DOI: 10.14744/cm.2025.71501
Compreh Med 2026;18(1):59-66

RESEARCH ARTICLE

Oral Hygiene in Focus: A Comparative Study Between Children with Rheumatic Disease and Their Healthy Peers

Büşra Başer Taşkın[1], Gülşah Kavrul Kayaalp[1], Selen Duygu Arık[1], Ayşenur Doğru Kılınç[1], Bengisu Menentoğlu[1], Ahmet Taşkın[2], Özlem Akgün[1], Nuray Aktay Ayaz[1]

[1]Division of Pediatric Rheumatology, Department of Pediatrics, İstanbul University Faculty of Medicine, İstanbul, Türkiye
[2]Division of Pediatric Neurology, Department of Pediatrics, İstanbul Medipol University, İstanbul, Türkiye

ABSTRACT

Objective: This study investigates the oral health status and hygiene practices of children with rheumatic diseases compared to healthy peers. It emphasizes the need to integrate dental care into managing these chronic conditions.

Materials and Methods: Children under 18 years of age with rheumatic diseases were recruited from a pediatric rheumatology clinic. Demographic, diagnostic, and treatment data were collected, and a survey administered via Google Forms assessed general information, oral hygiene practices, and education.

Results: The study included 303 participants: 150 with rheumatic diseases and 153 healthy controls. The results indicated that while dental visit frequency was similar between groups, children with rheumatic diseases were more likely to use manual toothbrushes (93.3% vs. 75.2%) and non-fluoride toothpaste. Both groups showed limited knowledge about toothpaste ingredients, but patients demonstrated slightly less awareness. Many participants had not attended oral hygiene workshops, although there was significant interest in further education.

Conclusion: The findings show differences in oral hygiene between children with rheumatic diseases and healthy controls, highlighting the need for targeted care and better rheumatologist-dentist collaboration.

Keywords: Dental health education, oral hygiene, rheumatology, toothbrushing

How to cite this article: Başer Taşkın B, Kavrul Kayaalp G, Arık SD, Doğru Kılınç A, Menentoğlu B, Taşkın A, et al. Oral Hygiene in Focus: A Comparative Study Between Children with Rheumatic Disease and Their Healthy Peers. Compreh Med 2026;18(1):59-66

INTRODUCTION

Pediatric rheumatic diseases (PedRDs) are conditions affecting the joints, muscles, and connective tissues. They mainly include autoinflammatory diseases, juvenile idiopathic arthritis (JIA), connective tissue diseases, and vasculitis, which each have their own set of symptoms and treatment approaches. The treatment plans usually comprise a combination of anti-inflammatory agents and conventional, biological, or targeted synthetic disease-modifying antirheumatic drugs. Regular follow-ups with a pediatric rheumatology healthcare team are of utmost importance for monitoring the disease and making the required arrangements during follow-up. Recent studies have increasingly emphasized the importance of multidisciplinary management in pediatric rheumatology, highlighting how systemic inflammation may influence oral health and vice versa.[1,2]

Upon in-depth evaluation of children with chronic diseases, physicians are now aware of many issues that can improve patients' well-being, such as regular exercise, a healthy diet, and avoiding smoking. Although oral hygiene constitutes an important part of overall well-being in children, it remains an understudied topic in pediatric rheumatology. Oral hygiene involves dental and periodontal health, which are interconnected in a two-way relationship with overall

Address for Correspondence: Nuray Aktay Ayaz, Division of Pediatric Rheumatology, Department of Pediatrics, İstanbul University Faculty of Medicine, İstanbul, Türkiye
E-mail: nurayaktay@gmail.com **ORCID ID:** 0000-0003-3594-7387

Received date: 07.08.2025
Revised date: 29.10.2025
Accepted date: 09.12.2025
Online date: 23.01.2026

systemic health. The oral cavity harbors the second-largest microbiota in the human body, following the gut. Dysbiosis in the oral and intestinal microbiomes has been demonstrated in patients with rheumatoid arthritis and other systemic inflammatory diseases through metagenome-wide association studies (MGWAS). Such microbial imbalance may contribute to systemic inflammation and disease activity. Therefore, incorporating dental evaluations into routine rheumatologic care and referring patients to dentists after diagnosis may improve both oral and systemic health outcomes. The condition of the mouth and gums can affect the body, and conversely, systemic well-being can impact oral health as well. Inflammation of the oral cavity is related to the spread of pathogenic microbes to remote body regions, which can cause systemic infection. Maintaining good oral hygiene is critical, as it can help prevent various dental issues such as cavities and gum disease, which may be a source of infection.[3]

The relationship between rheumatologic conditions and oral hygiene lies in the potential impact of these diseases on oral health. Some rheumatologic conditions, such as Sjögren's syndrome, can affect the salivary glands, leading to dry mouth and an increased risk of dental problems. Juvenile idiopathic arthritis has been linked to the development and progression of gingival inflammation, which may make periodontal diseases a significant problem for these patients.[4]

Additionally, medications used may have side effects that affect oral health, such as causing gum inflammation or increased susceptibility to infections. For example, methotrexate is known to often cause ulceration in the mouth, and the use of biologic disease-modifying antirheumatic drugs (bDMARDs) can lead to adverse oral effects manifested as mucosal changes. Therefore, individuals with rheumatologic diseases should pay extra attention to their oral hygiene routine, including regular dental check-ups, proper brushing and flossing, and maintaining good overall oral health practices.[5]

The aim of this study was to investigate the oral health status and hygiene habits of children with rheumatologic diseases followed up in the pediatric rheumatology outpatient clinic and to compare them with healthy controls.

MATERIALS and METHODS

Study Design and Survey Content

Patients under 18 years of age diagnosed with a rheumatic disease were recruited from a tertiary pediatric rheumatology clinic. The healthy control group was carefully matched to the patient group in terms of age and gender to ensure comparability. Healthy volunteers were recruited from the same community as the patient group, primarily among children attending the general pediatric outpatient clinics of our institution, with no known chronic or autoimmune disease. Demographic data, diagnosis, and treatment modalities were recorded from the patient files. The survey was administered through the Google Forms platform. The survey began with a brief description of the study's aims, and participants were asked to answer as accurately as possible. Each patient was asked to provide informed online consent explaining the purpose of the study and was given authorization to use the collected data.

Informed consent was obtained electronically from all participants and/or their legal guardians before the Google Form was sent, in accordance with institutional and ethical guidelines.

The survey was divided into three sections: general information, oral hygiene, and oral hygiene education. The questionnaire comprised two open-ended questions and 17 multiple-choice questions. Some questions were connected, so answering one question affected the ability to answer the next one. A comparative analysis was conducted between patients and healthy controls.

The complete questionnaire used in this study has been provided as Supplementary Material.

Statistical Analysis

IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis to evaluate the results of the study. Descriptive analyses were presented using appropriate measures such as proportions, medians, and interquartile range (IQR). Variables were compared between cases and controls using the chi-squared test or the Fisher exact test (two-tailed) for categorical variables. The Shapiro-Wilk test was used to test the normality of distribution for continuous variables. The Mann-Whitney U test was used to compare non-normally distributed continuous data between groups. $P<0.05$ was considered statistically significant.

Ethics

Written consent was obtained from each patient and control, or from their parent or guardian. Ethical approval for the study protocol was obtained from the Clinical Research Ethics Committee of Istanbul University, Istanbul Faculty of Medicine (Approval No: 2834454/23.08.2024). The study was conducted in compliance with the Declaration of Helsinki.

Table 1. Demographic characteristics in the cohort

Category	Patients (n=150)		Healthy controls (n=153)		p
	n	%	n	%	
Age (years), median (IQR)	13.0 (9.75–16)		12.0 (9.0–14.75)		0.06[ac]
Gender (female)	83	55.3	89	58.2	0.62[b]
Diagnosis of patients					
Familial mediterranean fever	64	42.7			
Juvenile idiopathic arthritis	25	16.7			
IgA vasculitis	14	9.3			
Behcet's disease	8	5.3			
Systemic lupus erythematosus	6	4.0			
Others	33	22.0			
Users of biologic disease-modifying antirheumatic drugs	37	24.7			

[a]: Mann Whitney U test; [b]: Chi-square test; [c]: p<0.05, statistically different. IQR: Interquartile range

RESULTS

A survey evaluating the oral hygiene habits of a total of 303 individuals was conducted. Among the respondents, 153 were healthy controls, and 150 were patients with rheumatic diseases. The median age of the patients was 13 (IQR: 9.75–16) years, while the median age of the healthy group was 12 (IQR: 9–14.75) years (p=0.06). Demographic characteristics and diagnoses of the patients are presented in Table 1.

The disease subgroups included Familial Mediterranean Fever (n=64, 42.7%), juvenile idiopathic arthritis (n=25, 16.7%), IgA vasculitis (n=14, 9.3%), Behçet's disease (n=8, 5.3%), systemic lupus erythematosus (n=6, 4.0%), and other connective tissue or vasculitic diseases (n=33, 22.0%). No statistically significant differences were observed between disease subgroups (FMF, JIA, IgA vasculitis, and others) and the type of toothbrush used (p=0.403), tooth-brushing frequency (p=0.752), or tooth-brushing duration (p=0.976).

When asked whether they had previously visited a dentist, 122 patients (81.3%) and 123 healthy controls (80.4%) answered affirmatively (p=0.83). The frequency of dental visits was higher between the ages of 5–9 in both groups, with 62 individuals (40.5%) in the healthy group and 55 individuals (36.7%) among the patients. There was no significant difference between the patient and healthy control groups in terms of tooth brushing habits, brushing times, flossing rate, and toothpaste content. The type of toothbrush used was predominantly manual, while the rate of electric toothbrush use was significantly higher in the healthy group (p<0.001) (Table 2).

Thirty-seven patients were taking biological disease-modifying antirheumatic drugs. Among these patients, 32 (86.5%) had previously visited a dentist, with the most common age group being 5–9 years (37.8%). The typical brushing time for these patients was 1–2 minutes (37.8%), and the preferred toothbrush choice was predominantly manual (89.2%). Within this group, 25 (67.6%) were unaware of the ingredients of toothpastes, with the most common type used being fluoride-free (64.9%). Approximately 56.8% of the patients in this group had not participated in any oral hygiene workshops, and an equal percentage expressed no interest in acquiring further information on oral hygiene practices.

Oral hygiene education from families was the most common source (74% in the patient group and 63.4% in the healthy group), with no significant difference compared to other parameters (p=0.22). Ninety-two patients (61.3%) and 102 controls (66.7%) reported not attending informative meetings about dental hygiene, with no significant difference compared to those who attended (p=0.33). Seventy-four patients (49.3%) and 104 controls (68%) said they would like to learn more about oral health (p<0.001) (Table 3).

DISCUSSION

Our study revealed that although the frequency of dental visits was similar between groups, children with rheumatic diseases were more likely to use manual toothbrushes and non-fluoride toothpaste. This finding underscores the need for improved oral hygiene awareness among this population.

Table 2. Oral hygiene habits

Category	Patients (n=150)		Healthy controls (n=153)		p
	n	%	n	%	
Have visited a dentist at least once	122	81.3	123	80.4	0.84[a]
Age at first dental visit?					0.638[a]
0–4 years	23	15.3	28	18.3	
5–9 years	55	36.7	62	40.5	
10–12 years	26	17.3	19	12.4	
>13 years	18	12	14	9.2	
How many times a day do you brush your teeth?					0.099[a]
Once a day (morning)	39	26	29	18.9	
Once a day (evening)	30	20	39	25.5	
Twice a day	76	50.7	72	47.1	
Three times	5	3.3	13	8.5	
How long do you brush your teeth?					0.636[a]
0–1 minute	39	26	36	23.5	
1–2 minutes	72	48	73	47.7	
2–3 minutes	31	20.7	39	25.5	
More than 3 minutes	8	5.3	5	3.3	
Children who brush their teeth before bed	113	75.3	124	81	0.23[a]
What type of toothbrush do you use?					0.001[ac]
Manual	140	93.3	115	75.2	
Electric	10	6.7	38	24.8	
Have you ever used dental floss?					0.088[a]
Never used	123	82	113	73.9	
Dental floss users	27	18	40	26.1	
Using other oral hygiene products at home	20	13.3	31	20.3	0.1[a]
If any, other products for oral hygiene					
Mouthwash	17	11.3	30	19.6	
Tongue cleaner	3	2.0	1	0.7	
Knowledge of toothpaste ingredients	60	40	78	8.4	0.14[a]
Children who use fluoride toothpaste	68	45.3	74	48.4	0.59[a]
Those who know the fluoride content of toothpaste	2	2.9	7	9.5	0.169[b]
Do you use braces?	6	4.0	4	2.6	0.54[b]
Have you ever had braces?	7	4.7	9	5.9	0.64[a]

[a]: Chi-square test; [b]:Fisher's exact test; [c]: p<0.05, statistically different

Aphthous stomatitis is a common manifestation in rheumatologic diseases. Recent studies have shown that the use of Sodium Lauryl Sulfate (SLS)-free toothpaste can reduce the frequency of recurrent aphthous ulcers compared with SLS-containing dentifrices. This finding highlights the potential relevance of toothpaste composition in maintaining oral health among pediatric rheumatology patients.[6]

According to the 2020 data from the Turkish Statistical Institute (TÜİK), the demographic group of children aged 5 to 14 years represents 15% of Turkey's total population. Given their significant representation, there is a pressing need to emphasize preventive and therapeutic services tailored to school-aged children for the betterment of public health. Furthermore, based on 2019 data from TÜİK, oral and den-

Table 3. Oral hygiene education

Category	Patients (n=150)		Healthy controls (n=153)		p
	n	%	n	%	
Who has educated you about oral hygiene?					0.22[a]
Family	111	74	97	63.4	
Dentist	25	16.7	36	23.5	
Internet	5	3.3	5	3.3	
No one	9	6.0	15	9.8	
Previous participation in oral health seminars	51	33.3	58	38.7	0.33[a]
Children who want to learn more about oral hygiene	104	68	74	49.3	0.001[ab]

[a]: Chi-square test; [b]: p<0.05, statistically different

tal health issues rank among the top five diseases affecting children aged 0–6 years (6.4%) and are the third most prevalent in the 7–14 age group (14.2%) in Türkiye.[7,8] This is a very important point for patients with chronic diseases such as JIA. Studies indicate that inadequate oral hygiene among JIA patients correlates with functional limitations in upper extremities and involvement of the temporomandibular joint. It's not surprising that proper brushing technique can be compromised by pain and restricted movement caused by hand and wrist involvement.[9]

Additionally, Yıldızer Keriş et al.[10] reported an elevated prevalence of temporomandibular joint disorders and oral health issues in rheumatic diseases such as rheumatoid arthritis (RA), primary Sjögren's syndrome (pSS), and ankylosing spondylitis, compared to healthy individuals. These findings underscore the intricate relationship between systemic rheumatic diseases and oral health outcomes. However, to the best of our knowledge, our study is the first to show this condition in patients with JIA. According to our results, patients had higher rates of tooth brushing than controls, but the difference was not statistically significant. As oral mucosal involvement is common in rheumatic diseases and may affect the quality of life of patients, and in some conditions, the outcome of the disease, considerable attention should be paid to this issue.

It is widely emphasized across various sources that children should be introduced to tooth brushing habits by the age of three, with brushing sessions lasting at least two to three minutes.[11] During the school years, it is advised that children engage in a daily oral hygiene routine by brushing their teeth a minimum of twice per day and participate in periodic dental examinations to ensure optimal oral health.[12] Establishing the habit of brushing teeth twice a day—in the morning before breakfast and at night after the last drink—is crucial for maintaining good oral hygiene by removing plaque and preventing dental caries and gum disease.[13]

When we examine the studies performed in healthy children, we find various reports. Çan et al.[14] reported that 25% of students brushed their teeth after every meal, whereas 75% brushed at least once a day. Meanwhile, Öztürk et al.[15] observed that 47.3% of students brushed their teeth 2–3 times daily. In our study, data indicates that a significant proportion of both patients and individuals in the control group adhere to these recommendations, with 50.7% of patients and 47.1% of controls reporting brushing their teeth twice daily. The slightly higher rate may suggest that individuals with rheumatic diseases may be more attentive to their oral health needs. This could be due to increased awareness prompted by their medical condition or advice from healthcare providers regarding the importance of oral hygiene in managing overall health.

Esmeray et al.[2] evaluated the oral health of children with Familial Mediterranean Fever through clinical dental examinations and reported poorer oral health compared with healthy controls. Both studies emphasize that oral health remains an underrecognized aspect of pediatric rheumatology and highlight the importance of preventive care and close collaboration between rheumatologists and dentists.

While the overall rates are similar between the groups, factors such as education level, socioeconomic status, and access to dental care may influence brushing habits. A limitation of this preliminary study is the lack of evaluation of these aspects in the cohort. As addressing factors that may influence tooth brushing habits may help im-

prove oral health outcomes, the researchers are planning future studies to better understand disparities in oral hygiene practices and develop targeted interventions to promote consistent tooth brushing habits by exploring these variables.

Despite a slightly higher prevalence of bedtime brushing in the healthy control group, no statistically significant difference was found between the two groups. This indicates that both groups generally adhere to the recommended practice of brushing before bedtime, which is crucial for removing plaque accumulated throughout the day and preventing dental issues such as cavities and gum disease.

In both groups of the research, the most frequently reported duration for tooth brushing was 1–2 minutes. Similarly, Öztürk et al.[15] found that 86.6% of students spent over one minute brushing their teeth. This duration is generally considered sufficient for effectively removing plaque and maintaining oral hygiene.

There was a significant difference between the groups in terms of the type of toothbrush used, favoring manual toothbrushes in patients (p=0.001). This disparity may reflect varying preferences or recommendations influenced by factors such as healthcare provider advice, accessibility, or cost considerations. Electric toothbrushes appear to be a beneficial alternative for patients with rheumatoid arthritis (RA), who may find manual brushing movements challenging and painful. However, only 10 patients (6.7%) used electric toothbrushes in our cohort. Children can be educated about these alternatives, which may have an impact on their compliance with tooth brushing recommendations.

The American Academy of Pediatric Dentistry and the European Federation of Periodontology advocate for the use of fluoride toothpaste as a measure to protect against dental caries.[16,17] Fluoride is an important ingredient in toothpaste, known for its ability to remineralize tooth enamel and protect teeth from decay.[18,19] The addition of dental floss and interdental brushing to tooth brushing effectively removes plaque from interdental spaces. According to our study, a significant proportion of the patient and control groups were unaware of the contents of toothpastes, and about half of the patients used toothpastes that did not contain fluoride.

Effective oral hygiene practices, such as flossing and mouthwash, are essential. Interestingly, only 7.3% of the patients and 13.7% of the control group used dental floss, and it was statistically more common among girls in both groups. The study by Walsh et al.[20] highlighted a stark contrast, where 75% of participants flossed Daily. These findings underscore cultural and regional variations in oral hygiene practices and highlight the importance of promoting consistent oral care routines globally.

Regular dental visits play a critical role in preserving oral health and preventing dental conditions. Despite the average number of individuals per dentist being higher in Türkiye (approximately 2300) compared to European Union countries (1500),[21] a significant majority of both patients and individuals in the control group reported having visited a dentist previously when queried about their dental history. The World Health Organization (WHO) emphasizes the importance of specific age groups and criteria for assessing community oral health and recommends assessments at 5, 12, and 15 years of age.[22] A notable finding of this study was the difference in dental visit patterns between different age groups. Both patients and control subjects had more frequent dental visits between the ages of 5 and 9. This period coincides with early childhood, a crucial time for establishing basic oral health habits and receiving preventive dental care.

The establishment of oral hygiene practices in childhood begins with parental guidance at home and continues throughout life.[23] Similarly, family members were identified as the primary oral hygiene educators in both the patient and healthy control groups. These findings highlight the central role of the family in shaping oral hygiene habits and knowledge in both patients and healthy individuals. Emphasizing oral health during these formative years is critical to improving and sustaining dental health outcomes in diverse patient populations. Unfortunately, a significant percentage of individuals in both cohorts reported not attending oral health education sessions.

A notable disparity was observed between patients and controls in their interest in advancing their knowledge of oral health. Patients with rheumatic diseases may have unique challenges related to oral hygiene due to their underlying condition or medications. It's essential for healthcare providers to educate these patients about the importance of maintaining good oral hygiene practices despite any challenges posed by their condition.[24] Tailored educational initiatives that underscore the crucial link between oral health and overall systemic well-being could prove beneficial. Such interventions might involve integrating comprehensive oral health education into rheumatic disease management protocols or employing patient-centered strategies to enhance engagement.

The study has several limitations that should be acknowledged. Although the sample size was considerable, it was not very large, which may limit the generalizability of the findings to larger populations with rheumatic diseases. In addition, this study was based solely on self-report measures rather than standardized clinical examinations. Studies incorporating comprehensive dental examinations to evaluate clinical factors, the effects of oral hygiene and dietary behaviors, and the social determinants of health identified in prior research seem to be beneficial.

CONCLUSION

This survey offers valuable insights into the oral hygiene practices of patients with rheumatic diseases in comparison to healthy controls. Understanding these habits is crucial as they directly impact oral health outcomes. A closer collaboration between rheumatologists and dentists is essential to promote proper hygiene measures and to address and prevent potential oral complications effectively. We anticipate that this paper will serve as a valuable resource for evaluating public health policies and encourage colleagues to develop and implement strategies aimed at enhancing patient care.

Disclosures

Ethics Committee Approval: The study was approved by the Istanbul University, Istanbul Faculty of Medicine Ethics Committee (No: 2834454, Date: 23/08/2024).

Informed Consent: Written informed consent was obtained from the parents.

Conflict of Interest Statement: The authors declare that there is no conflict of interest to disclose.

Funding: No specific funding was received from any bodies in the public, commercial or not-for-profit sectors to carry out the work described in this article.

Use of AI for Writing Assistance: No artificial intelligence (AI)-assisted technologies (such as Large Language Models [LLMs], chatbots, image generators, or tools like ChatGPT) were used in the preparation, writing, analysis, or submission of this manuscript.

Author Contributions: Concept – B.B.T., S.D.A., A.D.K.; Design – B.B.T., G.K.K., N.A.A.; Supervision – Ö.A., N.A.A.; Fundings B.B.T., N.A.A.; Materials A.D.K., B.B.T., B.M.; Data collection and/or processing – S.D.A., N.A.A, A.D.K.; Data analysis and/or interpretation – Ö.A., A.T.; Literature search – B.M., A.T.; Writing – B.B.T.

Peer-review: Externally peer-reviewed.

REFERENCES

1. Skeie MS, Gil EG, Cetrelli L, Rosén A, Fischer J, Åstrøm AN, et al. Oral health in children and adolescents with juvenile idiopathic arthritis - a systematic review and meta-analysis. BMC Oral Health 2019;19:285. [CrossRef]
2. Esmeray P, Keçeli T, Tekçiçek M, Batu ED, Arıcı ZS, Ünlü HK, et al. Oral health status in children with familial Mediterranean fever. Turk J Pediatr 2021;63:443–49. [CrossRef]
3. Kumar PS. From focal sepsis to periodontal medicine: a century of exploring the role of the oral microbiome in systemic disease. J Physiol 2017;595:465–76. [CrossRef]
4. Gualtierotti R, Marzano AV, Spadari F, Cugno M. Main oral manifestations in immune-mediated and inflammatory rheumatic diseases. J Clin Med 2018;8:21. [CrossRef]
5. Carpenter EH, Plant MJ, Hassell AB, Shadforth MF, Fisher J, Clarke S, et al. Management of oral complications of disease-modifying drugs in rheumatoid arthritis. Br J Rheumatol 1997;36:473–8. [CrossRef]
6. Alli BY, Erinoso OA, Olawuyi AB. Effect of sodium lauryl sulfate on recurrent aphthous stomatitis: A systematic review. J Oral Pathol Med 2019;48:358–64. [CrossRef]
7. Kalyoncu C, Metintas S, Balız S, Arıkan İ: The level of health in elementary school students in training and research areas and evaluation of school screening examination results. TAF Preventive Medicine Bulletin 2011;10:511. [CrossRef]
8. Şişko E, Dağhan Ş. What do the results of oral and dental health research on school-age children tell us in Turkey? Sürekli Tıp Eğitimi Dergisi 2022;31:67–80. [Turkish]
9. Merle CL, Hoffmann R, Schmickler J, Rühlmann M, Challakh N, Haak R, et al. Comprehensive assessment of orofacial health and disease related parameters in adolescents with juvenile idiopathic arthritis-a cross-sectional study. J Clin Med 2020;9:513. [CrossRef]
10. Yıldızer Keriş E, Yaman SD, Demirağ MD, Haznedaroğlu Ş. Temporomandibular joint findings in patients with rheumatoid arthritis, ankylosing spondylitis, and primary Sjögren's syndrome. J Investig Clin Dent 2017;8:e12255. [CrossRef]
11. Güler Ç. Kişisel hijyen. TSK Koruyucu Hekimlik Bülteni 2004;3:119–132. [Turkish]
12. Toumba KJ, Twetman S, Splieth C, Parnell C, van Loveren C, Lygidakis N. Guidelines on the use of fluoride for caries prevention in children: an updated EAPD policy document. Eur Arch Paediatr Dent 2019;20:507–16. [CrossRef]
13. Kuusela S, Honkala E, Rimpelä A. Toothbrushing frequency between the ages of 12 and 18 years-- longitudinal prospective studies of Finnish adolescents. Commun Dent Health 1996;13:34–9.
14. Can G, Topbas M, Kapucu M. The personal hygiene habits of the primary school students in two diffrent living areas of Trabzon. TAF Prevent Med Bullet 2004;3:170–7.
15. Öztürk M, Dicle A, Sarı H, Bektaş M. Determine health situation of school children. Milli Eğitim Dergisi 2004;163. [Turkish]
16. Policy on the use of fluoride. Available at: https://www.aapd.org/media/policies_guidelines/p_fluorideuse.pdf Accessed Jan 09, 2025.
17. European Academy of Paediatric Dentistry. Guidelines on the use of fluoride in children: an EAPD policy document. Eur Arch Paediatr Dent 2009;10:129–35. [CrossRef]
18. Holmes RD: Tooth brushing frequency and risk of new carious lesions. Evid Based Dent 2016;17:98–9. [CrossRef]
19. Zimmermann H, Zimmermann N, Hagenfeld D, Veile A, Kim TS, Becher H. Is frequency of tooth brushing a risk factor for periodontitis? A systematic review and meta-analysis. Community Dent Oral Epidemiol 2015;43:116–27. [CrossRef]

20. Walsh MM. Effects of school-based dental health education on knowledge, attitudes and behavior of adolescents in San Francisco. Commun Dent Oral Epidemiol 1985;13:143–7. [CrossRef]
21. TDB. Ülke kaynaklarının israf edilmemesi için; dişhekimliği fakültesi açılmamalıdır Available at: https://www.tdb.org.tr/icerik_goster.php?Id=3506 Accessed on Jan 09, 2025.
22. World Health Organization. Oral Health Surveys: Basic Methods. 4th ed. Geneva: World Health Organization; 1997.
23. Okada M, Kawamura M, Kaihara Y, Matsuzaki Y, Kuwahara S, Ishidori H, Miura K. Influence of parents' oral health behaviour on oral health status of their school children: an exploratory study employing a causal modelling technique. Int J Paediatr Dent 2002;12:101–8. [CrossRef]
24. Wendt LK, Hallonsten AL, Koch G, Birkhed D. Analysis of caries-related factors in infants and toddlers living in Sweden. Acta Odontol Scand 1996;54:131–7. [CrossRef]