Correlation between Family Economic Status and Dental Caries Risk Aged 6-12 Years

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Abstract

Low economic status is one factor to predict the poorness health status. It is a factor associated with high dental caries risk. This study aimed to know the correlation between family economic status and dental caries risk aged 6-12 years old.

The research was descriptive correlative using multistage random sampling. Family economic status was classified by Nielsen Media Research, and the risk of dental caries was measured by caries-risk assessment tool (CAT) by AAPD. The number of respondents was 89 children, from 6-12 years old, who are studying at SDN Ujung Berung, SDN Marga Cinta, SDN Padjadjaran, SDN Dadali and SDN Sekeloa.

The result of this study showed that most of the respondents have both high family economic status and high dental caries risk status. The statistic calculation used Wilcoxon Sign Rank Test show a Z-score of -0,821 and a p-value of 0,412.

The conclusion of this study, there was no correlation between family economic status and dental caries risk aged 6-12 years old.

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Introduction

Economic status of respondents in this study is determined by per capita income of the parents in accordance with the standards issued by the Central Bureau of Statistics. Parents respondents economic status of poor at 24.6%. Children with parents with sufficient income, have the opportunity to receive medical care.

Parents with sufficient income will allow providing better health care to their children.

People with less economic capacity will be difficult to meet their basic needs, so it will be difficult to provide health care for their families.[1] Children aged 6-12 years entered the period of mixed dentition, which newly erupted permanent teeth are more susceptible to caries.[2]

Caries risk assessment is an important process in making treatment decisions and a key component in caries prevention programs, which can reduce the incidence of dental caries.[3]

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This study is intended to determine the correlation between family economic status and dental caries risk ages 6-12 years.

Oral health is essential to general health and quality of healthy living. Mouth mean free throat cancer, infections and sores in the mouth, gum disease, tooth decay, tooth loss, and other diseases, so there is no interference limiting in biting, chewing, smiling, talking, and psychosocial well-being. One oral health is dental health.[4]

Dental health education should be introduced as early as possible to the children so that they can figure out how to maintain oral health is good and right.[5]

Materials and methods

The study was carried out at five public primary schools in five different regions in Bandung, which were SDN Padjadjaran (center), SDN Sekeloa (north), SDN Ujung Berung (east), SDN Dadali (west), and SDN Marga Cinta (south).

There were 89 children examined. Children who included in the study should be studying at the school, aged 6-12 years, and their

parents or caregiver granted permission to be a respondent in this study. Children with the systemic or mental disorder and uncooperative were excluded.

Caries risk was assessed using Caries Risk Assessment Tool (CAT) by American Academy of Pediatric Dentistry (AAPD). This tool has already been tested for validity and reliability. It included 3 factors, biological, protective, and clinical finding. Overall assessment of children dental caries risk is categorized into 3 groups, high, moderate, and low.[6]

Family Economic status is measured by Nielsen Media Research to provide questionnaires to parents about family spending each month in Indonesian currency (IDR). Expenditure is divided into the cost of food, transport, entertainment, etc. It is intended to facilitate the respondents tell about their expenditures. It is categorized into 3 groups based on their family expenses every month, high, moderate, and low.[7]

First, parents were given an inform consent and questionnaire. The questionnaire consisted of a general information about their children, monthly expenses, and some questions regarding biological factor and protective factor on CAT.

The questions were 1) do the children consume sweet snack, or carbonated drink more than 3 times a day? 2) do the children brush their teeth twice a day using fluoride toothpaste? 3) did the children receive topical fluoride from a dental professional? 4) do their children get home measures like antimicrobial, xylitol, or MI paste? 5) do the children get regular dental care?

To determine the clinical findings, children were examined to see interproximal caries, white spot lesion, defective restoration, salivary flow, and whether they use intraoral appliance.

The data collected were stored and analyzed using the SPSS Statistical Package. Bivariate Wilcoxon Sign Rank Test was employed with a p-value < 0.05 and α = 5%.

Results

Family economic status was shown in Table 1. There were 55 families (61,8%) which have high family economic status. Most of them were in the A2 class which expenditure range between 2.000.001 IDR to 3.000.000 IDR.

Family Economic Status		Frequency		TOTAL	
		F	%	F	%
High	A1	18	20,2	55	61,8
	A2	25	28,1		
	B	12	13,5		
Moderate	C1	14	15,7	22	24,7
	C2	8	8,9		
Low	D	10	11,2	12	13,5
	E	2	2,24		
Total		89	100	89	100

Table 1. 55 families.

Age	Gender	High Risk	Moderate Risk	Low Risk	Total
6	Male	1	-	1	2
	Female	-	2	2	4
7	Male	6	-	1	7
	Female	1	-	2	3
8	Male	6	1	3	10
	Female	6	-	1	7
9	Male	2	-	2	4
	Female	9	-	3	12
10	Male	9	-	1	10
	Female	7	-	2	9
11	Male	5	-	3	8
	Female	5	-	2	7
12	Male	2	-	1	3
	Female	3	-	-	3
Total		62 (30 male, 32 female)	3 (1 male, 2 female)	24 (11 male, 13 female)	89

Table 2. Carries risks on children aged 6-12.

Carries risks on children aged 6-12 was distributed in table 2. There were 47 female and 42 male. Sixty-seven of 89 children had high caries risk, 3 children had a moderate risk, and the rest 24 children had low caries risk.

Family Economic Status	Dental caries risk						Total
	Low		Moderate		High		
	F	%	F	%	F	%	
Low	0	0.00	0	0.00	12	13.48	12
Moderate	4	4.49	2	2.25	16	17.98	22
High	20	22.47	1	1.12	34	38.20	55
Total	24	26.97	3	3.37	62	69.66	89

Table 3. The distribution frequency of family economic status and dental caries.

The distribution frequency of family economic status and dental caries were shown in table 3. There were 34 children (38.2%) who both

had high family economic status and high dental caries risk. It was the highest percentage of all condition shown in Table 3. The two variables were analyzed with Wilcoxon Sign Rank Test, and the result was not significant (p=0.412>0.05) and had contralateral relationship (Z= -0.821)

Discussion

Family economic status obtained from this study showed 12 families at low economic status, 22 families at moderate economic status, and 55 families at high economic status. The majority of respondents have monthly expenses above Rp 1,500,001.00 (Class B, A2, A1).[7] Indonesian Central Bureau of Statistic (BPS) published in April 2015 from data in September 2014 that Indonesia's economic growth reached 5.52% and the poor population was decreased to 0.55 million from the data in March 2014.[8]

The comparison of the gender distribution of the caries risk was almost balanced between female and male children at every level of caries risk. It can be concluded that there was no correlation between sex and dental caries risk. The statement was also suggested in a study entitled Assessment of predictors of dental caries in 6-year-old schoolchildren in Malaysia.[9]

The results showed 62 children (69.6%) had a high caries risk, 3 children (3.4%) had moderate caries risk, and 24 children (36.9%) had low caries risk. High caries risk is owned by more than half of the respondents. The results of this study indicate similarities with the results of previous studies about dental caries risk conducted in Indonesia.[10]

Children who had moderate caries risk were less than children who had low caries risk in this study. This study used CAT by AAPD for children above 6 years old, which had 4 factors that used as an indicator for moderate caries risk, a patient has special needs, a patient is recent immigrants, a patient has a defective restoration, and a patient has been using intra-oral appliance 5. However, there were 2 factors excluded from this study. First, the recent immigrant factor didn't valid in validity and reliability test for Indonesian society. Second, a patient who has special needs.

It was because children with mentally and systemic disorders were excluded as respondent. Therefore, it contributed to fewer children with moderate caries risk than children with low caries risk.

The least caries prevention efforts in children led to only 36.9% of children had a low caries risk. The community and government didn't fully understand the importance of dental caries prevention. Indonesia didn't have water supply fluoridation program, so none of the subjects received the systemic fluoridation from the drinking water. The questionnaire proved that only a few children received topical fluoride and other preventive treatments like xylitol, antimicrobials, and MI paste. However, most of the subjects brush their teeth twice a day.

The correlation between family economic status and dental caries risk aged 6-12 years analyzed with Wilcoxon Sign Rank Test, and the result was not significant, (p=0.412>0.05) and contralateral relationship (Z= -0.821). Therefore, there was no correlation between family economic status and dental caries risk aged 6-12 years. Variable levels of education, socioeconomic level and the level of knowledge together can influence the incidence of dental caries in children under five years of 47.3% and 52.7% were influenced by other variables.[11]

Primary school students had eating snacks habit, it worsened by an inability of parents from all of the economic statuses to control their children's food especially when they are at school. In addition, parents give too much pocket money for the children, so they can buy snacks freely. Therefore, most of the children in this study had high dental caries risk.

This result was supported by the result of other studies which stated that there was no correlation between parents' income, education levels, as well occupation and caries in primary teeth of children aged 4-5 years, and most respondents also had a bad caries status.[1]

Both of the results showed that there was no correlation between family economic status and dental caries. These results happened because just a few parents from all economic status gave a preventive action for their children, so most of the children from high economic status had the high dental caries risk as well.

Report the results of the Basic Health Research (RISKESDAS) of 2013 states that the average prevalence of Indonesia's population aged 5-9 years of problematic teeth and mouth by 28.9% with the highest percentage of 30.5% at age 35-44. This shows the percentage of oral and dental problems by the age of 5-9 years has entered the high rate.[12]

There was another study conducted in United State which supported our result. The study measured the sensitivity and specificity of CAT by AAPD with four approaches, CAT, CAT without socioeconomic status (SES) and Streptococcus mutants culture, CAT without socioeconomic status factors, plus the culture of Streptococcus mutants and Streptococcus mutants culture.

CAT has a sensitivity of 100%, but the specificity of 2.5%, after the socioeconomic status factors issued specificity increased to 68.6% and the sensitivity decreased to 85.6%. The study was conducted on Hispanic children whose parents have low incomes. Epidemiological data state that children living in poverty have a definite high caries rate, in fact, this study were 58.7% have never experienced Early Childhood caries (ECC), and 81.4% have never experienced Severe Early Childhood Caries (S- ECC). This study suggested that CAT without the socioeconomic status factor have better performance.[13]

Based on this study result, every child should get caries risk assessment regardless their economic status. Caries risks assessment is still rarely done by a dentist in Indonesian, despite a dentist has a very important role in the prevention of caries, so as to minimize invasive treatments.[2] Every child should get caries risk assessment as early as possible.[6] It is an easy thing and should be carried out during routine visits to the dentist, and it should be updated regularly to do continuous maintenance. There is no influence of the income level of parents of children dental caries ($p = 0.164$).[14] Newly erupted dentition may be more at risk than the mature dentition due to immature enamel.[2]

Once the dental caries risk level was known, a dentist should give an appropriate instruction based on management protocol from the CAT. It is highly individualized, hence it should be discussed with a parent or guardian in order to be implemented properly. Children with low-risk required a regular visit every 6-12 months, and regular brushing two times a day. Children with moderate risk should get extra fluoride protection such as topical fluoride, restore all the teeth that have cavities, brushing teeth regularly, and regular visits to the dentist every 6 months. Children with high risk should make regular visits every 3 months, brushing teeth regularly, get extra fluoride protection, and xylitol, and restore all the teeth that have cavities.[6] The dentist should be able to motivate parents and children to obey the instructions so that treatment and prevention can be maximized.

Based on the research results Worang, et al in 2014 stated that the participation and concern of the parents who needed Pre school olds. One simple example one in the maintenance of dental health of children is always to teach children about the right time and a good way to brush your teeth and always Reminded that after eating sweet foods should Immediately rinse with water.[15]

Conclusions

This study, it was concluded that there was no correlation between family economic status and dental caries risk aged 6-12 years. It proved that most respondents had high dental caries risk status, both from high, moderate, and low family economic status. Children aged 6-12 years are the most susceptible to dental caries, therefore the caries risk assessment should be done as early as possible by every child. The cooperation between dentists and parents is needed to implement the management protocols.

This study yearned to persuade authorities to promote oral hygiene and decrease caries level among children aged 6-12 years, especially with preventive programs. Further research is needed to provide the best caries risk assessment tools and management protocols that appropriate for Indonesian children.

Declaration of Interest

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