

ICASH-A07

**FACTORS AFFECTING THE OCCURRENCE CARIES DENTAL
ON ELEMENTARY SCHOOL STUDENTS IN SD N PADANGSARI II
BANYUMANIK SEMARANG**

Hermien Nugraheni^{1,2,*}, Tri Wiyatini², Maria Okta Afian²

¹ Doctoral Program of Public Health Faculty, Diponegoro University

² Health Polytechnic Ministry of Health Semarang, Jawa Tengah, Indonesia

*Corresponding author's email: hermienprajoga@gmail.com

ABSTRACT

Background: Caries is the problems that were encountered in the field of dental health. Dental caries is an important issue for school student because it not only causes complaints of pain, but also spread the infection to other parts of the body resulting in declining productivity.

This study aims to determine what factors are likely to influence the case of caries in elementary school student Padangsari II District Banyumanik 2016.

Methods: This type of research used descriptive analysis with Cross sectional. Samples in this study were 50 students in grade 5 SDN Padasari II who have dental caries remains were taken with purposive sampling method. Collecting data in this study using clinical examination and the distribution of questionnaires. The questionnaire used in this study had previously been through validity and reliability test conducted on 35 students of SDN Meteseh District Tembalang. Methods of analysis used data using statistical calculations using Linear Logistic Regression Test.

Results: The results in the region Padangsari II showed that the Plaque Index value $exp(B) = 5,667$, behavioral factors (knowledge $exp(B) = 3.000$, Attitude $exp(B) = 3.000$, factors action $exp(B) = 2,333$, salivary hydration $exp(B) = 1,520$, salivary viscosity $exp(B) = 1,500$, salivary pH $exp(B) = 1.222$. OHIS $exp(B) = 1.143$, the factor of health care $exp(B) = 0,667$, heredity $exp(B) = 0.667$, environmental factors $exp(B) = 0.429$.

Conclusion: In this study it can be concluded that the plaque index is the biggestt factor in influencing the cavity on the case if community health centers in the region Padangsari II. Because it has the highest score is $exp(B) = 5,667$.

Keywords: Caries, internal factors, external factors

INTRODUCTION

Maintenance of oral hygiene is one way to improve health [1]. In Indonesia as many as 89% of children under 12 years old suffer from gum disease. Gum disease, will affect the health of the growth process and even a child's future. Children are vulnerable to nutritional deficiencies. The pain in the teeth and mouth clearly lowers child's appetite. Another impact a child's learning ability was down so it will obviously affect the learning achievement until the disappearance of the child's future. The one of disease that common in school-age children is dental and oral diseases. Dental caries is a dental hard tissue damage that is chronic and is caused by the activity of microorganisms that lead to dental caries [2]. Increased prevalence of caries in general is influenced by two factors, namely the risk factors and factor modification [3]. Factors directly cause caries is identified as a risk factor. The risk factors consisted of oral hygiene or dental and oral hygiene, bacteria, saliva and chew patterns

modification factor is the factor that indirectly cause caries, but the effect on the development of caries. These factors are age, heredity, gender, social factors and geografis [4].

The prevalence of oral and dental problems in Indonesia in 2013 was 25.9%, while the national prevalence rate brushing teeth every day is 94.2%. In Central Java, the prevalence of oral and dental problems in 2013 was 25.4%. DMF-T index illustrates the severity of tooth decay. DMF-T Index is the sum of the index D-T, M-T, and F-T. DMF-T index increases with age. The national prevalence of DMF-T index was 4.6%. While in Central Java was 4.3% [5].

Based on the results of Preliminary Study in SD Padangsari II Banyumanik Semarang on 18-21 January 2016 with the number of 440 students showed total DMF-T on elementary students Padangsari II is 731 where D = 725, M = 0, F = 8 with an average DMF-T was 3.3 with the criteria being and total def-t was in 1605 where d = 1500, e = 60, f = 45 with bad criteria and average OHIS was 1.5 with the criteria of being where DI = 1.3 and CI = 0.2. In the calculation of the priority problems using ultrasoundgraphy methods.

The purpose of this study was to determine what are the factors that cause caries on primary school students at SDN Padangsari II Banyumanik. Semarang.

METHODS

This type of research used descriptive analysis with Cross sectional. The technique of data collection is Survey. The sample in this study were 50 students taken with purposive sampling technique. Gay formula based on the method descriptive of at least 10% of the population and for a relatively small population of at least 20% [6].

Techniques of data retrieval is done through two phases. First, to determine the internal factors. Data obtained through clinical examination directly to the respondent. On clinical examination will receive the data in the form of a state of dental caries, the salivary pH , plaque index, salivary viscosity, salivary hydration, OHIS. Data obtained from this first phase of the data collection will be affected variable data and data on variable factors influence clinical causes.

The second phase to determine the external factors. Data obtained by filling a questionnaire by the respondent with the guidance and the guidance of researchers. Data obtained from the questionnaires is a non-clinical data is a factor in the variable influences.

Causes factor analysis test in this study using logistic regression. Logistic regression is a test for risk factors used in identifying / determining the causal factors because there are elements estimate the likelihood of an effect.

Then, as the causative factor is identified, do tackle the problem of proposing an alternative plan. In determining an alternative way out usually we collided with some way out. Therefore, to find alternatives which will take precedence will be assisted by a method Rinke (MIVC) [7].

RESULTS

Based on the results of research on the factors cavities on elementary students at SDN Padangsari II Semarang after analysis testing linear logistic regression was then obtained sequences corresponding cause of the problem of cases are most at risk are as follows.

Plaque index factors has a value of exp (B) 5.667 so the plaque index factor is a risk factor, which means that the respondent by a factor of bad plaque index will likely occur 5.667 times for dental caries.

The knowledge factor has the value exp (B) 3,000 so the knowledge factor is a risk factor for poor would likely occur 3,000 times for dental caries.

The attitude factor has the value exp (B) 3,000 so the attitude factor is a risk factor for dental caries remains, which means that respondents with a bad attitude factor that will likely occur 3,000 times for dental caries.

The practice has value factor exp (B) 2,333 practices that factor is a risk factor for dental caries remains, which means the respondent by a factor of bad practice will likely occur 2,333 times for dental caries.

Salivary hydration factor has the value exp (B) 1,520 so that the saliva hydration factor is a risk factor for dental caries, which means that respondents with poor salivary hydration factor will likely occur 1,520 times for dental caries.

The salivary viscosity has a value factor exp (B) 1,500 so that the salivary viscosity factor is a risk factor for dental caries, which means that respondents with a bad of salivary viscosity factors will likely occur 1,500 times for dental caries.

The salivary pH factor has the value exp (B) 1.222 so Salivary pH factor is a risk factor for dental caries, which means that respondents with poor salivary pH factor will likely occur 1,222 times for dental caries.

The OHIS factor has the value exp (B) 1.143 to factor OHIS a risk factor for dental caries, which means that respondents with poor OHIS factors will likely occur 1,143 times for dental caries.

Health Care values obtained for exp (B) 0.667 to factor health services do not have the risk factors and preventive nature.

The heredity value exp (B) 0.667 to heredity as a deterrent. For environmental factors value exp (B) 0.429 to heredity as a deterrent.

Table 1. Cause of the Problem Corresponding Sequence from the Most Risky Cases

No	Independent Variables	exp (B)	Intrepretation
1	Plak index	5,667	Cause
2	Knowledge	3,000	Cause
3	Attitude	3,000	Cause
4	Practice	2,333	Cause
5	Saliva Hidration	1,520	Cause
6	Saliva Viscosity	1,500	Cause
7	pH Saliva	1,222	Cause
8	OHIS	1,143	Cause
9	Health Care	0,667	Cause
10	Heredity	0,667	Cause
11	Environtment	0,429	Cause

Based on table 1 show the result of Regression Logistic Linier Test Analysis found the cause of the problem corresponding sequence from the most risky cases are as follows:

Plaque index factors has a value of exp (B) 5.667 so the plaque index factor is a risk factor, which means that the respondent by a factor of bad plaque index will likely occur 5.667 times for dental caries.

The knowledge factor has the value exp (B) 3,000 so the knowledge factor is a risk factor for poor would likely occur 3,000 times for dental caries.

The attitude factor has the value exp (B) 3,000 so the attitude factor is a risk factor for dental caries remains, which means that respondents with a bad attitude factor that will likely occur 3,000 times for dental caries.

The practice has value factor exp (B) 2,333 so that the attitude factor is a risk factor for dental caries remains, which means that respondents with a bad attitude factor that will likely occur 2,333 times for dental caries.

The hydration saliva factor has the value exp (B) 1,520 so that the hydration saliva factor is a risk factor for dental caries, which means that respondents with bad saliva hydration factor will likely occur 1,520 times for dental caries.

The viscosity of saliva factor has a value exp (B) 1,500 so that the viscosity saliva factor is a risk factor for dental caries, which means that respondents with a bad viscosity of saliva factors will likely occur 1,500 times for dental caries.

The salivary pH factor has the value exp (B) 1.222 so Salivary pH factor is a risk factor for dental caries, which means that respondents with bad Salivary pH factor will likely occur 1,222 times for dental caries.

The OHIS factor has the value exp (B) 1.143 so OHIS factor is a risk factor for dental caries, which means that respondents with poor OHIS factors will likely occur 1,143 times for dental caries.

The Health Care factor has the value obtained for exp (B) 0.667 to health care factor so that the health service factors do not have the risk factors and preventive nature.

The heredity factor has the value exp (B) 0.667 so heredity as a deterrent. for environmental factors value exp (B) 0.429 to heredity as a deterrent.

Tabel 2. Way Out Recommendation

No	Problem Cause Factor	Way Out Alternative
1	Plak index	a. Dental Health Education
		b. Cadre Training
		c. Mass Teeth Brushing Programme
2	Knowledge	a. Dental Health Education
		b. Cadre Training
3	Attitude	a. Dental Health Education
		b. Cadre Training
		c. Mass Teeth Brushing Programme
4	Practice	a. Dental Health Education
		b. Cadre Training
		c. Mass Teeth Brushing Programme
5	Salivary Hydration	a. Dental Health Education

		b.	Cadre Training
6	Salivary Viscosity	a.	Dental Health Education
		b.	Cadre Training
		c.	Mass Teeth Brushing Programme
7	Salivary pH	a.	Dental Health Education
		b.	Cadre Training
		c.	Mass Teeth Brushing Programme
8	OHIS	a.	Dental Health Education
		b.	Cadre Training
		c.	Mass Teeth Brushing Programme
9	Health Care	a.	Dental Health Education
		b.	Cadre Training
10	Heredity	a.	Dental Health Education
		a.	Dental Health Education
11	Environment	b.	Cadre Training
		c.	Mass Teeth Brushing Programme

The findings in Table 1 show a significant correlation between the causes of the occurrence of dental caries, and then table 2 show the plan or propose an alternative way out. Based on table 2 we arrange the Sequence of Planning Way Out Alternative. Here is an alternative way out based on the value expn (B) were obtained:

Table 3. Sequence of Planning Way Out Alternative

Way Out Alternative	M	I	C	V	Total	Priority
Dental Health Education	5	3	4	4	15	I
Cadre Training	3	4	2	3	8	III
Mass Teeth Brush Programme	4	2	3	2	12	II

A top priority of dispute resolution alternative is education about oral health. Alternative becomes the last priority is to do the training of cadres UKGS as the extension of health personnel so promotive oral health.

DISCUSSION

Problem Analysis

PI (plaque index) factor is a causative factor. Dental plaque acid production is a trigger factor of dental caries, and is the most important risk factor against tooth demineralization process [8]. Control of dental plaque in children of school age most efficient is to brush their teeth. Children who do not brush their teeth before going to bed at high risk of caries incidence [9]. Measurement of dental plaque is a major procedure that must be done to identify the risk factors and severity of dental caries.

This is due to lack of knowledge about how to prevent oral health, especially in terms of using water to rinse clean after eating, lack of awareness of respondents to check their teeth every six months and the majority of respondents still eating foods cariogenic [10].

Knowledge, practice and attitude factors expressed as a causes factor. This shows that behavioral factors on respondents are less good [11]. Knowledge in case rinse using clean water is lacking. Time brushing your teeth after breakfast in the morning is still not correct and the lack of

awareness in terms of gear teeth checked if the pain as much. Attitude that is less that in the case of teeth checked every 6 months.

Saliva hydration factor is expressed as a causes factor. Most elementary students in SDN Pasangsari II had low salivary flow rate is <60 seconds. This is because brushing teeth respondents wrong especially when brushing your teeth after breakfast, the lack of knowledge about how to prevent dental caries by means of using clean water rinse after meals [12].

Salivary viscosity factor is expressed as a causes factor. The viscosity of saliva test results show (72%) students have viscosity with high criteria (foamy, bubbly, sticky) and (28%) students have a viscosity at normal criterion (clear water). This could hamper the process of lubrication and cleaning teeth.

Salivary pH factor is expressed as a causes factor. From the results of the pH of saliva obtained as much as 68% of respondents have an acidic pH, where acidity of saliva can cause dental caries. This is due to lack of awareness of respondents to check their teeth if they feel a toothache, lack of awareness of respondents to check their teeth setap 6 months and the lack of knowledge about the time of to brush their teeth after breakfast that morning [13].

OHIS factor is expressed as a causes factor. In a study of factors OHIS be a factor because of the 50 respondents who have criteria were as much as 60% and as much as 6% worse. One of them is due to factors toothbrushing behavior is not timely because there are many students who do not brush their teeth after breakfast [14].

Health services expressed as a deterrent factors. The majority of primary school student in SDN Padangasari II had received counseling on dental health. Dental health services in the infirmary are already available in SDN Padangasari II but apparently UKGS in school is not running. This is due to lack of oral health cadres in schools and the ineffectiveness of dental and oral health services such as counseling and mass brush your teeth [15]. This shows that health care is not optimal.

Hereditary factors expressed as a deterrent factors. Based on the research of primary school students in SDN Padangasari II is an indirect factor for the majority of families of respondents have a neat arrangement of teeth. The process of the role of parents who directs anakya children so that his teeth into a neat growth / no crowding [16].

Environmental factors expressed as a deterrent factors. Based on the research of elementary school students in SDN Padangasari II easy to clean water and clean water to consume. Availability of vegetables and fruit for the family was also able to prevent caries [17].

Problem Solving Alternatives

Dental and oral health education is one way promotional activities against oral hygiene. Effective extension will be a positive influence on oral health. Counseling given is about dental caries, cariogenic foods and the importance of maintaining healthy teeth and mouth [18].

Activity brushing teeth together needs to be done in SD Padangasari II District Banyumanik Semarang to lower the level of bad plaque and changed their brush teeth properly. This activity has been carried out in SD Padangasari II on August 2, 2016.

Combating cases of dental caries is the execution of the training of cadres which dental health promotion efforts can work well to increase the knowledge and attitudes of respondents with respect to dental health, as well as the respondent can participate in preventing dental caries.

CONCLUSION

Causative factor that causes dental caries in elementary school student in SDN Padangsari II District Banyumanik Semarang 2016 include: plaque index, saliva hydration, saliva viscosity, pH salivary, OHIS, behavior (knowledge, practice, and attitude). Deterrence factor that causes dental caries in elementary school student in SDN Padangsari II District Banyumanik Semarang 2016 include: Health services, Environment, and ancestry. Alternative solutions in cases of dental caries in primary school students in SDN II is counseling on dental health with the highest priority, then brush your teeth and bulk latter alternative is the training of cadres. Counseling given is about dental caries, cariogenic foods and the importance of maintaining healthy teeth and mouth. Activity brushing teeth together needs to be done in SD Padangsari II District Banyumanik Semarang to lower the level of bad plaque and changed their brush teeth properly. The training of cadres which dental health promotion efforts can work well to increase the knowledge and attitudes of respondents with respect to dental health, as well as the respondent can participate in preventing dental caries.

ACKNOWLEDGMENTS

We would like to express sincere thanks to SD Padangsari II District Banyumanik Semarang, headmaster, teacher and student, Dean of Public Health Faculty Diponegoro University, Chairman of Health Polytechnics Ministry of Health Semarang, and Ms. Yodong in providing input and guidance in the processing of statistical data.

REFERENCES

- [1] Khotimah, K., Suhadi, Purnomo, *Faktor-Faktor yang Berhubungan dengan Kejadian Karies Gigi pada anak Usia 6-12 Tahun*, Available from URL:<http://pmb.stikestelogorejo.ac.id/e-journal/index.php/ilmukeperawatan/article/view/177/201>, 2013.
- [2] Rosidi, A., Haryani, S. and Adimayanti, E., *Hubungan Antara Konsumsi Makanan Kariogenik dengan Kejadian Karies Gigi Pada Anak SDN I Gogodalem Kec. Bringin Kab. Semarang*. In Prosiding Seminar Nasional, 2014.
- [3] Pintauli, S., Hamada, T., *Menuju Gigi dan Mulut Sehat, Pencegahan dan Pemeliharaan Karies Gigi*, Medan : USU Press, 2008.
- [4] Noorkasiani., Heryati., Ismail, R., *Sosiologi Keperawatan*, Jakarta : Penerbit EGC, 2009.
- [5] Kementerian Kesehatan Republik Indonesia, *Laporan Hasil Riset Kesehatan Dasar (Riskesdas)*. Jakarta : Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan Republik Indonesia, 2013.
- [6] Saryono, *Metodologi Penelitian Kesehatan*, Jogjakarta : Penerbit Mitra Cendika Press, 2011.
- [7] Kidd, E. A. M., Bechal, J. S., *Buku Ajar Ilmu Konservasi Gigi*, Jakarta : Penerbit EGC, 1992.
- [8] Walsh, L.J., *Dental Plaque Fermentation and Its Role in Caries Risk Assessment*, International Dentistry, 8 (5): 34-40, 2008.
- [9] Shimizu, K., Igarashi, K., dan Takahashi, N., *Chairside Evaluation of pH Lowering Activity and Lactic Acid Production of Dental Plaque: Correlation with Caries Experience and Incidence in Preschool Children*, Quintessence International, 30 (2): 151-158, 2008.
- [10] Worotitjan, I., Mintjelungan, CN., Gunawan, P., *Pengalaman Karies Gigi Serta Pola Makan dan Minum pada Anak Sekolah Dasar di Desa Kiawa Kecamatan Pekalongan Utara.*, Available from URL:<http://download.portalgaruda.org/article.php?article=107357&val=1000>, 2013.
- [11] Notoatmodjo, S., *Promosi Kesehatan Teori dan Aplikasi*, Jakarta : Penerbit Rineka Cipta, 2010.
- [12] Hapsari, F. H., Ismail, A., Santoso, O., *Pengaruh Konsumsi Keju Cheddar 10 Gram Terhadap pH Saliva*, Available from URL:<https://jurnal.unissula.ac.id>, 2013.
- [13] Sulendra, K.T., Fatmawati, D.W.A., Nugroho, N., *Relationship between Salivary pH and Viscosity to DMF-T Index of Pupils in Baletbaru I and Baletbaru II Elementary School*, Available from URL:<http://repository.unej.ac.id/>, 2013.
- [14] Tarigan, R., *Karies Gigi*, Jakarta : Hipokrates., 1995.
- [15] Setiawan, R., Adhani, R., Sukmana, IS., Hadiano, T., *Hubungan Pelaksanaan UKGS Dengan Status Kesehatan Gigi dan Mulut Murid Sekolah Dasar dan Sederajat di Wilayah Kerja Puskesmas Cempaka Putih Kota Banjarmasin*, Available from URL:<http://fkg.unlam.ac.id/wp-content/uploads/2016/01/pdf>, 2014.
- [16] Shivakumar, M., *Preventive and Community Dentistry: Clinical Record Book*, h. 20-2, New Delhi : Jaypee Brothers Medical Publishers, 2006.
- [17] Notoatmodjo, S., *Kesehatan Masyarakat Ilmu dan Seni*, Jakarta : Penerbit Rineka Cipta, 2007.
- [18] Herjulianti, E., Indriani, TS., Artini, S., *Pendidikan Kesehatan Gigi*, Jakarta : Penerbit Buku Kedokteran EGC, 2002.