# THE RELATIONSHIP BETWEEN TOOTH BRUSHING ABILITY AND DENTAL CARIES IN GRADE 5 CHILDREN AT SDN SIDOMULYO 03 JEMBER

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**ABSTRACT.** The most common oral health problem is dental caries, especially in elementary school children. The cause of these dental problems is the lack of maintaining oral hygiene such as improper brushing methods, improper brushing frequency, and the type of food consumed. To determine the relationship between tooth brushing ability and dental caries in 5th grade children at SDN Sidomulyo 03 Jember. Using observation sheets, interview sheets, and examination sheets. The research subjects were 42 grade 5 students with an age range of 10-11 years. Students brush their teeth then their oral cavity is examined to determine the presence or absence of dental caries. The frequency distribution of tooth brushing ability in grade 5 children showed that of the 42 respondents studied, 27 children had poor tooth brushing ability with a percentage of 64.3%. 3 out of 42 respondents did not have dental caries with a percentage of 7.1%. Meanwhile, 39 out of 42 respondents had dental caries with a percentage of 92.9%. The results of the cross tabulation showed that good tooth brushing ability with no caries was 3 respondents and 27 respondents had poor tooth brushing ability with caries. The statistical test results obtained sig. (2-tailled) = 0.000. There is a relationship between tooth brushing ability and dental caries in 5th grade children at SDN Sidomulyo 03 Jember.

**Keywords:** Ability, Brushing, Caries

## 1 BACKGROUND

Oral health problems are those that affect elementary-age children. The most common dental problems faced by students is tooth decay. Causes of these dental problems include failure to maintain oral hygiene, such as improper brushing, improper brushing frequency, and inadequate oral hygiene. oral hygiene, such as inappropriate brushing methods, inappropriate brushing frequency and the type of food the child eats (Jumriani, 2018) (Liu, H. Y. et al., 2010).

Tooth decay is a disease of dental tissue, characterized by tissue destruction, starting from the tooth surface, enamel, dentin and extending to the pulp (Boustedt, K. et al., 2020). Tooth decay is caused by many factors, including carbohydrates, microorganisms and saliva, tooth surface and shape, of which the two most common bacteria causing tooth decay are Streptococcus mutans and Lactobacillus (Retnaningsih, D., & Arinti, R, 2018) . If left untreated, this condition can lead to pain, tooth loss, and infection (Sukarsih et al., 2019).

To brush your teeth is to clean your teeth of food debris, bacteria, and plaque Ibrhim, R. E. H et al., 2020) . In cleaning, it must pay attention to the implementation of the right time in cleaning teeth (Hayasaki, H. et al., 2014). Therefore, the ability to brush teeth is a human behaviour in cleaning teeth from food debris that is carried out continuously (Deinzer, R et al., 2018). Brushing teeth as a form of behaviour will affect the good and bad oral hygiene, which will also affect the rate of caries and tooth decay (Qoyyimah & Aliffia, 2019).

Efforts to maintain oral health should be made from an early age. Elementary school age is the ideal time to develop motor skills, including brushing teeth (Ngatemi, T. P., & Purnama, T, 2021). The ability to effectively and properly brush your teeth is an important factor in maintaining oral health (Boeira, G. F et al., 2012). Tooth brushing in children with a suboptimal frequency may be because parents are not used to brushing their teeth from an early age, so children do not have the awareness and motivation to maintain oral health. This condition puts young teeth at risk for dental diseases (Jumriani, 2018).

Data from the 2018 Riskesdas results, the prevalence of caries in Indonesia was 88.8% and stated that as many as 57.6% of the Indonesian population had dental and oral problems with the largest proportion being damaged / perforated / diseased teeth, namely 45.3% (Saputri et al., 2022). Riskesdas in 2018 presents data on the proportion of caries in children aged 5-9 years reaching 92.6%, while children aged 10-14 years reached 73.4% (Nuriyah et al., 2022). It was also found that 56% of the population of East Java province still experienced oral health problems (Saputri et al., 2022). According to WHO, the measurement categories of the DMF-T (Decay Missing Filled-Teeth) index are: Very Low = 0.0-1.1; Low = 1.2-2.6; Medium = 2.7-4.4; High = 4.5-6.5; Very High = > 6.6. Based on the results of the initial data examination conducted on 10 grade 5 children at SDN Sidomulyo 03 Jember in October 2022, it was found that 8 out of 10 children had dental caries and obtained average DMF-T data of 2.8 which according to WHO the value was included in the moderate category. The DMF-T rate of 2.8 still does not meet the WHO target. WHO has a target in the Global Goals for Oral Health 2020 target DMF-T value in children aged 12 years is ≤ 1 (Sariyem et al., 2021). Thus, there are oral health problems, namely the gap between WHO targets and DMF-T values in 5th grade children at SDN Sidomulyo 03 Jember.

## 2 RESEARCH METHODS

This type of research is cross sectional analytic. The target of this study were 5th grade children of SDN Sidomulyo 03 Jember. This research was conducted in October 2022-May 2023 with sampling using non-random sampling method with saturated sample technique. Data collection instruments used were observation sheets, interview sheets and DMF-T examination sheets. The data analysis technique used was the Chi-Square Test.

## 3 RESULTS

The research results obtained the following data:

**Table 1.** Frequency Distribution of Respondents Based on Gender

| Gender | Frequency | Percentage (%) |
|---|---|---|
| Male | 22 | 52,4% |
| Female | 20 | 47,6% |
| **Total** | **42** | **100%** |

Table 1 shows that the majority of respondents, 22 people (52.4%), were male students.

**Table 2.** Frequency Distribution of Respondents Based on Age

| Age | Frequency | Percentage (%) |
|---|---|---|
| 10 years | 9 | 21,4% |
| 11 years | 33 | 78,6% |
| **Total** | **42** | **100%** |

Table 2 shows that the highest number of respondents, 33 people (78.6%), were 11 years old.

**Table 3.** Frequency Distribution of Tooth Brushing Ability

| Tooth Brushing Ability | Frequency | Percentage (%) |
|---|---|---|
| Very Good | 0 | 0% |
| Good | 3 | 7,1% |
| Enough | 12 | 28,6% |
| Less | 27 | 64,3% |
| **Total** | **42** | **100%** |

Table 3 shows that of the 42 respondents studied, 27 children had poor tooth brushing skills with a percentage of 64.3%.

**Table 4.** Frequency Distribution of Dental Caries

| Dental Caries | Frequency | Percentage (%) |
|---|---|---|
| There isn't Caries | 3 | 7,1% |
| There is Caries | 39 | 92,9% |

| | | |
|---|---|---|
| **Total** | **42** | **100%** |

Table 4 shows that of the 42 respondents studied, there were 3 children (7.1%) who did not have caries and 39 children (92.9%) had caries.

**Table 5.** Cross Tabulation of Tooth Brushing Ability with Dental Caries in Grade 5 Children at SDN Sidomulyo 03 Jember

| Dental Caries Category | Ability Criteria | | | | TOTAL |
|---|---|---|---|---|---|
| | Very Good | Good | Enough | Less | |
| | n | n | n | n | N |
| There isn't Caries | 0 | 3 | 0 | 0 | 3 |
| There is Caries | 0 | 0 | 12 | 27 | 39 |
| **Total** | **0** | **3** | **12** | **27** | **42** |

Table 5 shows that good brushing skills with no caries were 3 respondents and 27 respondents had poor brushing skills and caries.

**Table 6.** Analysis Results with Chi-Square Test

| No. | Variabel | N | Value | Df | Sig. (2-Sided) |
|---|---|---|---|---|---|
| 1. | Tooth Brushing Ability | 42 | 42.000 | 2 | 0.000 |
| 2. | Dental Caries | | | | |

Based on the results of the statistical test, the Sig.(2-tailed) of 0.000 <0.05. We can therefore conclude that H1 is accepted and H0 is rejected. Thus, it can be understood that there is a significant relationship between the ability to brush teeth and dental caries in children of grade 5 at SDN Sidomulyo 03 Jember.

## 4 DISCUSSION

This study was conducted on grade 5 children at SDN Sidomulyo 03 Jember, totalling 42 respondents. The results showed that the majority of respondents had the ability to brush their teeth in the poor category at 64.3%. Most respondents had dental caries, as many as 92.9%. Respondents who had the ability to brush their teeth in the good category and there were no caries were 3 respondents. A total of 12 respondents had the ability to brush their teeth in the moderate category and had caries. Meanwhile, respondents who had the ability to brush their teeth in the poor category and experienced caries were 27 respondents. So that there were 39 respondents who experienced caries. The results of the study using the Chi-Square correlation test obtained a p value of 0.000. The statistical test results show that the p value is < 0.05, which means that there is a significant relationship between tooth brushing ability and dental caries in grade 5 children at SDN Sidomulyo 03 Jember.

This is in accordance with research conducted by Husnia (2021), that there is a relationship between brushing teeth and caries, most children do not brush their teeth

properly and correctly so that they experience dental caries (Purnama, T et al., 2020). Brushing your teeth after breakfast will reduce the potential for mechanical erosion on the demineralised tooth surface, while brushing your teeth before bed to clean plaque because when sleeping the salivary flow will decrease so that the buffer effect will decrease (Tinanoff, N., & Reisine, S, 2009). Dental caries is a dental and oral disease that is suffered by most school-age children. Caries is also the primary pathological cause of tooth loss in children which occurs due to lack of child attention and parental knowledge (Santoso, B et al., 2020).

In line with the research of Firdaus et al., (2020), that there is a relationship between the accuracy of brushing teeth and dental caries in children at SDN 4 Tlogosari. The large percentage of students who experience dental caries caused by consuming sweet foods, but also this condition is influenced by several factors including brushing habits and improper and incorrect ways of brushing teeth. A good way to brush your teeth is to clean all parts of the teeth with vertical movements and gentle movements. All surfaces of the inner, outer and chewing teeth should be brushed thoroughly and vigorous brushing is not recommended as it can damage tooth enamel due to vibration (Liu, H. Y et al., 2009).

According to research conducted by Syaripah et al., (2023), the results showed that there was a significant association between tooth brushing behavior and the incidence of dental caries in elementary school children. Improper brushing behavior can cause tooth decay because food particles that are not cleaned properly accumulate and turn into plaque and are then decomposed by microorganisms, causing the mouth to become acidic and decayed. teeth will grow, leading to tooth damage. Tooth brushing behavior and tooth decay incidence have an inverse relationship: the better the tooth brushing behavior, the lower the tooth decay incidence (Razeghi, S et al., 2020) (Meyer, F., & Enax, J, 2018).

Prevention of dental caries can be done by having good and correct brushing habits. Proper and routine brushing behaviour is an effective first step to prevent dental caries and other dental health problems. Changing tooth brushing behaviour to be more appropriate can indeed be done based on self-awareness. It is important for individuals to realise how important it is to maintain oral health and brush their teeth properly. By realising that good brushing behaviour can prevent dental caries problems and other adverse effects, individuals will be more motivated to make changes to better brushing habits. In addition to proper tooth brushing, it is also necessary to pay attention to a healthy diet, namely reducing the consumption of sweet and sticky foods, as well as undergoing regular dental care by a dentist. Incorporating all these steps as part of daily habits can help maintain good oral health, there by preventing dental caries and other dental problems.

## 5 CONCLUSION AND RECOMMENDATION

The ability to brush teeth in grade 5 children at SDN Sidomulyo 03 Jember is in the deficient category. Dental caries in grade 5 children at SDN Sidomulyo 03 Jember is in the category of caries. There is a relationship between tooth brushing ability and dental caries in grade 5 children at SDN Sidomulyo 03 Jember. Suggestions that can be given by researchers are that students of SDN Sidomulyo 03 Jember are expected to always maintain dental and oral hygiene to avoid dental and oral diseases and are expected to routinely check their oral health every 6 months. Health workers are expected to

consistently conduct examinations and provide counselling on how to maintain oral hygiene and health in school children. For further researchers, it is hoped that further research can be carried out using different methods.

## 6 REFERENCES


Asih, S. W. J. (2018). Penggunaan Fluoride Dalam Pasta Gigi Untuk Anak Usia Dini. Institut Teknologi Sepuluh Nopember, May, 0–3.

Astannudinsyah, Ruwanda, R. A., & Basid, A. (2020). Faktor-Faktor Yang Berhubungan Dengan Status Karies Gigi Pada Anak Sekolah Min 1 Kota Banjarmasin. Jurnak Kesehatan Indonesia STIKes Husada Borneo, 2, 149–156.

Baba, W. N., & Avelina, Y. (2020). Pelatihan Cara Menggosok Gigi yang Baik dan Benar Bagi Siswa-Siswi Sekolah Dasar Islam Negeri Nangahure Lembah. Jurnal Abdimas Saintika, 2(2), 21–24.

Boeira, G. F., Correa, M. B., Peres, K. G., Peres, M. A., Santos, I. S., Matijasevich, A.,.& Demarco, F. F. (2012). Caries is the main cause for dental pain in childhood: findings from a birth cohort. caries research, 46(5), 488-495.

Boustedt, K., Dahlgren, J., Twetman, S., & Roswall, J. (2020). Tooth brushing habits and prevalence of early childhood caries: a prospective cohort study. European archives of paediatric dentistry, 21, 155-159.

Cahyaningtyastuti, M. P., Utami, B. S., & Prestiliano, J. (2020). Perancangan Board Game Sebagai Media Pembelajaran Tentang Pentingnya Merawat Gigi Bagi Anak Usia Sekolah Dasar. Citradirga - Jurnal Desain Komunikasi Visual Dan Intermedia, 2(01), 41–52. https://doi.org/10.33479/cd.v2i01.297.

Deinzer, R., Ebel, S., Blättermann, H., Weik, U., & Margraf-Stiksrud, J. (2018). Toothbrushing: to the best of one's abilities is possibly not good enough. BMC oral health, 18, 1-7.

Faizin, M., Devi, N., & Yudanari, Y. G. (2019). Deskriptif Korelational. Jurnal Universitas Ngudi Waluyo, 1–7.

Firdaus, I. A., Handayani, L., & Wahyuni, S. (2020). Hubungan Ketepatan Menggosok Gigi Dengan Kejadian Karies Gigi Di Sdn 4 Tlogosari. Jurnal Universitas Muhammadiyah Jember. http://repository.unmuhjember.ac.id/5753/12/L. ARTIKEL JURNAL.pdf.

Gerung, A. Y., Wowor, V. N. S., & Mintjelungan, C. N. (2021). Perilaku Pemeliharaan Kesehatan Gigi Mulut Siswa SD Dengan dan Tanpa Usaha Kesehatan Gigi Sekolah (UKGS). E-GiGi, 9(2), 124. https://doi.org/10.35790/eg.9.2.2021.32958.

Hayasaki, H., Saitoh, I., Nakakura-Ohshima, K., Hanasaki, M., Nogami, Y., Nakajima, T., ... & Yamasaki, Y. (2014). Tooth brushing for oral prophylaxis. Japanese Dental Science Review, 50(3), 69-77.

Husnia, V. (2021). Hubungan Menyikat Gigi terhadap Karies Gigi pada Anak Sekolah Dasar. Jurnal Poltekkes Medan, 3–6.

Ibrahim, R. E. H. M., Helaly, M. O., & Ahmed, E. M. A. (2021). Assessment of brushing techniques in school children and its association with dental caries, Omdurman, 2019. International Journal of Dentistry, 2021, 1-6.

Imran, H., & Niakurniawati. (2018). Pengetahuan Tentang Menyikat Gigi dan Status Kebersihan Gigi dan Mulut pada Murid Sekolah Dasar. Forum Ilmiah Kesehatan (FORIKES), 9, 258–262. https://doi.org/http://dx.doi.org/10.33846/sf9405.

Jumriani. (2018). Hubungan Frekuensi Menyikat Gigi dengan Tingkat Kebersihan Gigi dan Mulut pada Siswa SD Inpres BTN IKIP I Kota Makassar. Poltekkes Kemenkes Makassar Jurusan Keperawatan Gigi, 17(2), 46–55. https://doi.org/https://doi.org/10.32382/mkg.v17i2.706.

Keloay, P., Mintjelungan, C. N., & Pangemanan, D. H. C. (2019). Gambaran Teknik Menyikat Gigi dan Indeks Plak pada Siswa SD GMIM Siloam Tonsealama. E-GIGI, 7(2), 76–80. https://doi.org/10.35790/eg.7.2.2019.24143.

Liu, H. Y., Chen, C. C., Hu, W. C., Tang, R. C., Chen, C. C., Tsai, C. C., & Huang, S. T. (2010). The impact of dietary and tooth-brushing habits to dental caries of special school children with disability. Research in developmental disabilities, 31(6), 1160-1169.

Liu, H. Y., Huang, S. T., Hsuao, S. Y., Chen, C. C., Hu, W. C., & Yen, Y. Y. (2009). Dental caries associated with dietary and toothbrushing habits of 6-to 12-year-old mentally retarded children in Taiwan. Journal of Dental Sciences, 4(2), 61-74.

Maryani, E. (2019). Hubungan Perilaku Menggosok Gigi Dengan Kejadian Karies Gigi Pada Anak Kelas 1 Dan 2 Sekolah Dasar Tanggulrejo Kecamatan Tempuran Kabupaten Magelang. Doctoral Dissertation, Universitas Muhammadiyah Magelang, 1–52.

Maulina, H., Hariana Intiana, S. R., & Safruddin, S. (2021). Analisis Kemampuan Menulis Cerpen Siswa Sekolah Dasar. Jurnal Ilmiah Profesi Pendidikan, 6(3), 482–486. https://doi.org/10.29303/jipp.v6i3.276.

Meyer, F., & Enax, J. (2018). Early childhood caries: epidemiology, aetiology, and prevention. International journal of dentistry, 2018.

Ngatemi, T. P., & Purnama, T. (2021). Counseling with Tooth Brushing Demonstration Method as an Effort to Improve Tooth Brushing Skills and the Status of Dental and Oral Hygiene in Early Childhood at School. Med Leg Updat, 21(1), 684-7.

Nissa, I. C., Hadi, S., & Marjianto, A. (2021). Studi Literatur : Karies pada Anak Sekolah Dasar Ditinjau dari Perilaku Menggosok Gigi di Indonesia. Jurnal Ilmiah Keperawatan Gigi (JIKG), 3(2), 500–517. http://ejurnal.poltekkestasikmalaya.ac.id/index.php/jikg/article/view/768.

Notoatmodjo, S. (2018a). Promosi Kesehatan dan Ilmu Perilaku (cetakan ke). Rineka Cipta.

Notoatmodjo, S. (2018b). Promosi Kesehatan Teori dan Aplikasi (Ketiga). Rineka Cipta.

Nugraheni, H., Sadimin, & Sukini. (2019). Determinan Perilaku Pencegahan Karies Gigi Siswa Sekolah Dasar Di Kota Semarang. Jurnal Kesehatan Gigi, 6(1), 26. https://doi.org/https://doi.org/10.31983/jkg.v6i1.4404.

Nuriyah, E., Edi, I. S., & Ulfah, S. F. (2022). Karies Gigi Ditinjau dari Pengetahuan Kesehatan Gigi dan Mulut pada Siswa Sekolah Dasar. Indonesian Journal Of Health and Medical, 2(2), 167–179.

Nurla, Y., Al Munawwarah, R., Mustafa, H., & Sani, A. (2021). Pengaruh Kemampuan Intelektual dan Motivasi Kerja terhadap Kinerja Guru SMK Negeri 4 Soppeng. Amkop Management Accounting Review (AMAR), 1(1), 65–80. https://doi.org/10.37531/amar.vxix.232.

Paremeswara, M. C. (2021). Pengaruh Game Online Terhadap Perkembangan Emosi dan Sosial Anak Sekolah Dasar. Jurnal Pendidikan Tambusai, 5(Pengaruh Game Online), 1473–1481.

Purnama, T., Ngatemi, I. F., & Widiyastuti, R. (2020). Model Mentoring Teachers and Parents as an Efforts for Brushing Teeth Behavior in Preschool Children. Indian Journal of Forensic

Medicine & Toxicology, 14(4), 3511-3516.

Putri, W. W., & Nina. (2021). Hubungan Antara Frekuensi Menyikat Gigi, Cara Menyikat Gigi dan Kebiasaan Makan dengan Kejadian Karies. Jurnal of Public Health Education, 01(01), 13–19.

Qoyyimah, A. U., & Aliffia, C. E. (2019). Hubungan Frekuensi Menggosok Gigi dengan Kejadian Karies Gigi pada Siswa di TKIT B Mutiara Hati Klaten. Jurnal Kebidanan, XI(01), 35–43.

Razeghi, S., Amiri, P., Mohebbi, S. Z., & Kharazifard, M. J. (2020). Impact of health promotion interventions on early childhood caries prevention in children aged 2–5 Years receiving dental treatment under general anesthesia. Frontiers in Public Health, 8, 6.

Retnandiyanto, I. R. (2021). Kebiasaan Menggosok Gigi Dengan Kejadian Karies Gigi Pada Anak. EPrints.

Retnaningsih, D., & Arinti, R. (2018). Habit of tooth brushing with the dental caries incidence. International Journal of Research in Medical Sciences, 6(8), 2606.

Safela, S. D., Purwaningsih, E., & Isnanto. (2021). Systematic Literature Review : Faktor yang Mempengaruhi Karies Gigi Pada Anak Sekolah Dasar. Jurnal Ilmiah Keperawatan Gigi (JIKG), 2(2), 335–344.

Santoso, B., Susanto, E., Widyawati, M. N., Rahman, W. A., & Rajiani, I. (2020). Revitalizing School Dental Health Effort through" Model 222" as a Strategy to Achieve Caries-Free Indonesia 2030. Systematic Reviews in Pharmacy, 11(2).

Saputri, D. Y., Hadi, S., & Marjianto, A. (2022). Hubungan Cara Menyikat Gigi dengan Karies Gigi Pada Siswa Kelas XI SMA Widya Darma Surabaya. Indonesian Journal Of Health and Medical, 2(3), 233–242.

Sari, N. (2022). Kampanye Gosok Gigi Menyenangkan pada Anak Prasekolah. Jurnal Mitra Pengabdian Masyarakat, 1(September), 17–25.

Sariyem, S., Wiradona, I., & Sadimin, S. (2021). Information System for Early Detection of Dental and Mouth Diseases in Pregnant Women. Jurnal Kesehatan Gigi, 8(2), 141–145. https://doi.org/10.31983/jkg.v8i2.7927.

Septianti, N., & Afiani, R. (2020). Pentingnya Memahami Karakteristik Siswa Sekolah Dasar di SDN Cikokol 2. As-Sabiqun, 2(1), 7–17. https://doi.org/10.36088/assabiqun.v2i1.611.

Sukarsih, Silfia, A., & Muliadi. (2019). Perilaku dan Keterampilan Menyikat Gigi terhadap Timbulnya Karies Gigi pada Anak di Kota Jambi. Jurusan Kesehatan Gigi, 2, 80–86.

Suryani, L. (2018). Gambaran Menyikat Gigi Terhadap Tingkat Kebersihan Gigi Dan Mulut Pada Murid Kelas V Di MIN 9 Kecamatan Ulee Kareng Kota Banda Aceh. BIOTIK: Jurnal Ilmiah Biologi Teknologi Dan Kependidikan, 5(2), 149. https://doi.org/10.22373/biotik.v5i2.3024.

Syaripah, Fahmah, N. I., Kirmawati, R. R., & Amperawati, M. (2023). Perilaku Menggosok Gigi Dengan Kejadian Karies Pada Anak Sekolah Dasar. Jurnal Ilmu Kesehatan, 1, 210–217.

Tanu, N. P., Manu, A. A., & Ngadilah, C. (2019). Hubungan Frekuensi Menyikat Gigi dengan Tingkat Kejadian Karies. Dental Therapist Journal, 1(1), 39–43.

Tinanoff, N., & Reisine, S. (2009). Update on early childhood caries since the Surgeon General's Report. Academic pediatrics, 9(6), 396-403.

Utami Parta Santi, A., & Khamimah, S. (2019). Pengaruh Cara Menggosok Gigi Terhadap Karies Gigi Anak Kelas IV di SDN Satria Jaya 03 Bekasi. Jurnal Kesehatan Gigi, 1(5),

16–25.

Wahyuni. (2018). Identifikasi Pola Psikologi Komunikasi Resistensi Dalam Masyarakat. Jurnal Peurawi, 1(1), 1–14. http://jurnal.ar-raniry.ac.id/index.php/peurawi.