Research Article

The Overview of Eating Patterns and Dental Caries Status of The Community of Pendul, Argorejo, Bantul Yogyakarta

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Abstract

The primary caries etiology factors are hosts (teeth), agents (microorganisms), substrates, and time. Individual characteristics can be influenced by caries' risk factors, such as age, education level, economic status, and diet. The high frequency of food and snack consumption, especially cariogenic food, is riskier of being caries affected. This study aims to describe the eating pattern and dental caries status of the Pendul community in 2018. This research is a descriptive observational study with a cross-sectional approach. It was held from December 2018 to January 2019 in the Pendul district of Bantul. The subject of this research was selected using the accidental sampling method with 138 respondents. The research instrument employed the Food Frequency Questionnaire and DMFT index. The result showed that the higher the consumption of cariogenic foods is, the higher the caries index will be. The highest frequency of cariogenic foods consumption was snacks, with a mean DMFT index of 8,02. The highest frequency of cariogenic beverage consumption was sugar tea, with a mean DMFT index of each respondent was 8 teeth. The highest frequency of cariogenic consumption per week lay in snacks and packaged tea. Apart from the four etiological factors, such as agent, host, substrate, and time, caries can also be caused by other determinant factors such as gender, age, education level, and socioeconomic status.

Keywords: dental caries; diet role; DMFT index; food frequency questionnaire

INTRODUCTION

National health development also focuses on equitable distribution of health, protection of health resources, improvement of nutritional health status, and public health services[1], such as dental and oral health services. Dental and oral health problems in Indonesia still require special attention from the government. The most common dental and oral health problem is dental caries.[2] According to RISKESDAS data in 2018, the prevalence of dental caries.[3]

Dental caries occurs due to bacteria's activity in the oral cavity, especially *Streptococcus mutants,* which ferment carbohydrates into acids, especially lactic acid and acetic acid. Factors causing caries include host factors (teeth and saliva), substrate factors, microorganism factors (bacteria), and time factors. Caries occur when these four factors interact with each other.[2] Apart from these four factors, individual characteristics can also influence the occurrence of caries, such as age, education level, economic status, and daily eating patterns.[4]

An eating pattern is related to the frequency of food consumption, food portion, and daily food quality.[5] The high frequency of consumption of food and snacks, especially cariogenic ones, causes a person to be susceptible to caries.[2] Cariogenic foods are high in carbohydrates,

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sticky, and easily chewed in the oral cavity.[6] This study aims to describe eating patterns and the dental caries status of the people in Pendul in 2018.

MATERIALS AND METHODS

This study used a descriptive observational research method with a cross-sectional design. This research was conducted from December 2018 to January 2019 in Pendul, Argorejo Village, Sedayu District, Bantul, Daerah Istimewa Yogyakarta, Indonesia.

Based on the preliminary survey results, the total population was 730 people. The sample in this study included the people of Pendul, Argorejo Village, Sedayu District, whose minimum age was 5 years old. Based on the preliminary survey, it was found that 660 people met these criteria. This study used an accidental sampling technique and obtained 138 people. The variables of this study were dental caries status and eating patterns.

The operational variable of the dental caries status is the status of cavities characterized by the presence of cavities when measured using a probe. A probe was measured using the DMF-T index (Decay, Missing, Filled Teeth) in study subjects with permanent teeth and the DEF-T index (Decay, Exfoliate, Filled Teeth) in study subjects with primary teeth. An eating pattern is a habit of consuming food and drinks identified by filling out the Food Frequency Questionnaire (FFQ) sheet to calculate the type of food consumed and the frequency of eating habits per week in the past month. The research instruments included an odontography, FFQ questionnaire, oral mirror, probe, 70% alcohol, and container.

RESULT

Table 1. Distribution of Dental Caries Status with DMFT Index

	DMFT		Total	Mean DMFT
D	M	F		
702	381	7	1090	7.89

Table 1 shows that the dental caries status of the Dusun Pendul community assessed by the DMFT index has a mean of 7.89.

Table 2. Distribution of Dental Caries Status by Gender

Gender	Total	Mean DMFT
Male	440	7.71
Female	650	8.02

Table 2 shows that female respondents have a higher mean DMFT than male respondents, where the mean DMFT of male respondents is 7.71, while female respondents' mean DMFT is 8. 02.

Table 3. Distribution of Dental Caries Status by Age

Age	Total	Mean DMFT
5-11 years	32	4.71
12-25 years	25	5.32
26-45 years	27	7.25
46-65 years	47	10.6
> 65 years	7	16

Table 3 shows that the dental caries status's highest mean DMFT is at > 65 years old, namely 16.

Table 4. Distribution of Dental Caries Status by Latest Education Level

Education Level	Total	Mean DMFT
Uneducated	34	5.17
Elementary school	50	9.4
Junior High School	21	8.57
Senior High School	31	7.61
College	2	2

Table 4 shows that the highest number of respondents, 50 people (36.2%), have an elementary school educational background. Meanwhile, the lowest number of respondents, 2 people (1.4%), have a college degree as their latest educational level.

Table 5. Distribution of Dental Caries Status by Socio-Economic

Occupation	Total	Mean DMFT
Laborer	52	9.78
Housewife	14	9.35
Entrepreneur	8	11.37
Private Employees	5	3.8
Unemployed	54	5.02
Other	5	11.2

Table 5 shows that respondents who work as entrepreneurs have the highest mean DMFT of 11.37.

Table 6. Frequency Distribution of Weekly Cariogenic Consumption and Mean DMFT

Cariogenic Beverage	Total			
	Once	2-3 times	>3 times	Never
	n (DMFT)	n (DMFT)	n (DMFT)	n (DMFT)
Packaged milk	9	16	4	89
Packaged tea	2	23	44	69
Packaged coffee	3	9	8	118
Packaged syrup	7	2	3	126
Packaged Juice	5	5	3	125
Ice cream	9	19	7	103
Soft drink	6	3	1	128
Isotonic	9	2	0	127

Table 6 shows that the higher the frequency of cariogenic foods such as bread, cakes, candies, and snacks are, the higher the average of dental caries will be.

The highest cariogenic consumption was in snacks with a frequency of > 3 times per week, and the mean of DMFT was 9.29.

Table 7. Frequency Distribution of the Weekly Cariogenic Drinking Patterns and Mean DMFT

Cariogenic Food	Total			
	Once	2-3 times	> 3 times	Never
	n (DMFT)	n (DMFT)	n (DMFT)	n (DMFT)
Bread	24 (7.65)	31 (8.29)	27 (12.1)	54 (5.6)
Cake	16 (7.68)	16 (8.81)	11 (11.3)	95 (7.42)
Candy	13 (8.15)	9 (8,11)	24 (8.25)	92 (7.91)
Chocolate	7 (10.7)	15 (7.46)	7 (11,4)	109 (7.55)
Snacks	8 (7.75)	21 (8.47)	34 (9.29)	75 (7.12)

Table 7 shows that the most frequently consumed cariogenic beverage is packaged tea, with a consumption frequency of > 3 times per week with a mean DMFT of 9.27.

DISCUSSION

This study indicated that the highest frequency of cariogenic food consumption per week was snack consumption, with a frequency of > 3 times by 34 respondents. It had *a* mean DMFT of 9.29.

Furthermore, this study also revealed that the higher the frequency of respondents consuming bread, cakes, candies, and snacks is, the higher the respondents' mean DMFT will be. Certain bacteria can ferment food consumption high in sucrose and glucose into acids that can damage tooth enamel and lead to caries. The high frequency of consumption of cariogenic foods and snacks causes a person to be prone to caries.[5] Based on the present systematic review, an association was found between the time spent by preschool and school-aged children watching TV and poor diet quality, characterized by higher fat and sugar consumption with fewer fruits and vegetables and increased intake of sugar-sweetened beverages; therefore, representing a potentially cariogenic diet.[7]

The results of this study align with the previous research, revealing that the higher the consumption of sweets is, the higher the caries severity will be.[8] Previous research also revealed evidence to support the use of sugar-free gum in controlling Streptococcus mutans counts, which relate directly to caries progression in children

and adults. Chewing sugar-free gum reduces the load of Streptococcus mutants in the oral cavity compared to non-chewing controls.[9]

Furthermore, the highest frequency of cariogenic beverage consumption per week was packaged tea, with a consumption frequency of > 3 times by 44 respondents with *a* mean DMFT of 9.27. The sucrose content in packaged tea can accelerate extra cells so that microorganisms in the oral cavity quickly convert them, causing a decrease in pH. Consuming sweet, sticky or sour food causes persistent acidity, making saliva difficult to increase the pH; low pH causes dental caries. It is in line with the previous research, which found a relationship between the frequency of consumption of cariogenic foods and beverages with the level of dental caries.[10]

In terms of DMFT, this study revealed that the mean DMFT of the Pendul community was 7.89. It indicated that each respondent had an average of caries in 8 teeth. The high rate of dental caries can be influenced by many factors, such as gender, age, education level, socioeconomic status, environment, and culture.[2]

Based on the study results, it can be seen that female respondents had a higher mean DMFT than male respondents. The mean DMFT of female respondents was 8.02, while the mean DMFT of male respondents was 7.71, with the caries level categorized as very high. The high dental caries in women can be caused by a faster dental eruption than in men. The prevalence of dental caries in women was higher than that of men.[11]

In addition, the results of this study also indicated that the dental caries status based on age category in the age group of > 65 years had a higher mean DMFT than the age group below it. The mean DMFT in the age group > 65 years was 16. The high dental caries in the elderly can be influenced by a decrease in self-independence, resulting in a decreased level of dental and oral hygiene. The older the

age is, the lower the awareness of maintaining dental and oral health will be.[12]

The results of dental caries status based on the educational background showed that the highest mean DMFT lay in respondents who had elementary school as their latest educational level, with a total of 50 respondents and a mean DMFT of 9.4. The level of education affected the status of dental and oral hygiene and dental caries status. The lower the level of education is, the higher the caries rate will be suffered.[13] Dental caries risk factors included higher consumption of snacks, lower maternal education level, and socioeconomic status. The population with lower income and lower educational level are the most affected, independently of the evaluated indicator such as untreated dental caries, access to dental care services and hygiene habits.[14] Parental educational background frequently determines income, thus controlling access to home or professional preventive means such as toothpaste, dental floss, low caloric sugar-reduced diets, or privately paid dental sealants.[15] Educational background affects nonmaterial characteristics such as health literacy and behavior, including dietary and tooth cleaning habits or health service utilization frequency and patterns.[16] Mother's level of education increases the awareness of oral health-related issues. Educating mothers on child dental care will promote lifelong good oral hygiene habits and considerably reduce the prevalence of oral diseases.[17]

Based on socioeconomic status, the results showed that the highest mean DMFT was in entrepreneurs, with a total of 8 respondents and a mean DMFT of 11.3. In this study, the high mean DMFT was related to the behavior level in maintaining dental and oral health, which was included in the poor category.

Apart from the four etiological factors, such as agent, host, substrate, and time, caries can also be caused by other determinant factors such as gender, age, education level, and socioeconomic status. This research demonstrated that the mean

dental caries of each respondent was 8 teeth. The highest frequency of cariogenic consumption per week lay in snacks and packaged tea.

Parents should be advised that they are role models able to set eating behaviors at home by providing high-quality meals and having fruits, vegetables, and other healthy foods available as snacks.[18]

High sugar consumption, low maternal education, and low socioeconomic status increase the risk of dental caries.[19] Higher maternal education on tooth brushing, limiting sugars, and improving oral health education, are essential for reducing the prevalence of dental caries.[20]

CONCLUSION

The people in Dusun Pendul had an average of caries of 8 teeth per person. Furthermore, the highest eating pattern was in the consumption of snacks, with a mean DMFT of 9.29, and the highest cariogenic drinking consumption was packaged tea.

ACKNOWLEDGMENT

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