

The Effect of COVID-19 Pandemic on Tooth Brushing Habits of Pediatric Patients: A Cross-Sectional Study

COVID-19 Pandemisinin Çocuk Hastaların Diş Fırçalama Alışkanlıkları Üzerine Etkisi: Kesitsel Çalışma

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This study was presented as an oral presentation in 27th International Congress of Turkish Pediatric Dentistry Association, October 7-10, 2021, Bafra, Turkish Republic of Northern Cyprus.

ABSTRACT Objective: Children's tooth brushing habits might have been affected by various factors such as social isolation, restrictions, and homeschooling due to the coronavirus disease-2019 (COVID-19) outbreak. The recent study aimed to determine whether there was a change in the brushing habits of a sample of pediatric patients during the COVID-19 pandemic compared to the pre-pandemic period. **Material and Methods:** This cross-sectional study was held on the patients referred to the Gülhane Faculty of Dental Medicine. The patients aged 3-15 years and homeschooling since March 2020 up to questionnaire time (March 2021) were included in the study. The exclusion criteria were having a systemic disease in medical history and attending face-to-face education. Informed consent was obtained, and eight questions, including demographic features of parents/children and daily brushing habits, were directed to the participants. **Results:** The total number of participants was determined as 203. The mean age of the participants was 9.4±3 (years), and 53% of them were girls, and 47% of them were boys. Participants declared that they "rarely" brushed (31%) in the morning and "every time" (31%) at night before the pandemic. Individuals' brushing frequency was also mentioned as "rarely" (27%) in the morning and "every time" (33%) at night during the pandemic. Regarding the answers, no difference was detected between pandemic and pre-pandemic brushing frequencies of participants ($p>0.05$). The most mentioned answers were detected as "rarely-in the morning" and "everytime-at night" for whole periods. **Conclusion:** This study revealed that the childrens' brushing frequencies have not been affected by COVID-19 pandemic period.

ÖZET Amaç: Çocukların diş fırçalama alışkanlıkları, koronavirüs hastalığı-2019 [coronavirus disease-2019 (COVID-19)] salgınına bağlı sosyal izolasyon, kısıtlamalar ve evden eğitim gibi çeşitli faktörlerden etkilenmiş olabilir. Bu çalışma, bir grup çocuk hastanın pandemi öncesi diş fırçalama alışkanlıklarında pandemi öncesi döneme göre bir değişiklik olup olmadığını tespit etmeyi amaçlamaktadır. **Gereç ve Yöntemler:** Bu kesitsel çalışma, Gülhane Diş Hekimliği Fakültesine başvuran hastalar üzerinde gerçekleştirilmiştir. 3-15 (yıl) yaş aralığındaki, Mart 2020 tarihinden anket çalışmasının yapıldığı döneme dek (Mart 2021) evden eğitim gören hastalar çalışmaya dâhil edilmiştir. Yüz yüze eğitime devam etmiş olmak ve sistemik bir rahatsızlık mevcudiyeti dışlanma kriterleri arasındadır. Katılımcılardan bilgilendirilmiş onam formu alınmış ve günlük fırçalama alışkanlıkları ile çocuk ve ailelerinin demografik verilerin sorgulandığı 8 soru katılımcılara yönlendirilmiştir. **Bulgular:** Çalışmamızın katılımcı sayısı 203 olarak belirlenmiştir. Katılımcıların ortalama yaşı 9,4±3 (yıl) iken %53'ünün kız, %47'sinin erkek olduğu bulgulanmıştır. Çalışma sonuçlarına göre katılımcılar pandemi öncesinde sabahları dişlerini "nadiren" (%31) ve akşamları dişlerini "her zaman" fırçaladığını (%31) belirtmiştir. Pandemi sırasında ise katılımcıların %27'si dişlerini sabahları "nadiren" fırçaladığını, %33'ü ise akşamları dişlerini "her zaman" fırçaladığını ifade etmiştir. Verilen yanıtlar doğrultusunda pandemi dönemi ve pandemi öncesi dönemde katılımcıların diş fırçalama sıklıkları arasında bir değişiklik olmadığı tespit edilmiştir ($p>0,05$). Tüm zamanlar için en sık verilen cevaplar "sabahları-nadiren" ve "akşamları-her zaman" olarak tespit edilmiştir. **Sonuç:** Bu çalışma sonuçlarına göre çalışmamıza katılan çocukların diş fırçalama sıklıklarının COVID-19 pandemi döneminden etkilenmediği tespit edilmiştir.

Keywords: COVID-19; dental hygiene; tooth brushing; survey study

Anahtar Kelimeler: COVID-19; dental hijyen; diş fırçalama; anket çalışması

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Peer review under responsibility of Türkiye Klinikleri Journal of Dental Sciences.

Received: 25 Apr 2022

Received in revised form: 29 Oct 2022

Accepted: 28 Nov 2022

Available online: 01 Dec 2022

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World Health Organization announced coronavirus disease-2019 (COVID-19) as a pandemic in March 2020, and since that date, individuals have been informed of the required prophylactic measures by medical authorities and governments. Although personal hygiene implications came forward, oral hygiene habits are essential, too, since the oral cavity is the primary entrance of the whole internal system.¹⁻³

The recent studies showed that, although concomitant systemic illnesses and age are risk factors for mortality of COVID-19, some other indicators may affect the prognosis. The pediatric population has been known as the lower risk group for severe acute respiratory syndrome-coronavirus-2 infections due to the presentation of undeveloped angiotensin-converting enzyme 2 epithelial receptors. However, atypical pneumonia is the main reason for hospitalization, and secondary bacterial infections caused by strains similar to oral cavity pathogens, seem to be the reason for pneumonia. Additionally, these infections might affect the lower aged groups as they affect the older population.⁴⁻⁸

In most countries, children have been home-schooled from the early days of the pandemic. Either they might be going to school at various time intervals. The block downs and isolations might also restrict them from performing daily activities such as oral hygiene, eating, and sleeping.^{9,10} Considering this information, we planned a survey questionnaire comprising the tooth brushing habits of individuals. The study's primary purpose was to determine whether the tooth brushing habits of pediatric patients referred to our clinics had changed during the COVID-19 pandemic or not, comparing the period before the pandemic.

MATERIAL AND METHODS

The survey was held on 203 pediatric patients (107 girls, 96 boys) admitted to the University of Health Sciences Faculty of Gülhane Dental Medicine (1.02.2021-12.03.2021). The study group was determined by Sample Size Calculator-version: 2.04 (Relief Applications, UK, 2018) (80% power, $\alpha=0.05$). Completely healthy individuals (American Society of Anesthesiologists-I), aged between 3-15 years and homeschooled since March 2020, were included in

the study. Excluding criteria were decided as the existence of a systemic illness and face-to-face education. The minimum age group was determined as three since it includes the kindergarten period. The maximum age group was 15 years, considering the age limit of public pediatric dental clinics in Türkiye. The study protocol was conducted according to the Helsinki Declaration's principles, and the Gülhane Board of Ethics Committee approved the study (date: January 14, 2021, no: 2021/9). Informed consent was obtained from the participants' legal representatives, and individuals were informed that they were free to leave the study at any time they wanted. The necessary dental treatment and examinations were held independently of whether they had participated in the study. The survey consisted of eight questions, including demographic data and tooth brushing routines. The questionnaire was designed following a previous survey study using a 5-point Likert scale.¹¹ Accordingly, participants were asked to select the option compatible with their brushing routine (Every time-5, Frequently-4, Sometimes-3, Rarely-2, Never-1). The questions directed to the participants are shown in Table 1.

Data analysis was done using SPSS 27.0 software (Statistical Package for Windows 13.0, IBM Inc., Chicago, IL, USA). The chi-square test was used to analyze independent qualitative data, and the Fisher test was used when the chi-square test conditions were not met. Also, the McNemar test was used to analyze dependent qualitative data.

RESULTS

Questions directed to the participants and the answers obtained are shown in Table 1. Accordingly, 53% of the participants were female (n=107), and 47% were male (n=96). 29% (n=58) of the participants were younger than seven years, and 35% (n=72) were between 7 and 10 years. The participants older than ten years were 36% (n=73) of the whole group. The most frequently mentioned answers were as follows: Morning tooth brushing was found "rarely," with 31% (n=62) before the pandemic and 27% (n=55) during the pandemic. Night tooth brushing was found "every time," with 31 (n=62) before the pandemic and 33% (n=67) during the pandemic.

TABLE 1: The distribution of the answers given to the questions.

| | | Minimum-Maximum | Median | $\bar{X} \pm SD/n\%$ |
|--|------------|-----------------|----------|----------------------|
| Age of parent | 25.0-58.0 | 38.0 | 38.8±6.2 | |
| Age of patient | 3.5-15.0 | 9.0 | 9.4±3.0 | |
| Gender | Girl | | 107 | 53 |
| | Boy | | 96 | 47 |
| Age group | 0-7 | | 58 | 29 |
| | 7.1-10 | | 72 | 35 |
| | 10< | | 73 | 36 |
| Tooth brushing before pandemic-morning | Never | | 23 | 11 |
| | Rarely | | 62 | 31 |
| | Sometimes | | 47 | 23 |
| | Frequently | | 28 | 14 |
| | Every time | | 43 | 21 |
| Tooth brushing during pandemic-morning | Never | | 22 | 11 |
| | Rarely | | 55 | 27 |
| | Sometimes | | 50 | 25 |
| | Frequently | | 39 | 19 |
| | Every time | | 37 | 18 |
| Tooth brushing before pandemic-night | Never | | 16 | 8 |
| | Rarely | | 38 | 19 |
| | Sometimes | | 43 | 21 |
| | Frequently | | 44 | 22 |
| | Every time | | 62 | 31 |
| Tooth brushing during pandemic-night | Never | | 16 | 8 |
| | Rarely | | 30 | 15 |
| | Sometimes | | 40 | 20 |
| | Frequently | | 50 | 25 |
| | Every time | | 67 | 33 |

SD: Standard deviation.

In [Table 2](#), parents' educational levels and children's brushing habits before and during the pandemic were compared. The results showed that tooth brushing at night during the pandemic in the group with university-educated parents was significantly higher than in the middle school group ($p=0.024$). The participants whose parents were educated with under-college degrees mentioned that they had brushed frequently (18.5%, $n=12$) and every time (26.2%, $n=17$) during the pandemic. It was detected that the patients whose parents were educated with university degrees were frequently brushing (32.4%, $n=22$) and every time (33.8%, $n=23$) during the pandemic. No statistical difference was detected in the comparisons of the other groups. In [Table 3](#), individuals' age and tooth brushing habits were shown. As seen in [Table 3](#), brushing habits before and during the

pandemic did not show a statistical difference according to the age groups ($p>0.05$).

[Table 4](#) shows the relation between gender and the tooth brushing habits of individuals before and during the pandemic. As it was seen in [Table 4](#), the girls' brushing frequency at night (every time-32.7%, frequently-24.3%) was statistically higher than the boys' (every time-28.1%, frequently-18.8%) in the pre-pandemic period ($p=0.017$). No statistical difference was detected between the groups of boys and girls comparing the period of the pandemic and before the pandemic considering night and morning brushing habits.

DISCUSSION

The recent cross-sectional study examined the changes in the brushing habits of pediatric patients

TABLE 2: The relation between parents' educational levels and children's brushing habits before and during the pandemic.

| Brushing habits | | Secondary scholl and | | | | | | p value |
|--|------------|----------------------|------|-------------|------|------------|------|-----------------------|
| | | lower degrees | | High school | | University | | |
| | | n | % | n | % | n | % | |
| Tooth brushing before pandemic-morning | Never | 9 | 13.8 | 9 | 12.9 | 5 | 7.4 | 0.235 X ² |
| | Rarely | 25 | 38.5 | 20 | 28.6 | 17 | 25.0 | |
| | Sometimes | 15 | 23.1 | 13 | 18.6 | 19 | 27.9 | |
| | Frequently | 7 | 10.8 | 8 | 11.4 | 13 | 19.1 | |
| | Every time | 9 | 13.8 | 20 | 28.6 | 14 | 20.6 | |
| Tooth brushing during pandemic-morning | Never | 8 | 12.3 | 8 | 11.4 | 6 | 8.8 | 0.570 X ² |
| | Rarely | 19 | 29.2 | 16 | 22.9 | 20 | 29.4 | |
| | Sometimes | 18 | 27.7 | 16 | 22.9 | 16 | 23.5 | |
| | Frequently | 7 | 10.8 | 15 | 21.4 | 17 | 25.0 | |
| | Every time | 13 | 20.0 | 15 | 21.4 | 9 | 13.2 | |
| Differences in group p | | 0.267 | N | 0.251 | N | 0.222 | N | |
| Tooth brushing before pandemic-night | Never | 10 | 15.4 | 2 | 2.9 | 4 | 5.9 | 0.137 X ² |
| | Rarely | 14 | 21.5 | 13 | 18.6 | 11 | 16.2 | |
| | Sometimes | 13 | 20.0 | 14 | 20.0 | 16 | 23.5 | |
| | Frequently | 15 | 23.1 | 17 | 24.3 | 12 | 17.6 | |
| | Every time | 13 | 20.0 | 24 | 34.3 | 25 | 36.8 | |
| Tooth brushing during pandemic-night | Never | 11 | 16.9 | 3 | 4.3 | 2 | 2.9 | 0.024* X ² |
| | Rarely | 12 | 18.5 | 7 | 10.0 | 11 | 16.2 | |
| | Sometimes | 13 | 20.0 | 17 | 24.3 | 10 | 14.7 | |
| | Frequently | 12 | 18.5 | 16 | 22.9 | 22 | 32.4 | |
| | Every time | 17 | 26.2 | 27 | 38.6 | 23 | 33.8 | |
| Differences in group p | | 0.333 | N | 0.299 | N | 0.156 | N | |

^NRefers to McNemar test; X²Refers to ki-square test; *p<0.05 refers to statistically significantly difference.

TABLE 3: The relation between individuals' age and tooth brushing habits before and during the pandemic.

| Brushing habits | | Age 0-7 | | Age 7-10 | | Age >10 | | p value |
|--|------------|---------|------|----------|------|---------|------|----------------------|
| | | n | % | n | % | n | % | |
| Tooth brushing before pandemic-morning | Never | 8 | 13.8 | 7 | 9.7 | 8 | 11.0 | 0.519 X ² |
| | Rarely | 19 | 32.8 | 21 | 29.2 | 22 | 30.1 | |
| | Sometimes | 16 | 27.6 | 14 | 19.4 | 17 | 23.3 | |
| | Frequently | 9 | 15.5 | 9 | 12.5 | 10 | 13.7 | |
| | Every time | 6 | 10.3 | 21 | 29.2 | 16 | 21.9 | |
| Tooth brushing during pandemic-morning | Never | 7 | 12.1 | 7 | 9.7 | 8 | 11.0 | 0.783 X ² |
| | Rarely | 17 | 29.3 | 19 | 26.4 | 19 | 26.0 | |
| | Sometimes | 14 | 24.1 | 21 | 29.2 | 15 | 20.5 | |
| | Frequently | 13 | 22.4 | 10 | 13.9 | 16 | 21.9 | |
| | Every time | 7 | 12.1 | 15 | 20.8 | 15 | 20.5 | |
| Differences in group p | | 0.460 | N | 0.368 | N | 0.407 | N | |
| Tooth brushing before pandemic-night | Never | 6 | 10.3 | 6 | 8.3 | 4 | 5.5 | 0.880 X ² |
| | Rarely | 12 | 20.7 | 12 | 16.7 | 14 | 19.2 | |
| | Sometimes | 15 | 25.9 | 13 | 18.1 | 15 | 20.5 | |
| | Frequently | 11 | 19.0 | 16 | 22.2 | 17 | 23.3 | |
| | Every time | 14 | 24.1 | 25 | 34.7 | 23 | 31.5 | |
| Tooth brushing during pandemic-night | Never | 5 | 8.6 | 5 | 6.9 | 6 | 8.2 | 0.851 X ² |
| | Rarely | 9 | 15.5 | 9 | 12.5 | 12 | 16.4 | |
| | Sometimes | 14 | 24.1 | 12 | 16.7 | 14 | 19.2 | |
| | Frequently | 16 | 27.6 | 18 | 25.0 | 16 | 21.9 | |
| | Every time | 14 | 24.1 | 28 | 38.9 | 25 | 34.2 | |
| Differences in group p | | 0.501 | N | 0.706 | N | 0.662 | N | |

^NRefers to McNemar test; X²Refers to ki-square test; p<0.05 refers to statistically significantly difference.

TABLE 4: The relation between individuals' gender and tooth brushing habits in pandemic and pre-pandemic periods.

| | | Girl | | Boy | | p value | |
|--|------------|-------|------|-------|------|---------|----------------|
| | | n | % | n | % | | |
| Tooth brushing before pandemic-morning | Never | 11 | 10.3 | 12 | 12.5 | 0.110 | X ² |
| | Rarely | 25 | 23.4 | 37 | 38.5 | | |
| | Sometimes | 27 | 25.2 | 20 | 20.8 | | |
| | Frequently | 19 | 17.8 | 9 | 9.4 | | |
| | Every time | 25 | 23.4 | 18 | 18.8 | | |
| Tooth brushing during pandemic-morning | Never | 13 | 12.1 | 9 | 9.4 | 0.344 | X ² |
| | Rarely | 24 | 22.4 | 31 | 32.3 | | |
| | Sometimes | 27 | 25.2 | 23 | 24.0 | | |
| | Frequently | 25 | 23.4 | 14 | 14.6 | | |
| | Every time | 18 | 16.8 | 19 | 19.8 | | |
| Differences in group p | | 0.386 | N | 0.440 | N | | |
| Tooth brushing before pandemic-night | Never | 6 | 5.6 | 10 | 10.4 | 0.017* | X ² |
| | Rarely | 12 | 11.2 | 26 | 27.1 | | |
| | Sometimes | 28 | 26.2 | 15 | 15.6 | | |
| | Frequently | 26 | 24.3 | 18 | 18.8 | | |
| | Every time | 35 | 32.7 | 27 | 28.1 | | |
| Tooth brushing during pandemic-night | Never | 6 | 5.6 | 10 | 10.4 | 0.050 | X ² |
| | Rarely | 10 | 9.3 | 20 | 20.8 | | |
| | Sometimes | 26 | 24.3 | 14 | 14.6 | | |
| | Frequently | 30 | 28.0 | 20 | 20.8 | | |
| | Every time | 35 | 32.7 | 32 | 33.3 | | |
| Differences in group p | | 0.361 | N | 0.213 | N | | |

*Refers to McNemar test and; X²Refers to ki-square test; *p<0.05 refers to statistically significantly. difference.

referred to our clinics. The results revealed that no difference was detected between the brushing frequencies of individuals regarding the two periods compared. Participants “rarely” brushed (31%) in the morning and “every time” (31%) at night before the pandemic. Individuals’ brushing frequency was also mentioned as “rarely” (27%) in the morning and “every time” (33%) at night during the pandemic.

Oral health has always been an integral part of individuals’ general health, and the importance of maintaining it has become even more remarkable in the COVID-19 period. Studies have shown that bacterial superinfections added to viral infection affect hospitalization and intensive care needs in individuals with COVID-19 infection.^{2,3,12} The metagenomic examinations of samples isolated from these bacterial infections are *Prevotella*, *Fusobacterium*, and *Staphylococcus*, frequently found in the oral cavity.¹³⁻¹⁸ Although children were not in the risqué group, the beforementioned effects could play a role in the prog-

nosis of the disease if they are infected.¹⁹ Accordingly, in the current study, the effect of the COVID-19 pandemic on the brushing habits of pediatric patients was aimed to be assessed.

The primary provider of oral hygiene is tooth brushing.¹⁹ In addition, the use of various disinfectant mouthwashes with dental floss and interdental brush is also recommended.²⁰⁻²² Although the disinfectant effect of mouthwash is higher than toothpaste, since these attempts are preferred less frequently than toothbrushing in daily oral hygiene practices of pediatric patients, we preferred to ask about the brushing habits of individuals in the recent study.^{21,22} Morning and night routine was asked since brushing twice a day is the most recommended oral health instruction by the American Association of Pediatric Dentistry.²³ The routine dietary changes and the differences in carbohydrate consumption might have also been assessed in the questionnaire. However, considering the time spent at the clinics was tried to

be lessened due to the pandemic conditions, only the changes in the brushing habits were aimed to be asked as quickly as the researchers could. The limited number of the questions included in the questionnaire can be attributed to this fact.

The current survey study was held on a limited population admitted to our university clinics. It is a fact that the number of patients admitted to dental health care centers has shown a remarkable decrease, especially in the early periods of the pandemic. Accordingly, the number of participants was chosen according to the minimum number regarding the statistical analyses. A previous study aimed to assess the effect of the COVID-19 pandemic on oral hygiene, oral health, and dietary lifestyle of the Italian pediatric population. The total number of participants who completed the questionnaire was 225.²⁴ Although the questionnaire was sent to individuals via online platforms in this previous study, the number of the participants was compatible with the current study we held. Considering the lockdown and decrease in the dental health care delivery practices, taking into account that the survey was performed on the patients referred to our clinics, not via online platforms, the limited number of participants seems acceptable in the current study we held.

The study population was chosen in the age range of 3-15. The age group that the public pediatric dental health services deal with has a limit of 15 years. Considering the limited patient number referring to dental services and the uncertainty of the length of the pandemic period, all the pediatric patients in the age range of public dental health service were included in the survey study, and the study was planned to last in a curtail period. Considering that homeschooling during the pandemic period was one of the preconditions of including criteria, the children younger than three years (kindergarten period) were excluded from the study. This range of participants' age was also compatible with the similar previous studies held by Docimo et al. and Gotler et al.^{24,25}

The current study showed no statistical difference between the age groups and brushing habits in pandemic and pre-pandemic periods. Girls' brushing frequencies at night (every time-32.7%) were found

to be higher than the boys' (every time-28.1%) ($p=0.017$) in the pre-pandemic period, consistent with the previous studies in which the relation with personal hygiene habits and the gender was assessed.^{26,27}

Parents' education degrees, mostly the mothers' academic status, affect the children's oral hygiene habits.²⁸ The present study detected that the children whose parents were educated with university degrees brushed their teeth at night during the pandemic more frequently than those who were educated with under-college degrees ($p=0.024$). This finding was consistent with the relationship between parents' education and children's oral hygiene habits.²⁸

The participants "rarely" brushed (31%) in the morning and "every time" (31%) at night before the pandemic. During the pandemic, individuals' brushing frequency was also mentioned as "rarely" (27%) in the morning and "every time" (33%) at night. Although no statistical difference was detected between these findings, it was apparent that the brushing frequencies of individuals were limited in the morning, and the participants seemed to be more prone to brush at night.

Previously, a study was conducted to examine the relationship between children's oral hygiene, sleep patterns, and disorders.¹⁰ Another study also assessed the difference in the tooth brushing habits of the children during the pandemic. Accordingly, a decrease in oral hygiene habits in the pediatric population due to social distance, isolation, increased time spent at home, inability to socialize, and distance education was detected.^{10,25} However, in the recent study, although the exact conditions were prevalent for the pediatric population, no difference was seen in the oral hygiene habits between the two-period compared. It may be attributed to the fact that oral hygiene habits of the Turkish pediatric population have already been insufficient, so the effect of online education or the other restrictions may not impact these habits significantly.²⁹ In addition to that, though the participants were prone to brush at night, and the factors like social isolation and homeschooling mostly seem to be related to the morning brushing routines, the constancy in the brushing habits could be seen as predictable.

In another study, which has performed to observe the eating and brushing habits of the pediatric population during the period of the COVID-19 pandemic, no statistically significant differences were observed between the frequency of children's tooth-brushing before and after the COVID-19 outbreak, and these results were supporting the data we observed.³⁰

İnce and Aksoy held another similar study, including the adults and pediatric patients referred to the Afyonkarahisar Oral Health Center. Accordingly, the brushing frequencies of children were found non-affected by the conditions of the pandemic period, similar to the recent study. However, an increase was observed in the brushing habits of the adults in this previous study.¹¹

This study was held on a limited population living in a specific district of Ankara and with a group of children who stayed at home from the early days of the pandemic. These situations may be mentioned as the limitation of the study. The study can be extended by considering a large number of participants and including different areas of the country with different social-economical, educational and cultural statuses.

CONCLUSION

Although an increase in tooth brushing habits was supposed to be seen in the pandemic period, the recent study showed that this situation was not detected in the pediatric population referred to our clinics. Different variables such as age, gender, socio-economic status, and parents' education may affect oral hy-

giene. This study was conducted in a limited pediatric population in Ankara and homeschooling since the pandemic was announced. The results may be changed if they can be repeated in a significant population living in different social areas, including the difference between online and face-to-face education. However, it is still promising to examine that brushing habits of the pediatric population were not affected adversely during the period of the COVID-19 pandemic.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Merve Aksoy, Sultan İnce; **Design:** Merve Aksoy, Sultan İnce; **Control/Supervision:** Kübra Gülnur Topsakal; **Data Collection and/or Processing:** Merve Aksoy; **Analysis and/or Interpretation:** Cenkhan Bal; **Literature Review:** Merve Aksoy, Sultan İnce; **Writing the Article:** Merve Aksoy, Sultan İnce, Kübra Gülnur Topsakal; **Critical Review:** Cenkhan Bal, Kübra Gülnur Topsakal; **References and Fundings:** Merve Aksoy, Cenkhan Bal, Kübra Gülnur Topsakal; **Materials:** Merve Aksoy.

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