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ANALYSIS OF DISEASE RISK FACTORS OF EARLY CHILDHOOD CARIES (ECC) ON PRE-SCHOOL CHILDREN PSICOSOCIAL PROJECT REVIEW

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Abstract– Early Childhood Caries becomes a public health problem because of its high prevalence and rapid disease progression resulting in damage to the teeth of the developing-age child. Research shows that about 75% of Early Childhood Searches (ECC) are found in children aged 2 to 5 years. The severity of dental caries in pre-school age children has increased to 28%. Early Childhood Caries occurs in 45% of preschool-aged children and is present in 70-90% of infants and young children. Analyzes risk factors for dental caries for preschoolers based on proven risk factors, explains the factors and risk of dental caries in preschoolers related to the characteristics of children, local oral hygiene conditions, and family characteristics (mother), obtaining predictors and dominant dental caries risk factors in preschool children. The research design used is cross sectional design with 2 variables namely dependent variable and independent variable measured at the same time. In Ganrasub district, 264 children (74.1%) had caries teeth and 92 children whose teeth were not diagnosed with dental caries, respectively (49.4%, 89.9%) and mother (66.8 %, 2.5%). In children's behavior in maintaining dental health shows good habits in the case of morning brushing, using toothpaste and brushing their own teeth. As for the habit of brushing teeth at night before bed are still many children who do not do it. Brushing and drinking water after consumption of sweet foods and beverages has not been generally done. Mother's knowledge level shows significant differences on the correct and wrong answers about mother's knowledge about child dental hygiene. Based on the result and discussion, children psychosocial aspect can be a predictor in Early Childhood Caries.

INTRODUCTION

Dental caries is a major cause of toothache and tooth loss with very high prevalence and morbidity. There is no region in the world that is free from dental caries. Dental caries attacks all people, all ages, both men and women, all tribes, races and at all levels of socioeconomic status (Adiatmaka, 2008). Early Childhood Caries disease is a public health problem because of its high prevalence and rapid progression of the disease causing damage to the teeth of developing age children (Setiawati, 2012).

The number of caries disease Early Childhood Caries in children in developing countries including Indonesia is still very high, there is even a tendency to increase from year to year. Based on Household Health Survey (SKRT, 2010), caries prevalence in Indonesia reaches 90.05% and this is considered higher than other developing countries. Several studies have shown that about 75% of Early Childhood Searches (ECCs) are found in children aged 2 to 5 years. Compared with other age groups, the severity of dental caries in pre-school age children has increased to 28% (Achmad and Ramadhany, 2017; Bratthall *et al.*, 2005). The prevalence of caries in children in advanced countries has decreased considerably in the last 50 years, but the prevalence of caries in early

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childhood has increased. Early Childhood Caries occurs in 45% of preschool-aged children while in some socio-economic sub-populations in the United States, Early Childhood Caries (ECC)are found in 70-90% of infants and young children. Petersen et al (2005) stated risk factors for Early Childhood Searches (ECC), among others, community living conditions, lifestyle, environmental factors and the implementation of preventive oral health programs. Meanwhile, according to Hallett and Rourke (2003) stated that Early Childhood Caries (ECC) is a complex and multifactorial disease, caused by various risk factors (Achmad *et al.*, 2017). Early Childhood Caries in individuals depend on a balance between agent virulence, individual resistance, and environmental (social, cultural, demographic, behavioral and economic circumstances) (Santos and Soviero, 2002). According to Pretty (2006) that dietary factors and modification factors (lifestyle, socioeconomic status, adherence in diet, as well as healthy habits and behaviors) as a major risk of dental caries (Petersen, 2005).

Strong predictor of Early Childhood Caries is a lack of dental health services and health insurance. Pre-school children in poor families are twice as likely to suffer from Early Childhood Caries compared to children from families with higher socioeconomic levels (Bratthall *et al.*, 2005). Started that the level of parental education is related to the level of caries experience in children, whereas according to poverty and frequency of visits to dental and oral health services related to the incidence of Early Childhood Caries.Weight and height affect the health of teeth and mouth. Short children with low birth weight (BBLR) are associated with high dmf-t numbers. Determinants of Early Childhood Caries include health systems and dental and oral health services, socio-cultural, environmental, dental and oral health services, and behavioral factors (Hallet and Rourke, 2003). The purpose of this study is to analyze the risk factors of dental caries for preschoolers based on risk factors that proved to be influential, to explain the factors and the risk of dental caries in preschoolers related to the characteristics of the child, the local condition of the child's mouth and the characteristics of the family (mother) and risk factors for dominant dental caries in preschool children. Identification of behavior in preschool children includes three dimensions, namely psychological, and social (Reisine and Psoter, 2001; Petersen, 2005).

METHOD

This research was conducted on 8 and 9 April 2018 at Ganra Health Center, Ganra Subdistrict, Soppeng District. The target population is all kindergarten and play group students in the working area of PuskesmasGanra. Total research subjects collected were 356 children from 12 kindergartens and playgroups and communities in the work area of Puskesmas Ganra.

The research design used is cross sectional design with 2 variables namely dependent variable and independent variable measured at the same time. This cross-sectional design aims to develop dental caries risk factors by measuring 2 variables at a single point of time, to determine whether subjects are exposed or unexposed and to have caries or not dental caries.

This research was conducted in several stages, namely in the first stage of the researcher distributing questionnaires to parents / guardians and requesting the willingness of parents / guardians to follow the activities of dental examination of children. Then, anamnesis is done to the child, followed by intraoral examination, salivary pH examination to determine the salivary acidity of sample, diagnosis along with treatment recommendation recorded in status card. Furthermore, the data is analyzed with four steps of displaying data, selecting data, filtering / data reduction, and drawing conclusions.

RESULTS

This research uses descriptive analytic method with cross sectional survey approach. This study aims to find out about how the caries phenomenon in children occur as well as perform a correlation analysis between risk factors (psychosocial aspects) with the effect factor (occurrence of ECC) simultaneously. The population in this study is amounting to 356 children along with the number of mother 356 in total were also taken by nonprobability sampling with saturated sampling technique in kindergarten and play groups in the work area of Puskesmas Ganra Subdistrict of Ganra.

Profile of Research Subject

In this study, 356 children were grouped by sex, age and order of children in the family.

The following is the profile of the research subjects of parents and students

In Table 1 we can see the distribution of respondents by age group. Research subjects consisted of under 4 years of age (<48 months) up to 6 years (72 months). The age distribution of these respondents indicates more respondents in the kindergarten class.

Table 1. Distribution of Kindergarten Students and Playgroup

	N	Persentase
Age		
< 48 months	31	8.7 %
49 months – 60 months	201	56.4 %
60 months – 72 months	124	34.9 %
Sex		
Male	185	51.9 %
Female	171	48.1 %
Order of the child		
First	68	19.10%
Second	166	46.6%
Third	75	21.1%
Fourth and so forth	47	13.2%

It can be seen also the distribution of respondents by sex is male is more dominant compared with the number of women although there is no significant difference between the number of men and women amounting to 51.9% (male) and 48.1% woman.

Distribution of respondents by sequence of children indicates that the greatest repsonden comes from the second child and the lowest respondent is the fourth child and so on.

Table 2 shows that the number of respondents in mothers who did not work is 89.9%, while for unemployed father respondents is only 2.5%. This illustrates life in rural areas where a man makes a living while more women stay at home.

Table 2 also shows that the distribution of maternal education Mother's education level is mostly in the non-school group and only elementary school graduates are 66.8% while those who take S1-S2 is 2.2%. Similarly, for the education of the father in non-school group 49.4% and S1-S2 7.1%. This illustrates that the level of education in GanraSubdistrict is that men generally work even with low levels of education. Because of their average work in agriculture (farming)

Dental Examination Results

Assessment of caries status in school children is done by performing dental examination at Ganra Health Center simultaneously. The examination was carried out by involving 30 specialist doctors, dentists, and young doctors and assisted by several dental nurses. The dental examination is performed according to the standard of the child's dental examination by using a diagnostic tool to see if there is any caries or not. Determination of caries occurrence using ICDAS-II standards including caries lesions despite the presence of cavities. The results obtained were found as many as 264 children (74.1%) whose teeth were caries and only 92 children whose teeth were not diagnosed with caries. This shows that caries rates in the work area of PuskesmasGanra is still quite high. This caries number is similar to the general caries rate of children in Indonesia that is 70%.

Cross tabulation results between the history of feeding and eating habits with caries status

From the dental examination results obtained data on caries status in children who then cross tabulated

Table 2. Distribution of parents based on work and education

		N	Percentage
Mother			
Occupation	1. Unemployed	320	89.9 %
	2. Employed	36	10.1 %
Last education:			
	1. No School and Elementary	238	66.8%
	2. Junior - Senior High	110	31%
	3. Undergraduate- Postgraduate	8	2.2 %
Father			
Occupation	1. Unemployed	9	2.5 %
	2. Employed	347	97.5 %
Last education:	1. No School and Elementary	176	49.4 %
	2. Junior - Senior High	155	43.5 %
	3. Undergraduate - Postgraduate	25	7.1 %

with history data of breastfeeding and eating habits obtained through data collection using questionnaire instrument, it can be seen the results in Table 3 and 4.

From the results we can see caries based on the history of exclusive breastfeeding or breast milk accompanied by companion drink, breast milk using a bottle or not and how long to drink breast milk. In addition it can be seen existing caries based on whether the child when using a bottle to fall asleep, the frequency of how many times and whether there is the addition of sugar or not in the supporting drink / breast milk replacement. More details can be seen in Table 3 below.

In Table 3 shows that caries distribution in children with drinking only using bottle milk alone is large enough as much as 79.1%. Although not much different from children who drink breastmilk but also continue to use bottle milk is as much as 78.5%. Unlike those who only consume breast milk alone, the caries number is only 64.7%. For older varieties of breastmilk drinking was found to be greater in the group who drank longer breastmilk which is more than 12 months with caries number 75.2%. If children use bottles at night to fall asleep caries is found in groups of children who always use bottles to fall asleep by 79.8%. Frequency of drinking milk more than 4 times gave caries 74.6%, but did not show much difference with children who only 3 times drink milk. As for the addition of sugar in milk amounted to 78.5% of children experiencing caries. This shows that the addition of sugar in milk can cause caries in early childhood.

The results of this dental examination also conducted cross tabulation with children eating habits. Caries occurrence can be seen based on the frequency of eating candy / chocolate, the frequency of eating cake / sweet snacks, the habit of eating

Table 3. Breastfeeding history and replacement / supporting breastmilk

	Non-caries	Caries	Total
Breastfeeding History			
Exclusive Breastmilk	40 (35.3%)	73 (64.7%)	113
Breastmilk + Bottle Milk	42 (21.5%)	153 (78.5%)	195
Only Bottle Milk	10 (20.9%)	38 (79.1%)	48
Period of Breastfeeding			
< 12 months	69(26.3%)	194 (73.7%)	263
>12 months	23 (24.7%)	70 (75.26%)	93
Using Bottle Until Asleep			
Always	21 (20.2%)	83 (79.8%)	104
Never / Sometimes	71 (28.2%)	181 (71.8%)	252
Frequencyof Drinking Milk			
< 3 Times a day	60 (26.1%)	170 (73.9%)	230
> 4 Times a day	32 (25.4%)	94 (74.6%)	126
Addition of Sugar in the Milk			
Yes	32 (21.5%)	117 (78.5%)	149
No	60 (29%)	147 (71%)	207

Table 4. History of Eating Habits

	Non Caries	Caries	Total
The habit of eating candy			
Once or twice a day	61 (38.9%)	96 (61.1%)	157
Twice or more	31 (14.9%)	175 (85.1%)	207
The habit of eating cake / sweet snack			
Once or twice a day	27 (36%)	48 (64%)	75
Twice or more	65 (23.1%)	216 (76.9%)	281
The Habit of Chewing Food			
Yes	26 (18.4%)	115(81.6%)	141
No	66 (30.7%)	149 (69.3%)	215
The habit of eating vegetables			
Yes	52 (29.7%)	123 (70.3%)	175
No	40 (22.1%)	141 (77.9%)	181

foods equal to eating vegetables or not. For more details it can be seen in table 4 below.

From Table 4 it can be seen high caries rates in children who have habit of eating candies twice or more by 85.1%. In children with the habit of eating sweet cakes / snacks with frequency twice or more also has a high incidence of caries as much 76.9%. Food consumption habits also appear to cause considerable caries as much as 81% compared with children who do not chew food. Children who do not like to eat vegetables produce caries 77.9% compared to children who used to consume vegetables.

For the next table it will show the picture of the child's behavior in maintaining healthy teeth viewed from the habit of brushing, using toothpaste, brushing and gargling after eating sweet foods / drinks. More details can be seen in Table 5 below

Based on the parent or guardian's response to the questionnaire given for the behavior of the early child respondents studied showed that most children have done the toothbrush in the morning. This indicates that these early childhood respondents already have a good habit of brushing their teeth in the morning, using toothpaste and

Table 5. Behavior of Maintaining Dental Health of Children

No		Answer
1	Does your child brush teeth every morning?	
	1. Ye	216
	2. No	54
	3. Sometimes	86
2	Does your child brush teeth before bed ?	
	1. Yes	124
	2. No	143
	3. Sometimes	89
3	Does your child use toothpaste when brushing teeth	
	1. Yes	211
	2. No	59
	3. Sometimes	86
4	Does your child brush teeth after eating sweet snacks	
	1. Yes	23
	2. No	286
	3. Sometimes	47
5	Does your child brush teeth on their own ?	
	1. Yes	193
	2. Assisted	125
	3. Both	38
6	Does your child gargle with water after eating of drinking sweets ?	
	1.Yes	35
	2.No	268
	3. Sometimes	53
7	Has your child experienced a lost of appetite of toothache	
	1. Yes	198
	2. No	63
	3. Sometimes	95
8	Have you taken your child to a dentist ?	
	1. Yes	10
	2. Never	346
9	Have you taken your child to a health center for dental check ?	
	1. Yes	14
	2. Never	342
10	Have you every checked the condition of you child's teeth in the last 6 months to a health center/ dental practice	
	1. Yes	12
	2. Never	344

brushing their teeth. As for the habit of brushing teeth at night before bed are still many children who do not do it. Similarly, in the case of brushing and drinking water after consuming sweet foods and drinks in general has not been done. Therefore, since the early child they should be given attention to how to maintain a healthy cavity and mouth such as providing education after consuming sweet foods and drinks is one of the factors of early age caries.

For health service facilities, almost all respondents answered never took their children to the nearest puskesmas (health center) or dentist to get dental health services even only to check the condition of his child's teeth every 6 months. This point should certainly receive attention because the child should be accustomed to perform dental examination every 6 months that can be done at the nearest health center or to the family dentist. Most likely this does not receive the attention of parents because of the assumption that the child's milk teeth when the problem is not something that needs to be followed up because people still think that this milk teeth will also be replaced by permanent teeth.

Table 6 below is the maternal knowledge distribution of dental hygiene. In this table it can be seen some questions about the teeth growth of children and efforts to prevent cavities in early childhood

Table 6 shows some maternal responses to the questions given about teeth growth and prevention of cavities in early childhood to measure maternal knowledge. For the question of teething most of the answers to mothers have not answered correctly. But for the question of caries prevention efforts in general have many who answered correctly, although the value of the correct answers are varied. For many wrong questions are also found in the role of milk teeth is the question that asks whether milk teeth can affect the intelligence of children, whether milk teeth can affect child growth. Some respondents answered incorrectly to the question. These results show that although the general knowledge of maternal responders is good in general, but it turns out there are some points of questions that need to receive attention because

Table 6. Mother's Knowledge of Dental Health Care

No	Question	Correct Answer	Wrong Answer
1.	Milk tooth seeds begin to form when the baby is in the womb aged 1 ½ 2 months	30	326
2.	Adult or permanent teeth begin to form at 8-9 months of gestation	24	332
3.	At the age of 2 ½ - 3 years Milk teeth are complete as many as 20 teeth	53	303
4.	The mandibular first molars grow at the age of 6-7 years	65	291
5.	The number of milk teeth as many as 20 teeth while the permanent teeth are 32 teeth	69	287
6.	The mandibular first series teeth grow at 7-8 years of age	45	311
7.	The maxillary canine teeth grow at the age of 9-10 years	44	312
8.	The large third molars of the maxilla and lower jaws grow at the age of 17-21 years	26	330
9.	The mandibular first series teeth start to shake at 12-14 months of age	31	325
10.	The mandibular first molars begin to grow at the age of 14-16 months	26	330
11.	It is necessary to do dental examination on pregnant mother in health service facility/ dentist	96	260
12.	Porous teeth are marked with a blackish brown hole	216	356
13.	Tooth decay can be detected by direct observation of the teeth	295	61
14.	Teeth hollow due to lazy brushing teeth	343	13
15.	Tooth decay can be caused by drinking sweet milk	315	41
16.	Drinking milk with bottles at risk of cavities	284	72
17.	Chewing food for a long time in the mouth (eating food) can cause cavities	186	170
18.	A hole in the Milk teeth cause the child to have not appetite	198	158
19.	Dental perforated teeth can disrupt the growth of the child	75	281
20.	Milk teeth affect the child's intelligence	58	298
21.	Milk teeth lead to permanent tooth growth	70	286
22.	Dental cavities can be prevented	128	228
23.	Need to check the teeth to the dentist / puskesmas when toothache	259	97
24.	Filling of a child's tooth can prevent more severe damage	90	266
25.	Brushing your teeth at night after drinking milk (before bed) can prevent cavities	289	67

respondents have not answered correctly.

DISCUSSION

Caries in children becomes a problem that always increases from year to year. Efforts to reduce caries have been done in various ways either premier, secondary or tertiary action by governments, dentists and parties involved (Helderman *et al.*, 2006).

The cause of ECC is divided into 2 factors namely the main factors and predisposing factors. Microorganisms, host (teeth), substrate and time are the main factors of ECC (Angela, 2005; Ramayanti and Purnakarya, 2013), whereas one predictive factor (ECC) is the psychosocial aspect of the child and his environment. Psychosocial aspects are strongly influenced by parenting patterns of parents. Parenting is related to the level of education of parents. So the knowledge of parents, especially mothers who are the closest to the child in maintaining the health of the oral cavity and the child's mouth becomes very important to the attitude and behavior of children (Suratri, 2016). Research conducted in Sangihe about mother's knowledge includes two categories of knowledge of good knowledge and bad knowledge. Maternal knowledge is also based on factors such as: work, education level, parenting experience, residence environment and economic status (Rompis *et al.*, 2016).

From the results of research can be seen that mother as the respondents are more to be unemployed as much as 89.9%, while for father as the respondents are only 2.5%. This illustrates life in rural areas where a man makes a living while more women stay at home. The education level of mothers is mostly in the non-school group and only the primary school graduates are mothers who are not in primary school and 66.8% for primary school and 49.4% for fathers. Similarly, father education is mostly in the same group as mothers. This illustrates the level of education in GanraSubdistrict that men generally work even with low levels of education. Because in average they work in agriculture (farming).

In addition, many studies have shown that caries prevalence is higher in children with low socioeconomic status. A study conducted in Chidambaram (India), examined the association of socioeconomic status with prevalence of dental caries in school children aged between 5-15 years, the result showed that the percentage of caries experienced by the children was high. In the study 80.4% of the students were low socioeconomic groups (Susi and Azmi, 2012). Good childcare quality affects the quality of the child, measured by the nutritional status and health or development of social maturity (Achmad, 2018; Lestari and Atmadi, 2016).

The results of the study In Table 3 shows there are differences in caries prevalence in children based on the way, frequency and time of consuming bottle / breast milk. The prevalence of caries in children using bottle milk is only 79.1%, bottle and breast milk consumption of 78.5%, consuming only breast milk, caries rate is only 64.7%. For the variation of breastfeeding length and consuming frequency does not have too big difference, as for the addition of sugar in milk as much as 78.5% of children experience caries. This shows that the addition of sugar in milk can cause caries in early childhood (Talita *et al.*, 2013).

From the results of dental examination it was also done cross tabulation with children eating habits. Caries occurrence can be seen based on the frequency of eating candy or chocolate, the frequency of eating cake or sweet snack, the habit of eating foods eaqual to eating vegetables or not. It can be seen high caries rates in children who have a habit of eating candies is twice or more by 85.1%. In children with the habit of eating cakes or sweet snacks with frequency twice or more also has a high incidence of caries by 76.9%. The habit of eating foods also appears to cause considerable caries as much as 81% compared with children who do not chew food. Children who do not like to eat vegetables produce caries 77.9% compared to children who used to consume vegetables.

Based on research results conducted by Sri Lestari and Atmadi (2016). Crispy sweet foods favored by most of the respondents were 62.5%, sticky sweet foods favored by 27.5% respondents, hard sweet foods favored by 7.5% of respondents, while only 2.5% of respondents did not like any kind of sweet food. As we know, foods that have a sticky texture will last longer in the teeth and are the main cause of tooth decay. Meanwhile, fresh fruits are of food group with low cariogenic potential due to low percentage of carbohydrates and high percentage of water. The results showed that sweet foods can affect the occurrence of dental caries. Therefore, maintenance habits of dental and oral health need to be done as early as possible so that

the number of dental caries can be suppressed.

The results also show that there are significant differences in the correct and wrong answers about mother's knowledge about dental hygiene of children who only answered 6 correct of 17 questions. This happens because of the lack of mother's knowledge and the mother's concern about the importance of maintaining the dental and oral health of the child. This is supported by research conducted by Rompis *et al.*, (2016) which shows that dental health is often not made priority by parents in maintaining dental health of children. One study conducted by Puspitoningsih in kindergarten Dharma Wanita Kemusu Boyolali Subdistrict showed as many as 64% of mothers who claimed their children had dental caries. Mothers think that caries is not a serious problem for children's dental health, mothers never check their dental health to puskesmas or dentist and the child is not taught to brush teeth twice a day.

CONCLUSION

Based on the results of research and discussion it can be concluded that there is a relationship between psychosocial aspects of children as predictor factors Early Childhood Caries.

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