# Analysis of The Most Dominant Dental Carries Risk Factors on High def-t and DMF-T Value of Students Age 6-12 Years

*by* Perpustakaan IIK Bhakti Wiyata

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# Analysis of The Most Dominant Dental Carries Risk Factors on High def-t and DMF-T Value of Students Age 6-12 Years

Ilvana Ardiwirastuti[a, 1*], Balqis Istiqomah Gusbela[b,2], Olivia Maulana Santoso[c, 3], Richa Rochmani Adining Tias[a,4], Sahat Manampin Siahaan[a,5]

[a]Faculty of Dentistry, Bhakti Wiyata Institute of Health Sciences, Kediri, Indonesia
[b]Biotech and Healthcare Management, Taipei Medical University, Taiwan
[1]ilvana.ardiwirasti@iik.ac.id*; [2]d931112001@tmu.edu.tw; [3]oliviadentist.98@gmail.com;
[4]richarochmaniat@gmail.com; [5]siahaan.manampin@iik.ac.id
*Correspondence author:ilvana.ardiwirasti@iik.ac.id

**ABSTRACT**

**Background:** Riset Kesehatan Dasar (Riskesdas) shows that the highest rate of dental caries in children occurs in the 5–9 y.o group (92.6%). Dental caries should be prevented early by reducing the factors that cause caries. The def-t/DMF-t caries index can be used to assess the severity of dental caries, while the caries risk assessment can be used to study the various variables that cause dental caries. **Objectives:** To analyze the most dominant risk factors for dental caries with the highest def-T/DMF-T values in students in grades 1-6 at SDN Cenlecen 1 Pakong Pamekasan. **Methods:** This study is analytical and observational with a Cross-sectional method approach. The data analysis used the Chi-square test to examine the relationship between the variables. **Results:** This study shows that the most significant correlation value for high deft-t/DMF-T is eating and drinking sweet foods (p-value, 0.027), followed by having a mother who had dental caries experience, receiving dental care, having teeth lost as a result of caries, having visible plaque, and exposed root surfaces. **Conclusion:** The most dominant risk factor for dental caries for high def-T/DMF-T rates at SDN Cenlecen 1 Pakong Pamekasan is eating and drinking sweet foods.

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## Introduction

Basic Health Research (Riskesdas) in 2018, the prevalence rate of children's dental caries in Indonesia was still quite high, namely 88.8%, with the highest prevalence in the 5-9 year age group (92.6%).[1] Ages 5-9 years are included in the school-age group. School-age (6-12 years) is an important age in the growth and physical development of children.[2] School-aged children (6-12 years) tend to have a high risk of caries because they like to consume food and drinks according to their wishes, such as sweet foods and drinks.[3] Caries in children hurt oral cavity functions such as eating, drinking, and speaking. Caries also disrupt the growth and learning process. If left untreated, caries will spread and cause severe pain, abscesses, and difficulty swallowing, which will ultimately affect overall physical health.[4]

The causes of dental caries are multifactorial, caused by direct and indirect factors. Factors that cause dental caries include plaque, microorganisms, diet, carbohydrates, and time, while indirect factors that cause caries include socioeconomic, behavioral, and environmental factors.[5]

Early detection analysis of the factors that cause caries can be assessed with the help of dental caries risk factor assessment forms including, risk factors for dental caries by ADA (American Dental Association), AAPD (American Academy of Pediatric Dentistry), CAMBRA (Caries Management By Risk Assessment), and Cariogram. The most frequently and easily used dental caries risk factor assessment form is the ADA. The ADA assesses caries risk through three factors, including observation of contributing conditions, general health, and clinical conditions. Researchers want to see the highest level of correlation between these three factors and the incidence of children's dental caries.[6] The Objectives of this study is to analyze the most dominant risk factors for dental caries with the highest def-t/DMF-T values in students in grades 1-6 at SDN Cenlecen 1 Pakong Pamekasan.

## Methods

This type of research is Observational Analytical with a Cross-Sectional design. The population in this study were students in grades 1-6 at SDN Cenlecen 1, totaling 126 students. The research sample was 56 students determined using a simple random sampling technique. This research was conducted at SDN Cenlecen 1 Pakong Pamekasan in May 2023, and was declared ethically appropriate by the dental faculty team (Number: 213/FKG/EP/V/2023).

Data collection instruments used ADA-modified caries risk factor questionnaire sheets, and dental examination sheets that had been tested for validation and reliability. Data were processed and analyzed using Statistical Data Processing Software (SPSS) with a relationship test using Chi-Square between variables.

**Result**

The results of this study shows at the following tables.

Table 1. Frequency Distribution Based on def-t and DMF-T Numbers

| | def-t | | DMF-T | |
|---|---|---|---|---|
| | Total | Percentage | Total | Percentage |
| **High** | 19 | 76% | 28 | 90,3% |
| **Very High** | 6 | 24% | 3 | 9,7% |
| **Total** | 25 | 100% | 31 | 100% |

Table 1 shows that of the 56 students in the sample, there were 25 children with def-t and 31 children with DMF-T, from the 25 children who had left scores, 19 (76%) of them had high deft scores. The 31 children who had DMF-T numbers, 28 (90,3%) children had high DMF-T numbers and 3 others had very high DMF-T numbers.

Table 2. Frequency Distribution Based on Class

| Grade | def-t | | DMF-T | |
|---|---|---|---|---|
| | Total | Percentage | Total | Percntaeg |
| **1** | 11 | 44% | | |
| **2** | 11 | 44% | | |
| **3** | 3 | 12% | 2 | 6,5% |
| **4** | | | 11 | 35,5% |
| **5** | | | 8 | 25,8% |
| **6** | | | 10 | 32,3% |
| **Total** | 25 | 100% | 31 | 100% |

Table 2 shows that the highest caries rates (def-t) were in classes 1 and 2 (44%) and the highest caries rates (DMF-T) were in class 4 (35,5%), and the lowest caries rate was in class 3.

Table 3. Frequency Distribution Based on Gender

| | def-t | | DMF-T | |
|---|---|---|---|---|
| | Total | Percentage | Total | Percentage |
| Male | 13 | 52% | 13 | 41,9% |
| Female | 12 | 48% | 18 | 58,1% |

Table 3 shows that the highest def-t figures were found in male students with 13 students (52%) , followed by female students with 12 students (48%). The highest DMF-T rate was found in female students with a total of 18 students (41,9%), followed by male students with a total of 13 students (58,1%).

Table 4. Frequency Distribution Based on the Average Questionnaire Value

| | Percentage |
|---|---|
| Contributing Factors | 53,75% |
| General Health Condition | 22% |
| Clinical Conditions | 43,3% |

Table 4 shows that the largest factor in the caries risk factor questionnaire is Contributing Factors at 53.75%, followed by Clinical Condition at 43.3%, and the smallest average value in the questionnaire is General Health Condition at 22%.

Table 5. Chi Square Test Results for caries risk factors with def-t and DMF-T

| Contributing Factors | | |
|---|---|---|
| Chi-Square Test | Asymp. Sig (2-sided) | Explanation |
| Q1 * def/DMF | 0,134 | Not Related |
| Q2 * def/DMF | *0,027 | Related |
| Q3 * def/DMF | *0,037 | Related |
| Q4 * def/DMF | *0,04 | Related |
| **General Health Condition** | | |
| Chi-Square Test | Asymp. Sig (2-sided) | Explanation |
| Q8 * def/DMF | 0,56 | Not Related |
| **Clinical Conditions** | | |
| Chi-Square Test | Asymp. Sig (2-sided) | Explanation |
| Q10 * def/DMF | - | Not Related |
| Q11 * def/DMF | *0,044 | Related |
| Q12 * def/DMF | *0,014 | Related |
| Q13 * def/DMF | 0,099 | Not Related |
| Q15 * def/DMF | *0,024 | Related |
| Q17 * def/DMF | 0,087 | Not Related |

Table 5. shows that there is a relationship between the high def-t/DMF-T variables in questionnaire numbers 2, 3, 4, 11, 12, and 15 with a Sig (2-tailed) value <0.05. In questionnaires number 1, 8, 10, and 13 there is no relationship because the Sig (2-tailed) value is <0.05, then from several related questionnaires, the most significant relationship was found in questionnaire 12 with the Sig (2-tailed) value ) of 0.01, as well as on questionnaire 15 with a Sig value (2-tailed) 0.024, questionnaire 2 with a Sig value (2-tailed) 0.027, questionnaire 3 with a Sig value (2-tailed) 0.037, questionnaire 4 with a Sig value (2-tailed) 0.04, and questionnaire 11 with a Sig value (2-tailed) 0.044. The results of this data show that the most dominant caries risk factor is the high def-t/DMF-T number for the contributing condition category, namely Questionnaire 2 with a Sig value (2-tailed) 0.027, followed by Questionnaire 12 with a Sig value (2- 2-tailed) 0.014 in the Clinical Condition category. There is no relationship whatsoever in the General Health Condition category.

**Discussion**

This research was conducted on children with high and very high def-t and DMF-T numbers to determine the risk factors for each individual using the modified ADA (American Dental Association) dental caries risk factor form which has been translated into Indonesian. Table 2 shows that the highest rate of dental caries is found in students in grades 1, 2, and 4. The high rate of caries in children in grades 1 and 2 (aged 6-7 years) can be caused by children's

low knowledge about how to maintain healthy teeth and mouth, lack of parental supervision, high consumption of cariogenic foods, as well as a lack of awareness in maintaining dental health at that age.[7] Table 3 shows that the prevalence of caries in female students is higher than in male students. This could be due to the tendency for girls to snack more than boys, which is proven by Fankari's research that the number of caries in girls is more than in boys due to differences in the frequency of snacks.[8] Girls also have more estrogen than boys, an increase in this hormone during menstruation can reduce the rate of saliva and be a risk factor for increasing the incidence of caries.[9]

ADA modifications for caries risk factor research in research are divided into 3 main factors, namely: 1) Contributing factors 2) General health conditions, and 3) Clinical conditions. The research results of Table 4 show that the largest percentage is contributing factors (53.75%). Questionnaires included in the contributing factors include frequency of fluoride exposure, eating/sweet drinks, caries experience of mother, caregiver, siblings, and history of dental care. This is in line with the results of statistical tests in Table 5 which show that the highest correlation value for the incidence of high def-t and DMF-T numbers is eating sweet drinks (p-value 0.027). These results are in line with research by Erawati, and Meyer and Enix which shows the low knowledge of parents and children about dental and oral health, including the risk of consuming excess cariogenic foods.[7,10] The low level of knowledge of parents/caregivers was also proven by a significant correlation in questionnaire number 3 (p-value 0.037). Consumption of sweet foods and drinks is closely related to caries because elementary school children often consume sweet snacks and drinks such as candy, chocolate, ice cream, and other sweet drinks. These sweet foods and drinks tend to be consumed by children outside of meal times so the frequency of tooth exposure to cariogenic materials will be longer. This causes the risk of caries in children to also increase.[11,12] The high risk of sweet foods/drinks in school children is also supported by research by Ruminem, regarding children's habits of consuming snacks both at school and outside school. The types of snacks consumed are sweet and have high cariogenic content.  Examples of types of sweet foods consumed by children are ice cream, chocolate, candy, and sweet wafers.[13] Research by Melinda and Wowor shows Students who have a high level of consumption of cariogenic foods will have a high risk of dental caries, while students who have a low consumption of cariogenic foods will have a low risk of caries.[14,15]

**Conclusion**

This study concludes that there is a correlation between the high number of def-t and DMF-T on the caries risk factor analysis questionnaire. The factors that play the most roles are the contributing factors, while the correlation of the most dominant contributing factors related to high def-t and DMF-T numbers is consuming sweet foods.

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