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Prevalence of Gingivitis and Dental Caries in Early Childhood: A Cross-Sectional Study at TK Tat Twam Asi, Pesanggrahan, South Jakarta

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ABSTRACT

Introduction: Oral health is an integral part of overall health, yet it is often neglected in global and national policies. Periodontal diseases such as gingivitis and dental caries are major issues in children that can affect their quality of life. This study was conducted to identify the prevalence of periodontal disease and dental caries among children at TK Tat Twam Asi, Pesanggrahan, South Jakarta.

Objective: This study aims to evaluate the oral health status and dental care habits of children. Method: The research employed a cross-sectional design with random sampling techniques. The sample consisted of 36 children aged 3–6 years. Data were collected through dental examinations and parent/guardian questionnaires. Analysis was performed using SPSS version 24.

Conclusion: The study found that 97.2% of children had gingivitis, and 86.1% had dental caries. Key risk factors included poor brushing habits, frequent consumption of sugary foods, and low use of fluoride toothpaste. This study highlights the importance of educating parents about oral hygiene, promoting healthy eating habits, and improving access to preventive dental care to reduce the prevalence of oral diseases in children.

KEYWORDS: Gingivitis, Dental Caries, Children's Oral Health, Oral Hygiene, Fluoride

ARTICLE DETAILS

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I. INTRODUCTION

Oral health is an integral part of overall health. According to a recent study by Gaffar B (2024) et al., global and national policies often neglect the importance of oral health policies. This occurs because dental and oral diseases are considered non-life threatening. However, poor dental health can have a significant impact on an individual's physical, emotional, and social well-being, as well as affect their quality of life.[1]

National policies on oral health play a crucial role in preventing dental diseases by ensuring public access to quality dental health services. Additionally, these policies contribute to more optimal health system planning, increase public understanding of their rights, and encourage them to advocate for change and justice in health services.[1]

According to a study conducted by Sağlam G et al. (2023), gingivitis is more common in children than periodontitis, as bone loss and attachment tissue loss are rarely found unless there is a systemic disease or specific dental condition. The differences in periodontal tissue structure between children and adults affect the severity and progression of this disease. If not promptly addressed, periodontal disease can adversely impact a child's growth and development. Therefore, early detection and identification of risk factors are crucial to prevent periodontal disorders later in life.[2]

A study by Galunska BT et al. (2024) found that plaque-induced gingivitis is one of the most common periodontal disorders in children. This condition is triggered by plaque accumulation, which can increase the risk of gum inflammation. Maintaining good oral hygiene can help control pathogen growth in plaque at individual, group, and population levels. This research hypothesizes that routine dental hygiene habits, such as brushing teeth and using fluoride, can affect the amino acid composition in the saliva of children with plaque-induced gingivitis.[3]

In addition to periodontal disease, dental caries is also a health problem that can affect children. According to a study by Min SN et al. (2024), Early Childhood Caries (ECC) is a chronic disease widely experienced by children worldwide, especially among socially and economically disadvantaged groups. ECC can cause various adverse effects, such as overall health problems, growth impediments, difficulty in consuming food, and social and psychological issues. Although many developed countries have successfully controlled ECC, its prevalence remains high in low- and middle-income countries.[4]

According to the study by Gaffar B (2024), dental health problems in children, such as early childhood caries, can have long-term impacts on their health and well-being. If left untreated, dental diseases can cause chronic pain, infections, and disrupt daily activities, including school absenteeism and decreased parental productivity. Moreover, high dental care costs also become a significant economic burden for families and health systems.[1]

Based on various studies, periodontal disease and dental caries are health problems that often become primary diseases in children. This research aims to investigate oral health maintenance, particularly the number of children affected by periodontal disease and caries at TK Tat Twam Asi, Pesanggrahan, South Jakarta.

II. METHOD

The study was conducted at TK Tat Twam Asi in Pesanggrahan, South Jakarta, which was carried out on March 17, 2025, the study was conducted with a cross-sectional research design. Sampling in this study used a random sampling technique, calculated using the Slovin formula and obtained a sample size of 36 KB, TKA, TKB children. In this study, data collection was carried out through dental and oral examinations of children based on Annex 2 and continued by filling out the Annex 8 questionnaire by the parents/guardians concerned. Data analysis was carried out using SPSS software version 24 (Statistical Program for Social Sciences).

III. RESULT

Based on the examination result table, there were 36 sampling respondents of TK Tat Twam Asi, male respondents were found to be 58.3% and female respondents were 41.7%. The 6-year-old age group dominated at 36.1%, 5-year-olds 30.6%, 4-year-olds 22.2%, and 3-year-olds 11.1% (Table 1). Almost all of them experienced dental caries at 86.1% (Table 2). The examination results also found that 97.2% had periodontal disease (Table 3).

Table 1. Characteristics Distribution of Tat TK Tat Twam Asi Students

Gender		
Characteristics	**Jumlah**	**Persentase (%)**
Male	21	58.3
Female	15	41.7
Total	**36**	**100**
Age		
3 years	4	11.1
4 years	8	22.2
5 years	11	30.6
6 years	13	36.1
Total	**36**	**100**

Table 2. Dental Caries Examination Results

Dental Caries Status		
	Quantity	**Percentage (%)**
Positive	31	86.1
Negative	5	13.9
Total	**36**	**100**

Table 3. Periodontal Status Examination Results

Periodontal Status		
	Quantity	**Percentage (%)**
Positive	35	97.2
Negative	1	2.8
Total	**36**	**100**

Based on the results of Annex 8 questionnaire by parents/guardians (Table 4-Table 7), the results of the teeth and gums condition were found to be 80.6% with good results

and 29.4% with bad results (Table 4). The frequency of brushing teeth in respondents was found to be 2 times or more a day at 77.8%, several times a month (2-3) 16.7%, several times a week (2-6 times) and never each at 2.8%. (Table 5).

Table 4. Questionnaire Results Regarding Teeth and Gum Conditions

Teeth and Gum Condition		
	Quantity	**Percentage (%)**
Good	29	.6
Bad	7	.4
Unknown	0	0
Total	**36**	**100**

Table 5. Questionnaire Results Regarding Tooth Brushing Frequency

Teeth Brushing Frequency		
	Quantity	**Percentage (%)**
Never	1	2.8
Several times a month (2-3 times)	6	16.7
Once a week	0	0
Several times a week (2-6 times)	1	2,8
Everyday	0	0
2 times a day	28	77,8
Total	**36**	**100**

As many as 55.6% of respondents used fluoride toothpaste, 22.2% did not use it and 22.2% did not know (Table 6). The results of sweet food consumption are 41.7% consumed every day, 38.9% consumed several times a week, 8.3% consumed several times a month and consumed several times a day and once a week each of 5.6% (Table 7).

Table 6. Questionnaire Results Regarding the Use of Fluoride Toothpaste

Use of Fluoride Toothpaste		
	Quantity	**Percentage (%)**
Yes	20	55,6
No	8	22,2
Unknown	8	22,2
Total	**36**	**100**

Table 7. Sweet Food Consumption Questionnaire Results

Consumption of Sweet Foods (Biscuits, Sweet Cakes, Bread, etc.)		
	Quantity	**Percentage (%)**
Several times a day	2	5,6
Everyday	15	41,7
Several times a week	14	38,9
Once a week	2	5,6
Several times a month	3	8,3
Never	0	0
Total	**36**	**100**

IV. DISCUSSION

Gingivitis in children is a mild form of gum disease characterized by redness, swelling, and bleeding of the gums without loss of connective tissue. This condition is usually painless and rarely causes spontaneous bleeding, making it difficult for children and parents to recognize. Gingivitis in children is often reversible and represents the early stage of periodontal disease.[5]

The primary cause of gingivitis in children is plaque accumulation due to poor oral hygiene. Plaque is a sticky layer containing bacteria that triggers gum inflammation if not properly cleaned. Other contributing factors include socioeconomic conditions, such as low parental education and poor economic status, which are associated with higher prevalence of gingivitis. Eating habits also play a crucial role; frequent consumption of sugary foods and drinks, as well as

infrequent consumption of fresh fruits and vegetables, increase the risk. Additionally, poor oral hygiene practices, such as infrequent tooth brushing and lack of parental supervision during brushing, exacerbate this condition. Limited access to dental care, including infrequent dental visits or visits only when in pain, is also a contributing factor to gingivitis in children.[5]

A 2024 study by Olczak-Kowalczyk et al. involving 3,558 children aged 3-7 years found that 12.25% of children had gingivitis. Prevalence varied by age: 7.3% in 3-year-olds, 17.5% in 5-year-olds, and 15.97% in 7-year-olds. Boys were more likely to have gingivitis than girls in the 3-year-old group ($p = 0.0024$), but there were no significant gender differences in other age groups.[5] This study aligns with our research findings at TK Tat Twam Asi, which involved 36 children aged 3-7 years and found that 97.2% of children had periodontal problems, namely gingivitis. The data generated at TK Tat Twam Asi is greater than the national data from Riskesdas 2018, which was 74.1% of gingivitis cases affecting children in Indonesia.[6]

Gingivitis shows positive correlations with factors such as living in rural areas, poor dental health (e.g., dmft/DMFT > 0), infrequent dental visits, pain-driven visits, and unhealthy eating habits (like low consumption of fresh fruits and vegetables). Conversely, negative correlations were found with higher parental education levels, brushing teeth at least twice daily, parental supervision during brushing, and efforts to limit sugar consumption. These findings emphasize the importance of improving oral hygiene habits, healthy eating patterns, and access to preventive dental care to reduce the prevalence of gingivitis in children.[5]

Dental caries, commonly known as tooth decay, is one of the most prevalent chronic diseases affecting children globally. This disease involves the destruction of tooth enamel and dentin due to the interaction between bacteria and fermentable carbohydrates, producing acids that damage the teeth.[7,8]

Studies conducted in Huizhou, China, and Southwestern Ethiopia show high prevalence of dental caries among preschool children and associated factors. In Huizhou, China, the prevalence of dental caries was very high at 72.9%, with main risk factors including age, habit of consuming sweets before bedtime, poor interdental spacing, tonsil enlargement level, breastfeeding duration, and only-child status.[7] The study in Southwestern Ethiopia reported a prevalence of 36.4%, with main risk factors including dinner feeding, lack of parental supervision during tooth brushing, high body mass index (BMI), and history of dental visits.[8] Both studies align with the research findings at TK Tat Twam Asi, which involved 36 children aged 3-7 years and found that 86.1% of children had dental caries problems. The data generated at TK Tat Twam Asi is greater than the national data from Riskesdas 2018, which was 81.5% cases of dental caries affecting children in Indonesia.[6]

Dental caries in children is caused by a combination of dietary, hygiene, socioeconomic, and biological factors. Frequent consumption of sweets and dinner feeding significantly increase the risk by exposing teeth to fermentable carbohydrates for extended periods, producing acids that damage the enamel.[7,8]

Poor oral hygiene, especially when children do not brush their teeth properly or without parental supervision, allows plaque and bacteria to accumulate. Socioeconomic factors such as low family income and limited parental education also contribute to high caries prevalence due to limited access to dental care and preventive measures. Biological factors including reduced saliva flow and low buffering capacity reduce natural defenses against acids, making teeth more susceptible to damage. Additionally, prolonged breastfeeding, bottle feeding during sleep, and mouth breathing due to conditions like tonsillar hypertrophy are other contributing factors as identified in several studies.[7,8]

Research findings at TK Tat Twam Asi show that 41.7% of children consume sweets daily, and 38.9% consume sweets several times a week. Sugar contributes to dental caries in children by providing an energy source for cariogenic bacteria in the mouth, which produce acids that demineralize tooth enamel. Frequent consumption of sweet foods and drinks, especially before bedtime, increases the risk of caries due to longer exposure and reduced saliva flow during sleep.[9]

Parents can help prevent dental caries by limiting their children's free sugar intake, ensuring they brush regularly with fluoride toothpaste, and encouraging good oral hygiene habits. Encouraging children to consume water and dairy products as alternatives to sweet drinks, as well as maintaining a balanced diet rich in vegetables, fruits, and whole grains, can help protect against caries. Additionally, regular dental check-ups and fluoride treatments can further support dental health and reduce the risk of cavities.[9]

Fluoride toothpaste helps prevent dental caries in children by strengthening tooth enamel and making it more resistant to acid attacks from bacteria. Fluoride also supports remineralization, which can reverse early signs of tooth decay. However, excessive fluoride intake can cause dental fluorosis, a condition that affects enamel development.[10]

Parents should ensure their children use age-appropriate amounts of fluoride toothpaste, just a smear for infants and a pea-sized amount for older children, to minimize the risk of swallowing excess fluoride. They also need to be aware of other fluoride sources, such as drinking water and food, to prevent overexposure. Regular dental check-ups and guidance from healthcare professionals can help balance fluoride intake to provide maximum benefits without risks.[10]

V. CONCLUSION

The heading of the CONCLUSION section must be numbered. Gingivitis and dental caries are common oral health issues among children. Gingivitis, characterized by

gum inflammation, often goes unnoticed due to minimal pain symptoms. Meanwhile, dental caries has a high prevalence worldwide, reaching up to 72.9% in certain areas. Both conditions are caused by various factors, including poor oral hygiene, unhealthy dietary habits (especially excessive consumption of sugary foods), socioeconomic factors, and inadequate dental care practices.

Preventing and managing these issues require a comprehensive approach involving active participation from parents, children, and dental health professionals. Preventive measures include maintaining oral hygiene by brushing teeth regularly with fluoride toothpaste, limiting sugary food and drink intake, increasing the consumption of healthy foods like fruits and vegetables, and scheduling regular dental check-ups. Proper use of fluoride is also essential but must be supervised to avoid the risk of fluorosis. By raising awareness and implementing these preventive strategies, the prevalence of gingivitis and dental caries in children can be significantly reduced.

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