Jurnal Ilmiah Keperawatan
Scientific Journal of Nursing
p-ISSN 2477-4391
e-ISSN 2528-3022

HUBUNGAN KONSUMSI MAKANAN KARIOGENIK DENGAN KEJADIAN KARIES GIGI PADA ANAK SEKOLAH DASAR: TINJAUAN LITERATUR

The Relationship between Consuming Cariogenic Foods with Dental Caries Incidence in Elementary School Children: Literature Review

Rini Mulyati, Lilis Rohayani , Mia Santika Pratiwi

Universitas Jenderal Achmad Yani

Riwayat artikel
Diajukan: 5 Juni 2022
Diterima: 23 Juli 2022

Penulis Korespondensi:
- Rini Mulyati
- Universitas Jenderal Achmad Yani

e-mail:
rinimulyaaati@gmail.com

Kata Kunci:
Cariogenic foods, Dental caries, Elementary school children

Abstrak

Pendahuluan: Anak sekolah di dunia mengalami karies gigi, dengan rata-rata lebih dari satu gigi berlubang. Makanan kariogenik merupakan salah satu faktor pemicu tingginya angka karies pada anak usia sekolah yang berdampak pada kesehatan gigi anak. **Tujuan:** mengidentifikasi hubungan konsumsi makanan kariogenik dengan kejadian karies gigi pada anak sekolah dasar dengan menggunakan pendekatan literature review. **Metode:** Penelitian tinjauan pustaka ini mengambil berbagai sumber artikel dengan rentang artikel yang diterbitkan yaitu 2016-2021. Artikel dicari melalui ScienceDirect, Pubmed, ProQuest, Google Scholar dan Garuda menggunakan 3 kata kunci, yaitu "Anak SD", "Makanan Kariogenik", dan "Karies Gigi". **Hasil:** Berdasarkan hasil penelitian diketahui bahwa ada hubungan antara konsumsi makanan kariogenik dengan kejadian karies gigi pada anak sekolah dasar, dan ada faktor lain seperti cara menggosok gigi, usia, pengetahuan dan riwayat. ekstraksi ibu. **Kesimpulan:** Yang perlu dilakukan adalah melakukan upaya preventif dan promotif dengan meningkatkan peran perawat sebagai pendidik dalam memberikan edukasi seperti pemberian leaflet melalui orang tua siswa terkait karies gigi dan pencegahan karies gigi sebelum terjadinya agar dapat membimbing anaknya dalam memilih jenis jajanan di sekolah.

Abstract

Background: *School children in the world experience dental caries, with an average of more than one tooth decaying. Cariogenic food is one of the triggering factors for the higher caries rate in school-age children which has an impact on children's dental health.* ***Purpose:*** *to identify the relationship between consuming cariogenic foods and the incidence of dental caries in elementary school children using a literature review approach.* ***Methods:*** *This literature review research takes various sources of articles with a range of published articles, namely 2016-2021. Articles were searched through ScienceDirect, Pubmed, ProQuest, Google Scholar and Garuda using 3 keywords, namely "Elementary School Children", "Cariogenic Foods", and "Dental Caries".* ***Result:*** *Based on the results of the study, it was found that there was a relationship between consuming cariogenic foods with the incidence of dental caries in elementary school children, and there were other factors such as how to brush teeth, age, knowledge and history of maternal extraction.* ***Conclussions:*** *What needs to be done is to make preventive and promotive efforts by increasing the role of nurses as educators in providing education such as providing leaflets through parents of students related to dental caries and prevention of pre-eruption of dental caries in order to guide their children in choosing the type of snacks at school.*

INTRODUCTION

Elementary school children are children aged 7-13 years who already have awareness and obligations of rules, social skills, and thirst for new knowledge (Santoso, Devi, & Kurniawan, 2018). The theory states that school-age children are children aged 6 to 18 or 20 years. School-age children are divided into two categories, namely pre-adolescence aged 6-11 years and adolescence, adolescence is divided into three periods, namely early adolescence aged 11-13 years, mid-adolescence aged 14-17 years and elderly adolescents aged 17-17 years. 20 years. At the time of school-age children, children learn to know the new environment, begin to be affected by the environment of their peers according to the stage of their growth (Soetjiningsih, & Ranuh, 2012).

The growth stage of school-age children is influenced by genetic and environmental factors. Growth is a quantitative change, namely an increase in the number, size, dimensions at the cellular, organ and individual level which can be measured by weight (grams, pounds, kilograms), length (cm, meters), bone age and sex characteristics. secondary. Physical growth in school-age children is seen from the growth in height, weight, fat tissue, head circumference, teeth, and body organs (Soetjiningsih, & Ranuh, 2012).

WHO (2020) states that 60-90% of school children in the world experience dental caries, the global dental caries index includes children aged 12 years and on average each person experiences tooth decay more than one tooth (World Health Organization, 2020). The 2017 Global Burden of Disease Study found that oral disease affects nearly 3.5 billion people worldwide, with dental caries being the most common condition. Globally, an estimated 2.3 billion people suffer from caries in the permanent teeth and more than 530 million children suffer from caries in the primary teeth (Vos et al., 2017). Based on the results of the Basic Health Research (2018), Indonesia experienced an increase in the incidence of dental and oral problems by 57.6%, in other words, an increase from the previous Riskesdas results in 2013, which was 25.9%. The percentage of people in Indonesia who have dental caries problems according to Riskesdas in 2013 and 2018 increased from 25.9% to 45.3% (Kementerian Kesehatan RI, 2018).

Cariogenic food is a triggering factor for the higher caries rate in school-age children, because children often eat and drink sweet foods according to their wishes regardless of what type of food they often eat (Worotitjan, Mintjelungan, & Gunawan, 2013). This is also reinforced by other studies which show that the value of the cariogenic food factor is ($p = 0.003$), the knowledge factor is ($p = 0.027$), and the tooth brushing habit factor is ($p = 0.006$) which means that there is a significant relationship between consuming cariogenic foods with the incidence of dental caries (V. A. Damanik, 2020). School age is the age when children have a fairly high curiosity, including food. Interesting food always attracts children to buy it without knowing the type of food they consume, especially sweet foods with attractive shapes or colors that make children interested in consuming them, such as cariogenic foods (Notoatmodjo, 2012).

Types of cariogenic foods that are often consumed by children, namely foods containing glucose (sugar) or sucrose such as chewing gum, chocolate, sweet cakes, sweet ice, confectionery such as aromatics or gulai and especially manufactured snacks (snacks) are the most common cariogenic food consumed by children (Rahena, 2020). Cariogenic foods include potato chips, candy (especially chewing gum), cream-filled cakes, pastries and sugary drinks (Alfiah, 2018). The impact of cariogenic food is that it can damage teeth because cariogenic foods contain carbohydrates (glucose and sucrose), these foods can be fermented by bacteria, which causes a decrease in the pH (acid) of plaque within a certain time, will result in demineralization of the tooth surface which causes dental caries (Reca, 2018). Sucrose has the ability to be more efficient against the growth of microorganisms and is rapidly metabolized to produce acids. Food that sticks to the tooth surface if left unchecked will produce more acid, thus increasing the risk of developing dental caries (Kartikasari & Nuryanto, 2014). Dental caries is not only painful in the tooth area but can cause wider consequences as a result of dental caries.

Based on the data and research results above, the researchers are interested in conducting secondary data research or a literature review entitled "The Relationship between Consuming Cariogenic Foods with Dental Caries Incidence in Elementary School Children: Literature Review".

METHOD

The design used in this research is Literature Review. Literature Review means reading the literature, conducting an in-depth and critical evaluation of previous research on a topic.

A good literature review is one that evaluates the quality and new findings of a scientific paper. Research that includes literature review can be in the form of data sources: Papers from scientific journals, Papers from Conferences (Proceedings), Thesis and Dissertations, Reports from trusted organizations and textbooks. Before reviewing an article to be used as literature, the first step taken is a literature search.

The main type of article chosen was an observational study of the relationship between consumption of cariogenic foods and the incidence of dental caries in elementary school children with a range of publication years starting from 2016-2021. Articles were searched through ScienceDirect, Pubmed, ProQuest, Google Scholar and Garuda using 3 keywords in 2 languages namely "Anak Sekolah Dasar "Makanan Keriogenik", and "Karies Gigi" for searches in Indonesian, and for searches in English namely "Elementary School Children", "Cariogenic Foods", and "Dental Caries" which were searched in national and international journals.

The inclusion criteria used to select the research articles were the results showing the relationship between consumption of cariogenic foods and the incidence of dental caries in elementary school children, cross sectional study design, population of elementary school children and year of publication from 2016-2021, and Sinta indexed articles. or Scopus. The study was excluded if the research method was quasi-experimental and qualitative, the article did not have an ISSN and the article did not contain two or one of the variables.

The researcher uses secondary data or literature review with clarity of research question is "is there a relationship between the consumption of cariogenic foods and the incidence of dental caries in elementary school children: Literature Review?".

All articles obtained from various data sources in this study were further selected using a protocol and evaluated from the literature using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses). PRISMA chart can be seen in **Figure 1**.

RESULTS

Research Characteristics

There are 7 articles that meet the inclusion criteria as samples in this study. In general, the topic of the research problem is the relationship between consuming cariogenic foods and the incidence of dental caries in elementary school children. The research method as a whole uses quantitative research methods with a cross sectional design type, with a range of publication years starting from 2016-2021, and the population and samples taken as a whole are elementary school age children.

The variables used in this study were cariogenic food variables and dental caries variables. There are 7 journals that meet the inclusion criteria as samples in this study, namely 5 national journals and 2 international journals. In general, the topic of the research problem is the relationship between consuming cariogenic foods and the incidence of dental caries in elementary school children.

DISCUSSION

Similarities and Differences Research Articles

The results of the study based on the 7 articles studied, there are similarities and differences from each article. The methodological approach has the same research design, namely cross sectional, ie data collection is carried out at the same time. Most of these studies took large samples from the population studied, some other studies used random sampling techniques, such as cluster random sampling and simple random sampling. In this study, we will only limit cariogenic foods that cause dental caries."

Alfiah's research (Alfiah, 2018) uses a consecutive sampling technique, this technique is a technique used when all subjects who come sequentially and meet the selection criteria are included in the study until the required number of subjects is met (Alfiah, 2018). The selection of this technique is the best type of non-probability sampling and is the easiest way. In contrast to Damanik's research (H. Damanik, 2020) using the total sampling technique, this total sampling technique uses the entire population as the research sample. Methods of collecting data on all articles such as primary methods, interviews and clinical examinations for the mouth and teeth area.

Based on 7 research articles, there is a relationship between cariogenic foods and the incidence of dental caries, but there are other

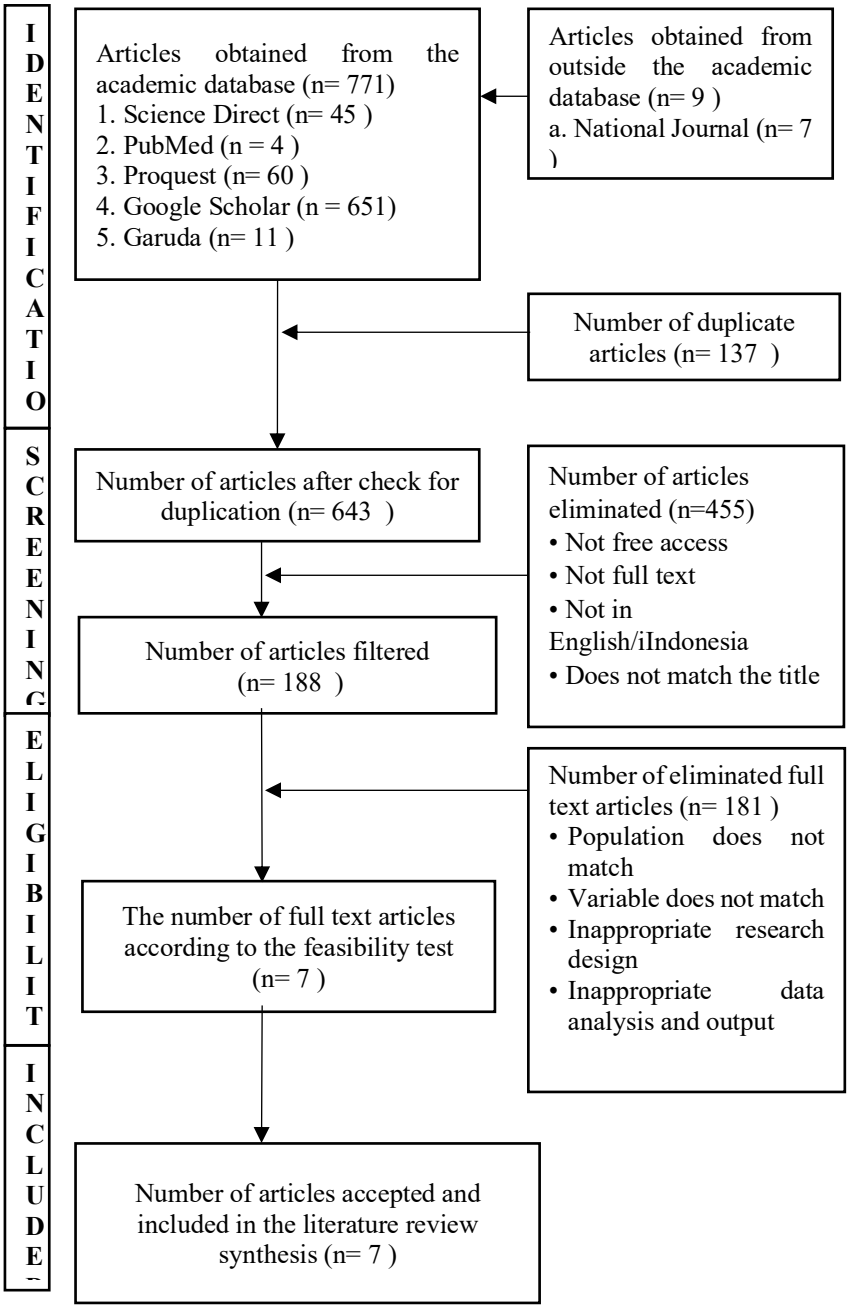

Figure 1. PRISMA Chart

Table 1. Results of a Literature Review

Research Title	Author	Research Methods	Result
Karakteristik dan Konsumsi Makanan Kariogenik dengan Kejadian Karies Gigi pada Siswa Umur 11-12 Tahun di Sekolah Dasar Negeri Terpilih Wilayah Kerja Puskesmas Taktakan Kota Serang	(Novianus, 2016)	Design: cross sectional Type of Sampling: cluster random sampling Research Place: Public Elementary School Drangong 1, Public Elementary School 1 Tatakan, and Public Elementary School Pereng Serang City. Subject: 140 respondents aged 11-12 years. Data collection : - Interview - Cariogenic food consumption questionnaire - Dental caries examination - Salivary measurement - Observation of how to brush your teeth	- The results showed that the consumption of cariogenic foods in the unfavorable category with a high incidence of dental caries was 73.2% and the low category was 26.8%, while the consumption of cariogenic foods in the high category was (53.6%) and the low category was 46.,4%. - The results of the chi-square test show that there is a relationship between the consumption of cariogenic food and the incidence of dental caries in students with a (p-value = 0.025), besides that there are other causes of dental caries in school children, namely pocket money, attitude, brushing teeth and how to brush teeth.
Hubungan Pola Jajan Kariogenik dengan Karies pada Siswa Sekolah Dasar di Wilayah Kerja Puskesmas III Denpasar Selatan, Bali	Sirat et al (2016)	Design: cross-sectional study Type of Sampling: simple random sampling Research Place: Elementary School in Serangan Village and Elementary School in Pemogan Village, Denpasar Bali Subject: 550 respondents aged 6-12 years. Data collection : - Interview - Cariogenic food consumption questionnaire Direct examination of dental caries using a dosgnostic set	- The results showed that as many as 66% of children consumed carcinogenic foods and as many as 34% of children did not consume cariogenic foods. - Children who have dental caries are 67.1%, children who do not have dental caries are 32.9%. - The results of the chi-square test showed that there was a relationship between cariogenic snack patterns and dental caries in students with a (p-value = 0.000).
Hubungan Konsumsi Makanan Kariogenik dengan Kejadian Karies Gigi pada Anak Kelas 1-3 di SD Negeri Bung Makassar	Alfiah (2018)	Design: cross-sectional study Type of Sampling: consecutive sampling Research Place: Public Elementary School Bung Makassar Subject: 77 respondents aged 6-9 years in grades one to three. Data collection : - Cariogenic food consumption questionnaire - Dental caries examination	- The results showed that as many as 24.7% of children who consumed cariogenic food and did not experience dental caries and as many as 24.7% of children who consumed cariogenic food and experienced dental caries, while 9.1% of children who consumed cariogenic food were at risk of developing dental caries and as many as 41.6% of children who consumed cariogenic foods and did not experience dental caries. - The results of the chi-square test showed that there was a relationship between the consumption of cariogenic foods and the incidence of dental caries in children with a (p-value = 0.003).
Hubungan Konsumsi Makanan Kariogenik	Alfiah (2018)	Design: cross-sectional study Type of Sampling:	- The results showed that as many as 24.7% of children who consumed

dengan Kejadian Karies Gigi pada Anak Kelas 1-3 di SD Negeri Bung Makassar		consecutive sampling Research Place: Public Elementary School Bung Makassar Subject: 77 respondents aged 6-9 years in grades one to three. Data collection : - Cariogenic food consumption questionnaire - Dental caries examination	cariogenic food and did not experience dental caries and as many as 24.7% of children who consumed cariogenic food and experienced dental caries, while 9.1% of children who consumed cariogenic food were at risk of developing dental caries and as many as 41.6% of children who consumed cariogenic foods and did not experience dental caries. - The results of the chi-square test showed that there was a relationship between the consumption of cariogenic foods and the incidence of dental caries in children with a (p-value = 0.003).
Faktor-Faktor yang Mempengaruhi Terjadinya Karies Gigi pada Anak di SDN 108 Taulan Kecamatan Cendana Kabupaten Enrekang	Jalante et al (2020)	Design: Cross-sectional study Type of Sampling: total sampling Research Place: Public Elementary School 108 Taulan Cendana District, Enrekang Regency. Subject: 31 respondents aged 7-10 years. Data collection : - Questionnaire - Secondary data	- The results showed that as many as 87.1% were in the category of unhealthy food and dental caries, and 12.9% of children were in the category of healthy food and did not experience dental caries. - The results of the chi-square test showed (p-value = 0.001), with other factors that can cause dental caries, namely the habit of brushing teeth.
Faktor - Faktor yang Berhubungan dengan Kejadian Karies Gigi	Damanik (2020)	Design: Cross-sectional study Type of Sampling: survey analitic Research Place: Public Elementary School 105273 Helvita Medan Subject: 66 respondents from grade four to six. Data collection : - Secondary data - Tertiary data	- The results showed that as many as 43.9% of children who frequently consumed cariogenic foods experienced dental caries incidence as much as 31.8%, and as many as 12.1% of children did not experience dental caries, while 56.1% of children who rarely consumed cariogenic foods 18.2% experienced dental caries and 37.9% did not experience dental caries. - The results of chi-square with a (p-value = 0.003), besides that there are other factors that cause caries, namely the habit of brushing teeth and knowledge.
Factors Associated with Dental Caries in Primary Dentition in a Non-Fluoridated Rural Community of New South Wales, Australia	Arora et al (2017)	Design: Cross-sectional study Research Place: New South Wales, Australia. Subject: 495 respondents aged 5-10 years. Data collection : - Interview - Questionnaire - Clinical examination	- The results of the study using the multicollinearity test showed (p = value <0.05). - Research shows that the average number of servings of chocolate was found to be higher in children who had one or more DMFT (Decay, Missing and Filled Teeth) scores compared to those who were free of dental caries (without DMFT), chocolate consumption per day was 242 (1.08) was higher than the 235 (0.81) score without DMFT,

			and each serving of chocolate consumption would develop caries in primary teeth by 52%. - Another factor in the incidence of dental caries is the history of the mother's extraction and lastly the age of the child.
The prevalence of dental caries among Egyptian children and adolescences and its association with age, socioeconomic status, dietary habits and other risk factors. A cross-sectional study	Abbass et al (2019)	Design: Cross-sectional study Research Place: Mesir Subjects: 369 respondents aged 7-12 years. Data collection : - Questionnaire - Dental caries examination	- The results showed that there was a positive correlation using the Spearman test with the results (p-value <0.05). - Research shows that dental caries based on DMFT score is positively correlated with chocolate consumption - Other factors in the incidence of dental caries are age, gender, body mass index, socioeconomic status, parental education, biological risk factors and dietary habits, namely the consumption of cariogenic foods such as chocolate and candy.

factors in several studies that can cause dental caries other than cariogenic foods, namely school allowances, attitudes, brushing habits, and how to brush teeth (Novianus, 2016).Research by Arora other factors that can cause dental caries in school children are the history of maternal extraction and age (Arora, Manohar, & John, 2017) . The results of the research by Abbass et al (2019), another factor in children's dental caries is the age factor. In contrast to the research by Jalante (Jalante, 2020) another factor causing dental caries is brushing teeth. Damanik's (H. Damanik, 2020) other factors that cause dental caries are brushing teeth, and knowledge (H. Damanik, 2020). The conclusion is that these 7 journals have the same research results, namely there is a relationship between consuming cariogenic foods with the incidence of dental caries in elementary school children.

Cariogenic Food Overview

The results of the research in the 7 articles above state that cariogenic foods are one of the triggers that greatly contribute to the occurrence of dental caries so that there is a relationship between the two research variables, namely cariogenic foods and dental caries, this is supported by the results of other studies which suggest that cariogenic foods are foods. Sweet foods that have high sugar or sucrose that can cause tooth decay, these cariogenic foods contain carbohydrates that are rich in monosaccharides (glucose and fructose) and disaccharides (sucrose, maltose, and lactose) and easily soluble in saliva (Agung, Wedagama, & Koesoemawati, 2018).

The theory above is in line with the facts from the research results of Sirat (Sirat, Sanjaya, & Wirata, 2017) who stated that the types of cariogenic foods are candy, chocolate, donuts, wafers, ice cream, and biscuits. Furthermore, research by Arora (Arora et al., 2017) suggested that the average number of servings of chocolate was found to be higher in children who had one or more DMFT scores (compared to those who were free of dental caries (without DMFT). provide clarity on the alignment with the theories above that cariogenic foods with soft physical form and the type of carbohydrates such as sucrose, ice cream, biscuits, wafers, candy and especially chocolate are cariogenic foods that can cause dental caries.

The frequency of consumption of cariogenic foods also affects the occurrence of dental caries (Lestari & Fitriana, 2018). This is supported by research from Damanik (J. P. Damanik, 2022), namely from respondents who often consume cariogenic foods and there are dental caries totaling 21 respondents and respondents who rarely consume cariogenic foods and not dental caries only 8 respondents. Other studies also suggest that in general the consumption of cariogenic foods can cause dental caries.

Research by Sirat (Sirat et al., 2017) suggests that elementary school-aged children have a penchant for consuming cariogenic snacks, especially sweet and sticky foods. This result is supported by other studies suggesting that school-age children are a group that is susceptible to dental and oral diseases because generally children at that age still have behaviors or habits that do not support dental health (Silaban, 2013). From this it can be said that elementary school-aged children have a susceptibility to dental caries because at this age, children still have behaviors or personal habits that do not support dental health, one of which is in consuming foods according to their preferences such as cariogenic chocolate, candy and others. This research is strengthened by other studies which suggest that cariogenic food is a triggering factor for the higher caries rate in school children, because children often eat and drink sweet foods according to their wishes regardless of what food they eat (Worotitjan et al., 2013).

Dental Caries Overview

The results of the research in the 7 articles above state that dental caries can occur due to the consumption of cariogenic foods. Based on the theory states that dental caries arises due to consuming carbohydrate foods continuously where glucose will be converted into lactic acid then there will be a process of destruction of dental minerals and if it continues, dental caries will occur. Several studies have

stated that dental caries is not only caused by cariogenic foods, but there are other factors (20).

Novianus' research (Novianus, 2016), it was found that apart from cariogenic food, there are variables of school allowance, brushing habits, and how to brush teeth which are factors related to the incidence of dental carie. In the study of (Arora et al., 2017) besides cariogenic foods (chocolate), there was a history of maternal extraction and age as other factors in the incidence of dental caries. Research by (Abbass et al., 2019) stated that apart from eating cariogenic (chocolate) foods, there was age as another factor related to the incidence of dental caries. In the research of (Jalante, 2020) it was stated that in addition to cariogenic food that brushing teeth is also a cause of dental caries, while in Damanik's research (H. Damanik, 2020) apart from cariogenic food, brushing teeth and knowledge are other factors for the occurrence of dental caries.

The research above is related to the theory which states that in general it can be said that age affects dental caries, especially in these research journals, the respondents are elementary school children, so this age is included in the mixed dentition period, where children aged between 6-12 years, first molars are the most common. Dental caries are frequently affected, as children are at high risk of dental caries when their teeth are newly erupted and at this time the occlusal surfaces of the first molars are developing . This is in line with the research proposed by (Arora et al., 2017) at the mixed dentition stage, which is a period of about 6 to 12 years, the primary teeth are exfoliated and replaced by their permanent successors. During this period, there is a high risk of caries incidence due to soft gums, crowding the teeth, caused by behavioral factors such as in the consumption of cariogenic foods. Primary teeth have proportionally thinner enamel and dentin which makes them susceptible to caries development and rapid development.

The other factor is the habit and way of brushing teeth, this is supported by the theory which states that post-eruption caries prevention efforts are plaque control by brushing your teeth before breakfast and brushing your teeth at night before going to bed, because all plaque must be cleaned so as to avoid changes in oral pH into acid which will further facilitate the occurrence of dental caries (Ramayanti & Purnakarya, 2013). Based on all the factors contained in the various research articles above, the cariogenic food factor is a factor that is always involved in the research.

Relationship of Cariogenic Food with Dental Caries in Elementary School Children

Based on the study of the studies above, cariogenic foods have an impact on the occurrence of dental caries in children, this is supported by research which suggests that cariogenic foods are sweet foods that are high in sugar or sucrose which can cause cavities and damage. Cariogenic foods do not directly affect the emergence of dental caries, because cariogenic foods have their own level of cariogenicity in a food for the occurrence of dental caries. This study is supported by the theory which states that the level of food cariogenicity depends on the form of food, the type of carbohydrate in the food and the frequency of food consumption which will affect dental caries, suggesting that the form of rough food and soft food (Nadia, Widodo, & Hatta, 2018).

Rough foods have teeth cleaning properties such as yam, guava and apples, while soft and sticky foods (cariogenic) such as candy, chocolate, ice cream and biscuits, then from the carbohydrate type, complex carbohydrates (starch) have large molecules, so that cannot diffuse into dental plaque. The type of sucrose caries in the diet is the main cause of dental caries. The frequency of consuming cariogenic foods that are too frequent will increase the likelihood of caries in the teeth compared to consuming large amounts of food but with less frequency (Mendur, Pangemanan, & Mintjelungan, 2017).

This is in line with the results of Damanik's research (2020) in his bivariate analysis of the relationship between cariogenic foods and dental caries which stated that the frequency of consumption of cariogenic foods was associated with dental caries. The results of his research showed that too often snacking on cariogenic

foods will make the saliva in the oral cavity remain in an acidic atmosphere, causing the teeth to be susceptible to caries, because after eating foods containing sucrose, the pH of the mouth will drop within 2.5 minutes and remain in a low state. up to 1 hour. Therefore. reduce the consumption of cariogenic foods by rarely consuming sucrose foods, the demineralization process that occurs will be mild and after the pH of the mouth returns to normal, the remenalization process will occur so as to reduce the possibility of rapid dental caries (V. A. Damanik, 2020).

Things that have happened before and the theory that has been discussed previously suggests that if carbohydrates are increased, then glycogen in dental tissue will also increase, glucose will be broken down, so demeralization causes the pH of the mouth to become caries with acidolysis. Sucrose has a faster ability to grow microorganisms than other types, with frequent or consuming cariogenic foods it will cause Streptococcus mutans and lactobacillus bacteria which produce acidic substances little by little causing plaque. Old plaque that is often exposed to sucrose causes microorganisms to be rapidly metabolized into organic acids, causing a drastic decrease in pH which can trigger demeralization when in contact with teeth and cause dental caries (Widayati, 2014).

Based on the description of the food, it can be proven that cariogenic is associated with dental caries in elementary school children, although there are other factors that can influence it. Cariogenic foods are the trigger for high caries, this is in line with the research of Worotijan (2013) which states that the factors that determine the increase in caries in school-age children. Based on the 7 articles above, the most cariogenic food types in the study were chocolate, which is a type of sucrose carbohydrate food that is favored by children.
Therefore, it is necessary to make preventive and promotive efforts by increasing the role of nurses as educators in providing health education or education such as providing leaflets through parents related to dental caries and prevention of pre-eruption of dental caries in order to monitor developments in the selection of types of snacks. Nurses also play a role as educators for the school environment in increasing the role of UKS (Usaha Kesehatan Sekolah) by means of a promotive way to procure the UKGS (Usaha Kesehatan Gigi Sekolah) program for schools that have not started the UKGS program, so that there is an increase in PHBS (Perilaku Hidup Bersih dan Sehat), which is good for children, especially in maintaining dental and oral health, which can prevent dental caries from occurring and even prevent the occurrence of more severe cases of caries.

CONCLUSIONS AND SUGGESTIONS

Conclusion are the results of the literature review of 7 articles found differences such as sampling techniques, data collection methods, data analysis, country and language, while the similarities were that all articles explained the types of cariogenic foods with the incidence of dental caries in elementary school children, and some studies also explained the factors Other factors include the occurrence of dental caries such as the habit of brushing teeth, how to brush teeth, knowledge, mother's extraction history and age. So it can be concluded that from 7 articles, there is a relationship between consuming cariogenic foods and the incidence of dental caries in elementary school children.

Suggestion is the results of this study are expected to be a reference for future researchers to conduct research using experimental methods related to the effect of brushing teeth on the incidence of dental caries in children who consume cariogenic foods.

REFERENCE

Abbass, M. M. S., Mahmoud, S. A., El Moshy, S., Rady, D., AbuBakr, N., Radwan, I. A., … Al Jawaldeh, A. (2019). The prevalence of dental caries among Egyptian children and adolescences and its association with age, socioeconomic status, dietary habits and other risk factors. A cross-sectional study. *F1000Research*, *8*.

Agung, I. G. A. A., Wedagama, D. M., & Koesoemawati, R. (2018). GIZI, KESEHATAN GIGI-MULUT DAN

DOKTER GIGI KECIL DI SDN 1 KETEWEL, SUKAWATI, GIANYAR. *Jurnal Bakti Saraswati (JBS): Media Publikasi Penelitian Dan Penerapan Ipteks*, *7*(1).

Alfiah. (2018). *Hubungan konsumsi makanan kariogenik dengan kejadian karies gigi pada anak kelas 1-3 di SD Negeri Bung Makassar*. *12*, 501–504.

Arora, A., Manohar, N., & John, J. R. (2017). Factors associated with dental caries in primary dentition in a non-fluoridated rural community of New South Wales, Australia. *International Journal of Environmental Research and Public Health*, *14*(12), 1444.

Damanik, H. (2020). Tingkat Kecemasan Pasien Gagal Ginjal Kronik dalam Menjalani Hemodialisa di Rumah Sakit Imelda Pekerja Indonesia. *Jurnal Ilmiah Keperawatan Imelda*, *6*(1), 80–85.

Damanik, J. P. (2022). Gambaran Pengetahuan Lansia Tentang Diet Diabetes Melitus di Puskesmas Sarimatondang Kecamatan Sidamanik Tahun 2021. *Jurnal Sosial Sains*, *2*(3), 433–439.

Damanik, V. A. (2020). Faktor-Faktor Yang Berhubungan Dengan Kejadian Karies Gigi. *Nursing Arts*, *XIV*(1), 22–29. https://doi.org/10.36741/jna.v14i1.107

Jalante, A. A. A. (2020). Faktor-Faktor Yang Mempengaruhi Terjadinya Karies Gigi Pada Anak Di Sdn 108 Taulan Kecamatan Cendana Kabupaten Enrekang. *Jurnal Ilmiah Kesehatan Diagnosis*, *15*(2), 129–133.

Kartikasari, H. Y., & Nuryanto, N. (2014). Hubungan Kejadian Karies Gigi dengan Konsumsi Makanan Kariogenik dan Status Gizi pada Anak Sekolah DasaR (Studi Pada Anak Kelas III dan IV SDN Kadipaten I dan II Bojonegoro). *Journal of Nutrition College*, *3*(3), 414–421. https://doi.org/10.14710/jnc.v3i3.6605

Kementerian Kesehatan RI. (2018). Laporan Provinsi Jawa Barat, Riskesdas 2018. In *Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan*.

Lestari, N. W. A. D., & Fitriana, L. B. (2018). Usia dan frekuensi mengkonsumsi makanan kariogenik berhubungan dengan kejadian karies gigi anak. *Journal of Holistic Nursing Science*, *5*(2), 72–81.

Mendur, S. C. M., Pangemanan, D. H. C., & Mintjelungan, C. (2017). Gambaran konsumsi makanan kariogenik pada anak SD GMIM 1 Kawangkoan. *E-GiGi*, *5*(1).

Nadia, N., Widodo, W., & Hatta, I. (2018). Perbandingan Indeks Karies Berdasarkan Parameter Kimiawi Air Sungai dan Air PDAM Pada Lahan Basah Banjarmasin. *Dentin*, *2*(1).

Notoatmodjo. (2012). *Metodologi Penelitian Kesehatan*. Jakarta: Rineka Cipta.

Novianus, C. (2016). Hubungan Karakteristik dan Konsumsi Makanan Kariogenik dengan Kejadian Karies Gigi Pada Siswa Umur 11 12 Tahun di Sekolah Dasar Negeri Terpilih Wilayah Kerja Puskesmas Taktakan Kota Serang. *ARKESMAS (Arsip Kesehatan Masyarakat)*, *1*(2), 83–87.

Rahena, Z. (2020). Hubungan Jenis dan Frekuensi Konsumsi Makanan Kariogenik dengan Kejadian Karies Gigi pada Anak SD Negeri 5 Waai Kabupaten Maluku Tengah. *Jurnal Kesehatan Ukim*, *2*(1), 41–48. https://doi.org/10.54639/mhj.v2i1.428

Ramayanti, S., & Purnakarya, I. (2013). Peran makanan terhadap kejadian karies gigi. *Jurnal Kesehatan Masyarakat Andalas*, *7*(2), 89–93.

Reca, R. (2018). Hubungan Jenis Makanan Jajanan Dengan Status Karies Pada Murid Sdn Lampeuneurut Aceh Besar. *AVERROUS: Jurnal Kedokteran Dan Kesehatan Malikussaleh*, *4*(2), 37. https://doi.org/10.29103/averrous.v4i2.1036

Santoso, A., Devi, M., & Kurniawan, A. (2018). Peningkatan Pengetahuan Siswa Mengenai Jajanan Sehat Menggunakan Media Minicard. *Preventia : The Indonesian Journal of Public Health*, *3*(2), 153. https://doi.org/10.17977/um044v3i2p153-163

Silaban, S. (2013). Prevalensi Karies Gigi Geraham Pertama Permanen Pada Anak Umur 8–10 Tahun Di SD Kelurahan Kawangkoan Bawah. *E-GiGi*, *1*(2).

Sirat, N. I., Sanjaya, A. A., & Wirata, I. N. (2017). Hubungan pola jajan kariogenik dengan karies pada siswa sekolah dasar di wilayah kerja Puskesmas III Denpasar Selatan, Bali 2016. *Inti Sari Sains Medis*, *8*(3), 193–197.

Soetjiningsih, & Ranuh, I. N. G. (2012). *Tumbuh kembang Anak*. Jakarta: Buku Kedokteran EGC.

Vos, T., Abajobir, A. A., Abbafati, C., Abbas, K. M., Abate, K. H., Abd-Allah, F., … Murray, C. J. L. (2017). Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*, *390*(10100), 1211–1259. https://doi.org/10.1016/S0140-6736(17)32154-2

Widayati, N. (2014). Faktor yang berhubungan dengan karies gigi pada anak usia 4-6 tahun. *Jurnal Berkala Epidemiologi*, *2*(2), 196–205.

World Health Organization. (2020). Oral Health Conditions. https://doi.org/2011

Worotitjan, I., Mintjelungan, C. N., & Gunawan, P. (2013). Pengalaman Karies Gigi Serta Pola Makan Dan Minum Pada Anak Sekolah Dasar Di Desa Kiawa Kecamatan Kawangkoan Utara. *E-GIGI*, *1*(1), 59–68. https://doi.org/10.35790/eg.1.1.2013.1931