooth of primary school age children in Kecamatan Bulang is 230 from 4524 children.[6] Not only dental health education and examination are important to improve and increase the awareness of their dental health status, but also proper health services should be provided for this community.

Kecamatan Sekupang is one of the kecamatan located in Kota Batam. People of Kecamatan Sekupang are classified from low to high socioeconomic class. SD Kartini I is one of the schools located in Kecamatan Sekupang, Kota Batam. SD Kartini I already has UKGS and the location of school to the nearest hospital with approximate 4,5 kilometers in distance which is quite accessible. The proper health services have been already provided for this community. From the data collected it shows that amount of dental filling and extraction are performed on permanent tooth of primary school age children in Kecamatan Sekupang is 507 from 9378 children.[6]

The objectives of this research are to know the differences of caries prevalence and caries index of children in primary school with UKGS (SD Kartini I) and without UKGS (SD 009 Bulang) in Kota Batam.

MATERIALS AND METHODS

The type of research is descriptive with survey technique. The criterias of population sampling are: children who are healthy with no congenital defect, children who are approved by their parents to participate in this research, children who are present on the day of research children who have teeth in their mouth, children who are selected from random sampling. Total samples are 407 children, it consist of 107 children in primary school with UKGS (SD Kartini I) and 86 children in primary school without UKGS (SD 009 Bulang). First research is performed on Wednesday 11th June 2008 at SD Kartini I Sekupang. The second research is performed on Thursday 12th June 2008 at SD 009 Bulang. Materials of this research are mouth mirror, explorer, tweezers, excavator, gloves, mask, informed consent form, teeth and mouth examination form, questionnaire, pen, cotton pellet, cotton roll, and 70% alcohol. The collected datas are then analyzed to get result and conclusion.

$$Caries\ Prevalence = \frac{\text{Number of individual affected by caries}}{\text{Number of individual examined}} \times 100\%$$

$$def\text{-}t\ Index = \frac{\text{Number of def-t tooth}}{\text{Number of individual examined}}$$

$$DMF\text{-}T\ Index = \frac{\text{Number of DMF-T tooth}}{\text{Number of individual examined}}$$

RESULT

Results of this research consist of caries prevalence and caries index of 107 children in SD Kartini I and 86 children of SD 009 Bulang.

From the statistic analysis of caries prevalence using Chi Square Test, it is concluded that there is a difference of caries prevalence between of children SD Kartini and SD 009 Bulang.

$\chi^2_{calculate} > \chi^2_{Table}$ ($\chi^2_{calculate}$=3,73 and χ^2_{Table}=2,71).

From the statistic analysis of def-t index using U Mann-Whitney, it is concluded that there is difference of def-t index between children of SD Kartini I and SD 009 Bulang.

$-Z_{Table} > Z_{calculate}$ ($-Z_{Table}$=-1,96 and $Z_{calculate}$=-2,91).

From the statistic analysis of DMF-T index using U Mann-Whitney, it is concluded that there is difference of DMF-T index between children in SD Kartini I and SD 009 Bulang.

$Z_{calculate} > Z_{Table}$ ($Z_{calculate}$ = 6,32 and Z_{Table} = 1,96).

Table 1. Samples Distribution of SD Kartini I and SD 009 Bulang

Grade	SD Kartini I	SD 009 Bulang	Total (n) Person
	Sample (n) Person	Sample (n) Person	
1	14	14	28
2	32	14	46
3	35	17	52
4	8	11	19
5	18	19	37
6	0	11	11
Total	107	86	193

Table 2. Caries Prevalence of Children in SD Kartini I and SD 009 Bulang

School Name	Total (n) (Person)	Children Affected with Caries (n) Person)	Caries Prevalence (%)
SD Kartini I	107	98	91.59%
SD 009 Bulang	86	85	98.84%

Table 3. def-t Index of Children in SD Kartini I and SD 009 Bulang

School Name	Total				def-t Index
	d	e	f	def	
SD Kartini I	128	85	3	216	2.02
SD 009 Bulang	176	166	0	349	4.06

DISCUSSION

Based on the results, it shows that caries prevalence of children in SD Kartini I and SD 009 Bulang are 91,59% and 98,84%. Based on World Health Organization (WHO), DMF-T index of SD Kartini I students is low (2,54) while DMF-T index of SD 009 Bulang students is high (4,51). def-t index of SD Kartini I students is low (2,01), on the other hand def-t index of SD 009 Bulang students is moderate (4,05). Low socio-economic status children had a higher mean dmft and DMFT indices than high socioeconomic status children.[7]

Ling[8] stated that frequency of tooth brushing has an impact on dental caries experience. Results of questionaire stated that majority of student brush their teeth everyday. 97,20% respondents of SD Kartini brush their teeth everyday while 84,88% respondents of SD 009 Bulang do. Frequency of tooth brushing varies from respondents of SD Kartini I and SD 009 Bulang. 67,29% respondents of SD Kartini I brush their teeth twice a day while 50% respondents of SD 009 Bulang brush their teeth three times in a day. Time of tooth brushing also shows that 60,75% respondents of SD Kartini I brush their teeth while showering whereas 60,47% respondents of SD 009 Bulang brush their teeth after having meals and before sleeping at night.

Dental floss, toothpick and mouthwash are often used as an aid for tooth brushing. Dental floss is a waxed or plain thread of nylon or silk used to clean the interdental areas.[9] A toothpick is a wooden sliver used to cleanse the interdental space.[9] Mouthwash or mouth rinses are products which posessing cleansing, germicidal, or palliative properties.[9] Dental floss, tooth pick, and mouthwash often are used as aid for tooth brushing. Majority children of SD Kartini I and SD 009 Bulang are not using other aids for tooth brushing. 58,88% respondent of SD Kartini I stated that they do not use other aids during tooth brushing and cleaning, and 79,07% respondents of SD 009 Bulang answered the same.

Newman, et al[10] stated that any methods of tooth brushing technique can provide excellent plaque control if it is properly performed. There are many techniques can be implemented for tooth brushing, according to the pattern of brushing motion there are few methods that can be implemented during tooth brushing, they are: roll method or also known as modified Stillmann technique, Bass techniques, circular or Fones techniques, vertical or Leonard technique, and horizontal or scrub technique. 42,06% respondents of SD Kartini brush their teeth horizontally while 63,96% respondents of SD 009 Bulang brush their teeth vertically. 58,88% respondent of SD Kartini stated that they clean all surfaces of teeth during tooth brushing, while 80,23% respondent of SD 009 Bulang stated that they only brush the inner and outer part of tooth. 64,49% respondents of SD Kartini stated that they never get dental health education at school while 83,72% respondents of SD 009 Bulang answered the same.

57,94% respondents of SD Kartini I stated that they have experienced toothache and 97,67% respondents of SD 009 Bulang have the same experience. Caries is the major cause of toothache from students of both schools. 90% children age 0 to 16 years old in Indonesia are affected by caries. Caries can easily result early exfoliation of the

primary tooth which may lead to malocclusion.[11] 69,49% respondents of SD Kartini go to Puskesmas (Pusat Kesehatan Masyarakat) to overcome their teeth problems, whereas 52,32% respondents of SD 009 Bulang take medication to lessen the pain.

75.58% respondents of SD 009 Bulang never visit dental clinic whereas 46,73% respondents of SD Kartini I only visit the dentist when they are having toothache. The majority reason why respondents of SD Kartini seldom visit the dentist because they do not experience toothache. The respondents of SD 009 Bulang state that the location of dental office that is far from their home is the major reason why they never or seldom visit the denti. Zatnika (2008)[12] stated that teacher and parents should encourage the children to go for dental check up at least once in 6 months.

75,70 % respondents of SD Kartini state that their father's education is >SMU while 75,58% respondent of SD 009 Bulang state that their father's education is until SD-SMP. 56,07% respondents of SD Kartini state that their mother's education is >SMU while 76,74% respondents of SD 009 Bulang state that their mother's education are until SD-SMP. 57,94% respondents of SD Kartini said that their father work as government officer while 88,37% respondents of SD 009 Bulang said their father work as a fisherman. Family income also significantly differentiates one group to another. 92,52% respondents of SD Kartini said that their monthly income of the family is more than Rp1.500.000,00 while 88,37% respondents of SD 009 Bulang stated that their monthly income of the family is lower than Rp500.000,00. Low income groups and those with lower education are prone to suffer from severe dental disease.[13]

Majority respondents of SD Kartini and SD 009 Bulang are often consuming staple food, side dish, milk, sweet snacks, fruit, and vegetables. Even though the type of food may vary from one to another. Almost all respondents of SD Kartini and SD 009 Bulang consume rice as their staple food. 97,67% respondents of SD Kartini are often consume eggs as their side dish while 87,21% respondents of SD 009 Bulang are often consume fish as their daily side dish. 69,16% respondents of SD Kartini are often consume spinach as their daily vegetables while 67,44% respondents of SD 009 Bulang are often consume kangkung as their daily vegetables. Orange is the fruit which majority consumed by respondents of SD Kartini and SD 009 Bulang. Cow's milk is the milk which majority consumed by respondents of SD Kartini and SD 009 Bulang beside goat's and soy milk. According to research performed by Petti, et al[14], milk contains both of caries preventing substances (calcium, phosphate, antibacterial substances) and a potentially caries inducing substances.

In vitro studies show that milk components reduce enamel solubility, promote its remineralization, and prevent the adehesion of mutans streptococci to the tooth surface. Milk has a caries preventive effect, it shows significantly on those subjects with a high daily sucrose consuming frequency. Ice cream is the favorite sweet snacks for respondents of SD Kartini and SD 009 Bulang, followed by chocolate, candy, and soda drinks. Sweet snacks consist of large amount of sucrose. Sucrose acts as cariogenic subtances. Minimizing consumption of cariogenic substance is one of the efforts to prevent formation of caries.[15] It should be noted that sweet snacks between meals can result in almost continous acid attack on the tooth surface.

19,63% respondents of SD Kartini stated that they gargled after consuming sweet snacks while 32,56% respondents of SD 009 Bulang answered the same. Brushing teeth after a solid meal and gargle after a sweet drink are some examples of how to keeps your teeth healthy.[16]

CONCLUSION

Based on the research performed, it could be conclude that there are differences of caries prevalence and caries index of children in primary school with UKGS (SD Kartini I) and without UKGS (SD 009 Bulang).

REFERENCES

1. Roberson TM, Heymann HO, Ritter AV. Sturdevant's art & science of operative dentistry. 4th ed. St Louis: C.V. Mosby Co: 2002. p. 65-6,90,92.
2. Depkes RI. Profil kesehatan gigi dan mulut di indonesia. Dirjen pelayanan medik Depkes RI. Jakarta: 1996.
3. Koloway B, Kailis DG. Indonesia Oral Disease Prevalence.[cited 2008 Oct 21]. Avalaible

from:http://www.whocollab.od.mah.se/searo/indonesia/data/indonesiacar.html.
4. Direktorat kesehatan gigi. Penuntun pelaksanaan usaha kesehatan gigi sekolah. Dirjen pelayanan medik depkes RI. Jakarta: 1997.
5. Direktorat kesehatan gigi. Penuntun pelaksanaan usaha kesehatan gigi sekolah. Dirjen pelayanan medik Depkes RI. Jakarta: 1994.
6. Dinas kesehatan kota batam. Pelayanan kesehatan gigi dan mulut di puskesmas Kota Batam: 2006.
7. Villa AE, Guerrero S. Caries experience and fluorosis prevalence in Chilean children from different socio-economic status. 1996. [cited 2008 Oct 21]. Avalaible from:http://grande.nal.usda.gov/ibids/index.php?mode2=detail&origin=ibids_references&therow=15069.
8. Zhu L, Petersen SE, Wang HY, Bian JY, Zhang BX. Oral health knowledge, Attitudes and behavior of children and adolescent in China. Int Dent J 2003:289-98.
9. Mosby's dental dictionary. St Louis: C.V. Mosby Co 2004. p. 93,159,404,657.
10. Newman MG, Takei HH, Carranza FA. Carranza's Clinical Periodontology. 9th ed. Philadelphia: W.B. Saunders Co: 2002. p. 656-9.
11. Kuntari S. 90 Persen Anak Indonesia Menderita Karies Gigi. 2007 [cited 2008 Oct 10]. Avalaible from: Available from:http://www.antara.co.id/arc/2007/7/30/90-persen-anak-indonesia-menderita-karies-gigi/.
12. Zatnika I. 89% Anak derita penyakit gigi dan mulut. 2008 [cited 2008 Oct 21]. Avalaible from:http://www.depkes.go.id/index.php?option=articles&task=viewarticle&artid=323&Itemid=3.
13. Borrell LN. Study finds low socio-economic status linked to poor dental health. 2006. [cited 2008 Oct 21]. Available from:http://www.bio/medicine-news/Study-Finds-Low-Socio-Economic-Status-Linked-to-Poor-Dental-Health-6675-1/.
14. Petti S, Simonetti R, Simonetti D, Area A. The effect of milk and sucrose consumption on caries in 6 to 11 Years Old Italian school children. 2004. [cited 2008 Oct 21]. Avalaible from:http://www.springerlink.com/content/k12572q0w6l53tn6/.
15. Baron S. Medical microbiology. The university of texas medical branch at galveston. 4th ed. London: A Harcourt Health Sciences Co 2001. p. 67, 103.
16. Ismail MK. Give diet more teeth. 2002.[cited 2008 Oct 21]. Avalaible from: http://www.hinduonnet.com/thehindu/mp/2002/09/19/stories/2002091900620300.htm.