Vol. 03 No. 03: pp. 227-238

DENTAL CARIES IN CHILDREN AGED 6-12 YEARS USING THE "HI BOGI" APPLICATION IN CIMAHI ELEMENTARY SCHOOL IN 2021

(GAMBARAN KARIES ANAK USIA 6-12 TAHUN MENGGUNAKAN PERANGKAT LUNAK "HI BOGI" DI SD KOTA CIMAHI TAHUN 2021)

Rina Putri Noer Fadilah[1*], Henri Hartman[2], Ramadhani Putra Kusaeri[3]

[1]Department of Dental Public Health, Faculty of Dentistry Universitas Jenderal Achmad Yani, Cimahi, 40285, Indonesia
[2]Department of Pediatric Dentistry, Faculty of Dentistry Universitas Jenderal Achmad Yani, Cimahi, 40285, Indonesia
[3]Faculty of Dentistry Universitas Jenderal Achmad Yani, Cimahi, 40285, Indonesia

*Corresponding author
rina.putri@lecture.unjani.ac.id

JHDS.unjani.ac.id/jite
Doi: 10.54052/jhds.

Article History
Received:27/05/23
Accepted: 13/11/23

ABSTRACT

Caries are a dental and oral problem that most often occurs in elementary school-age children. The emergence of the COVID-19 pandemic has caused most dental examinations and treatments to be postponed, and only emergency dental procedures can be performed with teledentistry, one of which is the HI BOGI application has to prevent, educate or detect early dental and oral problems. This study aims to find out the description of caries in children aged 6-12 years using the "HI BOGI" application at Cimahi City Elementary School in 2021. The research subjects were 315 children obtained by cluster random sampling method. This research is descriptive and observational. According to WHO, the indicators and standards for measuring the severity of dental

caries are the DMF-T index for assessing permanent teeth and the DMF-T index for primary teeth. The DMF-T/dmf-t (Decay Missing Filled Teeth) index is a value that indicates the severity of tooth decay due to caries. The results showed that from the DMF-T/dmf-t examination on 315 children, the results of the DMF-T and DMF-T index status results were the average value of the DMF-T index of 0.746 including the very low criteria and the average value of the dmf-t index was obtained of 1.39 is included in the low criteria. Based on the area of Cimahi City District, the DMF-T index in the North District (0.327) and Central (0.482) is very low. South District (1.582) is included as low, and for DMF index status in North (2) and Central District (1.254) including low and South District (0.835) is included as very low. In conclusion, the caries status of children aged 6-12 years at SD Kota Cimahi in 2021 is in the low-status category for primary teeth and very low for permanent teeth.

Keywords: caries status; DMF-T index; HI BOGI

ABSTRAK

Karies merupakan masalah gigi dan mulut paling sering terjadi pada anak usia sekolah dasar. Munculnya pandemi Covid-19 menyebabkan sebagian besar pemeriksaan dan perawatan gigi di tunda dan hanya prosedur gigi darurat yang dapat dilakukan, dengan adanya teledentistry salah satunya perangkat lunak HI BOGI dapat mencegah, mengedukasi, ataupun mendeteksi dini masalah gigi dan mulut. Penelitian ini bertujuan untuk mengetahui gambaran karies anak usia 6-12 tahun menggunakan perangkat lunak "HI BOGI" di SD Kota Cimahi tahun 2021. Subjek penelitian sebanyak 315 anak yang diperoleh dengan metode cluster random sampling. Penelitian ini bersifat deskriptif observasional. Indikator dan standar penilaian untuk dilakukannya pengukuran derajat keparahan karies gigi menurut WHO adalah indeks DMF-T untuk menilai gigi tetap dan indeks dmf-t untuk gigi sulung. Indeks DMF-T/dmf-t (Decay Missing Filled Teeth)

merupakan nilai yang menunjukkan tingkat keparahan kerusakan gigi karena karies. Hasil penelitian memperlihatkan dari pemeriksaan DMF-T/dmf-t pada 315 anak didapatkan hasil status indeks dmf-t dan DMF-T nilai rata-rata indeks DMF-T sebesar 0.746 termasuk pada kriteria sangat rendah dan di dapatkan nilai rata-rata indeks dmf-t sebesar 1.39 tersebut termasuk pada kriteria rendah. Berdasarkan wilayah Kecamatan Kota Cimahi yaitu indeks DMF-T di Kecamatan Utara (0.327) dan Tengah (0.482) termasuk sangat rendah dan Kecamatan Selatan (1.582) termasuk dalam rendah, dan untuk status indeks dmft pada Kecamatan Utara (2) dan Tengah (1.254) termasuk rendah dan Kecamatan Selatan (0.835) termasuk dalam sangat rendah. Dapat disimpulkan status karies anak usia 6-12 tahun di SD Kota Cimahi Tahun 2021 berada pada kategori status rendah untuk gigi sulung dan sangat rendah untuk gigi permanen.

***Kata kunci**: indeks DMF-T; HI BOGI; status karies*

INTRODUCTION

The high prevalence of dental and oral problems in children is caries.[1] Dental caries is very susceptible to occur in elementary school-age children because, at that age, they often consume cariogenic foods and drinks that trigger caries. Elementary school students aged 6-12 still do not understand or know how to clean their teeth and mouth.[2] Dental caries can be measured using the DMF-T/dmf-t index. The decayed value (D/d) is a tooth that has cavities due to caries, missing values (M/m) are teeth that have been lost due to caries or teeth indicated for extraction, filled values (F/f) are teeth that have been filled due to caries, and there is no caries.[3,4,5,6]

According to the 2018 Basic Health Research (Riskesdas) stated that the national prevalence of caries in Indonesia tends to be high at 88.8%; then, for the age group 5-9 years, the prevalence of caries is still relatively high because it reaches 92.6%, which is 19.2% greater than the 10-14 year age group is 73.4% and based on the Decayed Missing Filled-Tooth (DMF-T)

rate for the 5-9 year age group it is 0.7%, which is lower than the 10-14 year age group which reached 1.8%.[7]

Since 1951, the Ministry of Health of the Republic of Indonesia (RI) has organized the Usaha Kesehatan Gigi Sekolah (UKGS) to achieve a healthy generation and caries-free children aged 12 by 2030. However, the results of dental and oral health conditions have remained unsatisfactory, and children's understanding of sources of information on dental health maintenance and care has remained inadequate.[8,9]

The 2019 Coronavirus disease pandemic (COVID-19) spreads quickly through droplets, pollutants, and contacts, with a high risk of transmission in face-to-face exchanges between medical professionals and patients. As a result, dentists are among the most vulnerable medical staff.[10,11,12]

Teledentistry has the potential to give novel dental office solutions both during and after the present pandemic. Because the word "tele" means "far," teledentistry satisfies the WHO's recommendation for social separation to minimize the transmission of COVID-19. Because the COVID-19 epidemic has made it challenging to conduct screening and health promotion activities using UKGS, it is required to develop a dental measurement and examination tool that can be integrated into health software.[10,11]

The "HI BOGI" application, especially Halo Indonesia Bersama Dokter Gigi, which is a teledentistry with telesurvey that can be utilized online/onlinend does not require a vast internet connection, can be used to support UKGS operations. "HI BOGI" is an application for dental health education, self-checking for dental diseases, including caries, and online consultations with dentists. It is currently only available for Android-based smartphones.

According to earlier studies, such as Puspita Kania Dewi et al. (2017) research on the DMF-T index and def-t in children at SDN Mekarjaya, Cimenyan District, Bandung Regency, the DMF-T index for children aged 7-13 years is 2.8, which falls into the medium range according to WHO. This chart indicates that each child's mouth has an average of three caries-affected teeth.[2] According to Meilani Yustri Hutami et al. (2019), the Dental Caries Index of 12-Year-Old Students between Low and High Parental Income at SD Kota Cimahi, 12-year-olds with a high level of parental income have a low caries index average of 1.2, while 12-year-olds with a low level of parental income have a high caries index average of 4.2.[13]

Based on the background of these problems, the authors are interested in researching the description of dental caries in children aged 6-12 years in the SD Cimahi area using the "HI BOGI" application through an Android-based smartphone.

METHOD

This study was a descriptive categorical research method that describes the incidence of dental caries in elementary school children aged 6-12 years in Cimahi by examining the condition of the teeth in the oral cavity with the HI BOGI application. It was executed from September 2021 to January 2022 after being declared free from ethical review by the Research Ethics Committee (KEPK), Padjajaran University, with the number 11/UN6.KEP/EC/2022.

The method was used to calculate the sample size and result of the sample size to estimate the proportion of the population to know the description of the incidence of caries acquired 96 people as the minimum sample size.[15,16] With a target sample of 300 subjects. The cluster random sampling technique was used to collect data. This study used cluster random sampling to sample from three sub-districts in Cimahi City: South Cimahi, North Cimahi, and Central Cimahi. After acquiring primary school data in each sub-district, SPSS was used to randomly choose one of the district's primary schools for research.

The variables in this study were dental caries, which were permanent and primary teeth that had holes when the teeth were photographed. Caries were calculated using the Android smartphone software "HI BOGI" by calculating the DMF-T and DMF-t indexes.

The "HI BOGI" application is an Android-based smartphone applied in this research as a tool. This study's analysis is a univariate analysis performed on a computer with the help of a statistical software program called SPSS, aiming to represent each research variable's characteristics. This analysis produces only frequency distributions and percentages of variables in general.

RESULT

In this study, dental examinations were carried out using the HI BOGI software, uploaded online to 315 elementary school children in Cimahi City, Central, North and South Cimahi Districts, included in the inclusion and exclusion criteria.

Table 1. Caries characteristics of children

6-12 years old using HI BOGI application in Cimahi City elementary school in 2021

Characteristics	n (subjects)	Percentage
Gender		
Man	144	45.7
Woman	171	54.3
Age		
6 - 9 years	71	22.5
10 - 12 years	244	77.5
District		
North Cimahi	110	34.92
South Cimahi	91	28.89
Central Cimahi	114	36.19

Based on the data in Table 1, it shows that the caries of children aged 6-12 years using the "HI BOGI" application in Cimahi City Elementary School in 2021 are primarily female as many as 171 people (54.3%) and male as many as 144 people (45.7%). Based on children aged 6-12 years, mainly at 10-12 years, as many as 244 people (77.5%), and at 6-9 years, as many as 71 people (22.5%). Based on the area of Cimahi City District, as many as 110 people in North Cimahi District (34.92%), South Cimahi District as many as 91 people (28.89%), Central Cimahi District as many as 114 people (36.19%).

Table 2. Descriptive DMF-T index status

	DMF-T
Mean ± SD	0.746 ± 1.48
Min - Max	0 - 12

From Table 2, The average DMF-T index for children aged 6-12 years using the "HI BOGI" application at SD Kota Cimahi in 2021 is 0.746 with a minimum DMF-T index score of 0 and a maximum of 12. Based on the calculation of the DMF index -T according to the WHO category, the average DMF-T index value of 0.746 is included in the shallow criteria.

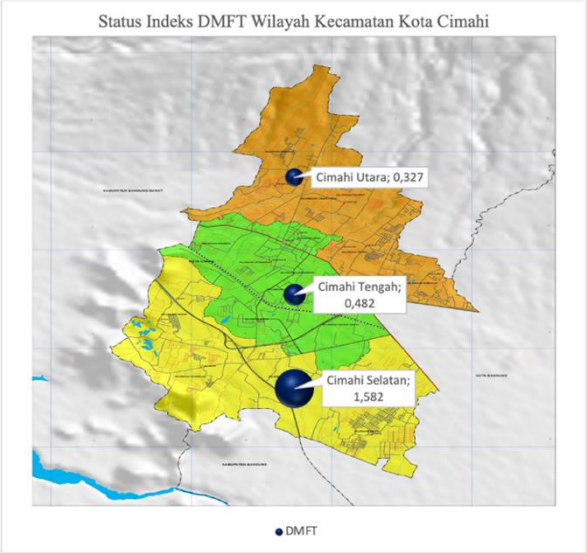

Figure 1. DMF-T index status for elementary school children aged 6-12 years in the Cimahi City District area.

Figure 1 shows the results of the DMF-T index status for elementary school children aged 6-12 years in 3 Districts of Cimahi City, namely North Cimahi District of 0.327, Central District of 0.482, and

South District of 1.582. Based on the calculation of the DMF-T index according to the WHO category, North and Central Districts are very low, and South Districts are low.

Table 3. Descriptive dmf-t index status

	dmf-t
Mean ± SD	1.39 ± 1.48
Min - Max	0 - 10

From Table 3, The average dmf-t index for children aged 6-12 years using the "HI BOGI" application at SD Kota Cimahi in 2021 is 1.39 with a minimum dmf-t of 0 and a maximum of 10. Based on the calculation of the dmf-t index according to the WHO category, the average value of the dmf-t index is 1.39, which is included in the low criteria

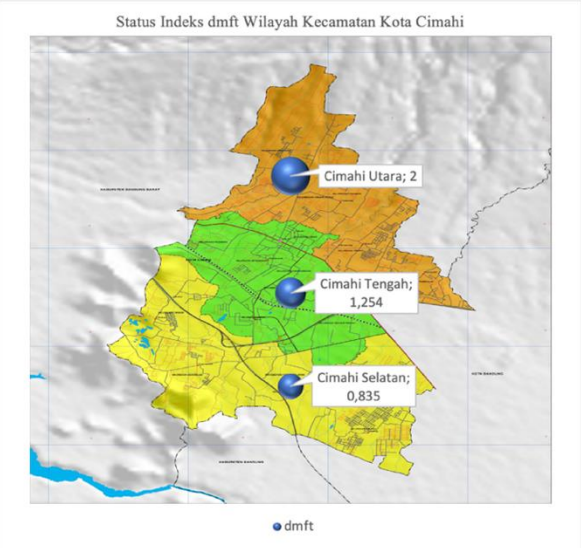

Figure 2. DMF-T index status for elementary school children aged 6-12 years in the Cimahi City District area.

Figure 2 shows the results of the DMF-T index status for elementary school children aged 6-12 years in 3 Districts of Cimahi City, namely North Cimahi District of 2, Central District of 1.254, and South District of 0.835. Based on the calculation of the dmf-t index according to the WHO category, North and Central Districts are low, and South Districts are very low.

DISCUSSION

After researching Caries of Children aged 6-12 Years Using the "HI BOGI" application in Cimahi City Elementary Schools in 2021. In this study it was found that from the results of the examination on 315 children, the average DMF-T index of elementary school children aged 6-12 years in Cimahi City, which is free from caries with a total of 210 children and an average of 165 children on the DMF-T index. Based on the category of caries status in the calculation of the DMF-T/DMF-T index according to WHO criteria, namely > 1.2 very low, 1.2 – 2.6 including low, 2.7 – 4.4 including moderate, 4.5 – 6.5 is high, and > 6.6 is very high.[14] Based on the area of Cimahi City District, the DMF-T index in North and Central Districts is

very low, and South District is low, and for DMF-T index status in North and Central Districts Central is low, and South District is very low. From the results of the DMF-T and DMF-T index status results, the average value of the DMF-T index of 0.746 is included in the very low criteria, and the average value of the DMF-T index of 1.39 is included in the low criteria.

The results of this study indicate a decrease in dental caries status in elementary school children in the Cimahi City area. In contrast, in the previous study, it was still classified as moderate in the Bandung area, and there was a large percentage in the Cimahi area.[2,13] Several supporting factors, such as oral hygiene, caries experience, habit of consuming cariogenic food, how to brush teeth, age, gender, education level, and social and economic status, can influence the decline in caries status so that children's knowledge in improving the quality and health of oral teeth can be increased.[17,18] According to a previous study, teledentistry is beneficial in dramatically enhancing children's dental and oral health knowledge for as many as 75% of parents.[19,20,21] In teledentistry virtual consultations, good results were obtained for the initial assessment phases, making it much easier to identify treatments that might be managed to be completed in the next visit.[22]

Since not all elementary school children have an Android-based smartphone, it is necessary to select children who meet the inclusion criteria, and some photos of their teeth condition are taken that are still not following what is in the video or photo guide, making analyzing the DMF-T index difficult. /dmf-t Furthermore, issues are logging In when registering the HI BOGI application because it requires synchronization between the cellphone number, the number listed when registering, and the OTP code, which is the most common problem.

CONCLUSION

According to the results of the research and data analysis, the caries status in children aged 6 to 12 in SD Cimahi City is found on the DMFT index with very low criteria of 0.746 and on the DMFT index with low criteria of 1.39, with an average of his teeth as free of caries.

CONFLICT OF INTEREST

We declare no conflict of interest in the scientific articles we write.

ACKNOWLEDGEMENT

Our gratitude goes to the Faculty of Dentistry, General Achmad Yani University Cimahi, Indonesia, to the Health Center and Elementary School in Cimahi

City District. This research is supported by the Halo Indonesia Bersama Dokter Gigi (HI BOGI) team, Jenderal Achmad Yani University Indonesia.

REFERENCES

1. Al-Samadani KHM, Ahmad MS. Prevalence of first permanent molar caries in and its relationship to the dental knowledge of 9–12-year olds from Jeddah, Kingdom Of Saudi Arabia. ISRN Dent. 2012;2012:1–6.
2. Prisinda D, Wahyuni IS, Andisetyanto P, Zenab Y. Indeks dmf-t dan def-t pada anak di sekolah dasar negeri Mekarjaya (SDN) Kecamatan Cimenyan Kabupaten Bandung. Padjadjaran J Dent Res Students. 2017;1(2):95–101.
3. Faulina Windiyana K, Adhani R, Azizah A, et al. Gambaran status karies gigi anak pada 3 sekolah dasar di wilayah Jakarta Barat (Laporan Penelitian). RepositoryTrisaktiAcId [Internet]. 2020;4(1):4–7. Available from: http://repository.trisakti.ac.id/usaktiana/index.php/home/detail/detail_koleksi/0/ARD/judul/00000000000000103080/
4. Dokter O, Dan G, Dokter B. Penilaian indeks dmf-t anak usia 12 tahun oleh dokter gigi dan bukan dokter gigi di Kabupaten Ketapang Propinsi Kalimantan Barat. Media Heal Res Dev. 2013;23(1 Mar):41–6.
5. Mitiche A, Ayed I Ben. Oral Health Surveys Basic Methods. Springer Top Signal Process. 2011;5:33–58.
6. Elsevier India. Preventive and Community Dentistry [Internet]. 2011. 211–13 p. Available from: https://books.google.co.in/books/about/Textbook_of_Preventive_and_Community_Den.html?id=Tz9cWJ3yUycC
7. Kemenkes. Laporan Nasional Riskesdas 2018. Badan Penelitian dan Pengembangan Kesehatan. 2018. p. 198. Available from: http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf
8. KemenKes RI. Pedoman Usaha Kesehatan Gigi Sekolah (UKGS) [Internet]. 2012. 2 p. Available from: http://pdgi.or.id/wp-content/uploads/2015/04/UKGS.pdf
9. Gigi P, Mulut DAN, Sekolah S. Evaluasi penerapan manajemen ukgs dalam perilaku perawatan gigi dan mulut siswa sekolah dasar. JHE (Journal Heal Educ. 2016;1(2).
10. Karaaslan F, Dikilitas A. The effect of coronavirus disease 2019 pandemic on oral health behavior of Turkish society. J Oral Heal Oral Epidemiol

[Internet]. 2020;9(4):187–95. Available from: https://doi.org/10.22122/johoe.v9i4.1126

11. Ghai S. Teledentistry during Covid-19 pandemic. Diabetes Metab Syndr Clin Res Rev [Internet]. 2020 Sep;14(5):933–5. Available from: https://linkinghub.elsevier.com/retrieve/pii/S1871402120301983

12. Achmad H, Tanumihardja M, Ramadhany YF. Teledentistry as a solution in dentistry during the Covid-19 pandemic period: A systematic review. Int J Pharm Res. 2020;12(2):272–8.

13. Hutami MY, Himawati M, Widyasari R. Indeks karies gigi murid usia 12 tahun antara pendapatan orangtua rendah dan tinggi di sd Kota Cimahi. Padjadjaran J Dent Res Student [Internet]. 2019;3(1):1–6. Available from: http://journal.unpad.ac.id/pjdrs/article/view/22124/11603

14. Anggara S, Wulandari E. Indeks karies gigi siswa kelas v sekolah dasar di pedesaan dan perkotaan di Kecamatan Patrang Kabupaten Jember (Dental Caries Index of 5 th Grade Elementary School in Rural and Urban Sub-district. Artik Ilm Has Penelit Mhs 2012. 2012;1–6.

15. Masturoh I, T NA. Metodologi Penelitian Kesehatan. Jakarta: Badan Pengembangan dan Pemberdayaan Sumber Daya Manusia Kesehatan; 2018. 307 p.

16. Dahlan MS. Besar Sampel dan Cara Pengambilan Sampel. 3rd ed. Suslia A, editor. Jakarta: Salemba Medika; 2013. 238 p.

17. Ferreira Zandoná AG, Ritter A V., Eidson RS. Dental caries: Etiology, clinical characteristics, risk assessment, and management. Sturdevant's Art and Science of Operative Dentistry. 2018. 40–94 p.

18. Liwe M, Mintjelungan CN, Gunawan PN. Prevalensi karies gigi molar satu permanen pada anak umur 6-9 tahun di sekolah dasar Kecamatan Tomohon Selatan. e-GIGI. 2015;3(2).

19. Alqarni A, Alfaifi H, Aseeri N, Gadah T, Togoo R. Efficacy of a self-designed mobile application to improve child dental health knowledge among parents. J Int Soc Prev Community Dent [Internet]. 2018;8(5):424. Available from: http://www.jispcd.org/text.asp?2018/8/5/424/242862

20. Tri T, Astoeti E, Sari A. Teledentistry Tri Erri Astoeti, Armelia Sari, 2020. 2020.

21. Hervina, Nasutianto H, Astuti NKA. Konsultasi dan edukasi masalah kesehatan gigi dan mulut serta protokol kesehatan selama masa pandemi Covid-19 secara online melalui teledentistry. J Kreat Pengabdi Kpd Masy [Internet]. 2021;4:299–306. Available from: http://ejurnalmalahayati.ac.id/index.php/kreativitas/article/download/3727/pdf

22. Murthy V, Herbert C, Bains D, Escudier M, Carey B, Ormond M. Patient experience of virtual consultations in Oral Medicine during the Covid-19 pandemic. Oral Dis [Internet]. 2021 Aug 25;(June):1–10. Available from: https://onlinelibrary.wiley.com/doi/10.1111/odi.14006