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Research Report

Snack consumption behavior and tooth decay-related pain during corona virus disease-19 pandemic

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ABSTRACT

Background: The corona virus disease-19 (COVID-19) pandemic has greatly affected community lives. The self-quarantine has an impact on the occurrence of psychological stress and the tendency to consume snacks. Dentist practice activities are limited in order to avoid the spread of this virus. As a result, oral and dental health is less controlled, and the habit of consuming cariogenic snacks during the pandemic increases the risk of dental problems. **Purpose:** This study aimed to analyze the correlation between snack consumption behavior and tooth decay-related pain complaints in the productive age population during the COVID-19 pandemic. **Methods:** This study design was an analytic observational study with a cross-sectional approach. The data collection used online questionnaires in the form of Google Forms to obtain the answer to snack consumption behavior. The population of this study was a productive age group population who lived in Surabaya. The total number of respondents in this study was 163 people. **Results:** The correlation test result showed a significant correlation ($p < 0.05$) between the snack consumption behavior and tooth decay-related pain, but there was no significant correlation between the snack consumption behavior and the habit of maintaining oral health. **Conclusion:** During the COVID-19 pandemic, there was an increase in snack consumption that leads to tooth decay-related pain complaints in the age-productive population in Surabaya.

Keywords: COVID-19; health risk; oral health maintenance habits; snack consumption; tooth decay-related pain; medicine

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INTRODUCTION

The coronavirus disease-19 (COVID-19) pandemic caused by the coronavirus (SARS-CoV-2) has been going on for almost two years. As of July 24th, 2020, the virus has spread to 196 nations, causing 15,296,926 cases and 628,903 deaths. Viruses originating from bats and pangolins can infect humans and spread through droplets and aerosols. This virus is commonly found in the nasopharynx and possibly in the saliva of infected humans.[1]

Various measures have been taken to slow and stop the COVID-19 spread. Self-quarantine is one of the efforts of the most affected countries. However, self-quarantine for months results in psychological stress that appears as a terrible mood and irritability in the community. Job loss, school closings, interpersonal violence, and other things that have happened during the pandemic have all contributed to psychological stress. Some people experience mental distress, sleeplessness, post-traumatic stress disorder (PTSD), and despair as a result of this situation. The emergence of false news, which spreads swiftly in the community, adds to the worry and anxiety, exacerbating the psychological stress.[2]

Psychological stress can affect individual eating habits and patterns during a pandemic. Staying at home for an extended time causes people to consume more food, snacks, and drinks, especially comfort foods, which typically contain a lot of sugar and are cariogenic. Based on a survey of 21 respondents, 15 people (71.5%) said they had increased their snack consumption during the pandemic. Increased consumption of cariogenic snacks might be caused by unrestricted availability of food and decreased physical activity. Cariogenic snacks are favored because of their sweet taste and high sugar content, so they can increase serotonin production, which can improve a bad mood.[2–4] Dentists are workers with the highest risk of exposure to COVID-19; this was stated by the New York Times in an article entitled "Workers Facing the Greatest Corona Virus Risk" on March 15, 2020. Therefore, world health organization (WHO) advises the public not to go to the dentist except for emergency cases. Procedures in dentistry that produce a lot of droplets and aerosols are considered to

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be able to increase the risk of transmission of COVID-19. As a result, poor oral and dental health coupled with the habit of eating cariogenic snacks during the pandemic increases the risk of dental caries.[5–7]

According to Basic Health Research or Riset Kesehatan Dasar (Riskesdas) 2018, 45.3% of the Indonesian population experienced tooth decay/cavities/pain. From the survey, it was found that 59.4% of Indonesians at productive age experienced oral problems, and more than 70% of Indonesians at productive age experienced caries. Bad oral health maintenance habits are one of the risk factors for dental and oral health problems. This habit can enhance plaque production and the growth of cavity-causing bacteria in the mouth. Plaque can be reduced by brushing your teeth twice a day using fluoride-containing toothpaste regularly. However, although the habit of brushing the teeth of the Indonesian people has reached 97.7%, there are only 2.8% who do this habit correctly, brushing their teeth after eating and before going to bed. Improper tooth brushing habits, increased consumption of cariogenic snacks, and uncontrolled oral health can increase the risk of many oral diseases, including caries, periodontitis, and various other diseases.[8,9] Based on this description, the aim of this study is to analyze the association between the frequency of snack consumption and the frequency of tooth decay-related pains experienced by the community during the COVID-19 pandemic.

MATERIALS AND METHODS

This research used observational analytic research with a cross-sectional design. The study's respondents are people between the ages of 15 and 65 who live in Surabaya City, East Java. The sample size in this study was 163, using the total sampling of those who visited the public health center in Surabaya. Respondents from this study were people who lived in the city of Surabaya, East Java, with a vulnerable age of 15-65 years. The sample size in this study was 163 respondents, who were taken using the quota sampling technique. In this study, snack consumption behavior during the COVID-19 pandemic variable and the tooth decay-related pain complaints during the COVID-19 pandemic were both obtained using an online questionnaire, namely Google Form. The online questionnaire was distributed to the samples through social media such as Instagram, Line, Twitter, and WhatsApp. Respondents immediately filled out and answered the questionnaires that had been distributed. The data that has been obtained by the researchers were collected and then analyzed. Data analysis in this study used the Spearman Correlation Analysis Test to determine the correlation between snack consumption behavior during the COVID-19 pandemic and complaints of tooth decay-related pain during the COVID-19 pandemic, where the p-value was less than 0.05.

Table 1. Characteristics of respondents

Characteristics	n	%
Gender		
Male	41	25.2
Female	122	74.8
Residential area		
Central Surabaya	18	11.04
North Surabaya	10	6.1
East Surabaya	108	66.3
South Surabaya	24	14.7
West Surabaya	3	1.3
Occupation		
Unemployee	10	6.1
Student	111	68.1
Civil Servant	2	2.5
Army or Police	1	0.6
Entrepeneur	8	4.9
Private Employee	20	12.3
Etc	9	5.5
Marital status		
Single	144	88.3
Married	19	11.7
Education background		
Elementary School or Equivalent	1	0.6
Junior High School or Equivalent	0	0
Senior High School or Equivalent	49	30.1
College or Equivalent	113	69.3

RESULTS

Table 1 showed the data on the distribution of the demographic characteristics of the respondents. Respondents were female with an average age of 22.26 years, more than male respondents with an average age of 24.22 years. The distribution of the occupation status and recent education shows that most of the respondents are students and have a college education or equivalent. The majority of respondents are unmarried, and most of them live in the East Surabaya area.

Table 2 showed the mean value of each snack variable, tooth decay-related pain, and oral health maintenance habits in Surabaya people aged 15 to 65 years. The mean value of the snacking variable was 16.06, tooth decay-related pain was 9.61, and oral health maintenance was 27.63. Which showed that most respondents are likely to consume snack, have a high tooth decay-related pain, and have good oral health maintenance.

Table 3 showed the distribution of the mean value of each variable tested by gender. The mean value of the

Table 2. The mean value of the variable

Variable	Average value
Snack consumption	16.06
Tooth decay-related pain	9.61
Oral health maintenance	27.63

Table 3. The mean value of the variables by gender

Gender	Snack consumption	Tooth decay-related pain	Oral health maintenance
Male	15.24	10.61	25.9
Female	16.34	9.27	28.2

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Table 4. Spearman correlation test results

		Snack consumption	Tooth decay-related pain	Oral health maintenance
Snack consumption	Correlation coefficient (r)		0.303	0.055
	P-value		0.000*	0.489
Tooth decay-related pain	Correlation coefficient (r)	0.303		-0.113
	P-value	0.000*		0.151
Habits of maintaining oral health maintenance	Correlation coefficient (r)	0.055	-0.113	
	P-value	0.489	0.151	

*There is a significant correlation (p-value < 0.05)

snack variables and the habit of maintaining oral health maintenance in male is lower than in female. Meanwhile, the total mean value of the tooth decay-related pain variable was lower for the female sex.

The results of the Spearman correlation test are presented in Table 4 with p<0.05. Spearman's correlation test on the snack consumption variable on tooth decay-related pain showed a significant association (p = 0.000) with a low correlation level (r = 0.303) and had a positive correlation coefficient. Meanwhile, the variable of maintaining oral health and tooth decay-related pain showed an insignificant association (p = 0.151) with a very low level of correlation (r = -0.113) and had a negative correlation coefficient. Finally, the snack variable with the habit of maintaining oral health maintenance showed an insignificant association (p = 0.489) with a very low level of correlation (r = 0.055) and had a positive correlation coefficient.

DISCUSSION

This study aimed to examine the relationship between snack consumption habits and tooth decay-related pain complaints in the productive-age population during the COVID-19 pandemic. In this study, females consumed more snacks than males; this result is consistent with previous research.[10] However, this study result in contrast to research conducted which shows that males consume more snacks than females.[11] Meanwhile, males do not have better oral health maintenance habits than females; this value is consistent with the study done by Lendrawati, which found that more females follow oral health maintenance habits such as brushing their teeth after breakfast and before bed. The mean value of tooth decay-related pain was lower in females.[11]

In this study, it was shown that the snack consumption variable affected the tooth decay-related pain variable. The correlation test results between the two variables support the prior study by Gorleku et al., which found a weak positive association between snack consumption habits and dental and oral problems, including tooth decay-related pain.[9] These results are in accordance with our study, which can explain that the association between snack consumption and tooth decay-related pain rates occurs; the higher the frequency of snack consumption, the higher the complaints of tooth decay-related pain. Snacks are considered to affect complaints of tooth decay-related pain because they are often consumed outside of mealtimes and typically include items such as ice cream, biscuits, chocolate, cakes, and soft drinks.[10–12] Cariogenic foods are sticky so they can easily stick to the tooth surface if not cleaned properly. If the consumption of cariogenic foods that are not balanced with good oral health maintenance habits is carried out continuously, acid levels in the oral cavity increase, thereby accelerating tooth demineralization. The imbalance between demineralization and remineralization of teeth will then cause dental caries. Dental caries left untreated can lead to life-altering symptoms such as difficulty eating and sleeping, as well as a reduction in productivity.[13,14]

The results of the correlation test between the variables of maintaining oral hygiene and pain due to tooth decay in this study are consistent with previous research conducted by Natassa et al., which found no significant relationship between maintaining oral hygiene and pain caused by tooth decay. Other factors, such as eating habits, particularly the consumption of sugary and sticky foods, play a significant role in the development of dental caries. These foods can cause bacteria in the mouth to produce acid, which damages tooth enamel, regardless of the maintenance of oral hygiene.[15] Research conducted by Hariani & Saputra states that many individuals have good knowledge of oral hygiene but still experience tooth decay. This suggests that knowledge alone is not sufficient to prevent caries, and inconsistent or ineffective tooth brushing behavior also contributes to this issue.[16]

Based on the analysis conducted, this study shows that there is no relationship between the increased consumption of snacks and the habit of maintaining good oral hygiene in relation to complaints of pain due to tooth decay among the productive-age population in Surabaya during the COVID-19 pandemic. This relationship suggests that the increase in snack consumption, when not accompanied by proper oral hygiene habits, does not have an impact on the occurrence of tooth pain.[17] According to research conducted by Eni, factors causing tooth pain are not only related to diet and oral hygiene but also to genetic factors, general health conditions, and access to dental care, all of which play a significant role in determining pain complaints.[18] However, due to the COVID-19 pandemic, the study was conducted in a few public health centers only, and the researcher could not use a randomized sampling technique.

This study concludes that during the COVID-19 pandemic, there was an increase in the consumption of

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snacks, which led to complaints of pain due to tooth decay among the productive-age population in Surabaya. Meanwhile, the habit of maintaining oral hygiene did not show a significant relationship with complaints of pain caused by tooth decay during the COVID-19 pandemic in Surabaya. The randomized sampling technique can be used for further study about the snack consumption behavior and pain related to tooth decay.

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