Research Article

Dental Health Status of Children in the Jember Regency's Agroindustry Environment

Sulistiyani, Dyah Setyorini*, Ahmad Syahrul Mubarok

Departement of Pediatric Dentistry, Faculty of Dentistry University of Jember, Jl. Kalimantan No. 37 Jember 6812, Indonesia.

Abstract

Caries is one of the most common dental health issues, particularly in children. Caries develops over time due to the interaction of bacteria on the tooth surface, plaque or biofilm, and diet, resulting in the demineralization of hard tooth tissue. School-age children frequently consume food and beverages with no knowledge of which foods and beverages may increase the risk of dental caries. This study aims to identify the ICDAS caries index used to describe children's dental health status in Nogosari Elementary School grades I-III. Descriptive observational research with a cross-sectional approach was used. The sample in this study consisted of 76 students from grades I-III, employing the total sampling method. The collected data were entered into the examination form, discussed descriptively, and presented in tabular form. There were 823 caries-free teeth and 929 carious teeth in each unit. Caries reaching the pulp (ICDAS code 6) were the most severe caries found in children, affecting 50 children. As a result, there were no caries-free children. Negeri Nogosari Elementary School children's dental health in grades I-III in Kebun Renteng's agro-industrial environment was relatively poor. The number of caries-infected teeth was 53% higher than that of caries-free teeth. There were no caries-free children in grades I-III, and the most severe dental caries discovered were caries that reached the pulp (ICDAS code 6).

Keywords: caries; dental health status; elementary school students grade I-III; ICDAS

INTRODUCTION

Teeth are tissues in the body that are extremely hard compared to other tissues. They are organs in the human mouth that play a vital role in human body systems.[1] Dental and oral health can impact overall health.[2] Dental caries is an infectious disease caused by the demineralization of enamel and dentin linked to the consumption of cariogenic foods. It can happen to adults as well as children.[3]

The global prevalence of dental caries is quite high, particularly among children. In Indonesia, 89 percent of those suffering from dental caries are children.[4] East Java has a prevalence of 49.88 percent, with the age group of 5-9 years mostly experiencing the cavities. Meanwhile, Jember is the fifth regency with cases of tooth decay or cavities, experienced by 50.87 percent of the population.[5]

Jember Regency is known as a food barn as the majority of the land is a green area consisting of forests, rice fields, plantations, and fields.[6] Kebun Renteng is one of Jember's largest agro-industrial areas, and Sekolah Dasar Negeri Nogosari 7 is a public elementary school in the area. Sekolah Dasar Negeri Nogosari 7 is an elementary school located in the Nogosari Health Center's working area as a local health facility.

School age is a critical time for laying a solid foundation for the realization of quality human beings, and health is an important factor in determining the quality

of human resources.[7] Elementary school children in grades I-III (age 6-10 years) are in a critical period for their dental health because, at that age, primary teeth begin to fall out and are replaced by the first permanent teeth that begin to erupt. [8]

Numerous issues can arise during the teeth-changing period. When one tooth erupts but the other has a cavity, or when one tooth erupts before the deciduous tooth falls out (persistence), the other teeth are difficult to penetrate the gums, causing swelling and even inflammation. This condition is extremely vulnerable because the possibility of tooth growth can cause abnormalities indirectly.[9] School-age children frequently consume their favorite food and beverages with no knowledge of which foods and beverages may increase the risk of dental caries. It can cause a slew of issues if not treated promptly.[10] Based on the background, this study used the ICDAS caries index to describe the dental health status of children in SD Negeri Nogosari grades I-III.

MATERIALS AND METHODS

This research used a descriptive observational method with a cross-sectional approach. From July to October 2021, the research was conducted at SD Negeri Nogosari 7, Rambi Puji District, Jember Regency. The research sample consisted of 76 students in grades I-III, with the sampling technique employing the total sampling method. The variables investigated were the caries descriptions of students in grades I-III at SD Negeri Nogosari 7. The dental examination was performed visually with the aid of a lamp,

using a disposable dental kit and a cotton pellet. The examination included primary and permanent teeth examinations, which were still in the oral cavity. The collected data was entered into the examination formula, then discussed descriptively and presented in tabular form. Ethical clearance was obtained from The ethical committee of medical research Faculty of Dentistry, Jember University No. 01275/UN 25.8/KEPK/DL.2021

RESULT

This study's total sample size was 76 students from 94 students in grades I-III. Eighteen students were not included in the study due to exclusion criteria, such as they were not present during the study, they were present but were not cooperative during the examination, or they were sick with the flu or cough. The sample included 41 male students and 35 female students, with 22 in grade I, 33 in grade II, and 22 in grade III. The examination results revealed that the number of caries-free teeth (ICDAS Code 1-6) was greater than that of caries-free teeth (ICDAS Code 0). The total number of caries-infected teeth was 929, while the total number of caries-free teeth was 823 (Table 1).

In 50 students, the most severe caries found in their oral cavity were caries that had reached the pulp (ICDAS Code 6). There were no caries-free children discovered. The presence of white spots when the teeth were dried (ICDAS code 1) was found to be the mildest caries in two students (Table 2).

Table 1. ICDAS-based distribution of caries per tooth.

Category	Number of Teeth	Percentage (%)
Code 0 (healthy)	823	47,0
Code 1 (*Whitespot* – dried teeth)	148	8,4
Code2 (*Whitespot*– wet teeth)	258	14,7
Code 3 (enamel caries)	204	11,6
Code 4 (enamel caries – discolored dentin)	54	3,1
Code 5 (dentinal caries)	84	4,8
Code 6 (pulp caries)	181	10,3
Total	1752	100

Table 2. ICDAS-based percentage distribution of the worst dental caries per child

Category	Number of Children	Percentage (%)
Code 0 (healthy)	0	0,0
Code 1 (*Whitespot* – dried teeth)	2	2,6
Code 2 (*Whitespot*– wet teeth)	0	0,0
Code 3 (enamel caries)	9	11,8
Code 4 (enamel caries – discolored dentin)	2	2,6
Code 5 (dentinal caries)	13	17,1
Code 6 (pulp caries)	50	65,8
Total	76	100

DISCUSSION

Caries are the most common and widely experienced disease in the world. Caries are caused by a high sugar intake, a lack of dental health care, and a lack of access to standard dental health services.[11] Caries are most commonly found in children's oral cavities. Children in elementary school are particularly vulnerable to dental caries as they are accustomed to consuming cariogenic foods and beverages.[12]

The results of dental caries examinations in each dental unit of children at SD Negeri Nogosari 7, Rambi Puji District, Jember Regency showed that the highest percentage of caries numbers found in dental units was code 0 (healthy/caries-free), with a total of 823 teeth (47.0 percent). However, several dental conditions were affected by caries. Caries were found in 53.0 percent of SD Negeri 7 Nogosari grade I-III children's teeth, including enamel and pulp caries. Six hundred an ten teeth (34.8 percent) had enamel caries (ICDAS codes 1-3), while 319 teeth (18.2 percent) had caries that had reached the dentin and pulp (ICDAS codes 4-6). It occurred due to the fact that teeth with a code of 0 or free of caries are most often found in the anterior teeth, whereas teeth with caries are most often found in the posterior teeth, specifically in the molars. Permanent molars begin to grow at the age of six years, making them more susceptible to caries. At the age of nine, the number of permanent and primary teeth in the oral cavity is nearly equal, with 14 permanent and ten primary teeth.[13] This study is supported by Wahyuni's (2019) research, which found that the first permanent molars erupted faster than other molars, making them most vulnerable to caries since the occlusal surface of the first molar developed at this time.[14]

The permanent first molar has more pits and fissures than the other teeth due to its anatomical shape. The occlusal surface of molar teeth is more frequently affected by caries as it has pits and fissures, putting these teeth at risk of caries. Food frequently becomes lodged in the pits and fissures, causing bacteria to become trapped and multiplied, resulting in dental caries.[14,15]

The percentage distribution of the worst dental caries in every child was found in the children of SD Negeri Nogosari 7, Rambi Puji District. There were no caries-free children discovered. Dental caries with code 6, namely caries reaching the pulp,

had the highest percentage distribution of the worst dental caries at 65.8 percent. It was followed by dental caries reaching the dentin (ICDAS code 5) at 17.1 percent and enamel caries (ICDAS code 3) at 11.8 percent. It happened due to various factors, including a lack of parental understanding of children's dental health and a lack of knowledge about how to brush teeth properly and correctly. This finding is supported by Perdani's (2018) research, which found a link between mothers' attitudes toward preventing dental caries by disciplining children to brush their teeth after eating and before going to bed, as well as limiting sweet and sticky foods that can cause caries in children.[16]

The findings revealed that there was still a lack of awareness among children about the importance of maintaining their dental health. It can be seen by comparing the percentage of dental units with caries to the percentage of teeth with no caries. Furthermore, caries reaching the pulp (ICDAS code 6) was children's most common type of dental caries. It could be influenced by the lack of parental knowledge about dental and oral health, living environment, information on media and supporting health facilities.

CONCLUSION

Based on the result of this study, it can be concluded that students at SD Negeri 7 Nogosari grades I-III had relatively poor dental health. Dental units with caries were found to be 53 percent more common than teeth without caries. There were no caries-free children in grades I-III, and the most common dental caries were caries reaching the pulp (ICDAS code 6), which was found in 50 students (65.8 percent).

REFERENCES

1. Tarigan R. Karies Gigi. Jakarta: EGC; 2014.

2. Marthinu LT, Bidjuni M. Penyakit Karies Gigi pada Personil Detasemen Gegana Satuan Brimob Polda Sulawesi Utara Tahun 2019. *JIGIM (Jurnal Ilmu Gigi dan Mulut)*. 2020;3(2):58–64. https://doi.org/10.47718/jgm.v3i2.1436

3. Shintia, Zainur RA. Gambaran Karies Gigi Ditinjau dari Makanan Jajanan. *JKGM*. 2019;1(2):21–6.

4. Norfai, Rahman E. Hubungan Pengetahuan dan Kebiasaan Menggosok Gigi dengan Kejadian Karies Gigi Di SDI Darul Mu'Minin Kota Banjarmasin Tahun 2017. *Din Kesehat*. 2017;8(1):212–218.

5. Kemenkes RI. Laporan Nasional Riskesdas 2018 [Internet]. Badan Penelitian dan Pengembangan Kesehatan. Jakarta: Badan Penelitian dan Pengembangan Kesehatan; 2019. 198 p.

6. BPS Jember. Kabupaten Jember dalam Angka. Kabupaten Jember dalam Angka. Jember: Badan Pusat Statistik Kabupaten Jember; 2020. 1–68 p.

7. Fatimatuzzahro N., Prasetya RC, Amilia W. Gambaran Perilaku Kesehatan Gigi Anak Sekolah Dasar di Desa Bangsalsari Kabupaten Jember. *J IKESMA*. 2016;12(2):85.

8. Mukhbitin F. Gambaran Kejadian Karies Gigi pada Siswa Kelas 3 MI Al-Mutmainnah. *J Promkes*. 2018;6(2):155–66. https://doi.org/10.20473/jpk.V6.I2.2018.155-166

9. Zahara E. Perilaku Ibu tentang Masa Pergantian Gigi dengan Persistensi pada Murid MIN Cot Gue Kecamatan Darul Imalah Kabupaten Aceh Besar Tahun 2018. *JUKEMA Poltekkes Kemenkes Aceh*. 2018;5(2):426–31.

10. Worotitjan I, Mintjelungan CN, Gunawan P. Pengalaman Karies Gigi serta Pola Makan dan Minum pada Anak Sekolah Dasar di Desa Kiawa Kecamatan Kawangkoan Utara. *e-GIGI*. 2013;1(1):59–68. https://doi.org/10.35790/eg.1.1.2013.1931

11. Safela, Dita S., Purwaningsih, Endang I. Systematic Literature Review: Faktor Yang Mempengaruhi Karies Gigi Pada Anak Sekolah Dasar. *Ejurnal Poltekkes Tasikmalaya*. 2021;2(2):335–44.

12. Mardiati E, Salikun, Supardan I. Faktor Penyebab Terjadinya Karies Gigi pada Siswa SD Sambiroto 02 Semarang. *J Kesehat Gigi*. 2017;4(1):26.

13. Listrianah L, Zainur RA, Hisata LS. Gambaran Karies Gigi Molar Pertama Permanen pada Siswa – Siswi Sekolah Dasar Negeri 13 Palembang Tahun 2018. *JPP (Jurnal Kesehat Poltekkes Palembang)*. 2019;13(2):136–49. https://doi.org/10.36086/jpp.v13i2.238

14. Wahyuni S. Gambaran Karies Gigi Molar Pertama Permanen pada Anak SD NegeriI 03 Sirah Pulau Padang Tahun 2018. *J Dent*. 2019;1(1):32–5.

15. Manoy NT, Kawengian SES, Mintjelungan CN. Gambaran Karies Gigi Molar Pertama Permanen dan Status Gizi di SD Katolik 06 Manado. *e-GIGI*. 2015;3(2). https://doi.org/10.35790/eg.3.2.2015.8825

16. Perdani APN. Sikap Ibu tentang Pencegahan Gigi Karies pada Anak Pra Sekolah di Tk Al-Qodiri Kabupaten Jember. *Jurnal MID-Z (Midwivery Zigot) Jurnal Ilmiah Kebidanan*.2018;1(2):42–7.