

Dental Caries and Habit of Eating Sweet Foods, Drinking Sweet Drinks, and Brushing Teeth Properly in the Community Aged 15-64 Years in Indonesia

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Abstract

Background: Dental caries is one of the most common dental and oral health problems in Indonesians. Dental caries were caused by many factors, including consuming sweet foods and brushing teeth properly. This study aimed to analyze the relationship between the incidence of dental caries with the habit of eating sweet foods and sweet drinks and the habit of brushing teeth properly in the community aged 15-64 years in Indonesia.

Methods: The research method is a further analysis of the data from the National Basic Health Research (Riskesdas 2018) with a cross-sectional and non-interventional design. The study population included Indonesians from 34 provinces, 514 districts/cities. The research sample was all household members in the selected households. The samples analyzed were household members aged 15-64 years. Implementation of data collection was done through interviews using a questionnaire.

Results: The results showed that the respondent's characteristics, that is age, gender, education, and residence had a significant relationship with the incidence of dental caries, with p-value < 0.05 (p=0.0001). The habit of eating sweet foods and drinking sweet drinks and brushing teeth properly had a significant relationship with the incidence of dental caries, with p-value < 0.005 (p= 0.0001). The number of respondents with dental caries caused by eating sweet foods 45.70%, drinking sweet drinks 45.70%, and brushing teeth properly 45.90%. The results of the multivariate test, almost all factors affect the incidence of dental caries, except for the occupational factor with p-value > 0.05 (p=0.260).

Conclusion: The habit of eating sweet foods, drinking sweet drinks and brushing teeth properly is significantly related to the incidence of dental caries in the community aged 15-64 years.

Keywords: Dental caries, eating sweet foods, drinking sweet drinks, brushing teeth properly, basic health research, Indonesia

Abstrak

Latar belakang: Karies gigi atau dental caries adalah salah satu masalah kesehatan gigi dan mulut yang banyak dikeluhkan masyarakat Indonesia. Karies gigi banyak disebabkan oleh kebiasaan yang tidak baik, diantaranya mengkonsumsi makanan yang manis manis dan menggosok gigi yang tidak teratur. Tujuan dari analisis ini untuk mengetahui hubungan kejadian karies gigi dengan kebiasaan makan makanan dan minuman yang manis dan kebiasaan menggosok gigi pada masyarakat umur 15-64 tahun di Indonesia.

Metode: Penelitian merupakan analisis lanjut data Riskesdas 2018 dengan disain potong lintang (cross-sectional) dan non intervensi. Sampel penelitian adalah seluruh anggota rumah tangga (ART) dalam rumah tangga terpilih. Sampel yang dianalisis adalah anggota rumah tangga berumur 15-64 tahun. Pelaksanaan pengumpulan data dilakukan melalui wawancara dengan menggunakan kuesioner. Analisis lanjut data ini dilakukan secara univariat, bivariat dan multivariat.

Hasil: Hasil penelitian menunjukkan bahwa karakteristik responden yaitu umur, jenis kelamin, pendidikan, dan tempat tinggal terdapat hubungan yang signifikan dengan kejadian karies gigi, dengan p value < 0,05 (p=0,0001). Kebiasaan makan makanan dan minuman yang manis dan kebiasaan menggosok gigi

terdapat hubungan yang signifikan dengan kejadian karies gigi, dengan p value $< 0,005$ ($p=0,0001$). Hasil uji multivariat, hampir semua faktor berpengaruh terhadap kejadian karies gigi, kecuali faktor pekerjaan dengan p -value $> 0,05$ ($p=0,260$).

Kesimpulan:kebiasaan makan makanan manis, minum minuman manis dan kebiasaan menggosok gigi dengan benar berhubungan secara signifikan dengan kejadian karies gigi pada masyarakat umur 15-64 tahun.

Kata kunci: Karies gigi, makan makanan manis, minum minuman manis, menggosok gigi yang baik, Riskesdas, Indonesia

INTRODUCTION

Dental caries is one of the dental and oral health problems that many Indonesian people complain about.¹Dental caries is a disease of dental tissue characterized by tissue damage, starting from the tooth surface and extending towards the pulp. Dental caries is also said to be a chronic process caused by disruption of the balance between the teeth and the environment in the oral cavity. Dental caries disease occurs due to demineralization of tooth surface tissue by organic acids derived from foods containing sugar. Many dental caries were caused by bad habits, including consuming sweet foods. This disease can attack all levels of society in all age groups regardless of gender and social status.²According to Tarigan (2013)³, dental caries can be experienced by everyone and can occur on one or more tooth surfaces, and can extend to the affected part. deeper than the tooth, for example from the enamel to the dentin or to the pulp. The causative factor of dental caries consist of direct factors in the mouth that are associated with dental caries (host, microorganism, substrate and time) and indirect factors called external risk factors which are predisposing factors and inhibiting factors for dental caries (age, gender, education, environment, economic status, attitudes and behavior on dental health).

Reported by Widayati N (2014), there is a strong relationship or correlation between the habit of buying sweet foods, sticky foods and drinking milk with the incidence of dental caries in children aged 4-6 years.⁴ In line with the results of research conducted by Sumini, et. al (2014), which explains that the occurrence of dental caries will be influenced by the habit of consuming cariogenic foods.⁵ The results of Ernawati, et al., 2011, stated that there is a relationship between dental caries and tooth brushing behavior.⁶

Based on data from Basic Health Research (Riskesdas) 2018, 45.3% of the Indonesian population who have dental problems. The prevalence of dental caries (age ≥ 3 years old) in Indonesia is 88.8%, this means that out of ten people in Indonesia as many as 9 people suffer from dental caries. People who live in rural areas have a higher prevalence of dental caries than in urban areas.⁷

Reported by Talibo, et. al (2016) that there is a relationship between consuming cariogenic foods, and brushing teeth with the incidence of dental caries.⁸ In accordance with the results of research Wandini R, et.al. (2019), there is a relationship between consuming cariogenic foods, and brushing teeth with the incidence of dental caries in kindergarten children.⁹ The results of research from Rehena Z (2020) which support previous research, it is known that the type and frequency of consuming cariogenic foods is associated with the incidence of dental caries in students of SD Negeri 5 Waai, Central Maluku District.¹⁰Based on the results of these studies, further analysis was carried out to determine the relationship between the incidence of dental caries and the habit of eating sweet foods, drinking sweet drinks, and brushing teeth properly.

Dental and oral health status is very close relation to the behavior or habits of community in the maintenance of dental and oral health. The behavior or habits in maintaining dental and oral health by reducing eating sweet foods, drinking sweet drinks, and brushing teeth properly. On the Basic Health Research 2018, available data are dental caries and other habit variables such as data on eating sweet foods, drinking sweet drinks, and brushing teeth properly. Data on characteristics such as age, gender, education, occupation, and residence. The purpose of this analysis is to determine the relationship between dental caries with the habit of eating sweet foods, drinking sweet drinks and the habit of brushing

teeth properly in the community aged 15-64 years in Indonesia. Furthermore, it is hoped that the prevention of dental caries in the community can be done by reducing the habit of eating sweet foods, drinking sweet drinks and always brushing teeth properly.

METHODS

This research is a further analysis of the Riskesdas data 2018. The design of research is a cross sectional study. Data collection was carried out by the National Institute of Health Research and Development, Ministry of Health of the Republic of Indonesia in 2018. The research population was the entire population of Indonesia, covering 34 provinces, 514 districts/cities. The research sample was all household members in the selected households. As the research sample for dental health, all respondents aged 15-64 years who were sampled for Riskesdas 2018.⁷ The implementation of data collection on the incidence of dental caries and habits or behavior of eating sweet foods and drinking sweet drinks and brushing teeth properly was carried out through interviews using questionnaires. Variables in research were the dependent variable, and independent variable. The dependent variable was incidence of dental caries, while the independent variable consists of characteristics age, gender, education, occupation, eating sweet foods, drinking sweet drinks and brushing teeth properly. Eating sweet foods, and drinking sweet drinks can be at risk of causing dental caries. The meaning of brushing teeth properly is brushing teeth in the morning after eating and at night before going to the bed. For the grouping of education was divided into lower education (junior high school and below) and higher education (high school up). Data collection was obtained well trained enumerators.

This data analysis was carried out using univariate, bivariate and multivariate methods. Univariate analysis includes the frequency distribution of the independent and dependent variables. Bivariate analysis is to see the relationship between the independent variable and the dependent variable, this test is to analyze the relationship between categorical variables and categorical variables. This analysis aims to examine differences in the proportions of two or more sample groups. Meanwhile, to see the effect of the independent variables together on the incidence of dental caries, multivariate analysis was performed using a complex sample approach. Multivariate logistic regression analysis aims to see or study the relationship of several independent

variables with one dependent variable at the same time. From this multivariate analysis, it can be seen which independent variable has the greatest influence on the dependent variable.¹¹

Conceptual Framework

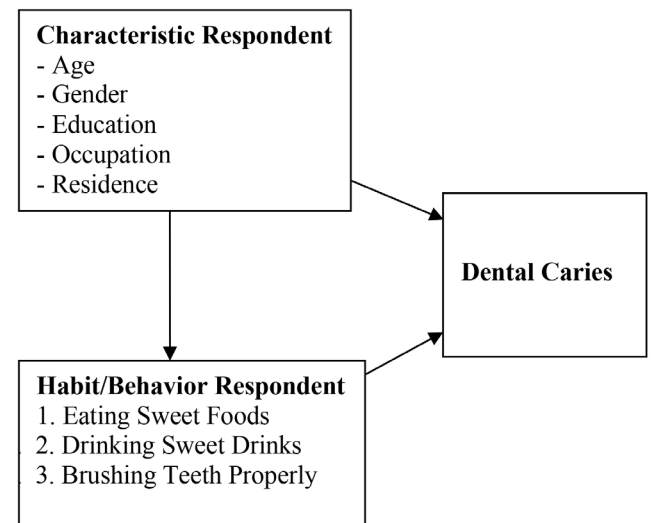


Figure 1. Conceptual Framework to Know the Relationship between Dental Caries with Habit or Behavior

Figure 1. shows the conceptual framework used in analyzing the data, to determine the relationship between dental caries and the habit of eating sweet foods and drinking sweet drinks and brushing teeth properly. The predisposing factors are the respondent's characteristics (age, gender, education, occupation, residence) and the respondent's habits or behavior (eating sweet foods, drinking sweet drinks, and brushing teeth properly).

Ethical Clearance

This research has received ethical approval from the Health Research Ethics Committee National Institute of Health Research and Development, Ministry of Health, Republic of Indonesia (No. LB.02.01/2/KE.024/2018 on January 24, 2018).

RESULTS

The number of respondents aged 15-64 years as many as 653,113 people, with the number of men as many as 312,684 people (47.90%) and women as many as 340,429 people (52.10%). Respondents with dental caries were 306,759 people (45.60%), and those without dental caries were 346,354 people (54.40%).

Table 1. Frequency Distribution of Respondents by Characteristics

Characteristics	Total Respondent (n)	Percentase (%)
Age Groups (year)		
15 – 24	144,375	22.10
25 – 44	290,197	44.40
45 – 64	218,541	33.50
Gender		
Male	312,684	47.87
Female	340,429	52.13
Education		
Lower	409,326	62.67
Higher	243,787	37.33
Occupation		
Not Work	173,217	26.52
Work	479,896	73.48
Residence		
Urban	285,061	43.65
Rural	368,052	56.35
Eating Sweet Foods		
Yes	561,305	86.40
No	91,808	13.60
Drinking Sweet Drinks		
Yes	588,707	90.70
No	64,46	9.30
Brush Teeth Properly		
Yes	212,349	66.60
No	440,764	33.40
Total	653,113	100.0

In table 1. It can be seen that the highest number of respondents is in the age group of 25-44 years (44.40%), where there are more female respondents than male (52.13%). Respondents with lower education are more than those with higher education (62.67%), respondents who work are more than those who do not work (73.48%), and respondents who live in rural areas are more than in urban areas (56.35%).

In table 2 shows that there is a significant relationship between the characteristics of the respondents (age, gender, education, occupation, and residence) with the incidence of dental caries, with a p-value <0.05, this means that the characteristics of the respondents are age, gender, education, occupation, and residence related to the occurrence of dental caries.

There is a significant relationship between the respondents habits or behavior (eating sweet foods, drinking sweet drinks and brushing teeth properly with the occurrence of dental caries, with a p value <0.05. This means that the occurrence of dental caries is related to the habit or behavior of eating sweet foods, drinking sweet drinks and brushing teeth properly with p-value = 0.0001. On the tooth brushing properly variable with OR below 1, that means tooth brushing properly was protective factor. (Table 3).

Table 2. Relationship between Dental Caries and Characteristic of Respondent

Characteristic Respondent	Dental Caries				p-value	Odds Ratio (95% CI)
	Yes		No			
	n	%	n	%		
Age Groups (year)						
15 – 24	57,222	39.60	87,153	60.40	0.0001	1.426
25 – 44	138,918	47.90	151,279	52.10		
45 – 64	110,619	50.60	107,922	49.40		
Gender						
Male	145,320	46.50	167,364	53.50	0.0001	1.055
Female	161,439	47.40	178,990	52.60		
Education						
Lower	200,916	49.10	208,410	50.90	0.0001	1.248
Higher	105,843	43.40	137,944	56.60		
Occupation						
Not Work	80,936	46.70	92,281	53.30	0.0180	1.005
Work	225,823	47.10	254,073	52.90		
Residence						
Urban	124,402	43.60	160,659	56.40	0.0001	1.188
Rural	182,357	49.50	85,698	50.50		

Table 4. Factors Related to the Occurrence of Dental Caries in Respondents Aged 15-64 years

Variable	Odds Ratio	SE	p-Value	B	95% CI
Age Groups (year)					
15 – 24					
25 – 44	1.437	0,0001	0.0001	0,363	1.436-1.438
45 – 64	1.584	0,0001		0,460	1.583-1.586
Gender					
Male	1.038	0,0001	0.0001	0,037	1.037-1.039
Female					
Education					
Lower	1.185	0,0001	0.0001	0,170	1.002-1.003
Higher					
Occupation					
Not Work	1.002	0,0001	0.260	0,002	0.980-1.005
Work					
Residence					
Urban	1.147	0,0001	0.0001	0,137	1.146-1.148
Rural					
Eating Sweet Foods					
Yes	1.052	0,0001	0.0001	0,051	1.051-1.053
No					
Drinking Sweet Drinks					
Yes	1.052	0,001	0.0001	0,051	1.051-1.053
No					
Brushing Teeth Properly					
Yes	0.925	0,0001	0.0001	-0,078	0.924-0.925
No					

From the results of multivariate tests carried out on all variables, both characteristic variables (age, gender, education, occupation, residence) and habit or behavior variables (eating sweet foods, drinking sweet drinks, and brushing teeth properly), almost all variables have an effect on the occurrence of dental caries except occupation variable, with p-value > 0.05 (p=0.260), where OR 1.002 (95% CI: 0.980-1.005)

DISCUSSIONS

In this study, it was found that respondents with dental caries were 306,759 people (45.60%) and those without dental caries were 346,354 people (54.40%). The incidence of dental caries with the highest percentage in the age group 45-64 years (50.60%), and the lowest in the age group 15-24 years (39.60%). Dental caries was found a lot in women than men. The proportion of dental caries in people with low

education (49.10%) is more than those with higher education (43.40%), the proportion of dental caries in people who work (47.10%) is more than those who do not work (46.70 %), and the proportion of dental caries in people living in rural areas (49.50%) is higher than in urban areas (43.60%).

The high prevalence of dental caries in women and the age group 45 years and over is caused by eating sweet foods, drinking sweet drinks, and brushing teeth improperly.

According to result of research from Martinez-Mier, EA et al. (2013), that sex differences in dental caries experience have also been widely observed, with most studies showing that women and girls are at higher risk and experience more carious lesions than do men and boys.¹²The result study from Marwa MMS et al. (2019), concluded that age, BMI (Body Mass Index), SES (Socio Economic Status), education level and

brushing frequency are risk factors significantly associated with caries prevalence amongst Egyptian adults.¹³

The results of Riskesdas 2013 showed that the incidence of dental caries in rural and urban communities was almost the same.¹⁴ Research in Lithuania in 2016, reported that the prevalence of dental caries was relatively high that was 78.3%, with a p-value <0.001 and the mean DMF-T score 2.93 (SD, 2.81). There were differences in the experience of dental caries between people in urban and rural areas. This is influenced by socio-economic differences, where the caries value in rural areas is higher than in urban areas, and for males the caries value is higher than for females.¹⁵ In oral health reports, the prevalence of dental caries usually is defined as the percentage of population affected by dental caries, and caries severity or experience is calculated based on D (decayed) M (missing) and F (filled) T (teeth) index following the WHO criteria (1997).

In Riskesdas 2018, it is known that there is a significant relationship between the habits or behavior of respondents who eating sweet foods, drinking sweet drinks and brushing teeth properly with the occurrence of dental caries, with a p-value <0.05.⁷ Nurhaeni (2020), there was a significant relationship between the habit of eating sweet foods with the incidence of caries in elementary school children.¹⁶ Results of research from Lendrawati L, et.al, (2019), supports previous research that consuming sweet foods is significantly associated with the occurrence of dental caries.¹⁷ Skinner J, et.al. (2016), reported that there was a high increase in the incidence of dental caries in adolescents aged 14-15 years who consumed high sugary drinks in New South Wales, Australia.¹⁸ The results of the study are in line with previous studies, it is said that the high prevalence of caries in grade 3 students in Georgia is associated with high consumption of sugary drinks.¹⁹

Dental caries can be prevented by brushing teeth properly and regularly at least twice a day, ie. after every meal and going to bed at night. The habit of brushing teeth, can also affect the severity of caries, respondents who brush their teeth regularly have a tendency to have milder caries than those who do not brush their teeth.²⁰ The results of research from Kurdaningsih SV, (2017), there is a significant relationship between the habit of brushing teeth with dental caries.²¹ The correct tooth brushing

behavior, after breakfast and at night before going to bed has a close relationship with the occurrence of caries.²² Brushing teeth properly can prevent or reduce the occurrence of dental caries, by inhibiting the growth of bacteria that can cause tooth decay. The most people know how to brush their teeth properly, but it is not applied in their usual daily brushing habits.

This study is in line with previous research, which states that there is a relationship between eating patterns and brushing teeth habits with dental and oral health (caries) in Indonesia, respondents who have a habit of consuming sweet foods tend to get caries above the average (>2) is 1.157 times compared to respondents who do not have the habit of consuming sweet foods.²³

The results of multivariate tests carried out on all variables, both on characteristic variables, that is age, gender, education, occupation, residence and habit or behavior variables, that is eating sweet foods, drinking sweet drinks, and brushing teeth properly, almost all variables have an effect/related with the occurrence of dental caries (p<0.05) except occupation variable, with p-value > 0.05 (p = 0.260). It was reported that occupational factors did not significantly influence the occurrence of dental caries.¹⁴

CONCLUSION

Dental caries is mostly found in people aged 45-64 years, in respondents who work, respondents with lower education, and those who live in rural areas. The habit of eating sweet foods, drinking sweet drinks, and brushing teeth properly is significantly associated with the incidence of dental caries in people aged 15-64 years in Indonesia. People aged 45-64 years are likely to experience dental caries 1.6 times than other age groups.

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Conflict of Interest

The authors declare that there are no competing or potential conflicts of interest.

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