FACTORS ANALYSIS CORRELATED WITH THE OCCURANCE OF DENTAL CARIES

**(Retrospective Study Research In Banjarbaru General Hospital Dental Clinic
From October-November 2016)**

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ABSTRACK

*Background : The most common dental and oral disease suffered by many Indonesian is dental caries. The only way to have healthy oral or dental is by maintaining oral hygenie and visiting the dentist regularly to have oral or dental checked. To know more about dental cariesproblems, we analyze the knowledge of dental and oral health, education level, age, sex, health infrastucture facility and health care worker. **Research purposes :** Analizing the Factors Related with Dental Caries Case (Study case in dental policlinic RSUD Banjarbaru). **Research method :** in this research, quantitative method with cross sectional method is used. Research population is all patients who have routine control visit at the dental policlinic of RSUD Banjarbaru, with one year span data cases in 2015. The sampling method used in this research is random sampling of the patients who was has a routine control visit with dentist at the dental policlinic. The variable used in this research are independent variable such as dental and oral healthy knowledge, sex, age, education level, dental clinic's infrastructure facility, health care workers` service, and habit or behaviour of dental routine control, and dependent variable which is DMF-T number. Measurement is done by collecting directly from the respondents who answered questionare given by the researcher (primary data). The measurement the secondary data in form of patient's medical record in RSUD Banjarbaru. Meanwhile, the measurement of caries is carried out by DMF-T index. **Research result :** The relation knowledge level, education level, age, sex, health infrastructure, and also healthcare workers' service with accident dental caries are showing sig number of >0.05, this decision is accepted which means there is not significant relation occured. While the relation dental routine control behaviour to dentist with accident dental caries are showing sig number of 0.006<0.05, this decision is rejected which means there is a significant relation occured.**Conclusion :** The factor dental control routine behaviour to dentist has a significant relation to the occurance of dental caries at dental polyclinic in RSUD Banjarbaru.*

Keywords : Behaviour control, knowledge, education, sex, age, health infrastructur, health care worker, dentist, caries

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INTRODUCTION

The health of oral cavity is vital to body health and affecting someone's life quality generally, including the ability to talk, mastification and also self confidence. Most people totally ignore their dental health. Dental care is considered to be less important, though the benefits are vital in supporting health and appearance.[1]

World Health Organization (WHO) reported dental caries prevalence is equal to 60% to 90%. The most common dental and oral disease suffered by many Indonesians is dental caries, which is about 90%. In 2013, according to Basic Health Research at the Health Department, Indonesian dental caries prevalence recorded in 2007 is showing the number of 43,3% and increasing to 53,2%. According to Basic Health Research in 2013, there were three provinces which has the higherst number in oral and dental problem (>35%), they are South Sulawesi, South Kalimantan, and Central Sulawesi.[3]

Oral and dental health knowledge is a kind of learning process due to the necessity of oral and dental health in order to obtain good dental and oral health and also to increase living standard. Knowledge is delivered by lecture or by direct demonstration with a model. The efforts in maintaining oral and dental care is done better in an early age. Family and school role are essential in the process of creating the six monthly regular visit to the dentist. This learning process should be done in an early age through health education process, especially oral and dental health by regular control visits.[5] Therefore, several methods and approachments are needed to establish the healthy knowledge, attitude and behaviour especially for oral and dental health.[5]

As in predisposition factor based on gender research held by Ningsih in 2015 said the low utilization was presumably caused by the 21st century quality, but the prevalence of dental caries occurance is still a significant clinical problem.[3] According the theory of L. Green, to change this behaviour there are three factors that needed to be paid attention to, they are: supporting factors/ predisposition (dental and oral health knowledge level, education level, age and gender), enabling factors (health facilities and infrastructure), and reinforcing factors(health service personnel). Behaviour is defined as totality of appreciation and activity which is the together results or resultante among many factors, in which among that many is knowledge.[5]

Predisposition factors for the dental helath knowledge level is a method to motivate patient to clean their teeth and oral cavity effectively. This approachement should not be considered as dentist instruction but only as encouragement to patient so that they will realize theimportance of the dental and oral hygiene.[6] A learning process is a part of knowledge and education process. Through education process there is an increase in knowledge to improve the behaviour pattern to get better results.[6]

Oral and dental health knowledge is a kind of learning process due to the necessity of oral and dental health in order to obtain good dental and oral health and also to increase living standard. Knowledge is delivered by lecture or by direct demonstration with a model. The efforts in maintaining oral and dental care is done better in an early age. Family and school role are essential in the process of creating the six monthly regular visit to the dentist. This learning process should be done in an early age through health education process, especially oral and dental health by regular control visits.[5] Therefore, several methods and approachments are needed to establish the healthy knowledge, attitude and behaviour especially for oral and dental health.[7]

As for predispsition factors, based on gender in Ningsih research in 2015 said that there is a correlation between the hygiene of dental and oral cavity and gender. Women are tend to have lower caries index than men.[8] Women are generally tend to have better hygiene of dental and oral cavity than men.[9] Seen by the age group, more in the younger age group suffers dental caries than those in 45 years of age and above. This condition shows that dental caries occurs more likely to productive age.[3]

As the enabling factors based on health facilities and inftrastructures and the reinforcing factors based on health service personnels show that the society whom use dental health facilities is still in a very low numbers. There is stil lack of service and even the availability has not yet met a good standard. Saragih's research at Pekanbaru Dental Treatment Center in 2009 gave the result of 60% service availability from the standard set with give or take nine patients visits.[10] the percentage of adequacy shoul have been higher than 60% of the standard set. It can be concluded from this research that the facilities availability in dental and oral health services is still far to meet the adequacy standard.

Based on Banjarbaru General Hospital profile database in 2013, there were 5,474 dental clinic visits, in 2014 there were 5,776 visits with an increase of 5.5% to 2013, while in 2015 there were 6.828 visits with an increase of 18.2% as of there is an increasing number of dental visits anually. Furthermore, the highest number of visit in Banjarbaru General Hospital clinic is dental clinic with 16% from all of the 19 outpatient installation polyclinics.[11] The case with the highest number in outpatient installation is dental caries, therefore we were interested to investigate factors which are correlated to the dental caries that occured to Banjarbaru General Hospital dental clinic.

METHODS AND MATERIALS

Analytic observational research design with cross sectional approachment was used in this research to study with approachment technique, observation and collecting data in one period (point time approach). Meaning that all research subjects would be observed once and measurement was done to the examination of character status or subject variable, though it did not mean that all subjects was being observed at the same time, then relating the independent variables to dependent variables. This research held at Banjarbaru General Hospital dental clinic between October to November 2016.

Population consisted of all the patients who were having a regular control visit at dental clinic in Banjarbaru General Hospital with cases counted to 6,828 and 735 patients of regular dental control visit. The research sample was regular dental visit patients in Banjarbaru General Hospital's with random sampling method to take data sampling to the number of visits by regular dental control patients within the year of 2015. The sample size was cross sectional for the population of precision proportion where the research was conducted in Banjarbaru General Hospital to obtain patient behaviour in dental routine control once every 6 months. If the study was conducted to require 10% accuracy, the 95% significance level and the prevalence of patient visit behavior in dentistry by 11.02% of the sample were 42 samples. The independent variables include knowledge of dental and oral health, sex, age, education level, dental facilities and infrastructure, health care workers, and routine and bounded control behaviors are DMF-T numbers. The instrument or data measuring instrument used in the research is a questionnaire. The questionnaire is a number of written questions that are used to obtain information from respondents about their personal or personal knowledge.

The measuring instruments used in the research were questionnaires for oral and dental health knowledge, level of responder's education, dental facilities and infrastructure as well as dental clinic personnels, to measure behaviour in response to dental routine control in every 6 months was by viewing data in the medical record or patient status within the range of 6 months prior to control, and DMF-T index was used to measure caries. Measuring the knowledge of dental and oral health, education level, dental clinic facilities and infrastructure and dental clinic personnels was by collecting data directly from the respondents (primary data). Responders were asked to fill out the questionnaire given by the researcher. Measurement of dental routine control was using secondary data in the form of medical record of Banjarbaru General Hospital's patients.

Prior to the clinical examination, the filling and approval of the consent informant sheet was sent to the respondents. Examination was carried out with the use of diagnostic tools, namely: stainless glass, *sonde*, excavator and sterile tweezers, the assessment was included in the DMF-T index and after patient's tooth condition with caries was discovered, the patient was instructed to perform routine maintenance and control later. Category DMF-T according to WHO 0.0 - 1.1 = very low, 1.2 - 2.6 = low, 2.7 - 4.4 = medium, 4.5 - 6.5 = high 6.6 > = very high. From raw data adjustment were made by organizing data in such a way that can easily be summed, arranged to be presented and analyzed. Bivariate analysis was conducted to find out the correlation of dependent and independent variable. Multivariate analysis was conducted to see the relationship and the relation of independent variables together to the dependent variable.

RESEARCH RESULTS

After data from 45 respondents had been acquaired, bivariate and multivariate results were obtained by using SPSS computer programme.

1. Bivariate Analysis

Bivariate analysis was conducted to determine the frequency distribution and the most dominant relationship of independent variable to dependent variable, that is between knowledge with dental caries occurance, education level with dental

caries occurance, age with dental caries occurance, gender with dental caries occurance, dental routine control behaviour with the occurance of dental caries, facilities and infrastructure with the incidence of dental caries occurance, and dental health personel

Table 1. The Correlation between Knowledge and Dental Caries Occurance

		highest	high	moderate	low	Very low	total	P-Value
		Dental caries occurances						
Knowledge	Good	17	8	11	2	2	40	
	% Total	38%	18%	24%	4%	4%	89%	0.357
	moderate	2	1	0	1	1	5	
	% Total	4%	2%	0%	2%	2%	11%	
Total	Total	19	9	11	3	3	45	
	% Total	42%	20%	24%	7%	7%	100%	

Based on the frequency distribution between the good knowledge and the occurance of very high criteria of dental caries is as many as 17 people (38%), good knowledge with the occurance of high dental caries criteria as many as 8 people (18%), and enough knowledge with very low caries criteria as many as 1 person (2%).

In the table above shows the results of statistical tests with Chi-Square test obtained p-value 0.357 with sig <0.05, so 0.357> 0.05, Ho decision is accepted which means there is no correlation between oral and dental health knowledge with the occurance of caries.

Table 2. The Correlation between Education Level and Dental Caries Occurance

		highest	high	moderate	low	Very low	total	p-Value
		Dental caries occurance						
Education level	TK	0	0	0	0	0	0	
	% Total	0%	0%	0%	0%	0%	0%	
	SD	2	2	0	0	0	4	
	% Total	4%	4%	0%	0%	0%	9%	
	SMP	2	1	0	0	0	3	0.793
	% Total	4%	2%	0%	0%	0%	7%	
	SMA	5	2	4	0	1	12	
	% Total	11%	4%	9%	0%	2%	27%	
	Perguruan tinggi	10	4	7	3	2	26	
	% Total	22%	9%	16%	7%	4%	58%	
Total	Total	19	9	11	3	3	45	
	% Total	42%	20%	24%	7%	7%	100%	

Based on the highest frequency distribution between Higher Education level and a very high occurance of dental caries is as many as 10 people (22%), between Higher Education level and a high occurance of dental caries is as many as 4 people (9%), and between Higher Education level and medium occurance of dental caries is as many as 7 people (16%.). In the table above shows the results of statistical tests with Chi-Square test obtained p-value 0.793 with sig <0.05, so 0.793> 0.05, Ho decision is accepted which means there is no correlation between respondents's education and the occurance of dental caries.

Table 3. The Correlation between Age and Dental Caries Occurance

		highest	high	moderate	low	Very low	total	p-value
		Dental caries occurance						
Age	> 40 th %	10	2	5	2	1	20	
	Total	22%	4%	11%	4%	2%	44%	
	< 40 th %	9	7	6	1	2	25	0.546
	Total	20%	16%	13%	2%	4%	56%	
Total	Total %	19	9	11	3	3	45	
	Total	42%	20%	24%	7%	7%	100%	

Based on the highest frequency distribution between age > 40 years with the very highoccurance of dental caries is as many as 10 people (22%). Between the age < 40 years with the very high occurance of dental caries is as many as 9 people (20%). In the table above shows the results of statistical tests with Chi-Square test obtained p-value 0.546 with sig <0.05, so 0.546> 0.05, Ho decision is accepted which means there is no correlation between the age of respondents with the occurance of dental caries.

Table 4. Relationship between Gender and Caries Dental Occurance

		highest	high	moderate	Low	Very low	total	p-Value
		Dental caries occurance						
Age	male	2	2	2	1	1	8	
	% Total	4%	4%	4%	2%	2%	18%	
	female	17	7	9	2	2	37	0.546
	% Total	38%	16%	20%	4%	4%	82%	
Total	total	19	9	11	3	3	45	
	% Total	42%	20%	24%	7%	7%	100%	

Based on the the most distributed frequencies of female gender with the very high occurance of dental caries is as many as 17 people (38%). In the table above shows the results of statistical tests with Chi-Square test obtained p-value 0.546 with sig <0.05, so 0.546> 0.05, Ho decision is accepted which means there is no correlation between gender and the occurance of dental caries.

Table 5. Frequency Distribution of Regular Dental Routine Control With Dental Caries Occurance

		highest	high	moderate	Low	Very low	Total	p-Value
		Dental caries occurance						
Dental routine control	good	19	9	11	3	2	44	
	% Total	42%	20%	24%	7%	4%	98%	
	Lack of	0	0	0	0	1	1	0.006
	% Total	0%	0%	0%	0%	2%	2%	
Total	total	19	9	11	3	3	45	
	% Total	42%	20%	24%	7%	7%	100%	

Based on the frequency distribution of many routine control behaviour to a very high dental caries occurrences is as many as 19 people (42%), between routine control behaviour with high dental caries occurrences held as many as 9 people (20%), between routine control behaviour with moderate dental caries occurance is as many as 11 people (24%). In the table above shows the results of statistical tests with Chi-Square test obtained p-value 0.006 with sig <0,05, so 0.006 <0.05, Ho

decision is rejected which means there is a significant relationship between regular dental routine control behaviour with the occurance of dental caries.

Table 6.The Correlation between Facilities and Infrastructures With Dental Caries Occurance

		highest	high	moderate	low	very low	total	p-Value
		dental caries occurance						
facilities and infrastructures	good	19	9	10	3	2	43	
	% Total	42%	20%	22%	7%	4%	96%	
	enough	0	0	1	0	1	2	0.095
	% Total	0%	0%	2%	0%	2%	4%	
Total	total	19	9	11	3	3	45	
	% Total	42%	20%	24%	7%	7%	100%	

Based on the highest frequency distribution of facilities and infrastructure that held very high occurance of dental caries is as many as 19 people (42%), between facilities and infrastructure with high dental caries occurance held as many as 9 people (20%), between facilities and infrastructure with the moderate occurance dental caries is as many as 10 people (22%). In the table above shows the results of statistical tests with Chi-Square test obtained p-value 0.095 with sig <0.05, so 0.095> 0.05, Ho decision is accepted which means there is no correlation between facilities and infrastructure of dental and oral facilities with the dental caries occurance.

Table 7. The Correlation between Service Given by Health CarePersonnels With Dental Caries Occurance

Service given by health care		Dental caries occurance						p-Value
		highest	high	moderate	low	Very low	total	
Very good	%	8	1	3	1	0	13	
	Total	18%	2%	7%	2%	0%	29%	
Good	%	10	8	5	2	3	28	
	Total	22%	18%	11%	4%	7%	62%	
Neutral	%	1	0	2	0	0	3	0.456
	Total	2%	0%	4%	0%	0%	7%	
Worse	%	0	0	1	0	0	1	
	Total	0%	0%	2%	0%	0%	2%	
Total	total %	19	9	11	3	3	45	
	Total	42%	20%	24%	7%	7%	100%	

Based on the frequency distribution between the excellent service of the health care personnels with the very high occurance of dental caries is as many as 8 people (18%), the frequency between the good service given by health care personnels with the very high occurance of dental caries is as many as 10 people (22%), between service given by health care personnels with high occurance of dental caries is as many as 8 people (18%). In the table above shows the results of statistical tests with Chi-Square test obtained p-value 0.456 with sig <0.05, so 0.456> 0.05, Ho decision is accepted which means there is no correlation between services that given by the Health Care Personnels with dental caries occurance.

2. Multivariate Analysis
a. Multiple Logistic Regression Equation
The results obtained with the help of SPSS program in logistic regression test to select free variables that fit into the multivariate test model are presented in the following table:

Table 8. Multiple Linear Regression Correlation Results to Level of Education, Dental Routine Control Behaviour, Health Facility and infrastructure with the occurance of dental caries
coeficients

No	Model	Sig.
1	(Constant)	0.002
	Level of knowledge (X1)	0.030
	Level of education (X2)	0.036
	Dental routine control (X5)	0.012
	Facilities and Infrastructure (X6)	0.022

b. Determination Coefficient Analysis (Adjusted R Square)
The result of the determination analysis (adjusted R^2) obtained after the processed data is presented in the following table:

Table 9. Test Results of correlation coefficient analysis of Knowledge level, Education Level, Regular dental routine control behaviour, Health Facility and infrastructure with the occurance of dental caries

Model	R	R Square	Adjusted Square
1	0.585	0.342	0.276

Based on the above table obtained R number of 0.585 indicating that there is a strong correlation between the independent variable to the dependent variable and Adjusted R2 value of 0.276 (27.6%). This R value indicates that the variation of independent variables used (level of knowledge, level of education, regular dental routine control behaviour, health facilities and infrastructure) is able to explain 58.5% variation of dental caries event variables, and the remainder is explained by variables not included in this research. Based on the *anova* table analysis, the correlation between the level of knowledge, level of education, regular dental routine control behaviour, health facilities and infrastructure, obtained sig value (0.002 <0.05), the decision is H_O rejected which means there is a significant correlation. Based on the results of this analysis it can be concluded that from the four independent variables which affect the occurance of

dental caries in Banjarbaru General Hospital dental clinic there is one variable that has the most influence to the occurance of dental caries which is of regular dental routine control behaviour with p-value 0.012 <0.05.

DISCUSSION

1. The correlation of dental and oral cavity hygiene knowledge with the occurance of dental caries in Banjarbaru General Hospital dental clinic

Good respondents' knowledge level can be obtained from various media such as social media and electronic media. Some factors that cause high caries rates are due to unfavorable habits of dental care, such as not brushing the teeth when the time comes, not knowing on how to brush the teeth properly, and consuming foods and beverages that are cariogenic.[12]

Based on research result which been done by Lianawati, et al in 2014 there is a correlation between the level of knowledge of dental and oral cavity health to the behaviour in maintaining oral cavity and dental health.[13] While the results of research done by Abiola, et al in 2011 stated that the level of knowledge and health behaviour showed parallel results, where there is good knowledge then behaviour will also be good.[14] In accordance to Notoatmojo's theory, that a person with a higher level of knowledge will pay more attention to dental health, and vice versa, as when there is lack of knowledge, so is the dental care.[5]

The results of research conducted by Ramadhan Azhari, et al in 2016, Marimbun Betrix, et al in 2016, and Jayanti in 2012 stated that there is a significant correlation between the level of knowledge of oral and dental health to dental caries.[12,15,16] The higher the level of knowledge of dental health the lower the number of dental caries. Knowledge of dental health is assessed from some of the assessment components that is about the knowledge of healthy teeth, causes or problems of dental health, Indonesians are generally not aware to problems that occur in dental health, and how to take a good care of dental health.[17]

The level of education is very influential on the dental knowledge, attitude and behaviour of healthy living. Someone with a high level of knowledge or education will have better health knowledge and behaviour that will affect their behaviour for healthy living.[18] According to research conducted by James Pontunuwu in 2013

explains that knowledge affects behaviours in improving health, especially in dental and oral cavity health, specifically to dental caries.[19] Based on the results research done by Ramadan Azhary, et al in 2016 showed that there is a significant correlation between the level of knowledge of dental and oral cavity health to the number of dental caries, when there is a higher level of knowledge of oral and dental health there will be lower the number of dental caries occurance. The lack of knowledge about health is a predisposing factor of health behaviour leading to the onset of illness whilst this knowledge is closely related to attitudes toward the disease and its prevention.[15]

2. The correlation of education level to dental caries occurance to patient in Banjarbaru General Hospital dental clinic

The results of Susi's research in 2012 also showed no significant correlation between education level and caries status experienced by respondents.[20] According to Ni Nengah Sumerti's research in 2013, there is a significant correlation between educational level with early dental caries detection practice where this research shows there is a tendency for higher education has a better detection of dental caries.[21] Notoatmojo's opinion stated that education in individuals/groups aims at finding the ability, the higher the education of a person, the better he receive information and use the information, higher education will have extensive experience and knowledge.[5] According to Green's theory, a person with a higher education will be motivated to make an effort to achieve an optimal health.[5]

Afiati Risti's research results in 2017, stated that the correlation of education level with dental caries index obtained a strong results where the higher the education the lower the caries index is, the lack of knowledge about dental and oral cavity is caused by low level of education that is less likely to understand explanations described by the dentist, ultimately resulting in paying less attention to health and dental care.[22] Knowledge can be obtained naturally and planned through the education process where a person who has a high level of education will have knowledge and good attitude about health and behaviour of healthy life.[37] Dewanti in 2012 stated the reluctancy to dentist visits, except in the condition of a complaint, could also be due to fear and cost that cosidered to be relatively expensive.[23]

3. The correlation of Age to the occurance of dental caries in Banjarbaru General Hospital dental clinic

Research conducted by Khotimah, K in 2013 states that there is no significant correlation between age to dental caries occurance.[25] Research results from Suhadi.Ns, et al in 2013 concluded that there is no significant correlation between age with dental caries events.[26] This is appropriate with the results of research we have done that age has no correlation with the occurrence of dental caries, although the risk of dental caries is parallel to the increasing age but if other factors that resulted in dental caries are not prevented the possibility of dental caries occurance tends to present.

In Jenatu's research, et al in 2014 stated that there was a significant correlation of age to the occurance of dental caries.[27] The increasing of age is most likely to have higher risk of dental caries as teeth will often be directly exposed to the caries factors. At the age where a person has their first permanent teeth that is resulting in very susceptible condition to caries until maturation is complete.[28] Whereas in the 2010 Kiswaluyo's research stated that age has a correlation with the occurrence of dental caries.[28] From the age factor, with the increasing of age of a person, there will be changes in physical and psychological aspects that will affect a person's ability in finding information or knowledge while at their productive age, respondents is able to find the required information well.[29]

4. The correlation between gender and the occurance of dental caries to patient in Banjarbaru General Hospital Dental Clinic

In the 2008, Lia Kartika held a research in line with our research with result that there was no relationship between gender and caries occurrences.[30] Research hold by Kiswaluyo in 2012 showed that caries prevalence was similar in girls and boys.[28] In the 2013 research and Rusmali's research in 2010 stated that there was a significant correlation between gender and caries occurrence.[26,31] Suwelo's theory states that women faces greater risk factors to experience caries due to their teeth have longer eruption in the mouth so the risk factors that cause dental caries are exposed to teeth longer.[32] Our research differs from others's as ours is depending on the condition of the teeth and dental care conducted by both men and women as well as the region conditions that affect the daily consumption of drinking water.

5. The correlation between regular dental routine control behaviour and the occurance of dental caries to patient in Banjarbaru General Hospital dental polyclinic

Respondents with good regular dental routine control behaviour condition but stil have higher risks and a lot of criteria of dental caries due to their daily dental care behaviour, the dietary habit of consuming cariogenic food and beverages.[12] Based on research done by Widayati in 2014, stated that correlation between behaviour of dental and oral cavity examination with dental caries are not significant, it is more likely due to lack of information and awareness in performing dental and oral examination to the dentist for every 6 months.[33] The treatment would be better by reducing or avoiding cariogenic foods and always brushing teeth properly. Meanwhile, based on Jenatu's resesarch result in 2012 stated no meaningful correlation between treatment and examination frequency by dentist with the occurance of dental caries. The effective frequency of dental care is per six months, regular dental checkups to the dentist are good attempt to avoid dental caries.[26]

6. The correlation of dental polyclinic facilities and infrastructures with the occurance of dental caries in Banjarbaru General Hospital dental polyclinic

The condition of dental caries in the respondents is very high although the facilities and infrastructure has been already good, this is because the patient's dental care behaviour is not good and the food and beverages consumed is damaging the teeth easily.[26] Based on the research from the Rundunganin 2015, dental care facilities and infrastructures with caries occurance was found in good condition with value 76 - 100% where the caries found was as much as 90% of respondents suffering from caries. It showed that high number in dental and oral cavity disease have not been balanced with utilization of dental and oral care service unit available, primarily at service level.[34]

Facilities and infrastructure service functions according to Moenir are: a. speeding up the working process thus saving time, b. Increasing productivity of goods or services, c. Assuring better quality product, d. Easier and simpler in the motion for the doers, e. Bringing comfort to the people involved, f. Generating sense of satisfaction to the people involved which resulted in reducing the

emotional temperament.[35] Complete facilities and infrastructure in accordance with the standards are expected to improve the quality of service, where the incomplete equipment in dental polyclinic will be very influential on the action taken and treatment to the patients.

7. The correlation of dental health services personnels with dental caries occurence in Banjarbaru General Hospital dental clinic

The rate of dental caries obtained is quite high even though the dental and oral care services personnels provide a satisfactory service. Many factors affect dental caries, such as genetics with poor quality teeth, pathogenic bacterias, improper daily care of both the frequency, time and the way of brushing teeth. It will be better by reducing or avoiding cariogenic foods and always brushing the teeth properly.[26]

The results of Kencana's resesarch in 2012 stated the interviews that have been done with some patients who come to dental clinic in Puskesmas Tabanan regency obtained information that on duty health personnels both dentists and dental nurses behave friendly and provide services relatively fast and no patients were unsatisfied with the dental and oral cavity care personnels in that clinic, the patients were mostly highly satisfied with their dental caries status (DMF-T score) that mostly is of more than 2, which means that the caries number was quite high.[34] At Sainuddin's 2010 research results in patients visiting dentist clinics, the reliability or ability to provide dental and oral care became the dominant factors that affected the satisfaction level.[35]

8. Other Factors Affecting/Correlating with Dental Caries Occurrence

Factors related to dental caries occurence with variables such as knowledge level, level of education, age, gender, polyclinic facilities and infrastructure, and dental and oral cavity health personnels at dental clinic of Banjarbaru General Hospital between October to November 2016 after bivariate and multivariate analysis done, there was no significant correlation. Another factor is the condition of groundwater consumed by residence in Banjarbaru which has low pH that is acidic and has no fluoride content.[38] For groundwater content that has no fluoride and pH 3.3-7.0 will cause dental caries, to overcome it there must be fluoridation done to drinking water and also water management to make the water less acidic.[36]

It has been chemically proven in vitro the cause of tooth decay is acid on tooth surfaces causing dental erosion, acid ions can penetrate into prisms in the enamel so that it becomes a porous known as the beginning of demineralization.[37] Low acid conditions will make the process of demineralization or solubility of mineral tooth which is the process of releasing dental mineral ions, in form of hydroxy apatite derived from the main component of email due to chemical processes. Demineralization conditions in enamel occur when the pH around the surface of the enamel is lower than pH 5.5.[36]

Demineralization of enamel occurs through the diffusion process, which is the process of transferring water-soluble molecules or ions to or from the enamel because of the difference in the concentration of acidity of drinking water on the surface and within the enamel. High concentrations of drinking water and low initial pH of drinking water will diffuse into enamel through crystal lattice and enamel prisms containing water and organic or protein matrix.[39] Decreasing pH over time will result in demineralization of the tooth surface thus causing caries.[40]

One of the prevention efforts is to strengthen tooth enamel so it will not easily soluble by acid in the presence of Fluoride ions contained in water. Ion Fluoride will increase the speed of remineralization on the enamel and demineralized dentine, tooth structure which undergoes remineralization in the presence of fluoride will present face the increase in flourhydroxyapatite which causes the tooth more resistant to acid than the original structure. In addition to strengthening enamel, Fluoride also has an antibacterial effect that may affect tooth sensitivity to caries occurrence and number of colonies of *streptococcus mutans* in the oral cavity.[38] Fluoride as one component of apatite crystal minerals that attaches to the apatite end of the cervical tip is then converted into apatite fluoride which is acid-resistant, it systemically affect the metabolism of glycolysis in bacterial cells so that no acid accumulation will dissolve at tooth surface which inhibit the metabolism of glycolysis of bacteria, thus it inhibits the process of dental caries.[39]

Due to the condition of Banjarbaru region goundwater which does not contain enough fluoride resulting in many dental caries, the systematic Fluoridation drinking water by the regional water company (PDAM) or mineral water is very effective. Flouridation of drinking water has been

proved that water consumed with right doses of fluoride will protect us from dental caries. Fluoride given in drinking water varies between 0.7-1.2 ppm. In addition, Fluoride can also be given topically, ie: topical application, fluoride toothpaste, and fluoride mouthwash.[40]

Conclusion

Regular dental routine control behaviour factors have a significant correlation with the occurance of dental caries in Dental Polyclinic Banjarbaru General Hospital.

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