Corona: Jurnal Ilmu Kesehatan Umum, Psikolog, Keperawatan dan Kebidanan
Volume 3, Nomor 1, Tahun 2025
e-ISSN: 3031-0172; p-ISSN: 3031-0180, Hal. 67-76
DOI: https://doi.org/10.61132/corona.v3i1.1024
Available Online at: https://journal.arikesi.or.id/index.php/Corona

The Relationship Between Snack Consumption and Dental Caries in Third and Fourth Grade Elementary School Students at SDN 064979 Medan 2024

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Abstract The consumption of snacks sold outside of school environments contains a lot of sugar, such as artificial sweeteners. Environmental and social factors in schools, like unsupervised off-campus cafeterias, can influence children's food consumption patterns and oral health habits. This study aims to analyze the relationship between snack consumption and dental caries in school children. The research method used is correlation with a cross-sectional approach. A total sampling technique is applied to 80 respondents. Based on the research results, snack consumption is found to be 86.3% in the sufficient category, while 73.8% of respondents are categorized with dental caries. The Spearman rank correlation test resulted in p-value of 0.168 (p > 0.05), indicating that there is no significant relationship between snack consumption and dental caries among third and fourth-grade students. This study suggests that good oral hygiene and promoting healthy snacks should be targeted for preventing dental caries in children.

Keywords: Snack, Consumption; Dental, Caries; Children

1. INTRODUCTION

The World Health Organization (WHO) reports that dental caries affects 60-90% school-age children negatively impacting the quality of life of children and families, dental caries in childhood, if left untreated, is usually associated with toothache and inability to eat or sleep, which in turn can negatively impact children's daily activities including school attendance. (Abed et al., 2020)

Dental caries in children is a high-prevalence disease that often causes pain and difficulty in chewing According to the Global Burden of Disease study, the prevalence of untreated permanent teeth is 267 million, untreated sequelae in children include poor school performance, absenteeism, verbal bullying, and has been shown to have an impact on oral health-related quality of life (Kimmie-Dhansay & Bhayat, 2022).

The Indonesian region found that 61% of Indonesian children aged 12 years had dental caries, and the average DMFT score was 1.58. The prevalence of caries and DMFT scores is higher than in other regions in Southeast Asia, which indicates that these Indonesian children have a worse oral health status (Maharani et al., 2019).

From the results of a study in North Sumatra, it is known that the younger generation who often eat sweet foods has a higher risk of getting tooth decay, which is 98%, in contrast to

Received: Desember 17,2024; Revised: Desember 31,2024; Accepted: Januari 12, 2025; Online Available : Januari 14,2025

children who rarely consume cariogenic foods, which has a risk of 40%. (Ayu et al., 2021). According to the results of the survey that has been carried out by the author at SDN 064979 MEDAN, the researcher asked about the habits of students in brushing their teeth every day, and it is known that many students brush their teeth a little every day, the researcher also asked about the habits of students when to check their teeth at hospitals and health centers, and students said to check their teeth sometimes when there is pain in the teeth and when the teeth are shaking to be extracted.

In elementary school children, many students still rarely brush their teeth after often consuming foods containing glucose, and artificial sweeteners that cause dental caries due to the leftovers from sweet snacks, and food that has been consumed sticks to the teeth between the teeth, and is not cleaned causing the formation of acids that make cavities and cause toothache to be experienced in elementary school children.

To prevent dental caries, according to the World Health Organization, primary school children should be educated to be able to 1) practice proper oral hygiene care, 2) limit the amount and frequency of sugar intake, and 3) adopt a routine check-up routine. (Phanthavong et al., 2019) With management and preventive measures, such as brushing teeth, it is much cheaper allinative (Kimmie-Dhansay & Bhayat, 2022).

2. MATERIAL AND METHOD

The research design used in this thesis is a type of quantitative research through the cross sectional method. In this method, the researcher will observe or measure the variables at a certain time together for each subject involved in the research. Each subject was only observed or measured once using the ICDAS analyzer and the dental diaostic examination device. In this study, the population consists of all students in grades III and IV at SDN 064979 MEDAN in 2024 (April), which totals 80 students. In the study, the sample was selected through a total population sampling technique with a sample of 80 students in grades III and IV at SDN Medan in 2024.

The location of the research was carried out at SDN 064979 on Jl. Setia Budi No.6, Tj. Rejo, Kec. Medan Sunggal Kota Medan Sumatera Utara. Independent variable in this study: Consumption of Cariogenic Foods. The bound variables in this study are: Tooth decay (Syapitri et al., 2022). The tools used in this study are questionnaires and observations. It can be concluded that the value of the calculated rs is > greater than the value of the table rs, then Ho

is rejected because it is 0.81 > 0.738 The interpretation is that the higher the snack consumption score, the more likely a person is to develop dental caries. This observation was adopted from the previous researcher, Annisaa Nur Khofifah Setiawan (2022) which was adopted from ICDAS II CRITERIA, the caries criteria are categorized into two categories, namely no caries and caries.

In this study, the researcher used a measuring tool for the food frequency questionaire (FFQ) form questionnaire and the dental caries observation sheet, using the ICDAS examination scale that had been prepared by the researcher. previously Annisaa in 2022, and a validity test has been carried out with the results of reliability estimates for the consumption of cariogenic foods with 10 questions obtained a p value of < 0.05, Observation of dental caries obtained a p value of < 0.05. The results of the reliability test that have been carried out have been successfully obtained. Snack frequency kones and dental caries observations were declared reliable with Cronbach's alpha > 0.7. The data analysis applied by the researcher in this study includes univariate and bivariate analysis.

Univariate analysis in this study, this statistical method is to identify the distribution and frequency of repondent characteristic data (initial name, gender, age, class) of independent variables of snack consumption, dependent dental caries. In this study, bivariate analysis was carried out to explain the relationship between two variables, namely the independent variable of the relationship between snack consumption and dental caries Dependent Variable. This research has been declared ethically feasible by the health research ethics commission of the Santa Elisabeth College of Health Sciences Medan with No.: 063/KEPK-SE/PE-DT/III/2024.

3. RESULT AND DISCUSSION

In this chapter, the results of research and discussion on the relationship between snack consumption and dental caries in grade III and IV school children at SDN 064979 Medan in 2024. This research began on March 27 – April 25, 2024. From the results of the demographic data of the respondents obtained included age, gender, class, observation of dental caries, food frequency questionaire (FFQ). The number of respondents in this study is 80 respondents.

Table 1. Distribution of Frequency and Percentage of Respondents' Demographic Characteristics Based on Age, Gender, and Class, at SDN 064979 Medan in 2024.

No	Characteristic	(f)	%
1.	**Age**		
	8 years	9	11,3
	9 years	43	53,8
	10 years	26	32,5
	11 years	2	2.4
	Total	80	100
2	**Gender**		
	Male	44	55,0
	Female	36	45,0
	Total	80	100
3	**Class**		
	3	57	71,3
	4	23	28,7
	Total	80	100

The above shows that of the 80 respondents based on age characteristics at 8 years, 9 respondents (11.3%), then 9 years 43 respondents (53.8%), then 10 years old 26 respondents (32.5%), 11 years 2 respondents (2.4%). Based on gender characteristics, it shows that 44 male respondents (55.0%) while female respondents are 36 people (45.0%). In the characteristics of the class, there were 57 people in class 3 (71.3%), then for class 4 there were 23 people (28.7%).

Table 2 Distribution of Respondents Based on Snack Consumption in Grade III and IV School Children at SDN 064979 Medan in 2024.

No.	Criteria	(f)	%
1.	Enough	69	86,3
2.	Bad	11	13,8
	Total	80	100

It can be seen that of the 80 respondents, most of the snack consumption in students at SDN 064979 Medan with sufficient criteria is 69 respondents (86.3%).

Table 3 Distribution of Dental Caries Respondents in Grades III and IV at SDN 064979 Medan

Criteria	Sum	Percentage
Caries	59	73,8
No Caries	21	26,3
Total	80	100

It can be seen that from 80 repondents, most of the dental caries numbers in students at SDN 064979 Medan with caries criteria are 59 respondents (73.8%).

Table 4. Cross-tabulation Between Snack Consumption and Dental Caries in Grade III and IV School Children at SDN 064979 Medan in 2024

Food Light	Dental Caries						P-value
	No Caries		Caries		Total		
	(f)	%	(f)	%	(f)	%	
Bad	1	9.1	10	90,9	11	100	0,168
Enough	20	29,0	49	71	69	100	
Total	21	26,3	59	73,8	80	100	

Based on the data from table 4 using the Sperm-rank p-value 0.168 (p > 0.05) statistical test, it can be concluded that there is no relationship between snack consumption and dental caries in grade III and IV school children at SDN 064979 Medan in 2024.

4. DISCUSSION

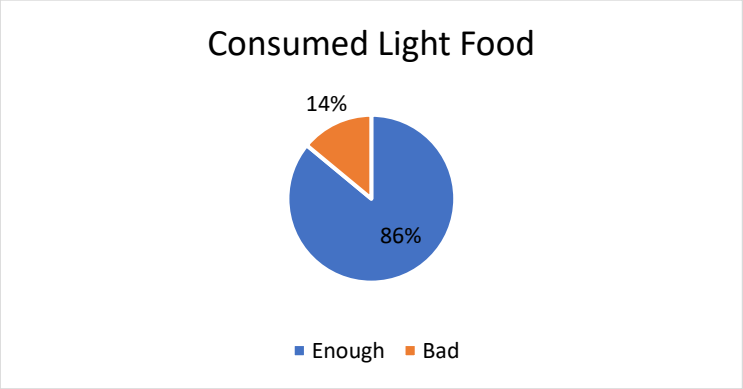

Diagram 1. Distribution of Respondents Based on the Relationship of Light Food Consumption in Grade III and IV School Children at SDN 064979 Medan.

Based on diagram 1, the results obtained from 80 respondents were obtained that the frequency of snacks in poor school children was obtained by 11 respondents (13.8%), and sufficient by 69 respondents (86.8%) The author assumes that generally, before the research was carried out, there were still many students and students who often snacked outside the school environment every day and could not even be separated from the consumption of snacks sold outside the school environment. Foods consumed contain a lot of sugar such as candy, and pastries are the most commonly consumed foods.

The above data is supported by Rosário et al., (2022) who stated that, Desserts (sweet snacks) and soft drinks can be common risk factors associated with a high incidence of caries. The above research data is supported by Cantoral et al., (2021) which states that, a higher total carbohydrate intake and the frequency of sweet food intake are associated with a higher experience of dental caries, there is no clear limit regarding the impact. The above data is supported by Karmińska et al., (2022) which states that unhealthy eating behaviors and food choices such as preferences for sweet foods and soft drinks are common in this vulnerable group, thereby increasing the risk of caries.

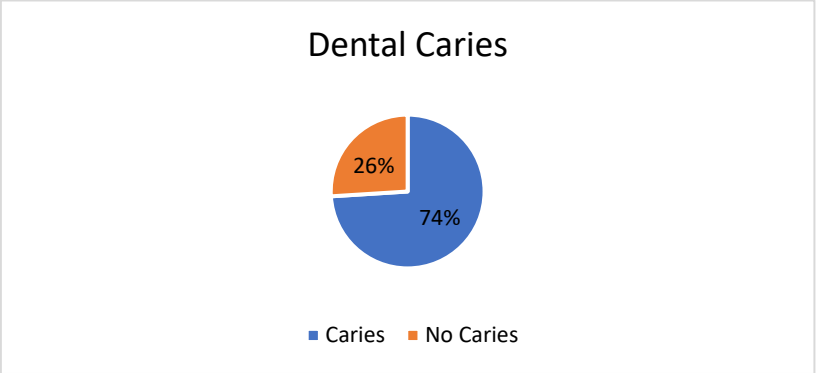

Diagram 2. Distribution of Respondents Based on the Relationship of Dental Caries in Grade III and IV School Children at SDN 064979 Medan in 2024.

Based on diagram 2, the results obtained from 80 respondents were obtained the frequency of not caries in bad school children as many as 21 respondents (26%), and caries as many as 59 respondents (74%)

The results of a study that has been conducted by researchers on the relationship between snack consumption and dental caries in grade III and IV school children at SDN 064979 Medan In 2024, snacks often contain sugar and simple carbohydrates that are easily absorbed by bacteria in the mouth. These bacteria then produce acid as a byproduct of sugar metabolism, which then damages tooth enamel and causes the formation of cavities or caries. Children who eat snacks regularly tend to have higher levels of acid in their mouths, which in turn increases the risk of developing dental caries.

Snack Consumption Patterns in School Children of SDN 064979 Medan, grade III and IV school children tend to have a more frequent snack consumption pattern, especially between main meal times. This may be due to factors such as advertising, the availability of snacks in the school environment or around the area where they live, and personal preferences.

This finding is supported by Keumala's research, (2024) which states that dental caries is a damage to the hard tissue of teeth caused by microbial activity in fermented carbohydrates. One of the causes of cavities is food that causes cavities. The results of the research data found by the researcher are in line with the researcher Hidayah., (2023) who stated that there was no significant relationship between the consumption of cariogenic foods and the incidence of dental caries (p value = 0.236) The results of the study showed that most respondents consumed cariogenic foods in the moderate category. There is a relationship between the consumption of cariogenic foods and the incidence of dental caries in children. The results of the research data found by the researcher are in line with the researcher Wowor et al., (2024) The researcher argues that the height One of the causes of cavities is food that causes cavities. One of the behaviors in children that can cause cavities is the consumption of cariogenic foods, which are foods that can cause cavities.

The relationship between snack consumption and dental caries in grade III and IV school children at SDN 064979 Medan in 2024.

Based on the results of the analysis conducted with the Sperm-rank test, a p-value of 0.168 ($p>0.05$) was obtained, which means that there was no significant relationship between snack consumption and dental caries in grade III and IV school children at SDN 064979 Medan in 2024.

There was no significant relationship between snack consumption and tooth decay in grade III and IV students of SDN 064979 Medan. This study shows that children have different eating habits. Although some children often consume snacks, there is no clear relationship between the frequency of snack consumption and the severity of tooth decay. In addition, other factors such as dental hygiene habits and regular visits to the dentist are also very important in preventing cavities Children who pay attention to dental hygiene and regularly visit the dentist tend to have a lower risk of tooth decay. This study shows that everyone reacts differently to snacks and their impact on dental health. There are children who are prone to tooth decay even though they rarely consume snacks, there are also those who often consume snacks and do not experience dental problems. The results showed that there was no significant relationship between snack intake and tooth decay in children at SDN 064979 Medan, but larger samples and further research, as well as dental examinations by dentists and dental nurses are needed to ensure the accuracy of the results of future studies. In summary, there are factors that affect a child's dental health, and the importance of a comprehensive approach to cavities prevention

that focuses not only on the intake of snacks but also on dental care habits and daily food activity factors.

The results of this study are supported by Ayu et al., (2024) who stated that in conclusion, karogenic school snacks consumed by children aged 12-14 years at SMPN Kulon Progo are in the low category (71%). The risk of caries based on CAT studies in children aged 12-14 years is in the high category (50%). There was no significant effect on the cariogenicity of snack schools at risk levels. The advantage of this study is that school children who are samples from general dental examinations are carried out in areas where the incidence of caries in young or pre-school children often occurs. The limitation in this study is the potential for bias in dental examinations using the ICDAS scale, the results of dental examinations are still general, not detailed in dental examinations, researchers use a general measuring tool set of dental diagnostic.

5. CONCLUSION AND SUGESSTION

Based on the researcher's findings on the relationship between snack consumption and dental caries in grade III and IV school children at SDN 064979 Medan in 2024, the following conclusions can be drawn: Snack consumption among students at SDN 064979 Medan with sufficient criteria was 69 respondents (86.3%) out of 80 respondents. Dental caries in students at SDN 064979 Medan with caries criteria as many as 59 respondents (73.8%) out of 80 respondents. There was no significant relationship between snack consumption and dental caries in grade III and IV school children at SDN 064979 Medan in 2024 with a p-value of 0.168 (p =>0.05).

The school is advised to collaborate with canteen managers in providing healthier and low-sugar food options. These alternatives can include. Foods that are often popular with children now such as corndogs with vegetables, fruit salads, puddings with fruit, fruit chips. In addition, schools also need to ban the sale of foods and drinks that are high in sugar content. This research is expected to be a reference material for future researchers who study the relationship between brushing teeth and tooth decay, the relationship between diet and the development of tooth decay in school children, and the relationship between socioeconomic factors and the development of tooth decay. prevalence of tooth decay. Tooth decay in schoolchildren.

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